DOCKETED	
Docket Number:	21-BSTD-02
Project Title:	2022 Energy Code Update CEQA Documentation
TN #:	239176
Document Title:	Final Environmental Impact Report
Description:	The Final Environmental Impact Report (EIR) consists of revisions to the Draft EIR, comments received on the Draft EIR, a list of persons, organizations, and public agencies that commented on the Draft EIR, the CEC staff's responses to significant environmental points raised in the review and consultation process, and other information added by the CEC staff. The Draft EIR was released for public review on May 19, 2021.
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Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	8/4/2021 8:54:54 AM
Docketed Date:	8/4/2021

CALIFORNIA
ENERGY COMMISSION

California Energy Commission

Final Environmental Impact Report

Amendments to the Building Energy Efficiency Standards (2022 Energy Code)

August 4, 2021
Docket Number 21-BSTD-02 | CEC-400-2021-007-F
State Clearinghouse Number 2021030504

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Chapter 1

Introduction

Introduction

On May 19, 2021, the California Energy Commission (CEC) released for public review a Draft Environmental Impact Report (Draft EIR) that evaluated the potential environmental impacts of its proposed 2022 amendments to the California Building Energy Efficiency Standards.

The CEC amends the Building Energy Efficiency Standards, contained in the California Code of Regulations, title 24, part 6 (hereinafter, the "Energy Code") on a three-year cycle. The CEC is required to regularly amend the Energy Code "to reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy, including the energy associated with the use of water, and to manage energy loads to help maintain electrical grid reliability."[1] The proposed 2022 amendments, if adopted, would be incorporated into the 2022 edition of the Building Energy Efficiency Standards and become effective on January 1, 2023. The proposed 2022 amendments to the Energy Code are hereinafter referred to as the "Project," "2022 amendments," or "Energy Code updates."

This Final Environmental Impact Report (Final EIR) has been prepared to comply with the requirements of the California Environmental Quality Act (CEQA),[2] Public Resources Code Section 21000 et seq., and the guidelines in California Code of Regulations, title 14, section 15000 et seq. (CEQA Guidelines).[3] The CEC is the lead agency under CEQA for consideration of this Final EIR and potential Project approval. Pursuant to CEQA Guidelines section 15132, this Final EIR consists of revisions to the Draft EIR, comments received on the Draft EIR, a list of persons, organizations, and public agencies that commented on the Draft EIR, the CEC staff's responses to significant environmental points raised in the review and consultation process, and other information added by the CEC staff.

1 Pub. Resources Code §§ 25402(a)-(b).

2 Pub. Resources Code § 21000 et seq. (The CEQA statutes generally require state and local government agencies to inform decision makers and the public about the potential environmental impacts of proposed projects and to reduce those environmental impacts to the extent feasible.)

3 Cal. Code of Regs., tit. 14, § 15000 et seq. (Guidelines) (Details the protocol by which state and local agencies comply with CEQA requirements.) Hereinafter the Guidelines are cited as "CEQA Guidelines, § ____."

1.1 Public Review and Response to Comments

In accordance with CEQA Guidelines sections 15087 and 15105, the Draft EIR was circulated for public review from May 20, 2021, to July 8, 2021. Prior to circulation, a public scoping meeting was held on April 9, 2021. During the public review period, the CEC received six comment letters. The comment letters received on the Draft EIR and responses to each of the comments are provided in Chapter 2, "Comments and Responses to Comments."

Although some of the comments received during the public review period resulted in revisions or clarifications to the Draft EIR (See Attachment A, "Draft EIR With Revisions"), none of the revisions and clarifications constitute "significant new information" that would require recirculation of the Draft EIR. Significant new information is defined in CEQA Guidelines section 15088.5(a) as:

1) A new significant environmental impact would result from the project or from a new mitigation measure proposed to be implemented.
2) A substantial increase in the severity of an environmental impact would result unless mitigation measures are adopted that reduce the impact to a level of insignificance.
3) A feasible project alternative or mitigation measure considerably different from others previously analyzed would clearly lessen the environmental impacts of the project, but the project's proponents decline to adopt it.
4) The Draft EIR was so fundamentally and basically inadequate and conclusory in nature that meaningful public review and comment were precluded.

None of these circumstances has arisen from comments on the Draft EIR or the materials attached to the comments; therefore, recirculation is not required. Recirculation is also not required where new information added to the EIR merely clarifies or amplifies or makes insignificant modifications in an adequate EIR. In the response to comments some additional information is included to clarify existing detailed information and data in or referenced in the Draft EIR. This clarifying information also does not require recirculation.

The Draft EIR, Final EIR, and associated documents are available for review online at docket 21-BSTD-02 at:
https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=21-BSTD-02

To obtain a physical copy of the Draft EIR, Final EIR, and associated documents, please contact the CEC's Docket Unit at docket@energy.ca.gov or call (916) 654-5076. Physical copies may also be reviewed during the CEC's business hours at the following address:

California Energy Commission
Docket Unit, Third Floor
715 P Street

Sacramento, CA 95814

1.2 Organization of the Responses to Comments

Chapter 2 includes all written comments received on the Draft EIR and the CEC staff's responses to environmental issues raised in those comments. As required by Section 15088(c) of the State CEQA Guidelines, the focus of the responses to comments is on the disposition of significant environmental issues that are raised in the comments.

Each comment letter has been reproduced in Chapter 2. Responses to comments follow each issue raised in the comment letter. In some instances, the response to a comment letter resulted in revisions or clarifications to the text of the Draft EIR. The revisions and clarifications to the text of the Draft EIR are compiled in Attachment A, "Draft EIR With Revisions." The text deletions are shown in strikeout (~~strikeout~~) and additions are shown in underline (<u>underline</u>).

Chapter 3 includes all references, originally noted in the Draft EIR as well as supplemental references relied upon in responding to or rebutting comments; these supplemental references clarify or amplify the information, analyses, and conclusions in the Draft EIR.

Chapter 4 provides a list of the authors and reviewers of this Final EIR.

Attachment A includes the Draft EIR for this Project, with all revisions and clarifications made following the public review period in underline and strikethrough.

1.3 Comments that Require Responses

In accordance with CEQA Guidelines Section 15088(c), the responses to comments in this Final EIR focus on the disposition of significant environmental issues raised during the noticed comment period. Responses to comments are not required on comments raising issues not related to the Project's environmental impacts or regarding the merits of the Project. Comments on the merits of the proposed Project or comments that do not raise environmental issues will be reviewed by the CEC as part of 2022 amendments rulemaking docket, available at https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=21-BSTD-01, before an action is taken on the Project. The responses in this Final EIR indicate where issues raised are not environmental or address the merits of the Project and do not provide further response.

1.4 Project Decision Process

The Final EIR, which constitutes this document and the Draft EIR with Revisions, will be considered by the CEC Commissioners at a CEC business meeting before a decision on whether to approve the Project. As required by CEQA Guidelines Section 15090, if the CEC Commissioners decide to approve the Project, they must first certify that the Final EIR has been completed in compliance with CEQA's requirements, was reviewed and considered by the CEC Commissioners, and reflects the CEC's independent judgment and analysis.

Pursuant to CEQA Guidelines Section 15091, the CEC Commissioners would then be required to adopt findings on the disposition of each significant environmental impact. In the case of the proposed 2022 Energy Code Updates, no significant environmental impact would result; therefore, written findings pursuant to Section 15091 are not required. As such, in accordance with CEQA Guidelines Section 15092(b)(1), the CEC may decide to approve the 2022 Energy Code Updates for which the EIR was prepared because the Project will not have a significant effect on the environment.

1.5 Project Updates

On July 13, 2021, CEC staff published a Notice of 15-day Public Comment Period[4] and a set of 15-day express terms for the 2022 Energy Code,[5] which contains revisions to the original express terms published on May 6, 2021, noted in double underline and ~~double strike through~~. The 15-day express terms reflect CEC staff's consideration of public comments on the original express terms, and the majority of the main Project components contained in the project description for the Draft EIR are unaffected by the 15-day express terms. As noted below, the changes are not "significant new information" that would require recirculation of the EIR prior to certification because none of the changes have the potential to result in a significant environmental impact that was not fully disclosed and analyzed in the Draft EIR, and the insignificant Project modifications in the 15-day express terms do not alter the Draft EIR's conclusions that the Project[6] would not result in significant environmental impacts. To ensure analytical completeness, Section 3.4.1 was added to the Draft EIR on pages 46 to 47 to note the issuance of the 15-day express terms and modifications to the Draft EIR that resulted from the minor changes to the Project.

The following is a summary of the notable changes in the 15-day express terms as they relate to the analysis in the Draft EIR. Except for the final bullet point, which notes a change to Part 1, all proposed changes are to Title 24, Part 6, of the California Code of Regulations:

- **Section 110.2 – MANDATORY REQUIREMENTS FOR SPACE-CONDITIONING EQUIPMENT**: The changes to the equipment tables in Section 110.2 incorporate values found in the ASHRAE 90.1 standards that are currently

4 CEC staff. 2021. Notice of 15-day Public Comment Period. TN#238839. California Energy Commission. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=238839.

5 CEC staff. 2021. 15-Day Express Terms 2022 Energy Code - Residential and Nonresidential. TN#238848. California Energy Commission. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=238848.

6 CEQA Guidelines, § 15088.5.

undergoing a federal adoption process led by the U.S. Department of Energy. Federal law allows for states to adopt these standards ahead of federal adoption, and adoption at the federal level serves to preempt any alternate standards present in state law. To the extent that these standards can be reasonably anticipated to become adopted and effective at the federal level ahead of or shortly after the effective date of the 2022 amendment, the effect of this change is negligible as its only result is an accurate statement of federal appliance standards. To the extent that the federal adoption process may be delayed, the values are more stringent than those originally proposed for the Energy Code updates and their impact would be to marginally increase the environmental benefits of the Project resulting from increased energy efficiency and decreased energy use; in other words, the change could only improve the environmental performance of the Project. For this reason, the proposed change to this code provision does not change the analysis or conclusions in the Draft EIR.

- **Section 110.12 – MANDATORY REQUIREMENTS FOR DEMAND MANAGEMENT**: The Section 110.12(c) threshold for demand response lighting control requirements was changed to total installed lighting power rather than general lighting power. This results in a marginal increase in the number of building projects where these requirements apply: accessory types of lighting such as decorative and display lighting will count toward this threshold, though the power use of such lighting is generally small and such lighting is not present in all building projects. This change only acts to improve the environmental performance of the Project, and only by a negligible amount; it does not change the analysis of adverse environmental impacts or the conclusions included in the Draft EIR.
- **Section 130.1 – MANDATORY INDOOR LIGHTING CONTROLS:** The revision of wattage-based exceptions to Section 130.1(d) into a single exception (Exception 3) removes an unintended reading of the exception language that would have effectively increased the threshold for daylighting control requirements from 120w to 240w in the majority of building projects. While returning to the lower 120w threshold results in a marginal increase in the number of building projects where these requirements apply, doing so matches the assumptions staff relied upon in drafting the Draft EIR given that the alternate reading was not intended. For this reason, the proposed change to this code provision does not change the analysis or conclusions in the Draft EIR.
- **Section 130.2 – OUTDOOR LIGHTING CONTROLS AND EQUIPMENT**: The reversion of proposed changes to exceptions to Section 130.2(c)3 lowers the threshold for exception from a proposed 68w to the existing (2019) value of 40w. This causes a marginal increase in the number of building projects where outdoor motion sensing controls apply, a marginal associated decrease in energy use, and a marginal improvement in associated environmental impacts. This change only acts to improve the environmental performance of the Project, and only by a negligible amount – it does not change the analysis or conclusions in the Draft EIR.
- **Section 140.6 – PRESCRIPTIVE REQUIREMENTS FOR INDOOR LIGHTING**: The changes to Table 140.6-C are corrections that align lighting power allowances to the values stated in the underlying code change proposal. There are four changes

that lower general lighting power allowances or additional decorate/display allowances in specified areas by 0.10 watts per square foot, and one change that increases allowances for Barber, Beauty Salon, and Spa Area by 0.05 and 0.10 for general and decorative/display lighting respectively. For context, there are over 50 area categories listed in this table, and typical lighting power allowances for general lighting range from 0.5 to 1.0 watts per square foot (plus any allowances for additional lighting). Taken as a whole, these changes represent negligible overall differences in statewide energy consumption – they do not change the analysis or conclusions in the Draft EIR.

- **Section 140.9 – PRESCRIPTIVE REQUIREMENTS FOR COVERED PROCESSES**: The changes to add Net Sensible COP criteria to the Section 140.9(a)1C prescriptive option for the use of refrigerant-based economizing for computer rooms resolve an issue where the original requirements potentially and inadvertently allowed for installation of refrigerant-based systems that underperform relative to the air- and water-based options in Sections 140.9(a)1A and B, respectively. As staff's analysis in the Draft EIR assumed roughly equivalent performance between these options, this change ensures this equivalency and does not affect the analysis in the Draft EIR or its conclusions.
- **Section 141.0 – ADDITIONS, ALTERATIONS, AND REPAIRS TO EXISTING NONRESIDENTIAL, AND HOTEL/MOTEL BUILDINGS, TO EXISTING OUTDOOR LIGHTING, AND TO INTERNALLY AND EXTERNALLY ILLUMINATED SIGNS**: The change to add Exception 7 to Section 141.0(a) more clearly and directly states that the heating system type restrictions in 140.4(a)2 do not apply to additions, consistent with staff's intent that these prescriptive requirements apply to newly constructed buildings: reference to "applicable requirements of Sections 110.0 through 120.7, 120.9 through 130.5, and 140.2 through 140.9" were not intended to be understood as making Section 140.4(a)2 applicable to additions. As the descriptions and analysis in the Draft EIR assumed that Section 140.4(a)2 was not applicable to additions consistent with staff's intent, this change to code provisions does not affect the analysis in the Draft EIR or its conclusions.
- **Section 150.0 – MANDATORY FEATURES AND DEVICES**: The change to Section 150.0(m)1B to allow ducts to be uninsulated "when the duct system is located entirely in conditioned space" lowers the initially proposed insulation values of 3 and 1. Although this change lowers an insulation requirement, it has a negligible impact on energy performance given that the energy transfer is between the heated or cooled air within the duct and the area that said air is intended to heat or cool (noting that the primary justification for the original insulation values was based on uniformity and condensation concerns rather than energy use per se). This change therefore does not affect the analysis in the Draft EIR or its conclusions.

  The change to Section 150.0(o)1K to remove the prohibition on atmospherically vented or solid fuel burning appliances in dwelling units with conditioned floor area less than 1,000 square feet returns the requirements in this situation to their baseline condition – dwelling units are still required to comply with California Mechanical Code requirements as well as ASHRAE 62.2 requirements with regards to atmospherically vented or solid fuel burning appliances. As this addresses a rare situation and the California Mechanical Code and ASHRAE 62.2 provisions ensure stringent ventilation requirements remain applicable in this case, the effects of this change are negligible: they do not represent an adverse change from the environmental setting as described in the Draft EIR, and this provision was otherwise not separately analyzed in the Draft EIR. This change therefore does not affect the analysis in the Draft EIR or its conclusions.

- **Section 150.1 – PERFORMANCE AND PRESCRIPTIVE COMPLIANCE APPROACHES FOR SINGLE-FAMILY RESIDENTIAL BUILDINGS**: The change to remove climate zone 10 from Exception 1 to Section 150.1(c)8 switched the prescriptive baseline water heating systems for single-family buildings from a natural gas water heating system to a heat pump water heating system. This change coincided with the switching of the prescriptive baseline space heating system for these buildings from a heat pump system to a natural gas system. Space heating was a smaller load in comparison to water heating for single-family buildings in climate zone 10. CEC staff accounted for these changes in minor revisions to the analysis of the Project's effects in Section 4.2 Air Quality, Section 4.4 Energy Resources, Section 4.5 Greenhouse Gas Emissions, and Section 4.7 Utilities and Service Systems of the Draft EIR. Results from the revised analysis were also included in Appendix B to Draft EIR and the Excel spreadsheet supporting Appendix B. These changes represent negligible overall differences in statewide energy consumption and do not reveal new significant adverse environmental impacts. They do not change the conclusions in the Draft EIR.
- **Section 150.2 – ENERGY EFFICIENCY STANDARDS FOR ADDITIONS AND ALTERATIONS TO EXISTING SINGLE-FAMILY RESIDENTIAL BUILDINGS**: The change to add Exception 7 to Section 150.2 more clearly states that the heating system type restrictions in 150.1(c)6 do not apply to additions, consistent with staff's intent that these prescriptive requirements apply to newly constructed buildings. As the descriptions and analysis in the Draft EIR assumed that Section 150.1(c)6 was not applicable to additions consistent with staff's intent, this change to code provisions does not affect the analysis in the Draft EIR or its conclusions.
- **Section 180.1 – ADDITIONS**: The change to add Exception 7 to Section 180.1 more clearly states that the heating system type restrictions in 170.2(c)3 do not apply to additions, consistent with staff's intent that these prescriptive requirements apply to newly constructed buildings: reference to "applicable requirements of Sections 110.0 through 110.9, Sections 160.0, 160.1, 160.2(c) and (d), 160.3 through 160.7" were not intended to be understood as making Section 170.2(c)3 applicable to additions. As the descriptions and analysis in the Draft EIR assumed that Section 170.2(c)3 was not applicable to additions consistent with staff's intent, this change to code provisions does not affect the analysis in the Draft EIR or its conclusions.
- **Part 1, Section 10-115 – COMMUNITY SHARED SOLAR ELECTRIC GENERATION SYSTEM OR COMMUNITY SHARED BATTERY STORAGE**

SYSTEM COMPLIANCE OPTION FOR ON-SITE SOLAR ELECTRIC GENERATION OR BATTERY STORAGE REQUIREMENTS: The changes to Part 1, Section 10-115 are administrative in nature and do not change the analysis in the Draft EIR. The primary change in 15-day express terms were to increase the minimum duration requirements for participation in a community solar program to 20 years and to add an option for homeowners to opt out of a community solar program by adding sufficient on-site solar generation to meet code requirements in effect as of the time the builder originally applied for a building permit, and to make other necessary adjustments to the requirements for administration of a community solar program. These changes do not have the potential to cause any new or previously unidentified environmental impacts; it provides direction to program administrators regarding what is to occur if or when a building owner elects to install and utilize self-owned solar photovoltaic equipment, including recordkeeping and other administrative requirements.

The remaining changes within the 15-day express terms are all either to correct typographical errors or serve to define, rephrase, or relocate code provisions to improve clarity without making substantive changes to requirements. CEC staff has evaluated these changes and concluded they have no potential to cause an environmental impact.

1.6 Summary of Revisions to the Draft EIR

The following table contains a summary of the revisions to the Draft EIR contained in Attachment A as well as a classification of the purpose for the changes. Additional detail about the changes made in response to comments is available below in Chapter 2 Comments and Responses to Comments. Changes related to 15-day express terms are discussed above in Section 1.5.

Table 1.6-1 Revisions to Draft EIR in Attachment A

Location (Section or Table Number)	Summary of Revision	Fixing Error	Response to Comment	15-day Change
3.4.1	Added section 3.4.1 to note the 15-day express terms in the project description chapter			X
3.6	Add utilities and service systems to list on page 49 for consistency with the previous page	X	X	
3.6	Add footnote 32 on page 49 explaining the baseline and impacts analysis methodology used in the biological resources chapter		X	
3.6	Add statement about changes to single-family construction starts in response to ConSol comments		X	
3.7 References	Revise TN# and link for Statewide CASE Team Construction Forecast Methodology reference.	X		
4.2.3	Revise natural gas savings to 27 million therms and electricity savings to 1.4 billion kWh.		X	X
4.2.3	Add explanation for changes made to Tables 4.2-2 and 4.2-3.		X	X
Table 4.2-2	Revise NOx emissions values for newly constructed single-family buildings and associated totals.		X	X
Table 4.2-3	Revise SOx emissions values for newly constructed single-family buildings and associated totals.		X	X

Location (Section or Table Number)	Summary of Revision	Fixing Error	Response to Comment	15-day Change
4.2.3	Add explanation for changes made to Table 4.2-4.	X	X	X
Table 4.2-4	Revise NOx and SOx emissions values.	X	X	X
4.3.3-a	Revise natural gas savings to 27 million therms and electricity savings to 1.4 billion kWh.		X	X
4.4.3-a.1.	Revise estimated consumption of buildings built under the proposed 2022 amendments to 198,200 GWh and 6.13 billion therms.		X	X
4.4.3-a.1.	Revise estimated consumption of buildings built under the 2019 Energy Code to 199,200 GWh and 6.15 billion therms.		X	
4.4.3-a.1.	Revise natural gas savings to 27 million therms and electricity savings to 1.4 billion kWh.		X	X
4.4.3-a.1.	Add explanation for changes made to Table 4.4-1.		X	X
Table 4.4-1	Revise savings for newly constructed single-family buildings and associated totals.		X	X
4.4.3-a.1.	Revise increased electricity used by heat pumps to 83 million kWh and net statewide electricity reduction to 1.4 billion kWh.		X	X
4.5.3-a.	Revise natural gas savings to 27 million therms and electricity savings to 1.4 billion kWh.		X	X

Location (Section or Table Number)	Summary of Revision	Fixing Error	Response to Comment	15-day Change
4.5.3-a.	Add explanation for changes made to Table 4.5-1.		X	X
Table 4.5-1	Revise greenhouse gas emissions values for new construction single-family buildings and associated totals.		X	X
4.5.3-a.	Add explanation for changes made to Table 4.5-2.	X	X	X
Table 4.5-2	Revise gross greenhouse gas emissions values.	X	X	X
4.6.1	Revise citation to Athalye et al. 2021.	X		
Table 4.6-1	Add National Fire Protection Association (NFPA) 855 to list of standards and codes that may apply to lithium-ion battery storage systems.		X	
4.6.3	Revise citation to Athalye et al. 2021.	X		
4.7.3	Add explanation for changes made to Table 4.7-1		X	X
Table 4.7-1	Revise savings for single-family heat pump measures and associated totals.		X	X
5.3-b	Revise natural gas savings to 27 million therms and electricity savings to 1.4 billion kWh.		X	X
5.3-b	Remove incorrect citation.	X		
Appendix B	Revise docket number and link for the documented spreadsheet.	X	X	X

Location (Section or Table Number)	Summary of Revision	Fixing Error	Response to Comment	15-day Change
Appendix B-1	Add explanation for new Tab ResCountDataEntry and adjusted Appendix numbering accordingly.		X	
Appendix B-2	Add explanation for changes made in Tab SF-HPSD.		X	X
Appendix B-9	Add explanation for errors found in Tab Combined All Buildings.	X		
Appendix B-13	Add explanation for errors found in Tab Criteria Pollutants.	X		

CALIFORNIA ENERGY COMMISSION

Chapter 2

Comments and Responses to Comments

Comments and Responses to Comments

This chapter contains the comment letters received during the public review period for the Draft EIR that ended on July 8, 2021.

CEQA Guidelines Section 15088(c) specifies that the focus of the responses to comments shall be on the disposition of significant environmental issues. Responses are not required on issues regarding the merits of the Project or on issues not related to the Project's environmental impacts. Accordingly, the CEC staff's responses either address environmental issues raised or indicate that issues raised are not environmental or related only to the merits of the Project, in which case no further response is provided.

2.1 Commenters on the Draft EIR

Table 2-1 below identifies all comment letters received, the author of the comment letter, and the date the comment letter was received.

Table 2-1 List of Comments Received

Ref.	Author	Date
A	Thomas J. Phillips, Healthy Building Research[7]	June 21, 2021
B	Michael G. Hodgson, ConSol	July 6, 2021
C	Pierre Delforge, Natural Resources Defense Council	July 7, 2021
D	Jennifer L. Hernandez, Holland & Knight LLP	July 8, 2021
E	Matt Vespa, Earthjustice and Lauren Cullum, Sierra Club California	July 8, 2021

7 Two comments were received from Thomas J. Phillips and Healthy Building Research on June 21, 2021, see TN#238403 and 238408. These two comments are treated as a single comment because the second comment submitted, TN#238408, stated: "Please delete my previous submittal; a few typos were corrected."

2.2 Organization of Comments and Responses on the Draft EIR

Comment letters received regarding the Draft EIR during the public review period are organized as follows:

1) Each comment letter has been reproduced in its entirety. Each separate issue raised with a comment letter is indicated by a line bracket and identifying number in the margin.

2) Responses to each separate issue follow the comment letter using the corresponding line-bracket and number in the letter.

3) In some instances, the Draft EIR has been revised or clarified in response to an issue raised. In such cases, the CEC's response includes a citation to the page or section number of the Draft EIR, Attachment A, where the changes were made. Deletions are shown in strikeout (~~strikeout~~) and additions are shown in underline (<u>underline</u>). Unless otherwise noted, all page and section references in Chapter 2 are to the version of the Draft EIR as revised and included as Attachment A.

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2.3 Comment A: Thomas J. Phillips, Healthy Building Research

Letter A

TO: California Energy Commission, 2022 Title 24 Rulemaking

FROM: Thomas J. Phillips, Healthy Building Research, Davis, CA

DATE: February 11, 2021

SUBJECT: Health, Productivity, and Economic Impacts of Building Energy Standards, Rulemaking Docket No. 21-BSTD-01

A1-1

The extensive work of CEC staff to address various issues and include carbon emission metrics in updating the Title 24 building standards is greatly appreciated. However, for the sake of due diligence and public and worker health and safety, building standards must be developed with full consideration of ongoing climate change, and significant non-energy benefits on climate change adaptation on Human Health and Productivity should be considered. The recommended approaches and examples to address the climate change risks for overheating and increased energy costs, GHG emissions, and peak power demands were summarized in my pre-rulemaking comments on Feb. 11, 2021.

In short, we cannot afford to lock in maladapted building design and to reduce GHG emissions by waiting to address these issues. Even if CEC lacks staffing and funding to address these issues adequately, it can at least provide guidance for builders and designers who can address these issues now -- by including guidance in CalGreen, in the Title 24 Manuals, and in collaborations with state building and other sustainability programs. If we fail to plan, we will plan to fail (Ben Franklin).

Other major institutions have recently prioritized the urgent need to address overheating, peak demand reduction, and carbon emissions now (IEA, 2021; UK Committee on Climate Change, 2021, Independent Assessment of UK Climate Risk). California should follow their example.

In addition, please consider the **additional information** below in developing and assessing the **costs and benefits climate adaptation** in the 2022 Title 24 standards, and in developing guidance to mitigate the health, safety, grid, and climate impacts.

1. Modeling study of US health risks from overheated buildings during power outages.

Stone et al., April 2021. **Compound Climate and Infrastructure Events: How Electrical Grid Failure Alters Heat Wave Risk.**
Environ Sci Technol 2021 Apr 30.
doi: 10.1021/acs.est.1c00024. Online ahead of print.

https://pubmed.ncbi.nlm.nih.gov/33930272/
"...Study results find simulated compound heat wave and grid failure events of recent intensity and duration to expose between 68 and 100% of the urban population to an elevated risk of heat exhaustion and/or heat stroke."

Comment: Under conservative climate projections (RCP 4.5), Phoenix homes had **indoor temperatures averaging about 37-42 C for SFam and MFam over 5 days.** Much of inland California will experience climate similar to that of present day Phoenix by mid century, based on Cal-Adapt RCP 8.5 projections.

2. I shared the following information on the **benefits & business case for climate adapted/future proof buildings** with CEC staff in April 2021 via email, and with DGS Sustainability staff who are updating the State building Climate Resilience policy.

RDH, 2019. Designing Climate Resilient Multifamily Buildings. Prepared for U. of British Columbia.
Analyses of several types of MFam in BC under future climate conditions. Includes recommendations for mitigating overheating, by building type.
Caveat: the ASHRAE 55 Thermal Comfort standard and its 80% acceptability limit for thermal comfort was used as benchmark, but this is not appropriate for residential settings, schools, care facilities, etc. and is not very health-protective.

ASBEC & Climate Works Australia, 2018 (AU). Final Report. Built to Perform: An industry led pathway to a zero carbon ready building code. https://www.monash.edu/__data/assets/pdf_file/0011/1602758/180703_asbec_cwa_built_to_perform_-_zero_carbon_ready_building_code_-_web.pdf. The report outlines a set of energy performance targets for different building types across different climates, based on societal cost-benefit analysis of energy efficiency and on-site renewable energy opportunities. The goal of the analysis is to assess the contribution that the Code could make towards achieving GHG emissions reductions in line with overarching zero carbon targets.

Benefits & Cost, p. 8 +, p. 19; health discussed re: underestimate of costs.
Cost estimate for passive measures by building types and climate zones: p. 20+
Note: Australia has some climate zones similar to those in CA, but their building stock is somewhat different than ours.
The CRC for Low Carbon Living has undertaken work to investigate inclusion of comfort metrics in the NatHERS framework through its 'Advanced Comfort Index for Residential Homes' project, assuming a **70 year lifetime for homes.**

Technology Strategy Board, 2014 (UK). The business case for adapting buildings to climate change: Niche or mainstream? Summary report: The business case for adapting buildings to climate change: Niche or mainstream?
Aimed at building designers, construction professions, policy makers, regulators,

etc., the report is based on various case studies and interviews with experts, and questionnaires. Slides at https://www.slideshare.net/SustEast/building-a-resilient-environment-morning-session.

Note: since then CIBSE building design standards for addressing overheating and urban heat island impacts have been more widely used, e.g. various projects, the London Plan, and t**he 2021 draft UK building energy standards.**

4. I also shared this info re: **guidelines and standards for building overheating in other jurisdictions**

BC Housing, 2019. Overheating and AQ Design Guidelines Supplement. BC Energy Step Code Design Guide & Supplemental. Summary at Builder Insight 19: Modelling the Future Climate for Passive Cooled Buildings.

RCP 8.5 climate scenario is recommended. Morphed future weather files have their limitations, but "...using the weather files described in this Builder Insight is a good first step toward improving building resilience…"

Note: Based on recent discussions at weekly Passive House Accelerator webinars, many designers have already run into overheating problems in new Canadian & US homes, mainly due to poorly controlled solar heat gain. Some are starting to use lower SHGC windows and solar window films, and better external shading. Almost all are using HSPHs so they can do some mechanical cooling too and still meet or approach Passive House energy, carbon, and thermal comfort standards. Some are doing overheating assessments, with future weather files.

Toronto Atmospheric Fund, TowerWise project: various case studies and IEQ & overheating studies of deep MFam retrofits, by Touche & Siegel at U. Toronto. Future overheating impacts were assessed. **10 buildings completed so far.**

National Research Council Canada: Preventing Overheating (2019)**.**
The project aims to produce decision support tools, including codes, guides and models for the design of new climate resilient buildings and infrastructure.
A risk analysis framework was published in 2019. They have recently published articles on reference weather files for Canada, and a health based evaluation method. They plan to publish national guidance for overheating risk assessment in April 2021 publication.

Draft 2021 UK Future Homes Standard and Building Regulations are in the consultation phase until mid April. They include low carbon and ventilation measures. Also, in response to earlier comments from a public health commission, architects, etc., they have included an **overheating assessment method and requirement.**

News: https://www.architecture.com/knowledge-and-resources/knowledge-landing-page/the-future-homes-standard-explained
Draft standards: https://www.gov.uk/government/consultations/the-future-buildings-standard
The overheating part is based on the CIBSE TM 59 standard, which has been around for several years.
An independent health commission recommended last year and previously that the UK standards address the overheating issue in current and future climates, and various demonstration projects have been done in the UK using future climate projections.

5. Recent Harvard modeling **study of energy and non-energy benefits** SFam retrofits in 10 US cities under current climate.

Williams et al. 2020. Health and Climate Benefits of Heat Adaptation Strategies in Single-Family Residential Buildings

- October 2020
- Frontiers in Sustainable Cities 2(47):561828
- DOI: 10.3389/frsc.2020.561828

"… Under light and deep retrofit scenarios, respectively, we estimate that the simulated heat adaptation retrofits in this subset of relatively new buildings have the potential to yield $1.10 or $1.57 billion in direct utilities savings. There is an additional $462.9 million ($301.3–$909.9 million) or $692.8 million ($442.6 million–$1.385 billion) in climate and health benefits, due to avoided GHG and AP emissions. **Put simply, the climate and health benefits may account for an additional 42–44% of the direct utility savings, on average. Climate and health benefits were generally highest for adaptations simulated in hot climates (Dallas, TX and Houston, TX)** or in areas with dirtier fuel mixes (Chicago, IL and Philadelphia, PA). **When climate and health savings are included, the payback periods of these interventions can decrease by nearly half.** We also discuss the **potential additional health benefits of reducing indoor temperatures during extreme heat. These significant savings from avoided climate and public health damages should be factored into climate change adaptation decision making by stakeholders and policymakers."**

Comment: Lesser but significant benefits would be expected from including such damage estimates for new building design in California, especially when hotter future climates are considered over a 60-100 year life cycle.

Thank you in advance,
Thomas J. Phillips
Healthy Building Research, Davis, CA

Responses to Comment A: Thomas J. Phillips, Healthy Building Research (TN#238408)

A1-1: The comment recommends full consideration of ongoing climate change and non-energy benefits of climate change adaptation on human health and productivity in the development of energy measures for the 2022 amendments to the Energy Code. The comment does not raise any significant environmental issues associated with the Project and does not address specific contents of the Draft EIR.

2.4 Comment B: Michael G. Hodgson, ConSol

From: Mike Hodgson
To: McAllister, Andrew@Energy; Bozorgchami, Payam@Energy; Shirakh, Maziar@Energy; Pennington, Bill@Energy; Vicent, Will@Energy; Strait, Peter@Energy
Cc: RRaymer@cbia.org; Chris Ochoa; Tom Paine
Subject: Overestimation of emission and energy savings for single family housing
Date: Thursday, June 10, 2021 2:52:41 PM
Attachments: image001.png
Appendix B - Combined Emissions and Energy Savings CIRB inputs (1).xlsx
CBIA 2004-2020 Housing Production in California (8-17-20).xlsx

Letter B

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Commissioner McAllister and CEC staff;

I am concerned that the CEC Appendix B which estimates energy and emission savings is using incorrect single family housing starts. The CEC uses 119,045 single family starts in 2020 (2022?) while the market was 57,029. This over predicts energy and emission savings for single family homes by more than a factor of two. If these numbers are supposed to represent the "future" market I have attached a slide Bob Raymer and I use that illustrates the housing starts in CA over the last 17 years. The single family housing market has not recovered from the great recession of 2007 through 2009. It may never return to the amount of housing that we were building 15 years ago. The single family market for the past 5 years has hovered around 50,000 single family starts. It improved to the high 50,000 range in 2017 and 2018 and since seems to be receding. It looks like 2021 will be 4-8% below the 2020 mark of 57,029. B1-1

I have added the Construction Industry Research Board (CIRB) 2020 housing starts into the published Appendix B. You can review the starts by climate zone by reviewing the green highlighted sections (see SF-HPSD spreadsheet, columns O and V).

ConSol has provided these statistics to CEC Staff over the past few years. I am concerned that the CEC's housing starts are so far from the current market.

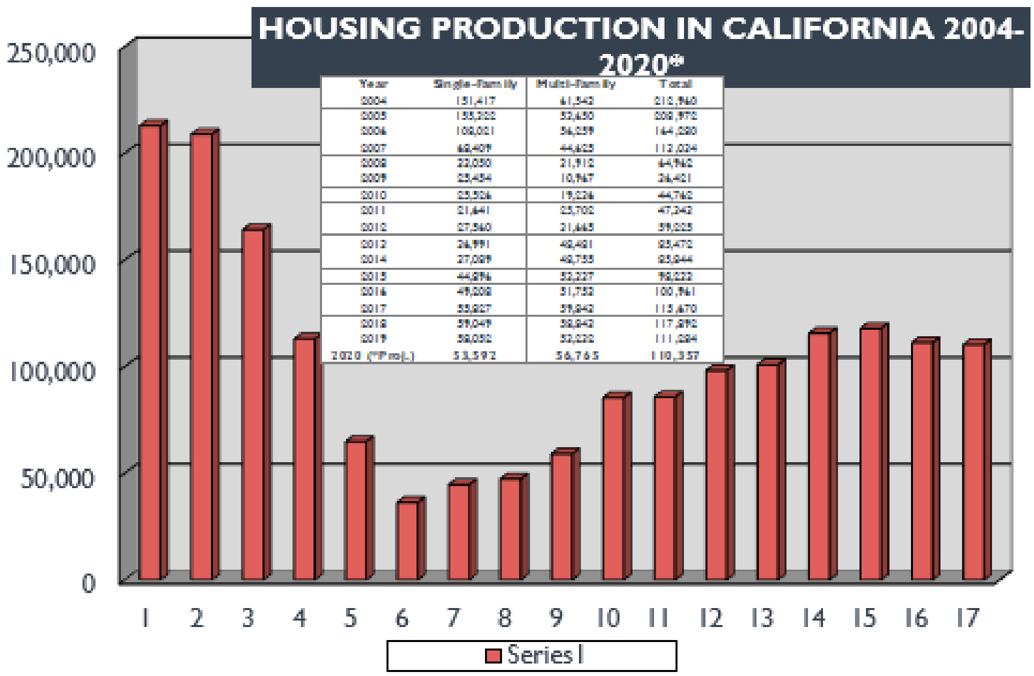
I am happy to explain the CIRB data at your convenience.

Mike

Michael G. Hodgson
President

1610 R Street, Suite 200
Sacramento, CA 95811
Phone: (209) 481-1191
mhodgson@consol.org

Attachment – CBIA 2004-2020 Housing Production in California (8-17-20): B1-2



Attachment - Appendix B: Combined Emissions and Energy Savings CIRB inputs (1) available at: B1-3

https://efiling.energy.ca.gov/GetDocument.aspx?tn=238705-3&DocumentContentId=72100

Responses to Comment B: Michael G. Hodgson, ConSol
(TN#238705-1, 238705-2, 238705-3)

B1-1: This comment states that the number of single-family housing starts used in the Draft EIR analysis may overestimate the number of new single-family buildings that should have been included in the Project, resulting in an overestimation of energy and emissions savings attributable to new efficiency measures for single-family homes. In part as a response to this comment, CEC staff revised and lowered the number of single-family housing starts used in analyzing the effects of the Project from 119,045 units per year to 58,052 units per year to better reflect historical new construction starts for single-family residences. This resulted in revisions to the Draft EIR in Section 3 Project Description at pages 46, 49 and 50; Section 4.2 Air Quality at pages 69, 71, 72, 74, and 75; Section 4.4 Energy Resources at pages 95 through 98; Section 4.5 Greenhouse Gas Emissions at pages 112 through 115; Section 4.7 Utilities and Services Systems at pages 147 and 148, and Appendix B at pages 250 and 251. Revisions were also made to the Excel spreadsheet supporting Appendix B, which are available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=239152&DocumentContentId=72605.

These revisions do not constitute significant new information because, although they show a reduction in aggregate benefits from the Project, they do not increase the severity of any environmental impact identified in the Draft EIR or reveal a new impact that was not adequately disclosed in the Draft EIR. Similarly, the changes did not prevent meaningful participation in the review of the Draft EIR. In fact, because the Draft EIR was transparent about its inputs, the commenter was able to identify that the analysis and portrayal of the benefits resulting from the Project could be clarified through the inclusion of single-family home figures that better reflect historical trends. Accordingly, the changes do not meet any of the definitions of "significant new information" in CEQA Guidelines section 15088.5(a)(1)-(4) that would trigger recirculation of the Draft EIR.

B1-2: This comment provides historical information of single-family and multi-family housing production per year in California from 2004 to 2020. This historical information was used to support comment B1-1.

As noted in response **B1-1**, in part as a response to this comment, CEC staff revised and lowered the number of single-family housing starts used in analyzing the effects of the Project from 119,045 units per year to 58,052 units per year to better reflect historical new construction starts for single-family residences. CEC staff considered the supporting information in **B1-2** to determine that a lower rate of single-family starts should be used in analyzing the effects of the Project.

B1-3: This comment provides projected single-family housing starts distributed by climate zones for comparison to the single-family housing starts estimated in the Draft EIR analysis.

As noted above, CEC staff considered the estimated single-family housing starts provided by the commentor in revising the analysis of the Project's effects. Results from the revised analysis were included in Appendix B and the sections relying on Appendix B, as noted above in the response to **B1-1**.

2.5 Comment C: Pierre Delforge, Natural Resources Defense Council

NRDC

Letter C

Dear Commissioner McAllister and Energy Commission Staff,

July 7, 2021

Re. NRDC Comments on NRDC Comments on Draft Environmental Impact Report for 2022 Building Standards Released May 19, 2021, Docket Number 21-BSTD-02

On behalf of the Natural Resources Defense Council (NRDC), we submit the following comments in response to the California Energy Commission's (CEC) Draft Environmental Impact Report for the 2022 Title 24 Efficiency Standards released May 19, 2021. Our comments are focused on the potential greenhouse gas (GHG) emissions impacts associated with 2022 Building Energy Standards.

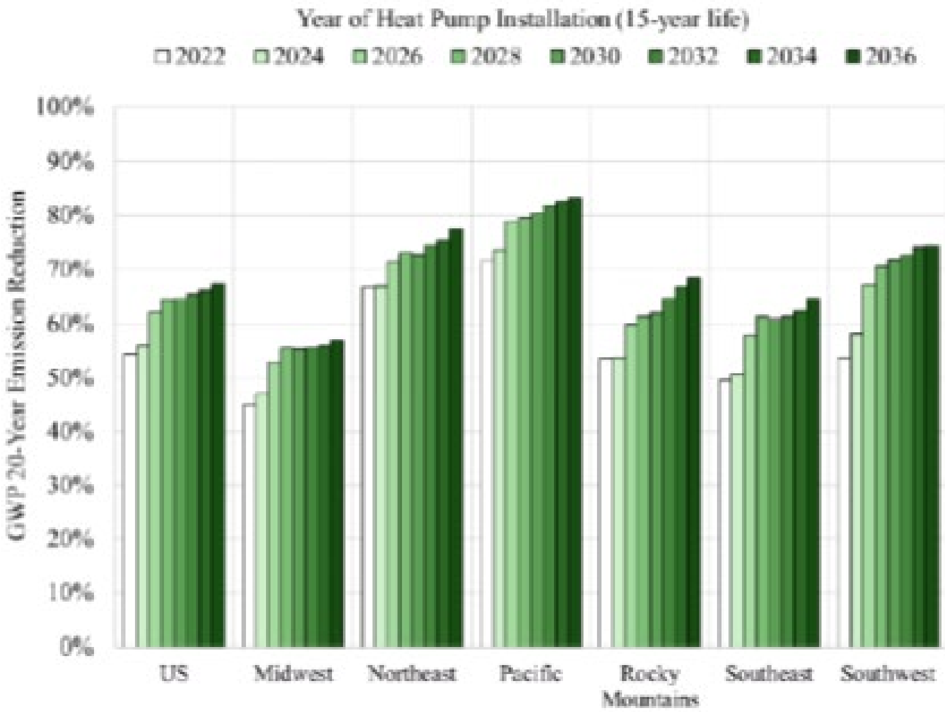
C1-1

NRDC supports the findings of the Draft Environmental Impact Report that the 2022 building energy code (the "2022 Code") would result in a reduction of GHG emissions statewide. In fact, CEC's analysis is overly conservative for several reasons, and NRDC estimates that the 2022 Code would result in a much larger reduction of GHG emissions statewide.

C1-2

The biggest reason is that CEC's analysis does not include the indirect benefits of all-electric new construction: as space and water heating in new construction transitions from fossil fuels to highly-efficient electric heat pump technologies, the price of these technologies will fall as it did with solar energy technologies over the past 15 years, and familiarity and capacity among installers will increase, leading to much lower equipment and installation costs. This will accelerate electrification of space and water heating in existing buildings, which are responsible for the bulk of energy related GHG emissions in buildings. Therefore, **the 2022 Code will indirectly contribute to energy related GHG emissions reductions in California's building sector in excess of 70 percent for heat pumps installed in the 2023-2025 time period, and more than 80 percent by 2030.**

These reduction estimates are based on the preliminary results of a study commissioned by NRDC to the UC Davis Western Energy Cooling Center (WCEC) on the GHG impacts of electrification of residential space heating, included as Appendix A.



C1-2 Cont.

The study uses a comprehensive and robust methodology by accounting for:

- **Hourly long-run marginal emissions rates for the electric grid**, from the National Renewable Energy Laboratory (NREL) Cambium dataset. Contrary to average or short-run marginal emissions rates often used in similar studies, NREL's dataset forecasts the mix of generation resources that would serve a persistent and large-scale change in end-use demand, taking into account structural changes to the grid in response to the change in demand, which is the most appropriate way to model the impacts of widespread electrification of space and water heating.

C1-3

- **Methane emissions** associated with methane production and behind-the-meter leaks in residential homes.
- **Refrigerant emissions from heat pumps**, including refrigerant leakage during operation and at end of life, the proportion of homes that already have air conditioning or are projected to adopt it over the study's time period, and the increased refrigerant charge in heat pumps vs. air conditioners.

C1-4

- **The use of electric resistance backup** in heat pumps when the outdoor temperature drops below the threshold where the heat pump can provide sufficient capacity in compressor-only mode, or when needed to recover from nighttime thermostat setbacks. **C1-4 Cont.**

The WCEC study's methodology is generally aligned with CEC's with two notable differences:

- Figure 1 shows emissions impacts for the entire U.S. Pacific region, which includes the states of California, Oregon, and Washington. NREL emissions factors are slightly lower for California than for other Pacific states, so California-specific results would show higher emissions reductions than for the entire Pacific region. **C1-5**
- WCEC's study includes out-of-state methane emissions associated with gas imported into California for use in buildings, whereas CEC's includes in-state leakage only. California imports 90 percent of the gas used in the state, and the majority of methane emissions takes place at the extraction well. Phasing out gas use in California's buildings will result in fewer new gas wells drilled, and therefore a reduction in associated methane emissions. California Air Resources Board accounts for out-of-state emissions for electricity generation, the same approach should be used with fugitive methane emissions for consistency and to allow for a fair comparison of the GHG impacts of fossil fuels vs. electric alternatives. **C1-6**

However, the WCEC study shows that both methane and refrigerant emissions are significantly lower than the direct CO2 emissions of gas furnaces and heat pumps, so they do not directionally change the results of the study. The WCEC study therefore corroborates CEC's analysis findings that electrification of space heating significantly reduces emissions compared to gas furnaces. **C1-7**

The WCEC study did not analyze the electrification of water heating, but NRDC estimates that the results would be even more favorable for electrification because heat pump water heaters have a lower refrigerant charge and typically operate at a higher level of performance than heat pumps for space heating.

Finally, the WCEC study does not consider the potential beneficial impacts of heat pump demand flexibility controls, which shift heat pump operation from peak-demand and GHG times to times when lower carbon intensity electricity is available, through strategies such as smart thermostats that pre-heat buildings ahead of peak time periods, and use of thermal storage particularly for water heating and hydronic heating systems. **C1-8**

Sincerely,

Pierre Delforge
Senior Scientist
Natural Resources Defense Council

Responses to Comment C: Pierre Delforge, Natural Resources Defense Council (NRDC) (TN#238719)

C1-1: Staff appreciates NRDC's support for the Draft EIR's conclusion that the Project would result in a reduction of GHG emissions. No changes are required in response to this comment. The comment does not raise any significant environmental issues associated with the Project.

C1-2: The comment provides evidence, based on a study appended to NRDC's comments, suggesting that further GHG reductions could result from the Project as a result of the Project's indirect effects on the market for certain technologies. No changes are required in response to this comment. The comment does not raise any significant environmental issues associated with the Project.

C1-3: The comment identifies that the study appended to NRDC's comments was based on long-run, marginal emissions rates for the electric grid. The approach described generally in the comment is comparable to the approach taken by CEC staff in completing the analysis for the Project, and its findings appear to staff to be consistent with the analysis in the Draft EIR. No changes are required in response to this comment. The comment and appended report do not raise any significant environmental issues associated with the Project.

C1-4: The comment identifies that the study appended to NRDC's comments addresses methane leakage and refrigerant leakage. The comment also identifies that the report addresses how electric resistance heating operates in heat pumps. Electric resistance heating was taken into account in each of California's 16 climate zones in the analysis for the Project. No changes are required in response to this comment. The comment does not raise any significant environmental issues associated with the Project.

C1-5: The comment identifies a difference between the CEC's analysis and the methodology in the study appended to NRDC's comments and states that the emissions factors for California are slightly lower than for other states in the Pacific region. No changes are required in response to this comment. The comment does not raise any significant environmental issues associated with the Project.

C1-6: The comment identifies that the study appended to NRDC's comments analyzed out-of-state methane emissions in a different manner than the analysis for the Project.[8] No changes are required in response to this comment. The comment does not raise any significant environmental issues associated with the Project.

C1-7: The comment identifies that the study appended to NRDC's comments corroborates the conclusion in the Draft EIR that the Project's requirements for heat pump space heating would reduce GHG emissions. No changes are required in response

8 CEQA Guidelines, § 15277.

to this comment. The comment does not raise any significant environmental issues associated with the Project.

C1-8: The comment identifies that the study appended to NRDC's comments did not analyze load shifting that is feasible with heat pump space heating or water heating, but that an analysis of load shifting controls would have shown additional GHG emissions reduction benefits resulting from cases where they are installed and used. This conclusion is consistent with the Project's compliance options for the load shifting benefits of heat pump water heaters. No changes are required in response to this comment. The comment does not raise any significant environmental issues associated with the Project.

2.6 Comment D: Jennifer L. Hernandez, Holland & Knight LLP

Holland & Knight

Letter D

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Jennifer L. Hernandez
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Jennifer.Hernandez@hklaw.com

July 8, 2021

Via Electronic Submission

David Hochschild, Chair
California Energy Commission
Docket Unit, MS-4
Docket No. 21-BSTD-02
1516 Ninth Street
Sacramento, CA 95814-5512

Re: Comments in Response to the Draft Environmental Impact Report for the 2022 Energy Efficiency Standards (TN # 237853)

Dear Mr. Hochschild:

Holland & Knight, LLP appreciates the opportunity to comment on the Draft Environmental Impact Report ("DEIR") for the California Energy Commission's ("CEC") proposed 2022 amendments to the California Building Efficiency Standards (the "Project") contained in Title 24, Part 6 of the California Code of Regulations. We offer these comments to ensure a thorough analysis of the Project's potential impacts to the environment and public health, as required by the California Environmental Quality Act ("CEQA") (Pub. Res. Code § 21000 *et seq.*).

These comments are submitted in furtherance of Holland & Knight's commitment to the social and economic equity of California's working families who will be disparately impacted by the Project. When confronted with the disparate racial impacts of California's climate policies, regulators often tokenize California's working class communities of color as though such policies are being adopted in their best interests. But in practice, these regressive environmental policies impose much higher cost burdens on residents and businesses in areas of the state with less costly housing (and less temperate climates) than coastal areas. When confronted with the disparate racial impacts of their policies, these regulators often point to limited economic assistance programs reserved for the poorest Californians, and endorse raising taxes or undertaking other measures outside the jurisdiction and control of their agency as the appropriate solution for helping people to pay the ever increasing climate regulatory costs for housing and D1-1 energy. These regulators routinely point to ratepayer subsidized measures – like rooftop solar, home-based batteries, and community aggregators – as solutions to these increased regulatory costs, measures which are disproportionately accessible to wealthier and whiter Californians, including single-family home owners.[1] In fact, a 2021 study published by the Lawrence Berkeley National Laboratory found that the average household median income for solar-adopters in 2019 was $113,000,[2] nearly 34 percent higher than the state average median income of $75,235.[3] D1-2

Holland and Knight respectfully submits these comments to ensure the Project analysis reflects a robust and complete examination of the direct and reasonably foreseeable indirect impacts as required by CEQA in order to achieve the state's climate goals.

I. General Comments

The purpose of CEQA is to inform the public and decisionmakers alike of the environmental impacts resulting from a proposed project.[4] However, the DEIR fails to thoroughly analyze and quantify all of the direct and reasonably foreseeable indirect environmental impacts associated with the Project. CEQA specifically prohibits a lead agency from deferring the analysis of "reasonably foreseeable significant environmental effects of the project and does not justify deferring such analysis to a later tier EIR or negative declaration."[5] D1-3

The Project proposes a broad range of new energy efficiency standards and updates to California's Building Code and Energy Efficiency standards. The Project would require certain commercial and residential buildings to incorporate various electric-based technologies. The Project also requires specific buildings to be "electric-ready," meaning they must have installed electrical connections and other features at the time of initial construction. The Project also proposes updated standards for solar photovoltic ("PV") systems, including battery requirements, and proposes prescriptive standards for new construction of buildings including: high-rise multifamily, hotel/motel, tenant-space, office, medical office or clinic, restaurant, grocery store, retail store, school, and theater/auditorium/convention center buildings.[6]

The DEIR contains a number deficiencies, but most importantly is missing critical details that would give readers a full understanding of the Project's scope and the full multitude of potential direct and reasonably foreseeable indirect impacts resulting from Project implementation. Further, most of the DEIR's impact determinations are not supported by D1-4

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[1] *See, e.g.*, Borenstein, S., *Rooftop Solar Inequity*, Energy Institute at Haas: Rooftop Institute Blog (June 1, 2020), https://energyathaas.wordpress.com/2021/06/01/rooftop-solar-inequity/.
[2] Barbose, G., et al., *Residential Solar-Adopter Income and Demographic Trends: 2021 Update*, at 5 (Apr. 2021), https://eta-publications.lbl.gov/sites/default/files/solar-adopter_income_trends_final.pdf.
[3] U.S. Census Bureau, Quick Facts: California: Median Household Income (in 2019 dollars), 2015-2019, https://www.census.gov/quickfacts/fact/table/CA/INC110219, accessed June 28, 2021.
[4] Cal. Code. Regs., tit. 14, § 15121(a), hereinafter "CEQA Guidelines."
[5] CEQA Guidelines § 15152(b).
[6] CEC, Notice of Preparation of an Environmental Impact Report for the 2022 Amendments to the Energy Code, at 2 (Mar. 18, 2021) hereinafter "NOP," https://efiling.energy.ca.gov/GetDocument.aspx?tn=237212&DocumentContentId=70393.

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substantial evidence, or are supported by evidence that fails to take into account all direct and reasonably foreseeable indirect impacts.

- First, the DEIR contains an inadequate Project Description that is overly vague and lacks sufficient detail to understand the actions being proposed and their true environmental impacts.[7] While the Project would apply new regulations statewide, the Project Description in the DEIR fails to adequately describe which regions of the state would be subject to specific standards and requirements, and which building projects would be required to install specific equipment, such as heat pump technology, solar PV equipment and battery storage systems. The information is provided in an extremely inaccessible manner in the DEIR, requiring the reader to click on several hyperlinks and search several other documents in order to even attempt to decipher the actual Project scope and its potential environmental impacts. D2-1

- The DEIR also impermissibly uses hypothetical future conditions as the baseline for the Air Quality, Greenhouse Gas ("GHG"), Energy, Utilities and Service Systems, and Biological Resources analyses.[8] Even if the DEIR could validly use a "future projected conditions" baseline, the DEIR fails to provide sufficient justification for the deviation from the requirement that baseline conditions are typically the physical existing conditions at the time the Notice of Preparation ("NOP") is drafted. The use of an improper baseline casts a serious question on the reliability of any of the analyses or conclusions that relied on this baseline throughout the DEIR. D2-2

- Like the Project Description, the DEIR also fails to provide sufficient information regarding the assumptions relied upon in its baseline calculation, leaving the reader to sift through thousands of pages of documents in order to attempt to understand the Project impact analyses. This does not meet CEQA's requirement for a clear and understandable analysis.[9] D2-3

- As it relates to the Air Quality analysis, the electric grid's current capacity to serve the Project is doubtful, and the DEIR fails to provide substantial evidence that there is sufficient capacity to serve the anticipated increased electricity demand from Project implementation. Additionally, the analysis fails to account for all direct and reasonably foreseeable indirect air quality impacts resulting from the Project, including impacts resulting from construction of new renewable energy projects to supply the increased D3-1

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[7] *Laurel Heights Improvement Association v. Regents of University of California* ("*Laurel Heights I*") (1988) 47 Cal.3d 376, 405 (holding that an EIR must contain sufficient detail to enable those who did not participate in the process to meaningfully understand the issues raised by a proposed project).
[8] CEQA Guidelines §15125(a)(3); *see also, Environmental Planning & Information Council v. County of El Dorado* (1982) 131 Cal.App.3d. 350 (holding that a lead agency's analysis of a proposed plan's environmental impacts against the existing plan, as opposed to the existing environmental, was illusory and misled the public).
[9] CEQA Guidelines § 15151 ("An EIR shall be prepared with a sufficient degree of analysis to provide decisionmakers with information which enables them to make a decision which intelligently takes account of environmental consequences."); *see also Dry Creek Citizens Coalition v. County of Tulare* (1990) 70 Cal.App.4th 20, (if a project description is inadequate, the environmental analysis will probably fail to analyze the complete project).

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electricity required by the Project and impacts from the use of diesel generators during Public Safety Power Shut-offs ("PSPS") Events.

- Similarly, the DEIR fails to account for the impacts to Biological Resources associated with the reasonably foreseeable impacts of the Project, which would result in the need to construct, install, operate and maintain utility-scale renewable energy source infrastructure, transmission and distribution facilities and lines, and their potential impacts to wildlife habitats, linkages, and rangelands. **D4-1**

- Additionally, in the Energy analysis, the Project fails to analyze impacts related to the Project's effects on peak and base load demands, which would likely result in an inefficient or wasteful consumption of energy. Because the DEIR purports to analyze peak and base load demand, but instead only evaluates the Project's impacts on a seasonal basis, the DEIR misleads the reader. The analysis also overstates the efficiencies associated with heat pump technologies, which are likely to result in a wasteful or inefficient consumption of energy in certain circumstances. **D5-1**

- The GHG analysis is insufficient because it only assesses direct emissions and fails to account for indirect and lifecycle emissions resulting from the Project. The DEIR also overstates the reach and relevancy of proposed regulations for the future use of refrigerants and fails to explain assumptions made in the GHG impact analysis. **D6-1**

- The DEIR analysis fails to adequately analyze and disclose impacts related to Hazards and Hazardous Materials by artificially limiting the discussion to impacts associated with lithium-ion ("Li-ion") technologies without explaining the reason for excluding other potential technologies from the analysis. Additionally, the analysis fails to adequately disclose the direct and reasonably foreseeable indirect impacts related to the operation of battery storage systems including risks associated with thermal runaway and fires, mining activities, and end-of-life activities. **D7-1**

- The DEIR improperly concludes that there would be less than significant impacts to Utilities and Service Systems despite substantial evidence that the current electric grid is strained and that increased electricity consumption would require the construction of more energy projects and supporting infrastructure. **D8-1**

- The DEIR also fails to analyze the direct and reasonably foreseeable indirect impacts from Wildfires and increased occurrence of PSPS Events, including public safety impacts. **D9-1**

- The DEIR prematurely brushes off impacts to California's low-income and disadvantaged communities as purely economic impacts. This analysis is flawed because it ignorantly assumes that California's impoverished families can absorb the exorbitant energy costs resulting from the Project, and fails to acknowledge the serious public health impacts associated with energy poverty. **D10-1**

- The cumulative impacts associated with the Project are downplayed by the DEIR's failure to account for and analyze the Project's impacts together with a litany of other **D11-1** local ordinances, including local Reach Codes, that have recently been adopted or are currently under consideration that would, cumulatively with the Project, result in significant impacts in multiple impact areas, including but not limited to Air Quality, GHGs, Hazards and Biological Resources.

D11-1 Cont.

- Lastly, the DEIR fails to recognize that Alternative 6.4.4 is able to meet the Project's first objective (Objective 1) that aims to deploy technically feasible and cost-effective technologies and measures. The DEIR thus must accurately analyze the Project's project-level and cumulative impacts and conduct a new comparison of those likely significant impacts with the reduced impacts likely to occur under Alternative 6.4.4 and then determine whether Alternative 6.4.4 presents an environmentally superior alternative to the Project.

D12-1 Cont.

II. General Defects and Inconsistencies

Procedural Defects. The NOP encouraged commenters to submit comments using the electronic filing system through a link provided in the NOP.[10] However, the link led commenters to a separate docket for the Rulemaking Process. While this deficiency was pointed out when submitting comments on the NOP, it is unclear whether CEC staff took any action to ensure that all comments that were intended for the CEQA Docket were correctly submitted and considered by staff when drafting the DEIR.

D1-5

Use of Undefined Terms to Describe Project Impacts. The DEIR uses the term "no significant impacts" in several areas of the DEIR, including to describe the Project's impacts to Air Quality and GHGs.[11] Because "no significant impact" is not a defined term in the DEIR, this term has the potential to confuse readers regarding the Project's environmental impacts. It is unclear whether the term is intended to mean "No Impact" or "Less than Significant Impacts." This should be clarified.

D1-6

Relevancy of SB 100 and SB 100 Joint Agency Report. In multiple places the DEIR vastly overstates the relevance of SB 100, and cites to both SB 100 and the SB 100 Joint Agency Report ("SB 100 Report"), which are referenced in the Regulatory Setting for both the Energy Resources, GHG, and Utilities and Service Systems chapters. The DEIR consistently relies on both sources to provide substantial evidence that SB 100 objectives will offset increased electricity demand resulting from the Project, and that therefore the Project would not result in the construction, operation, and maintenance of utility-scale energy projects.[12] As explained in further detail below, the DEIR's reliance on SB 100 and the SB 100 Report as substantial evidence that the Project would not result in the need to construct energy projects and supporting infrastructure is speculative and should be removed from the DEIR.

- SB 100. SB 100 requires utilities to procure a minimum quantity of eligible renewable energy resources, but does not provide a failsafe route to statewide decarbonization. Nor does the legislation mandate the construction, operation,

D1-7

[10] NOP at 2.
[11] *See* DEIR at 60, 102.
[12] *See e.g.*, DEIR at 138, 143, and 199.

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and maintenance of any energy projects or infrastructure to support the increased electrical demand resulting from the Project. Further, SB 100's requirements can be waived if a utility can establish that there "is inadequate transmission capacity to allow for sufficient electricity to be delivered from eligible renewable source projects."[13]

- SB 100 Report. The DEIR mischaracterizes the relevancy of the SB 100 Report to the Project's environmental analysis by stating that the report performs a "robust analysis of the massive grid improvements that will be necessary"[14] to meet the goals of SB 100, and purporting that the SB 100 objectives will offset near-term increased electricity consumption. However, the SB 100 Report actually concludes that in order to achieve carbon neutrality, there would need to be a significant increase in the development of renewable generation projects, including utility-scale projects. The Report recognizes that in order to meet the anticipated increase in demand, the state would need to accelerate the pace of renewable energy projects from an average of 1 GW of utility-scale solar and 300 MW of wind each year to 2.8 GW of solar, 1 GW of wind, and 2.0 GW of battery storage systems per year in order to meet SB 100. This exceeds even historic single-year build rates, a maximum of 2.7 GW of utility scale-solar and 1 GW of wind.[15] The SB 100 Report also states that build rates are critical to determining whether there will be bottlenecks in the supply chain or regulatory and permitting processes.[16] Thus, contrary to the DEIR's assertion, nothing in the SB 100 Report would offset the increase in demand for electricity resulting from the Project. In fact, the Report recognizes that there is currently insufficient capacity to accommodate increased demand.

D1-7 Cont.

Neither SB 100 nor the SB 100 Report provide a commitment to build any new necessary renewable energy projects or "provide a prescriptive roadmap" that would meet the increased electricity demand created by the Project. For these reasons, the DEIR's reliance on SB 100 and the SB 100 Report to somehow prove that an increase in electricity demand would be met without the need to construct additional renewable energy projects is erroneous.

III. Inadequate Project Description and Baseline

Project Description. The Project Description does not provide a sufficient level of specificity to allow a reader to understand when a specific building would be subject to the Project's requirements or standards, how to comply with the requirements or standards, or understand the Project's environmental consequences.[17] The DEIR contains an inadequate Project Description that provides minimal detail, leaving the reader in the dark as to the Project scope and any direct and indirect impacts resulting from the Project. The Project is highly

D2-4

[13] Stats 2018, ch. 312 (S.B. 100).
[14] DEIR at 90.
[15] SB 100 Report at 11.
[16] *Id.*
[17] CEQA Guidelines § 15151 ("An EIR shall be prepared with a sufficient degree of analysis to provide decisionmakers with information which enables them to make a decision which intelligently takes account of environmental consequences"); *see also Dry Creek Citizens Coalition*, 70 Cal.App.4th 20.

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technical, complex, and imposes varying standards depending on the type of development and project location (climate zones), and provides both prescriptive and performance standards. The Project Description does not provide a level of detail that allows a reader to meaningfully assess Project impacts.[18] In fact, the level of detail is so insufficient that a reader would not even be able to tell that there may be differing standards that apply to particular developments. Instead the reader is expected to click through a number of hyperlinks to other documents and rifle through a separate 571 page technical document (the Express Terms), which contains no contextual information and is replete with technical terms and acronyms, in order to understand the Project. This is not the clear and understandable Project Description that CEQA mandates.[19] **D2-4 Cont.**

For example, the Project proposes to "[r]evise the prescriptive measure-based compliance path available for building projects to include only heat pump technology in specific circumstances."[20] This description does not allow a reader to understand which building projects would trigger the requirement for a heat pump (commercial vs. residential, minimum square footage requirements, whether specific heat pump technology is required, or whether such technology would be required for new construction only or also include alterations) or how the requirements change depending on the climate zone, much less understand any potential environmental impacts associated with the use of heat pump technology. Without this information, neither the reader nor the decisionmakers can accurately assess the Project's environmental impacts.[21] **D2-5**

In another example, the Project Description proposes to "[r]evise residential energy efficiency requirements for solar PV systems, including battery storage, and associated compliance options."[22] The Project Description does not explain the current requirements and associated compliance options and thus it provides no meaningful information for the reader to be able to determine what environmental impacts may result from the change in requirements with Project implementation.

In fact, all of the summarized bullet points in the Project Description fail to provide a level of detail adequate to enable a reader to understand the Project scope, much less understand the environmental impacts that may occur or are reasonably foreseeable with Project implementation.[23] **D2-6**

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[18] *See* CEQA Guidelines § 15124; *see also County of Inyo v. City of Los Angeles*, (1977) 71 Cal.App.3d 185, 198 ("A curtailed, enigmatic or unstable project description draws a red herring across the path of public input.").
[19] CEQA Guidelines § 15151 (requiring adequacy, completeness, and a good faith effort at full disclosure.); *see also Dry Creek Citizens Coalition*, 70 Cal.App.4th 20, 26 (holding that failure to include relevant information precludes informed decisionmaking and informed public participation, thereby thwarting CEQA's statutory procedural goals).
[20] DEIR at 41.
[21] *Association of Irritated Residents v. County of Madera* (2003) 107 Cal.App.4th 1383, 1391 ("[T]he failure to include relevant information precludes informed decisionmaking and informed public participation, thereby thwarting the statutory goals of the EIR process."); *County of Inyo v. Yorty*, (1973) 32 Cal.App.3d 795, 810 (the EIR serves as an "environmental alarm bell" whose purpose is to alert the public and its responsible officials to the environmental impacts associated with a proposed project.).
[22] DEIR at 42.
[23] *See County of Inyo*, 71 Cal.App.3d at 192-93 ("Only though an accurate view of the project may affected outsiders and public decision-makers balance the proposal's benefit against its environmental cost, consider

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Baseline. The DEIR attempts to impermissibly use hypothetical future conditions as the baseline for the analysis for the Air Quality, Energy Resources, GHG, Utilities and Service Systems, and Biological Resources sections. CEQA Guidelines § 15125(a) generally requires baseline conditions to be described as the existing physical conditions at the time the NOP was published. In particular, CEQA Guidelines § 15125(e) requires that, when a proposed project is compared to an adopted plan, like a regulatory regime, the analysis must examine existing physical conditions at the time the NOP is published.[24] The DEIR tries to skirt this requirement by attempting to differentiate the application of the 2019 Energy Code from a general, specific, or regional plan. However, any perceived differences between these documents is inconsequential as they are all regulatory frameworks that future projects must follow. Instead of using the CEQA mandated baseline, the DEIR attempts to use a convoluted "modeled date-of-implementation" baseline, another way of saying "hypothetical future conditions," in order to avoid or mask true impacts from Project implementation. **D2-7**

The DEIR describes the baseline as an incorporation of "the impacts of the 2019 Energy Code in 2023, when the new requirements of the 2022 Energy Code go into effect."[25] This baseline calculation creates a hypothetical baseline which constitutes what the CEC believes will have occurred in 2023 given the impacts of the 2019 Energy Code. This future baseline is prohibited by CEQA Guidelines § 15125(a)(3). CEQA requires an EIR to analyze a proposed project's impacts on the existing environment, rather than an existing regulatory plan.[26] This was pointed out in our comment letter on the NOP (the "NOP Comment Letter"), which stated "CEQA reaches beyond the mere changes in the language in the agency's policy to the ultimate consequences of such changes to the physical environments" and therefore recognizes that regulations adopted by public agencies have the *potential to guide virtually all future growth and development.*[27] **D2-8**

Nor would the attempt to use a "modeled baseline" pass muster as a "projected future conditions" baseline permitted under CEQA Guidelines § 15125(a)(2). Such a projected future conditions baseline is only allowable if the lead agency can establish: (1) that use of existing conditions would be misleading or without informational value supported by substantial **D2-9**

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mitigation measures, assess the advantage of terminating the proposal (*i.e.*, the 'no project' alternative), and weigh other alternatives in the balance.").

[24] *See Environmental Planning & Information Council v. County of El Dorado* (1982) 131 Cal.App.3d. 350.

[25] DEIR at 48.

[26] *Environmental Planning & Information Council*, 131 Cal.App.3d 350 (holding that a lead agency's analysis of a proposed plan's environmental impacts against the existing plan, as opposed to the existing environment, was illusory and misled the public); *Communities for a Better Environment v. South Coast Air Quality Management District* (2010) 48 Cal.4th 310, 315 (analysis that compares impacts with conditions that may be allowed rather than with existing environmental conditions results in misleading comparisons, rather than an informed decisionmaking process).

[27] *See, e.g., City of Redlands v. County of San Bernardino* (2002) 96 Cal.App.4th 398 (holding that a lead agency failed to accurately provide a project description when adopting a regulatory document that deferred the full environmental analysis of the consequences of such action, when it could be reasonably inferred from the adopted regulatory language that the project would result in environmental impacts); *San Joaquin Raptor/Wildlife Rescue Center v. County of Stanislaus* (1994) 27 Cal.App.4th 713 (requiring the project description to include the construction of offsite infrastructure within the project description).

evidence and (2) the projected future conditions baseline is supported by reliable projection based on substantial evidence in the record.[28] The DEIR fails on both accounts.

As to (1), the DEIR claims that the use of a future conditions baseline would provide the "most accurate picture" and that "it is not always possible to use actual historical data to establish existing conditions."[29] The DEIR attempts to justify the use of future conditions by explaining "2020 is the first full year for which the 2019 Energy Code was in effect, and the applicable Energy Code to a building project is determined at the time a building permit is issued, many buildings completed in 2020 would have been built in accordance with the 2016 Energy Code or earlier codes, rather than the 2019 Energy Code."[30] This statement fails to provide substantial evidence that the use of existing conditions would be misleading or without informational value. Additionally, the claim that historical data cannot be used to establish existing conditions is without merit. At the time the NOP was published on March 18, 2021, the 2019 Energy Code had been in effect for over 15 months, meaning there were 15 months of building permits issued that were subject to the 2019 Energy Code. Historical statewide data is also publicly available at the Legislative Analyst's Office website and is regularly updated.[31]

As to (2), the DEIR attempts to show support that the baseline is supported by reliable projections based on substantial evidence in the record by stating "the 2023 date-of-implementation methodology applied in these sections is supported by data from reports submitted to the CEC as part of the rulemaking proceeding for the proposed 2022 amendments (**see Appendices B and D**). Building construction starts were determined following a methodology described in a memo to the CEC (Case Memo, 2021)."[32] However, this statement fails to establish what data is contained in those reports and whether the data and assumptions are consistent with and comply with CEQA.[33] The modeled date-of-implementation baseline explanation provides readers with no meaningful information as to the assumptions made in the hypothetical baseline, nor is the calculation supported by substantial evidence in Appendices B and D, as claimed. Appendix D is a listing of hyperlinks to 36 separate documents that have been considered by the CEC in a separate rulemaking process pursuant to Gov. Code 11340 *et seq*. The DEIR text contains no information as to what information was relied upon in those documents to create the modeled baseline. Appendix B "provides an overview of the workbook of spreadsheets used to compute the values reported in Tables 4.2- 2, 4.2-3 and 4.2-4 in Chapter 4.2 and Tables 4.5-1 and 4.5-2."[34] While the document provides some information as to the assumptions made, it fails to provide a source for the information relied upon. Similarly, the "Case Memo" referenced in the DEIR describes changes made to the construction estimates from

D2-9

Cont.

[28] *See Neighbors for Smart Rail v. Exposition Metro Line Construction Authority* (2013) 57 Cal.4th 439.
[29] DEIR at 28.
[30] DEIR at 28, n.29.
[31] *See, e.g.*, Legislative Analyst's Office. California Economy & Taxes: Building Permits Update May 2021 webpage, https://lao.ca.gov/LAOEconTax/Article/Detail/673, accessed June 28, 2021.
[32] DEIR at 49 (emphasis in original).
[33] *California Oak Foundation v. City of Santa Clarita*, (2005) 133 Cal.App.4th 1219, 1239 (quoting *Santa Clarita Organization for Planning and Environment v. County of Los Angeles* (2003) 106 Cal.App.4th, 715, 772 that "information 'scattered here and there in EIR appendices,' or a report 'buried in an appendix,' is not a substitute for 'a good faith reasoned analysis in response.'").
[34] DEIR at 245.

the Energy Commission, but is extremely vague and difficult to follow. In this way, the DEIR presents only an invalid hypothetical future baseline that is not allowed under CEQA.[35]

Nowhere does the DEIR provide the necessary substantial evidence to prove that an existing conditions baseline is misleading or without informational value, or support the future conditions baseline with reliable projections based on substantial evidence. A reader should not be expected to rifle through dozens of documents with incomplete information, or very little context, in order to understand the Project baseline.[36] Nor does the Project Description make any effort to provide any of the key assumptions utilized to create the tables or to synthesize the information that went into creating the future baseline in a way that is digestible to the average reader. Based on the information provided, the DEIR fails to establish that there are unusual circumstances present that would justify the use of a projected future conditions baseline. The confusing and misleading use of an unjustified future conditions baseline undermines the analysis in every impact area in the DEIR and causes the entire document to fail.[37]

D2-9

Cont.

Lastly, the DEIR inconsistently states which sections are analyzed using the impermissible modeled date-of-implementation baseline. One section of the Project Description states the baseline is used in the analysis for Air Quality, Energy Resources, GHG Emissions, Utilities and Service Systems.[38] The next page of the Project Description purports that the baseline only used in the Air Quality, Energy Resources, and GHG Emissions - omitting Utilities and Service Systems.[39] The Project Description also fails to mention that the analysis for Biological Resources also relies on the use of this baseline, because it on the analysis in Section 4.4 Energy Resources to conclude the Project will not likely "result in the development of future utility-scale renewable projects either directly or indirectly.[40] Failure to provide a consistent Project Description is misleading, and prevents a meaningful public participation process.[41]

D2-10

Project Impacts. As discussed in the Project Description, the Energy Efficiency standards are updated every three years.[42] Due to the confusing language used to describe the Project, the baseline, and Project impacts, it appears that the DEIR only analyzes Project impacts after one year of Project implementation. The DEIR states that it uses "a full calendar year to demonstrate

D1-8

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[35] *Communities for a Better Environment*, 48 Cal.4th at 315 (analysis that compares impacts with conditions that may be allowed rather than with existing environmental conditions results in misleading comparisons, rather than an informed decisionmaking process).
[36] *See Vineyard Area Citizens for Responsible Growth v. City of Rancho Cordova*, (2007) 40 Cal.4th 412, 442 (holding that data in an EIR must be presented in a manner calculated to adequately inform the public and decisionmakers who may not be previously familiar with the project).
[37] *Laurel Heights Improvement Association v. Regents of University of California* (1988) 47 Cal.3d 376, 405 (holding that an and EIR "must include detail sufficient to enable those who did not participate in its preparation to understand and to consider meaningfully the issues raised by the proposed project."); *Neighbors for Smart Rail*, 57 Cal.4th at 463 (holding that a "prejudicial abuse of discretion occurs if the failure to include relevant information precludes informed decisionmaking and informed public process, thereby thwarting the statutory goals of CEQA.")
[38] DEIR at 48.
[39] *Id.* at 49.
[40] *Id.* at 82.
[41] *County of Inyo*, 71 Cal.App.3d at 197; *see also San Joaquin Raptor Rescue Ctr. v. County of Merced* (2007) 149 Cal.Ap.4th 645, 655 (a shifting project description can be indicative of an attempt to minimize a project's impacts by failing to discuss reasonably foreseeable project impacts).
[42] DEIR at 37.

the effects of the 2022 Energy Code relative to the continuation of the 2019 Energy Code [to provide] an accurate assessment of the project potential environmental impacts because construction, energy production, meteorological and climatological conditions fluctuate over the course of a year, with corresponding effects on air quality, energy resources and greenhouse gas emissions."[43] Additionally, in the Air Quality analysis, the DEIR explains that the air quality impacts compare the modeled baseline (the number of anticipated construction starts for the year 2023, "which would be subject to the 2019 Energy Code if the project is not approved") against impacts "from the new buildings that would be constructed in 2023 under the 2022 amendments."[44] This suggests that the analysis is limited to Project impacts occurring after only one year of implementation. However, nowhere does the DEIR explain this or explain why it limits the analysis to only one year. Because the Energy Code has a three-year life cycle, analyzing Project impacts after only one year provides an incomplete picture of the direct and reasonably foreseeable indirect impacts of the Project, particularly the cumulative impacts of the Project. This choice filters through every impact analyses in the DEIR and makes each of them invalid and inadequate under CEQA. D1-8 Cont.

IV. Air Quality Impacts

The DEIR concludes that the Project would result in less than significant impacts to air quality, however, the analysis fails to account for all direct and reasonably foreseeable indirect air quality impacts associated with the Project, including:

- impacts from fires stemming from battery storage systems installed as a result of the Project; D3-2
- impacts resulting from the construction, operation, and maintenance of energy projects due to an increase in electricity demand, including renewable energy facilities and transmission and distribution projects; and D3-3
- impacts resulting from an increased demand for electricity which will result in increased reliance on diesel generators during PSPS Events and power outages. D3-4

A. Inadequate Disclosure of Impacts Related to Building Operations

The Project must analyze the direct and reasonably foreseeable indirect impacts related to the release of toxic air contaminants that may result from the installation of battery storage systems. As discussed in further detail in Section VIII below, Li-ion battery storage systems may result in thermal runaway, leading to fires and the release of toxic air contaminants ("TACs") into the air, including, but not limited to, hydrogen flouride ("HF"), ethyl methyl carbonate ("EMC"), diethyl carbonate ("DEC"), ethylene carbonate ("EC"), carbon monoxide ("CO"); and carbonyl sulfide ("COS"). The DEIR limits its analysis of criteria pollutants and TACs to NO_X and SO_X, without providing any explanation as to why the discussion is limited or any substantial evidence that these are the only TACs that may be emitted with Project D3-5

[43] DEIR at 49.
[44] DEIR at 68.

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implementation. The impacts from thermal runaway can be significant given the difficulty in fighting these types of fires. Li-ion fires are different than typical fires due to their extremely high temperatures, leading to rapid spread and making them more difficult to extinguish.[45] The DEIR cannot wholesale ignore a potentially significant impact of the Project when it is clear that the Project will lead to the installation and operation of more battery storage systems. D3-5 Cont.

B. Inadequate Disclosure of Impacts Related to the Construction of Renewable Energy Projects and Infrastructure

As more buildings are constructed and more electricity is required, it is reasonably foreseeable that renewable energy projects would need to be constructed to meet the increased demand. The DEIR repeatedly attempts to avoid the analysis of the Project's indirect impacts by stating that the Project does "not approve any construction" projects, including the construction of infrastructure, such as utility-scale solar and wind facilities and transmission and distribution lines.[46] Regardless of whether the Project approves specific construction, a lead agency is required to analyze a project's direct <u>and</u> reasonable foreseeable indirect environmental impacts. It is reasonably foreseeable that the Project would result in the construction of buildings that are subject to the Project's requirements, therefore increasing overall electricity demand. D3-6

The DEIR analysis anticipates increased electricity use due to the increased prevalence of electric heat pumps, especially during cooler months. The DEIR further purports that the increase in demands would be met by "existing in-state under-utilized electric sector capacity," but fails to quantify or provide substantial evidence to support the argument that the electric sector is "under-utilized" or has sufficient capacity to meet increased demand, but fails to provide substantial evidence to support this claim. While the DEIR describes the capacity for natural gas power plants in California, this fails to prove up how the Project's increased daily demand will be met by existing utility facilities and infrastructure, and attempts to categorize any analysis of potential impacts as speculative. While the DEIR points to reports summarizing renewable energy portfolio progress, this does not amount to substantial evidence that quantifies how the state's current electric capacity can meet future increased demand due to Project implementation. And, as further described in more detail in Section IX below, the DEIR and other informational sources emanating from the California Public Utilities Commission ("CPUC"), CEC, and the California Independent System Operator ("CAISO"), have indicated that the current electric grid is already strained. D3-7

In our NOP Comment Letter, we noted that increased electricity consumption due to Project implementation would foreseeably result in the construction of renewable energy projects (e.g., solar and wind facilities), as well as transmission and distribution projects, the impacts of which must be analyzed under CEQA. In Section 4.7 (Utilities and Service Systems) the DEIR states that "[t]ransmission expansion plays a vital role in enabling the interconnection and deliverability of renewable energy to meet demand and support load-serving entities in meeting the state's RPS requirements. The California ISO conducts its transmission planning process

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[45] *See, e.g.*, Diaz, L., et al., *Review - Meta-review of Fire Safety of Lithium-ion Batteries: Industry Challenges and Research Contributions*, Journal of Electrochemical Society (Aug. 17, 2020), hereinafter "Diaz - *Meta-review of Fire Safety of Lithium-ion Batteries*," https://iopscience.iop.org/article/10.1149/1945-7111/aba8b9.
[46] DEIR at 75, 76, 77.

annually to identify system upgrades needed to meet grid reliability requirements, projects that could bring economic benefits to consumers, and projects needed for policy reasons, such as to meet California's renewable and clean energy goals."[47] While CAISO may determine exactly when and where future projects may be required, it does not absolve the DEIR from analyzing the Project's reasonably foreseeable indirect environmental impacts, even if the lead agency does not know exactly when and where these projects will be developed. CEQA requires an analysis of all potential Air Quality impacts from future construction, operation, and maintenance of energy projects, including but not limited to, impacts from fugitive dust and exhaust occurring from the use of heavy equipment, support vehicles, and other internal combustion engines during construction. The DEIR fails to provide substantial evidence that there are enough planned energy projects to meet the increased electricity demand resulting from the Project and that no future renewable energy projects will need to be developed to meet Project increased demand. This analysis thus cannot be ignored under CEQA. D3-7 con't

C. Inadequate Disclosure of Impacts Related to PSPS Events and Power Outages

Wildfires and planned power outages PSPS Events) have become a part of the new norm in California.[48] As more homes and businesses rely on electricity to fulfill energy needs, they will become more susceptible to power outages. Evidence shows that PSPS Events result in the increased use of personal diesel generators which can create significant air quality impacts, particularly in areas of high population that are already nonattainment for Particulate Matter ("PM"). In March 2021, the SB 100 Report reported issues with grid reliability and stated that achievement of a 100 percent clean energy target would require the identification of options for "clean backup power when there are disruptions to the grid" which have been recognized to "degrade air quality and emit greenhouse gases."[49] D3-8

The use of diesel generators as a result of PSPS Events is not attenuated. Guidelines for PSPS Events require IOUs to "assess the need for backup generation and determine whether additional equipment is needed, including providing generators to facilities or infrastructure that are not well prepared for a power shut off."[50] The role of diesel fuel generators during PSPS Events is especially significant due to the fact that PSPS Events are typically long term events that can last for several days. As pointed out in the NOP Comment Letter, a recent California Air Resources Board ("CARB") report analyzing the GHG and air quality impacts of the October 2019 PSPS Events found that they resulted in reliance on approximately 125,000 generators statewide. As stated in the CARB report "[g]enerators used during the power outage will

[47] DEIR at 145.
[48] Blunt, K., *PG&E Warns of More Blackouts During California's Wildfire Season*, The Wall Street Journal (June 11, 2021) https://www.wsj.com/articles/pg-e-warns-of-more-blackouts-during-californias-wildfire-season-11623414658.
[49] CARB, CPUC, and CEC, SB 100 Report, Publication No. CEC-200-2021-001, at 19 (Mar. 2021), https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=237167&DocumentContentId=70349.
[50] CPUC, Decision Adopting De-energization (Public Safety Power Shut-Off) Guidelines (Phase 1 Guidelines), Rulemaking.18-12-005, Decision 19-05-042, at A12, (May 30, 2020) https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M296/K598/296598822.PDF ; *see also*, CPUC, Resolution ESRB-8 (July 16, 2018), https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M218/K186/218186823.PDF.

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increase emissions compared to an average day."[51] CARB estimates that during this time, the use of diesel-powered generators resulted in 6,026 tons of NO_X emissions.[52] NO_X emissions from diesel combustion are important because they can result in chemical reactions in the atmosphere leading to the formation of PM2.5 and ozone.[53] D3-8 con't

The use of diesel generators and their impacts are also recognized in a reference cited in the Wildfire analysis (Section 4.8), but conveniently left out of the Air Quality analysis:

- "[O]lder, larger industrial diesel generator[s] spew as much in an hour as driving a truck from Sacramento to Salt Lake City."[54]
- In some instances, generators are even offered by insurance companies as a way to deal with the unreliability of electricity.[55]

D3-9

The DEIR analysis must account for and analyze the reasonably foreseeable air quality impacts resulting from PSPS Events, given an increased electricity use and thus increased number of people who will face loss of power during these events. D3-10

V. Biological Resources Impacts

The DEIR concludes that the Project would have no or less than significant impacts on biological resources. However, this determination is based on an erroneous narrowing of the Project as "not likely to result in the development of future utility-scale renewable projects either directly or indirectly."[56] As previously explained, there is no evidence in the record that this is accurate, and, in fact, evidence presented in this letter and the NOP Letter determinatively prove the opposite; that increased demand in electricity due to Project implementation will result in the development of energy projects to ensure that demand is met. The DEIR cannot based a less than significant finding on a scoping out of major parts of a Project. D4-2

The construction of energy projects, including renewable energy facilities, transmission and distribution facilities, and transmission lines, have been found to have significant environmental impacts on biological resources. In fact, the DEIR recognizes this and states that the Project would result in increased electricity consumption and that "utility-scale projects are D4-3

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[51] CARB, *Potential Emissions Impact of Public safety Power Shutoff (PSPS) Emission Impact: Additional Generator Usage Associated with Power Outage* (Jan. 30, 2020), at 1, https://ww2.arb.ca.gov/sites/default/files/2020-01/Emissions_Inventory_Generator_Demand%20Usage_During_Power_Outage_01_30_20.pdf; *see also*, CPUC, Decision Adopting De-energization (Public Safety Power Shut-Off) Guidelines (Phase 1 Guidelines), Rulemaking.18-12-005, Decision 19-05-042, at B4 (identifying the need to address increased emissions resulting from PSPS Events).

[52] CARB, *Potential Emissions Impact of Public safety Power Shutoff (PSPS) Emission Impact: Additional Generator Usage Associated with Power Outage*, at 1.

[53] CARB, Overview: Diesel Exhaust & Health webpage, https://ww2.arb.ca.gov/resources/overview-diesel-exhaust-and-health, accessed June 30, 2021.

[54] Moench, M., *During PG&E outages, generators caused fires, carbon monoxide poisoning, San Francisco Chronicle* (Nov. 14, 2019), https://www.sfchronicle.com/california-wildfires/article/During-PG-E-outages-generators-caused-fires-14833601.php.

[55] *Id.*

[56] DEIR at 82.

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well documented to have various adverse impacts on biota."[57] Despite this admonition, the DEIR only analyzes impacts related to rooftop solar, not any potential impacts from utility scale solar, wind, or battery projects. The incorrect conclusion that "the beneficial changes in energy demand attributable to the project are not likely to result in the development of future utility-scale renewable projects either directly or indirectly"[58] relies upon the Energy analysis in Section 4.4. However, as discussed in further detail in Section VI below, the energy analysis is flawed not only because it uses an impermissible baseline (explained in Section III above), but also because it fails to account for the inefficient use of energy during peak load times. D4-4

There is substantial evidence pointing to the impacts on biological resources resulting from the construction of utility-scale renewable energy projects and supporting infrastructure. In 2019, the Nature Conservancy issued a study based on the modeling developed for the CEC's 2018 Deep Carbonization in a High Renewable Future study, which also takes into account SB 100's renewable energy goals.[59] The study concluded that in order to meet the state's climate change goals, construction of renewable energy project would significantly overlap (more than 50 percent) with land with high conservation value, creating significant environmental impacts that must be analyzed under CEQA.[60] The study found that "ecological impacts due to wind and solar generation infrastructure and additional transmission requirements are significant. These impacts include loss of Important Bird Areas, Eagle Habitat, Big Game Habitat, and Wildlife Linkages."[61] In particular: D4-5

- transmission projects were found to potentially have impacts on Wildlife Linkages;[62]
- solar infrastructure would have significant impacts on Important Bird Areas;[63] and
- wind generation facilities and transmission corridor projects would need to be sited on rangeland habitats, which have high biodiversity values, provide significant habitat connectivity, and form the foundation for a number of ecosystem services.[64]

As we have previously explained, the Project would result in the need to construct, operate, and maintain energy projects and infrastructure to support the increased electricity demand resulting from the Project. The DEIR must analyze these potential biological resources impacts, in addition to the impacts related to rooftop solar PV equipment.

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[57] DEIR at 82.
[58] *Id.*
[59] *See* Energy and Environmental Economics, *Deep Decarbonization in a High Renewables Future: Updated Results from the California PATHWAYS Model*, CEC, Publication No. CEC-500-2018-012, (Jun. 2018), https://efiling.energy.ca.gov/GetDocument.aspx?tn=223785.
[60] Wu, G. et al, The Nature Conservancy, The Power of Place: Land Conservation and Clean Energy Pathways for California (June 2019), at 38 https://www.scienceforconservation.org/assets/downloads/Technical_Report_Power_of_Place.pdf.
[61] *Id.* at 40.
[62] *Id.* at 39.
[63] *Id.* at 36.
[64] *Id.* at 39.

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VI. Energy Impacts

The DEIR Energy analysis fails to account for:

- the reasonably foreseeable impact that an increased electricity demand would likely result in the construction of more energy projects and supporting infrastructure; D5-2
- impacts related to peak and base load demands; and D5-3
- the nuances of heat pump technologies and their efficiencies, thus resulting in an overstated efficiency of such technologies and an undercounting of electrical demand. D5-4

A. Inadequate Disclosure of Impacts Related to Existing Energy Capacity

D5-5

The Project will lead to the construction of homes and commercial buildings that will be subject to the requirements of the 2022 Building Code. It is reasonably foreseeable to conclude that construction of these homes and commercial buildings will result in an increased demand for electricity, thereby straining existing supply and resulting in the need to construct additional energy projects and supporting infrastructure, including renewable energy projects and transmission and distribution lines, to meet demand. However, the DEIR relies on the use of an impermissible baseline to determine Project impacts, thereby calling into question the entire analysis of Energy impacts and the conclusion that there are adequate facilities to accommodate the increased demand.

B. Inadequate Disclosure of Impacts Related to the Effects of the Project on Peak and Base Load Period Demands

D5-6

Rather than analyzing Project impacts throughout all times of the day, including peak and base load period demands, as required by Appendix F, the DEIR analyzes Project impacts on a seasonal basis.[65] Providing a seasonal analysis of energy masks the true impacts and energy inefficiencies potentially presented by the Project. An analysis of the Project's energy impacts must account for the realistic daily peak loads anticipated by an increased electricity consumption, primarily caused by the Project's heat pump installation requirements. An analysis of the anticipated seasonal impacts masks the Project's impacts as described below.

D5-7

Base load is defined as the minimum amount of electrical power delivered or required over a given period of time at a steady rate (usually a 24-hour period),[66] whereas a peak load is defined as the maximum load required during a specific period of time (usually a smaller timeframe).[67] As shown in Figure 1 below, energy use increases in morning and in the evening hours (generally the peak usage) when renewable energy sources are no longer available. A

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[65] *See* DEIR at 96.
[66] U.S. Energy Information Administration, Glossary webpage (B), https://www.eia.gov/tools/glossary/index.php?id=B (Accessed June 30, 2021).
[67] U.S. Energy Information Administration, Glossary webpage (P), https://www.eia.gov/tools/glossary/index.php?id=P (Accessed June 30, 2021).

recent study conducted by the UCLA Institute of Environment and Sustainability concluded "that aggressive electrification of residential end-use appliances has the potential to exacerbate daily peak electricity demand"[68] and that, even if additional intermittent wind and solar generation capacity is deployed, "[u]nder best case efficiency assumptions, full electrification is expected to increase daily peak loads, on average throughout the year, by 80%. Conversely, under worst case assumptions, daily peak loads are estimated to increase by an average of 265%."[69] Thus, even with the potential for energy efficiency stemming from the switch from natural gas to electricity, *potential energy impacts are likely to be wasteful and inefficient* because they would result in massive overbuilding of energy projects to support the increased energy consumption, particularly during peak load periods. D5-7 con't

A 2018 study found that as the percentage of intermittent renewable power sources services a community increases, the amount of energy that is "curtailed" or wasted because it is not produced when it is needed (e.g., peak load periods) can reach up to 40 percent of total generation.[70] Due to the timing mismatch between the availability of intermittent sources and peak load demands, solar and wind would be unable to meet approximately 30 percent of the state's annual demand.[71] As a result, overbuilding massive amounts of electrical battery storage would be required to capture the surplus power generation and make it available when needed. Estimates by the Clean Air Task Force, a nonprofit organization committed to reducing climate change risks, conclude that California's energy storage needs would require batteries with an instantaneous capacity "larger than the generating capacity of the entire U.S. electric grid."[72] Alternatively, the state's hydrological storage capacity and build new or expanded reservoirs with 100 times the state's current capacity.[73] D5-8

Due to the low energy density of solar and wind generation, the deployment of renewable energy projects would result in much greater land and biological resource impacts and "significantly increases the land use consequences of power systems dominated by variable renewable sources." If California were to meet its climate goals based on solar and wind energy sources alone, the state would been to deploy new energy generation projects at five times the state's historical rates every year for the next 25 years and install "the equivalent of nearly ten of the world's largest onshore or offshore windfarms every year."[74] D5-9

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[68] Fournier, D., et al., *Implications of the timing of residential natural gas use for appliance electrification efforts, Environmental Research Letters 15*, no. 12, UCLA Institute of Environment and Sustainability, at 1 (Nov. 2020), https://iopscience.iop.org/article/10.1088/1748-9326/aba1c0/pdf
[69] *Id.* at 5.
[70] Jenkins, J., et al., *Getting to Zero-Carbon Emissions in the Electric Power Sector,* Joule (Dec. 19, 2018) https://www.sciencedirect.com/science/article/pii/S2542435118305622.
[71] Clean Air Task Force, Comment re SB 100 Joint Agency Report: Charting a Path to a 100% Clean Energy Future, Docket No. 19-SB-100, (Sept. 19, 2019) https://efiling.energy.ca.gov/GetDocument.aspx?tn=229800&DocumentContentId=61244..
[72] *Id.*
[73] Brick, S., *Charting Pathways to Deep Decarbonization: Challenges for Analysts, Policymakers, Advocates and Public: Presentation to the UCSD Deep Decarbonization Initiative* (Jan. 2018) https://deepdecarbon.ucsd.edu/_files/01312018_brink_presentation.pdf.
[74] Clean Air Task Force, Comment re SB 100 Joint Agency Report: Charting a Path to a 100% Clean Energy Future, Docket No. 19-SB-100, (Sept. 19, 2019), https://efiling.energy.ca.gov/GetDocument.aspx?tn=229800&DocumentContentId=61244.

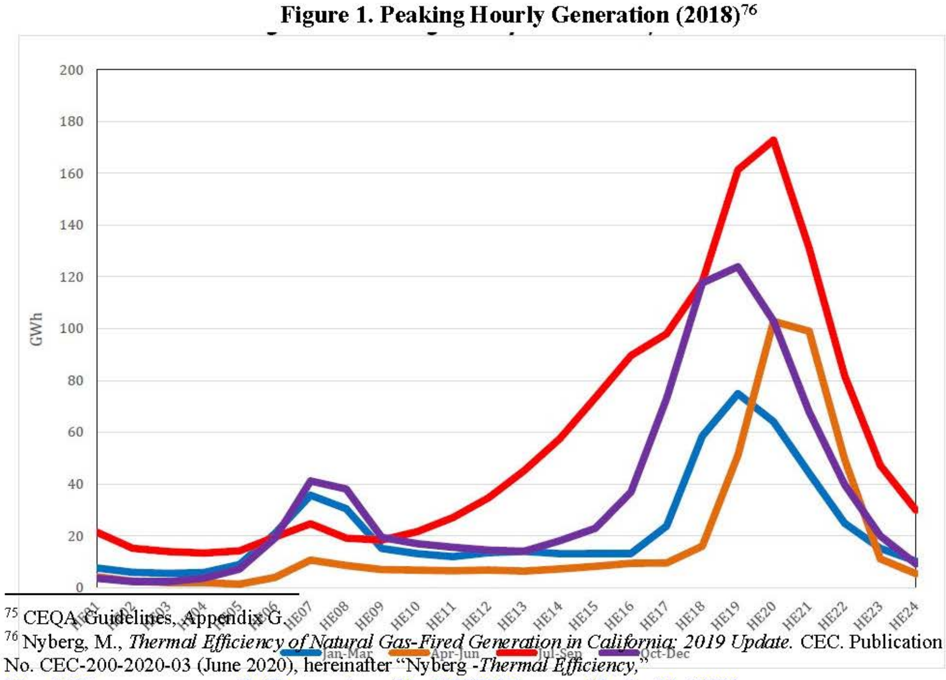
The underestimation of the Project's energy impacts, specifically the increased electricity demand during peak load hours, results in a "wasteful, inefficient, or unnecessary consumption of energy resources"[75] because there is substantial evidence that indicates that an increased reliance on electricity significantly increases daily peak loads, thereby resulting in inefficient and wasteful energy impacts. While the DEIR attempts to explain that PV and battery storage, energy efficiency measures, and reductions in process loads would offset the overall increase in electricity demand due to heat pump requirements, it is unclear from the analysis what assumptions underscore this conclusion. This conclusion is questionable given that there is substantial evidence indicating the most significant daily peak loads take place during the evening hours when people have returned home from work and are tending to their daily household tasks, such as cooking and laundry. Here, the analysis fails to explain how the Project's battery storage requirements for commercial buildings, will meet daily peak energy demands in the evenings when most people are in their homes, thereby masking a wasteful and inefficient use of intermittent energy sources. Further, there is substantial evidence indicating that an increased reliance on renewable intermittent energy sources, such as solar and wind, would require massive overbuilding of energy projects to support an increased demand.

D5-10

By looking at only seasonal peak demands, rather than the daily peak demands, the analysis masks the Project's potentially significant impact as wasteful and inefficient because a seasonal analysis fails to capture the true energy consumption patterns which alter significantly throughout the day.

D5-11

Figure 1. Peaking Hourly Generation (2018)[76]



[75] CEQA Guidelines, Appendix G.
[76] Nyberg, M., *Thermal Efficiency of Natural Gas-Fired Generation in California: 2019 Update.* CEC. Publication No. CEC-200-2020-03 (June 2020), hereinafter "Nyberg -*Thermal Efficiency,*" https://efiling.energy.ca.gov/GetDocument.aspx?tn=233380&DocumentContentId=65895.

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C. Overstatement of Heat Pump Technology Efficiencies

The DEIR also overstates the purported efficiencies from heat pump technologies due to the fact that their efficiency varies depending on a number of factors, including the temperature of water adjacent to the condenser, ambient air temperature and humidity, set point temperature, hot water draw profile, and operating mode.[77] It is unclear whether the DEIR accounted for these factors, given the little detail provided in the analysis. While all of these factors impact efficiency, ambient air temperatures, or colder climates, can have major efficiency implications. This is because, rather than generating heat, heat pump technologies use electricity to move heat from a cool space to a warm space, much like a refrigerator. For this reason, heat pump water heaters ("HPWH") will only operate in heat pump or hybrid mode if the ambient temperature of the air is between approximately 45°F and 110°F. When the temperature of the incoming air drops below 45°F, the HPWH will switch into electric resistance mode which greatly reduces the efficiency of the unit.[78] California is home to no less than half a dozen climate regions in which temperatures fall below 45°F during winter months.[79] Given the state's climate diversity, which ranges from dry desert, mild coastal, to cold mountainous regions, it would be unreasonable to assume that energy efficiency rates for HPWH would be consistent statewide or that such technologies would necessarily be energy efficient in colder regions. D5-12

The loss of efficiency in cooler climates is demonstrated by a 2013 study conducted by the National Renewable Energy Laboratory ("NREL"), which highlights the fact that areas such as the Pacific Northwest are particularly susceptible to higher energy impacts resulting from heat pump technologies. The report concluded that in homes in cooler climate zones, it "can take up to three times as much energy for the [electric resistance] heating equipment to meet the space heating load imposed by HPWH on the conditioned space."[80] D5-13

In addition, hot water demand also affects heat pump energy efficiency. As common sense would dictate, electricity consumption increases with overall water consumption. However, as demonstrated in Figure 2 below, if the hot water demands are intense, a hybrid D5-14

[77] U.S. Department of Energy Office of Energy Efficiency & Renewable Energy, *Energy Savings and Breakeven Cost for Residential Heat Pump Water Heaters in the United States* (July 2013), at 12, hereinafter "U.S. Dept. of Energy - *Energy Savings,*" https://www.nrel.gov/docs/fy13osti/58594.pdf.
[78] U.S. Department of Energy Office of Energy Efficiency & Renewable Energy, *Measure Guideline: Heat Pump Water Heaters in New and Existing Homes* (Feb. 2012), at 8, hereinafter "U.S. Dept. of Energy -*Measure Guideline,*" https://www.nrel.gov/docs/fy12osti/53184.pdf.
[79] These regions include 2, 11, 12, 13, 14, and 16. Pacific Energy Center, *Guide to California Climate Zones and Bioclimatic Design* (Oct. 2006), https://www.pge.com/includes/docs/pdfs/about/edusafety/training/pec/toolbox/arch/climate/california_climate_zones_01-16.pdf.
[80] U.S. Dept. of Energy - *Energy Savings*, at 27.

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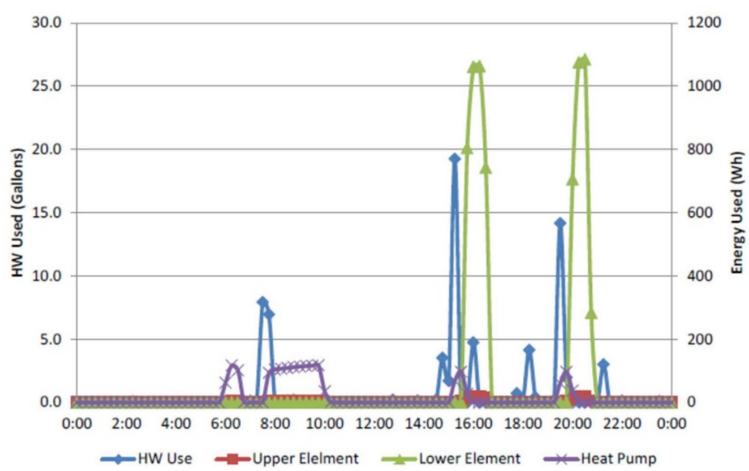
HPWH will revert into electric resistance mode, which consumes at least twice as much electricity as heat pump mode and would therefore greatly exacerbate energy impacts.[81]

D5-14 con't

Figure 2. Electricity Demand for HPWHs Relying On Electric Resistance[82]



VII. Greenhouse Gas Emissions Impacts

The DEIR impermissibly concludes that the Project would result in "no significant" impacts to GHG emissions, based on an invalid hypothetical future baseline and flawed analysis. The DEIR analysis fails to adequate analyze and disclose the Project's impacts as it relates to GHG emissions for energy sources that provide electricity and contains an inadequate disclosure of impacts related to Global Warming Potential ("GWP") refrigerants. D6-2

A. Inadequate Disclosure of Impacts Related to Energy Sources that Provide Electricity

The Comment Letter on the NOP urged the DEIR analysis to account for the variation in GHG emissions throughout the day because buildings rely on different energy sources throughout the day. It appears that the DEIR fails to account for GHG emissions, or any other environmental impacts, stemming from the particular energy source utilized to meet demand at any given time. This omission is significant because intermittent renewable energy sources, such as solar power, have the capability of producing lower levels of GHG emissions, but are only useful during midday hours, when energy demands are lowest and most people are not in their homes.[83] A 2019 article published in the Journal of Building Engineering found that a shower D6-3

[81] U.S. Dept. of Energy -*Measure Guideline*, at 5.
[82] U.S. Dept. of Energy -*Measure Guideline,* at 7.
[83] *See, e.g.*, Smith, O. *The Dark Side of the Sun: Avoiding Conflict Over Solar Energy's Land and Water Demands*

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that takes place between the hours of 7:00 p.m. and 7:00 a.m. that relies on an electric water heater would likely rely on a natural gas power plant to heat the water, and likely produce up to three times as much GHG emissions compared to a water heather that is directly powered by natural gas.[84] As explained above, because of time of day energy use, electricity demand is high when renewable sources are not available. Thus, in order to meet demand, stored power must be utilized from batteries (which California does not have currently have in sufficient quantity), power must be generated from non-renewable sources, such as natural gas-fired peaker plants, or power can be imported from other states and less environmentally friendly and less efficient plants. All three options create potentially significant impacts which the DEIR must consider. D6-3 con't

The impacts of GHG emission for electricity generation are significant. Emissions from electricity generation is the third leading source of GHG emissions in the state of California,[85] yet the DEIR does not appear to account for such emissions. The DEIR provides one short statement regarding GHG impacts for electricity generation: "on-site electricity use can result in the generation and distribution of electricity at renewable and fossil-fuel power plants, resulting in GHG emissions."[86] However, Table 4.5-1 (Typical Greenhouse Gas Emissions from California's Building Sector for 2019 (BAU) and 2022 Energy Code) does not provide meaningful information related to the assumptions made in the GHG analysis, including whether the analysis took into consideration any GHG emissions resulting from power plants when intermittent (renewable) sources of energy are not available. These impacts can be significant, given that in 2018 natural gas made up 34.9 percent of the state's electric generation, followed by large hydroelectric (10.7 percent), and nuclear (9.1 percent).[87] In order to comply with CEQA, the Project must analyze the reasonably foreseeable impacts from the Project, which include energy supplied from peaker plants during times in which intermittent energy sources are not available. D6-4

A 2019 study published by the U.S. Department of Commerce, National Institute of Standards and Technology ("NIST") that analyzed energy use, environmental impacts, and economic performance of residential buildings in Maryland using either electricity or natural gas for space and domestic water heating concluded that a natural gas-heated home is more economical, results in "lower environmental impacts across numerous impact categories," including lower GHG emissions, has a faster heating response time, and generates a greater level of indoor comfort than an all-electric residence. GHG emissions were found to be higher in an all-electric home because of the greater amount of fuels required to produce electricity for use in the home as compared with the use of natural gas equipment in a residence.[88] D6-5

(Oct. 2, 2018) https://www.newsecuritybeat.org/2018/10/dark-side-sun-avoiding-conflict-solar-energys-land-water-demands/.

[84] O'Rear, E., et al., *Gas vs. electric: Heating system fuel source implications on low-energy single-family dwelling sustainability performance*. Journal of Building Engineering. (Sept. 2019), hereinafter "O'Rear - *Gas vs. Electric,*" https://tsapps.nist.gov/publication/get_pdf.cfm?pub_id=926046.

[85] *See* DEIR at 103; CARB. 2000-2018 California Greenhouse Gas Emission Inventory (2020), https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2018/ghg_inventory_trends_00-18.pdf.

[86] DEIR at 108.

[87] Nyberg -*Thermal Efficiency,* at 17.

[88] O'Rear - *Gas vs. Electric.*

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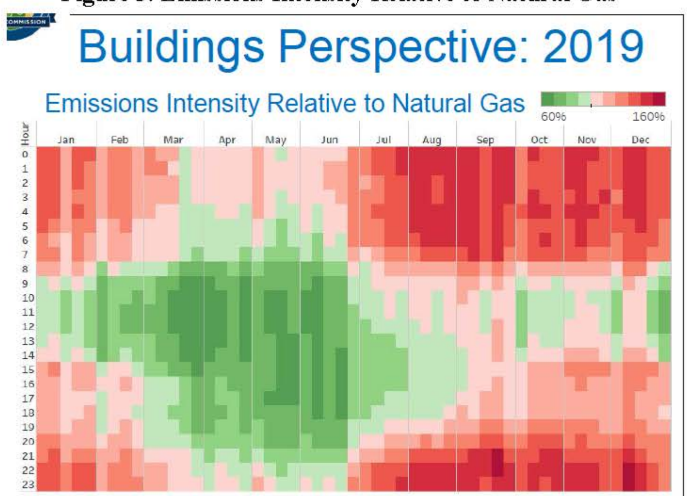
Although California has a larger proportion of renewable utility-scale energy than Maryland, the CEC has shown that in California, consistent with the NIST study, buildings that rely on natural gas generate substantially lower GHG emissions on average than buildings that rely on electricity. As shown in Figure 3 below, in 2018 the *CEC estimated that electricity use in buildings produces a greater level of GHG emissions than natural gas use for approximately 60 percent of the year.*[89] This is because natural gas results in lower GHG emissions during a significant majority of the morning and evening hours in all months, which are the periods of highest residential energy demand. The significantly lower GHG emissions in California buildings that rely on natural gas reflects the fact that, except during daytime hours from about March to June, intermittent solar and wind is insufficient to meet in-state building energy demand. When intermittent renewable energy is not available, electrical generation is less efficient and produces higher GHG emissions than if buildings were relying on natural gas. D6-6

Figure 3. Emissions Intensity Relative to Natural Gas[90]



Additionally, the DEIR erroneously claims that both in-state *and out-of-state* electricity generation combined, is the third leading contributor to GHG emissions. However, the report only accounts for in-state GHG emissions. This misstatement is significant because it misleads readers about the actual GHG impacts emanating from in-state resources. Therefore, the statement contained on page 102 should be edited to read: D6-7

[89] CEC, Building Decarbonization, 2018 Update – Integrated Energy Policy Report, IEPR Workshop Presentation by M. Brook, at 16 (June 14, 2018), hereinafter "CEC - 2018 Building Decarbonization Update," https://efiling.energy.ca.gov/GetDocument.aspx?tn=223817.
[90] CEC -2018 Building Decarbonization Update, at 16.

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> The largest source of GHG emissions in California is transportation, followed by industrial activities and in state ~~and out of state~~ electricity generation (CARB 2018).

D6-7 con't

B. Inadequate Disclosure of Impacts Related to High GWP Refrigerants

The analysis of refrigerants and end-of-life leakage, is also flawed because it fails to account for and quantify any annual or end-of-life leakage once heat pumps are replaced with new technologies; and overstates the reach and relevancy of proposed regulations, currently under consideration by CARB, for the use of refrigerants.

All refrigerants are prone to leakage during their lifetime and at end-of-life. The 2018 Building Decarbonization Update found that "HFCs, a common class of refrigerants, make up 17 percent and 6 percent of all commercial and residential building GHG emissions (in CO2 equivalent), respectively. *These percentages are expected to increase with the transition to electrification.* HFC refrigerants are a fast-growing source of GHGs in California and nationally; without action to curtail them, the emissions from these refrigerants could more than double by 2030."[91] The DEIR analysis must account for these leakages in its GHG analysis. D6-8

To evade disclosing the Project's immediate impacts, Table 4.5-2 (Changes in Gross Greenhouse Gas Emissions From California's Building Sector) shows GHG emissions beginning in 2025 not in 2023. The DEIR fails to explain why it does not analyze the Project's near term impacts, but this is likely because the analysis relies on the implementation of a set of proposed regulations that are not yet adopted to help demonstrate a reduction in potential GHG impacts from Project implementation. While not contained in the main text of the DEIR, Appendix B states that the analysis for air conditioning and space heating considers an effective date of January 1, 2025 for the CARB Refrigerant Regulations."[92] This statement is a misrepresentation of the significance of these proposed regulations, as they have not yet been submitted to the Office of Administrative Law ("OAL") as of the date of publication of the DEIR, and may still be subject to modifications, based on the rulemaking process pursuant to Gov. Code § 11340 *et seq.* Because these regulations have not been adopted, and are not expressly included as a part of the Project scope, the DEIR's reliance on these assumptions is speculative, improper, and must be excluded from the analysis. In any event, it is improper for the GHG analysis to use a horizon year of 2025, waiting specifically for that date to mask true GHG emission impacts, when other impact sections utilize 2023 as the Project year for impact analysis. D6-9

VIII. Hazards and Hazardous Materials Impacts

The Hazards and Hazardous Materials analysis concludes that the Project would have less than significant impacts. However, the DEIR studies only one type of battery storage technology, and fails to adequately analyze and disclose direct and reasonably foreseeable indirect impacts related to: D7-2

[91] CEC, *Toward A Clean Energy Future, 2018 Integrated Energy Policy Report Update, Vol. II,* Publication No. CEC-100-2018-001-V2-CMF (Feb. 2019), at 43, https://efiling.energy.ca.gov/getdocument.aspx?tn=227391.
[92] DEIR at 248-49.

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- the operation of battery storage systems and associated risks;
- exposure of risk, injury or death involving wildland fires;
- impacts related to end-of-life activities; and
- impacts related to mining activities.

D7-2

A. CEQA Requires a Complete Analysis of the Available Battery Storage Technologies and Their Potential Environmental Impacts

The Project would impose battery storage system requirements into specific nonresidential buildings, high-rise residential buildings, hotels, and motels.[93] However, the DEIR analysis is premised exclusively on the environmental impacts associated with Li-ion batteries, though there is no express requirement to utilize Li-ion technology.[94] If Li-ion technology is the only type of technology that can meet the Project's performance and energy requirements, it is not made clear with the text of the Express Terms nor within the DEIR's discussion. Instead, there are several different types of battery storage technology options available on the market. Options for residential battery storage systems include but are not limited to: Lithium NMC, Lithium LFP, Lithium Titanate, Redox, and Sodium-ion.[95] Because the Project does not mandate a particular type of technology for battery storage, the DEIR must analyze potential impacts associated with other types of battery storage technology systems that can meet the same power capacity and energy capacity mandated by the Project.

D7-3

B. Inadequate Disclosure of Impacts Related to the Operation of Battery Storage Systems

Even assuming the Project mandates Li-ion technology, or that Li-ion technology is the only type of technology that satisfies Project requirements, the DEIR fails to account for the risks associated with the use of Li-ion technologies, including the significant risks associated with thermal runaway by dismissing it as a rare occurrence, without providing substantial evidence to support its conclusion, despite the DEIR's recognition that Li-ion fires can rapidly reach temperatures of 932 degrees Farenheit (500 degrees Celcius).[96]

Li-ion fires are not novel. Li-ion technologies are well-known to "spontaneously combust" due to thermal runaway, and it is not unusual to see an evening news story highlighting another Li-ion product that has caught fire. Thermal runaway can be caused by a number of contributing factors including: physical, electrical and thermal factors, manufacturing defect and

D7-4

[93] DEIR at 114.
[94] *See* CEC, Draft 2022 Energy Code Express Terms, Table 140.10-B Battery Storage Capacity Factors (Feb. 22, 2021).
[95] Clean Energy Reviews, Solar Battery Comparison Chart webpage, https://www.cleanenergyreviews.info/hybrid-solar-battery-energy-storage-system-review, accessed June 28, 2021; U.S. Department of Energy, Energy Storage: Types of Batteries webpage, (Mar. 2020) https://energystorage.pnnl.gov/batterytypes.asp.
[96] DEIR at 116.

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even battery aging.[97] The impacts of these fires are amplified when associated with large scale battery storage systems as opposed to common consumer products like cell phones. This is due to the fact that large scale Li-ion batteries, including building storage systems, contain more energetic materials and flammable chemical electrolytes, thus thermal failure becomes "more vigorous and fierce"[98] and leads to extreme fire danger.[99]

The issue with "[l]ithium ion battery fires [is that they are] notoriously challenging to fight. Gaseous suppression and water systems simply are not effective… The most effective method of extinguishing these fires requires large amounts of water applied for many hours or even days. In many locations, especially those that are remote or where water is scarce, this is not desirable or even achievable."[100] "In November of 2017, a fire at a Belgium grid-connected lithium-ion battery energy storage site near Brussels resulted in a cloud of toxic fumes that forced thousands of residents to stay at home. In April of 2019, a lithium-ion battery system exploded at an Arizona Public Service site, severely injuring eight firefighters... And between 2017 and 2019, there were 28 [Energy Storage System ("ESS")] fires in Korea, resulting in the suspension of 522 ESS facilities."[101]

D7-4 con't

Lithium-ion fires are also associated with the release of toxic substances. Due to the chemical composition inside of the batteries, toxic emissions including: hydrogen flouride ("HF"), ethyl methl carbonate ("EMC"), diethyl carbonate ("DEC"), ethylene carbonate ("EC"), carbon monoxide ("CO"); and carbonyl sulfide ("COS"), can be released, which may result in severe health impacts, including death.[102]

Despite the popularity of lithium-ion technology, experts have not yet determined a singular approach to mitigate fire risks and therefore, " a wide range of different safety strategies are combined to achieve a sufficient level of safety."[103] Additionally, with the increasing prevalence of battery storage systems comes increased risk and occurrence of fires associated with such systems.[104] A 2020 article published in the Journal of Electrochemical Society concluded that "containing any fire or explosion within the battery case during failure is still a

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[97] Ouyang, D., et al. *A Review on the Thermal Hazards of the Lithium-Ion Battery and the Corresponding Countermeasures,* Applied Sciences (June 18, 2019) https://res.mdpi.com/d_attachment/applsci/applsci-09-02483/article_deploy/applsci-09-02483-v2.pdf

[98] Wang, J., *Evaluating the thermal failure risk of large-format lithium-ion batteries using a cone calorimeter,* J. of Fire Sci., at 82 (2019) https://journals.sagepub.com/doi/pdf/10.1177/0734904118816616.

[99] Li, W., et al., *Fire Boundaries of Lithium-ion Cell Eruption Gases Causes by Thermal Runaway,* iScience (May 21, 2021) https://www.cell.com/iscience/pdf/S2589-0042(21)00369-2.pdf.

[100] Energy Storage News, Preventing Thermal Runaway in Lithium-ion Energy Storage Systems webpage, (May 10, 2021) https://www.energy-storage.news/blogs/preventing-thermal-runaway-in-lithium-ion-energy-storage-systems.

[101] *Id.*

[102] Nedajalkov, A., et. al., *Toxic Gas Emissions from Damaged Lithium Ion Batteries - Analysis and Safety Enhancement Solution,* MDPI, (March 7, 2016); *see also,* Center for Disease Control, Facts About Hydrogen Fluoride (Hydrofluoric Acid) webpage, (April 5, 2018) https://emergency.cdc.gov/agent/hydrofluoricacid/basics/facts.asp (Hydrogen flouride can easily penetrates the skin, resulting in severe burns and even death upon skin contact. Inhalation can result in lung damage and swelling, fluid accumulation, and chronic lung disease).

[103] Diaz - *Meta-review of Fire Safety of Lithium-ion Batteries* at 5.

[104] S&P Global Market Intelligence, *Burning Concern: Energy Storage Industry Battles Battery Fires,* (May 24, 2019) https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/burning-concern-energy-storage-industry-battles-battery-fires-51900636.

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challenge for most industries that operate with large format cells (e.g. EVs, HVs, aerospace, manufacturing or stationary grid). Specific research on what energy needs to be contained in the battery case, how to calculate it, and thus what thickness of material to use for the case, is still required."[105] The DEIR must analyze all direct and reasonably foreseeable indirect impacts related to the operation of battery storage systems, including the potential for fires resulting from thermal runaway. D7-4 con't

C. Inadequate Disclosure of Impacts Related to Exposure of Risk, Injury, or Death Involving Wildland Fires

While the Project does not incentivize building in areas that are more susceptible to wildland fires, the DEIR's finding of a "less than significant risk" for wildland fires caused by transmission lines fails to account for the potential of other kinds of fires due to Project implementation. For example, the Project presents an increased risk of wildfires resulting from a malfunctioning batter or thermal runaway and could present an increased risk of severe wildfire if such an event were to combine with an already-existing wildfire.[106] D7-5

The DEIR dismisses such risks because "industry standards and fire code compliance that would be required to install and operate the systems required by the Energy Code updates would ensure that this risk is minimized and that there is an insignificant resulting likelihood of harm to the environment and public safety." To support this claim, the DEIR cites to Table 4.6-1 (Standards and Codes That May Apply to Lithium Ion Battery Storage Systems). However, it is unclear exactly which of these safety measures and precautions are required to be implemented, when these standards and codes apply to a large scale battery storage system, and how they would lessen the risk of wildfire. Nor is it clear that any of the standards and codes provided in Table 4.6-1 actually minimize the risks associated with large format cells.

Finally, the Federal Emergency Management Agency ("FEMA") has conducted studies that indicate that the DEIR overestimates the knowledge and capability of utility companies and other regulators, including fire fighters to deal with such risks: "Although the fire service routinely responds to explosive scenarios, such as those associated with natural gas leaks, standard operating procedures do not exist for scenarios like a battery energy storage system for which there is no way to cut off the gas supply. The fire service is unaware and inexperienced with the fire and explosion hazards of [battery storage systems]."[107] This clearly significant impact cannot be ignore and must be analyzed and disclosed in the DEIR. D7-6

D. Inadequate Disclosure of Impacts Related to End-of-Life Activities

The Project will result in an increased utilization of battery storage systems which will eventually reach end-of-life stages and need to be disposed of in some manner. Battery storage systems, and Li-ion batteries, contain toxic and hazardous materials that pose significant environmental impacts if not properly disposed. However, the DEIR's analysis fails to discuss the life span of batteries, how much lithium or other hazardous materials are present in the D7-7

[105] *See* Diaz - *Meta-review of Fire Safety of Lithium-ion Batteries.*
[106] DEIR at 134.
[107] Federal Emergency Management Agency, Emerging Hazards of Battery Energy Storage System Fires webpage, (Oct. 27, 2020) https://www.fema.gov/case-study/emerging-hazards-battery-energy-storage-system-fires.

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batteries and need to be disposed of once the battery's life span is over, or the environmental impacts associated with improper disposal. As stated in the DEIR, current research and product data shows grid connected batteries could have a life of 7 to 10 years, depending on how well the battery is maintained. Presuming buildings have a lifespan of 30 years (using the same methodology as the GHG analysis), a battery could potentially be changed 3-4 times during a building's lifespan. Therefore, the DEIR must analyze the impacts associated with a high turnover rate of batteries. D7-7 con't

The DEIR attempts to downplay the environmental impacts associated with end-of-life activities, by making broad assumptions that batteries will be adequately disposed, recycled, or repurposed, when in actuality substantial evidence indicates that these assumptions are not reasonable (largely due to lack of regulation and impractical technologies). For example, the DEIR states "It is anticipated lithium ion batteries will be repurposed for a second life."[108] However, the DEIR fails to provide substantial evidence to support this conclusion. It is unreasonable to assume that all batteries would be repurposed, when there is no regulatory or statutory requirement to do so. Instead, the DEIR relies on a 2020 Markets and Markets report to demonstrate that there will be sufficient recycling facilities to accommodate demand. However, the DEIR provides no specific details about the assumptions made in the report, including the number of recycling facilities required to meet anticipated demand, and whether any facilities are planned for or anticipated within the state of California. Additionally, the report is not readily available to the public, nor is it provided on the CEC's Docket, and is only available for purchase at the exorbitant cost of $4,950, before which a prospective reader must first share their objectives or purpose for requesting the report.[109] While we have requested a copy of this report from the CEC, they have responded that they do not have possession of the report.[110] This raises the question as to whether the DEIR has truly provided the public and decisionmakers with the information necessary to understand Project impacts. D7-8

Additionally, a 2020 report by the Energy Trade Storage Association highlights the many challenges associated with repurposing large lithium-ion energy storage systems, in part due to unstable markets for collection, transport, and recovered resource sales.[111] Contrary to the DEIR's blanket assertion that many batteries would be repurposed for a second life, the report indicates that there are currently no facilities that fully recycle Li-ion batteries or provide them a second life.[112] Further, a 2019 report indicates that less than 5 percent of lithium-ion batteries are recycled, largely due to lack of uniformity of these battery systems.[113] Manufacturers have been focused on lowering costs, and increasing battery longevity and charge capacity rather than recyclability, making it less than cost-effective to pursue such processes for very small amounts D7-9

[108] DEIR at 129.
[109] Markets and Markets, Purchase Report webpage, https://www.marketsandmarkets.com/Purchase/purchase_reportNew.asp?id=153488928, accessed June 28, 2021.
[110] Email from Josephine Crosby, California Energy Commission to Jennifer Hernandez and Paloma Perez-McEvoy, Holland & Knight, dated June 30, 2021.
[111] Energy Storage Association, *End-of-Life Management of Lithium-ion Energy Storage Systems* (Apr. 22, 2020), at 13, https://energystorage.org/wp/wp-content/uploads/2020/04/ESA-End-of-Life-White-Paper-CRI.pdf.
[112] *Id.* at 12; *see also* Climate Central, Climate Central Solutions Brief: Battery Energy Storage webpage (Nov. 13, 2019), https://www.climatecentral.org/news/climate-central-solutions-brief-battery-energy-storage.
[113] Jacoby, M., *It's Time to Get Serious About Recycling Lithium-ion Batteries*, Chemical & Engineering News, (July 14, 2019) https://cen.acs.org/materials/energy-storage/time-serious-recycling-lithium/97/i28.

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of expensive resources like cobalt and nickel.[114] The DEIR cannot ignore these potentially significant impacts and must analyze the direct and reasonably foreseeable indirect impacts resulting from the end-of-life activities related to battery storage systems. D7-9 con't

E. Improper Disclosure Regarding Mining Activities

The DEIR also completely ignores mining impacts associated with the anticipated increase in demand for battery storage and rare minerals due to Project implementation. Li-ion technology commonly relies on cobalt, a highly valuable natural resource primarily mined in Congo. An investigative report from the Washington Post estimates that as much as 60 percent of the world's cobalt comes from Congo. Cobalt miners in Congo often suffer from death, injuries, and "mining activities expose local communities to levels of toxic metals that appear to be linked to ailments that include breathing problems and birth defects.[115] The report also found that residents living at or in near proximity to mining areas also have high levels of cobalt, lead, cadium and uranium in their urine, that there are elevated levels of metals in fish swimming in nearby rivers, and that there are increased rates of birth defects if one of the parents works in the mining industry.[116] The Project cannot ignore the broad impacts it causes by pigeonholing itself into a narrow regulatory change to "improve the climate". The DEIR must grapple with, disclose, and analyze all direct and reasonably foreseeable indirect impacts that will occur due to Project implementation, including those related to mining activities necessary to support the increased batter storage that will necessarily occur when the Project is adopted. D7-10

IX. Utilities and Service Systems Impacts

The DEIR concludes that the Project would result in no impacts on water, wastewater treatment, storm water drainage, or telecommunication facilities, and would have less than significant impacts on electric power and natural gas facilities. The DEIR's conclusion that there would be a less than significant impact on electric power facilities is grounded on the assertion that "[t]he current capacity of instate electricity generation is expected to meet any near-term potential increase in electrical usage from heat pump technologies with minimal expansion of existing electrical infrastructure."[117] To support this vague statement, the DEIR points to Table 4.7-1 which indicates the Project's expected energy savings. However, reliance on this table is misplaced because it relies upon an improper baseline, as explained above. Further, the Table refers the reader to Appendix B as its source, but it is wholly unclear how the numbers provided in the Table compare with the state's existing grid capacity. The lack of meaningful information contained in the DEIR robs the reader of the ability to understand the Project and its potential environmental impacts and thus violates CEQA central tenants that an EIR must be understandable and clear.[118] D8-2

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[114] *Id.*
[115] Frankel, T., *The Colbalt Pipeline: Tracing the Path From Deadly Hand-dug Mines in Congo to Consumers' Phones and Laptops*, The Washington Post (Sept. 30, 2016) https://www.washingtonpost.com/graphics/business/batteries/congo-cobalt-mining-for-lithium-ion-battery/.
[116] *Id.*
[117] DEIR at 142.
[118] *Association of Irritated Residents*, 107 Cal.App.4th at 1391.

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The SB 100 Report indicates that the August 2020 rolling blackouts highlighted the state's strained electrical grid, and found that the following factors contributed to the rolling blackouts:

- The extreme, climate change-induced heat wave resulted in electricity demand exceeding supply; the existing resource planning processes are not designed to fully address extreme heat waves.

- Resources planners have not kept pace with the rapid rise of solar and wind power on the grid, resulting in insufficient support to meet the high demand in the early evening in extreme conditions.

- Some practices in the day-ahead energy market exacerbate supply challenges when the grid is under high stress.[119]

D8-3

In response to the rolling power outages, CAISO wrote to Governor Newsom stating that "[w]e know that capacity shortfalls played a major role in the CAISO's ability to maintain reliable service on the grid."[120] Such impacts would only be exacerbated by an increased reliance on the electrical grid such as that which would occur with Project implementation. Importantly, this letter also contains the signature of the CEC Chair, making it difficult to fathom how the CEC can now allege that increased electricity demand will not further strain the grid.

In 2020, consultants at ScottMadden prepared a report studying key integration issues and resiliency concerns amidst state and local clean energy and GHG reduction policies.[121] The report found that California's clean energy goals and the potential for in-state demand vastly exceed in-state renewables supply, and that resiliency concerns point to the potential need for increased capacity.[122] The report also suggested that "[a]s regions and states develop and communicate clean energy goals, *they should work with the RTO/ISO to understand the degree to which these goals must be facilitated by transmission* (both intra- and interregional)."[123] The DEIR cannot bury these impacts and refuse to address them under vague allegations that current supply is sufficient and that additional energy efficiency will make up for any increase demand. CEQA require more than blind assertions and the DEIR does not provide that.[124]

D8-4

[119] SB 100 Report at 44-45.
[120] Letter from Marybel Batjer, President, CPUC, Stehen Berberich, President and Executive Officer, California Independent System Operator, and David Hochschild, Chair, California Energy Commission to Governor Gavin Newsom at 2 (Aug. 19, 2020), https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/News_Room/NewsUpdates/2020/Joint%20Response%20to%20Governor%20Newsom%20Letter%20August192020.pdf.
[121] ScottMadden, *Informing the Transmission Discussion, A Look at Renewables Integration and Resilience Issues for Power Transmission in Selected Regions of the United States, Executive Summary* (Jan. 2020), https://www.scottmadden.com/content/uploads/2020/01/ScottMadden_WIRES_Informing-the-Transmission-Discussion_1-Executive-Summary_2020_0115.pdf.
[122] *Id.* at 15.
[123] *Id.* at 18 (emphasis added).
[124] CEQA Guidelines § 15384 ("Substantial evidence" means enough relevant information and reasonable inferences from this information that a fair argument can be made to support a conclusion); *see also Sierra Club v. County of Fresno* (2018) 6 Cal.5th 502 (an EIR must contain facts and analysis, not just bare conclusions and options).

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X. Wildfire Impacts

The DEIR concludes that the Project would result in no or less than significant impacts related to Wildfires. This is because the analysis attempts to limit the discussion of reasonably foreseeable indirect impacts to those "occurring only as a result of buildings being constructed in compliance with the 2022 amendments after they have taken effect."[125] This unreasonable narrowing of the Project masks its true impacts, including those from new utility infrastructure. D9-2

Because the Project will result in an increased reliance on electricity, it is reasonably foreseeable that new utility infrastructure will need to be constructed (as discussed in Section IX above), including renewable energy facilities and transmission and distribution lines. This may cause an increase in fire risk because, in an era of increasingly dry and warm climates, California wildfires are occurring at increased frequencies and severities, many of them caused by electric transmission lines.[126] Fires attributable to power lines comprise roughly half of the most destructive fires in the state's history.[127] Therefore, the increased risk of wildfires caused by electric transmission lines must be analyzed in the DEIR.

It is also reasonably foreseeable that the increased presence of these projects, increased wildfires, and increased electricity demand may result in more PSPS events. PSPS events are disruptive and can span large geographic areas for long periods of times. In 2019, a PSPS Event instituted by Pacific Gas & Electric ("PG&E") beginning October 9, 2019 impacted over 732,348 households in 35 counties across the Sacramento Valley, Sierra Foothills, North Bay, South Bay, East Bay, Central Coast, and parts of Southern California.[128] PSPS events also raise a number of significant public safety issues that have not been analyzed in the DEIR. These impacts include loss of power at critical medical facilities (disparately impacting medically vulnerable communities requiring access to medical devices), added strain on first responder services (such as local police departments and EMTs), loss of school days and disruption of critical city infrastructure during emergency responses (such as traffic lights), and an inability to access other necessary services from gas stations and ATMs.[129] Under certain circumstances, PSPS events may even curtail access to critical phone services, inclusive of wireless services, D9-3

[125] DEIR at 155.

[126] Energy and Environmental Economics, Inc., *Decarbonizing Pipeline Gas to Help Meet California's 2050 Greenhouse Gas Reduction Goal,* (Jan. 2015), hereinafter "E3 - *Decarbonizing Pipeline Gas,*" https://www.ethree.com/wp-content/uploads/2017/02/E3_Decarbonizing_Pipeline_01-27-2015.pdf.

[127] CPUC, Public Safety Power Shutoff (PSPS)/De-energization webpage, https://www.cpuc.ca.gov/psps/#:~:text=In%202012%2C%20the%20CPUC%20ruled,order%20to%20protect%20public%20safety.&text=In%202020%2C%20the%20electric%20companies,provisions%20for%20COVID%2D19%20measures, accessed June 28, 2021.

[128] PG&E, *Amended Public Safety Power Shutoff (PSPS) Report to the CPUC Oct. 9-12, 2019 De-Energization Event* (Nov. 8, 2019), https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/News_Room/NewsUpdates/2019/PGE%20Public%20Safety%20Power%20Shutoff%20Oct.%209-12%20Report_Amended.pdf.

[129] *See, e.g.*, CPUC, Frequently Asked Questions about Utility Public Safety Power Shut-off (PSPS) Events webpage, https://www.cpuc.ca.gov/PSPSFAQ/, accessed Apr. 16, 2021; *see also*, Luna, T., *Power shut-off could prevent wildfires, but at what cost to the elderly and disabled?* Los Angeles Times (Aug. 18, 2019), https://www.latimes.com/california/story/2019-08-17/california-utilities-power-outages-wildfires; Pickoff-White, L., et al, *PG&E Shutoffs Are Here Again: What to Know About Power Outages Today*, KQED (September 8, 2020), https://www.kqed.org/news/11836990/pge-shutoffs-are-here-again-what-to-know-about-power-outages-today.

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leaving some of the state's most vulnerable populations stranded.[130] Loss of access to reliable phone services would result in an inability to access emergency services, and to access public safety updates related to the PSPS event.[131] The Project analysis must account for the reasonably foreseeable public safety impacts associated with PSPS Events.

D9-3 con't

It appears that the DEIR attempts to claim that battery storage requirements would "partially supplant more volatile equipment in the absence of battery energy storage, such as fossil fuel backup generators."[132] The DEIR fails to account for the fact that battery storage systems would only serve if a building has not burned down in a fire. The analysis also fails to explain if and how a battery storage system could provide energy for a long duration, as wildfires and PSPS events can leave customers without power for days. Lastly, this statement fails to analyze the air quality impacts associated with other power-generating equipment, such as diesel-fueled generators, in the event of a wildfire or PSPS event, as described in greater detail in Section IV above.

XI. Disparate Impacts on Working-Class and Disadvantaged Communities

The Project would result in an increased demand in electricity and increased electricity costs.[133] The DEIR prematurely concludes that such impacts would be "purely economic effects" because it assumes that low-income households not only have access to electricity, but have the resources to pay for it.[134] The Project must analyze the reasonably foreseeable public health impacts that will result from an increased demand for electricity and rising energy costs that will disproportionately impact California's most vulnerable low-income and working class communities.[135]

D10-2

California already has the highest poverty rates in the nation[136] and these are the residents who will undoubtedly be impacted by the Project's attempt to increase reliance on electricity. A

[130] CPUC, Public Safety Power Shutoff(PSPS)/De-Energization: Potential Impacts on Telephone Service during De-Energization webpage, https://www.cpuc.ca.gov/psps/, accessed June 28, 2021.
[131] *See* CPUC, Public Report on the Late 2019 Public Safety Power Shutoff Events, at 18, (Apr. 30, 2020) https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/News_Room/NewsUpdates/2020/SED%20Public%20Report%20On%20The%20Late%202019%20PSPS%20Events.pdf.
[132] DEIR at 156.
[133] *See e.g.*, Murray, B., *The Paradox of Declining Renewable Costs and Rising Electricity Prices*, Forbes (June 17, 2019), https://www.forbes.com/sites/brianmurray1/2019/06/17/the-paradox-of-declining-renewable-costs-and-rising-electricity-prices/?sh=33dded0c61d5, *see also*, Bryce, R. *Department of Energy Price Data Spotlights Regressive Nature of 'Electrify Everything' Effort*, Forbes (Mar. 19, 2021), https://www.forbes.com/sites/robertbryce/2021/03/19/department-of-energy-price-data-spotlights-regressive-nature-of-electrify-everything-effort/?sh=43cdd614574f (finding that on an energy-equivalent basis, electricity will cost more than twice as much as natural gas and propane as energy fuel sources).
[134] Dolsack, N., et al. *Urban Heatwaves Are Worse For Low-Income Neighborhoods*, Forbes (Aug. 14, 2020) https://www.forbes.com/sites/prakashdolsak/2020/08/14/urban-heatwaves-are-worse-for-low-income-neighborhoods/?sh=32ca93319d50.
[135] Nature Energy, *Editorial: Energy Justice Toward Racial Justice*, (Aug. 14, 2020), https://www.nature.com/articles/s41560-020-00681-w (finding African Americans face higher rates of energy poverty than other racial groups).
[136] *See* Downs, R., *Census Bureau: California has the highest poverty rate in the U.S., UPI* (Sept. 13, 2018), https://www.upi.com/Top_News/US/2018/09/13/Census-Bureau-California-has-highest-povertyrate-in-US/1611536887413/.

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2020 report prepared by Next10 and the Energy Institute at UC Berkeley's Haas School of Business ("Next10 Report") found that electricity rates among California's three IOUs are already substantially higher than the national average.[137] Such rates are not likely to decrease as roughly 66 to 77 percent of the costs recovered by the state's IOUs are for fixed operational costs that are independent of customer consumption, to which *"lower- and average-income households bear a greater burden."*[138] In fact, a 2020 study concluded that as many as 12.8 percent of Californians lack enough resources to meet a household's basic needs,[139] leaving the state's most vulnerable populations in a "heat or eat" dilemma.

These high energy burdens can lead to an inability of low-income families to pay their utility bills, thereby exposing them to a high vulnerability of utility shut off or eviction; and negative health impacts, such as thermal discomfort leading to hypothermia or heat stress, respiratory problems like asthma and chronic obstructive pulmonary disease ("COPD"), exposure to lead and carbon monoxide poisoning, and severe mental health problems resulting from the stress of dealing with the threat of disconnection or inability to pay.[140]

D10-2
con't

The completely unfounded conclusion that such impacts are purely economic and the attempt to tout financial incentive or tax policies that will allegedly ease the burden on low-income households is inadequate.[141] Financial incentives typically require a consumer to commit to high up-front costs, and "[l]ow-income households often cannot afford the up-front financial 'match' required to obtain the rebates and loans available to consumers who buy energy-efficient household appliances."[142] As common sense would dictate, an energy-burdened household that is struggling with the ability to pay for monthly utility costs certainly cannot be expected to pay for even more costly energy upgrades. Similarly, tax credit programs do not provide much financial incentive because low-income households do not have a high tax burden.[143]

There is substantial evidence indicating that the Project would result in increased demand in electricity and increased electricity rates. Such impacts on low-income households are exacerbated by the fact that energy-burdened households suffer from greater health impacts and mental distress resulting from the inability to pay and/or threat of utility disconnection. As such impacts are not purely economic, they must be analyzed in the DEIR.

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137 Energy Institute at Haas, *UC Berkeley, Designing Electricity Rates for An Equitable Energy Transition*, Executive Summary at 4, (Feb. 23, 2021) https://www.next10.org/publications/electricity-rates.
138 *Id.*
139 Bohn, S., et al., *Just the Facts, Poverty in California, Public Policy Institute of California and Stanford Center and Poverty and Inequality* (July 2020), https://www.ppic.org/publication/poverty-in-california/.
140 Brown, M., et al. *High Energy Burden and Low-Income Affordability: Conclusions from a Literature Review*, Progress in Energy (Oct. 27, 2020), hereinafter "Brown - *High Energy Burden*," *https://iopscience.iop.org/article/10.1088/2516-1083/abb954/pdf* (finding a direct correlation between household income and rates of utility disconnection); *see also*, Ayala, R., et al. *How High Are Household Energy Burdens? An Assessment of National and Metropolitan Energy Burden Across the United States*, American Council for an Energy-Efficient Economy, at 5 (2020), https://www.aceee.org/sites/default/files/pdfs/u2006.pdf;.
141 *See, e.g.*, Borenstein, S., *Rooftop Solar Inequity*.
142 Brown - *High Energy Burden* at 7.
143 *Id.*

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XII. Cumulative Impacts

CEQA Guidelines § 15130(a) requires a discussion of a project's cumulative impacts when the project's incremental effect is cumulatively considerable, meaning the individual project's effects are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects. CEQA Guidelines § 15355 also defines the cumulative impact of two or more individual effects that, when considered together, are considerable or that compound or increase environmental impacts. Additionally, cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

CEQA requires the DEIR to disclose and analyze the cumulative effects of the Project in conjunction with the multiple legislative and regulatory efforts that are intended to and will result in an increased reliance on electricity. Despite the DEIR's efforts to list all of the energy policies aimed at "decarbonization", the analysis fails to take into account the cumulative impacts of the Project in connection with various policies and programs that will increase electrical demand. For example, the analysis fails consider local building codes, including Reach Codes, which contemplate bans on natural gas, increased reliance on electrical power, and sometimes an all-electric scenario.[144] According to the DEIR, 42 local jurisdictions have adopted policies that are more stringent than the 2019 Energy Code[145] and 37 local codes that exceed the 2019 Energy Efficiency requirements have been approved by the CEC.[146] However, the DEIR fails to analyze the impacts of these policies in conjunction with the Project in its cumulative impacts analysis. D12-1

Such efforts are intended to and will result in an increased reliance on electricity. Therefore, it is reasonably foreseeable that the Project, in conjunction with these past, present, and reasonably foreseeable future projects, would result in the construction, operation, and maintenance of more renewable energy facilities, including utility-scale solar and wind facilities, utility-scale battery storage systems, and supporting infrastructure such as transmission and distribution lines, and the various impacts of these activities, as described in general below, must be analyzed in the DEIR.

Additionally, the DEIR fails to take into account that the Diablo Canyon Power Plant, which is responsible for approximately 10 percent of the state's energy, is due to shut down in 2024.[147] The CPUC has not yet approved a plan to replace this lost source of power that looms in the short-term.[148] This raises questions as to the grid's reliability and ability to meet demand, particularly the increased demand that will occur due to Project implementation. D12-2

Air Quality. As described in Section IV above, the construction of energy projects would result in fugitive dust and exhaust occurring from the use of heavy equipment. The development D3-11

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[144] *See, e.g.*, Gough, M., *California Cities Lead the Way to a Gas-Free Future,* The Sierra Club (June 2, 2021) https://www.sierraclub.org/articles/2021/06/californias-cities-lead-way-gas-free-future.
[145] DEIR at 97.
[146] *Id.* at 91.
[147] Balaraman, K., *California's Last Nuclear Plant is Poised to Shut Down. What Happens Next?* Utility Dive (Mar. 23, 2021) https://www.utilitydive.com/news/californias-last-nuclear-plant-is-poised-to-shut-down-what-happens-next/596970/.
[148] *Id.*

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of utility scale projects and increased battery use could also result in other impacts such as increased operational emissions, increased TAC emissions, and health risk from battery disposal. D3-11 con't

Biological Resources. As discussed in Section V, the construction of energy projects and supporting infrastructure would have significant impacts on wildlife habitats and rangelands. The cumulative impacts analysis in the DEIR concedes that "utility-scale projects are well documented to have various adverse impacts on biota."[149] Further, a 2019 study conducted by the Nature Conservancy found that in order to meet the state's climate change goals, construction of project areas would significantly overlap (more than 50 percent) with land areas that have high conservation value. To meet future demand in a world where cumulative projects result in significantly increased electrical demand, wind and solar facilities would have to be sited in habitats that have biodiversity and important ecological value, as the scale of land needed to meet such demand is huge. Similarly, wind generation facilities and transmission corridor projects would also likely need to be sited on rangeland habitats. These impacts are likely to be cumulatively considerable in light of the various other policies that encourage the deployment of renewable energy sources and supporting infrastructure that would increase reliance on electricity and require the construction of more projects and infrastructure to support increased electrical demand. D4-6

Utilities and Service Systems. The DEIR concludes that the "grid is already transforming to accommodate projects meeting the policies that encourage electrification with renewable energy[,]" and states that "existing powerplant capacity is sufficient to accommodate shifted peaks without the need for additional development."[150] However, as discussed in Section IX, the DEIR overstates existing electric grid capacity and fails to provide any information related to projects that will add capacity to the grid. It is reasonably foreseeable that local policies which are aimed at increasing dependence on electricity, taken together with the Project, would result in cumulatively considerable impacts to Utilities and Service Systems which must be analyzed in the DEIR. The DEIR must take the Project's impacts, along with policies like SB 100 and other local ordinances that exceed the 2022 Energy Efficiency requirements, into consideration to determine whether the Project's impacts are cumulatively considerable. D8-5

Hazards and Hazardous Materials. The DEIR fails to account for cumulative impacts associated with an increased reliance on Li-ion batteries. The Project analysis concludes that because the transportation sector makes up the significant majority of the demand for lithium ion batteries, the number of lithium ion batteries resulting from the Project would be "small." However, this fails to quantify the number of batteries used, explain assumptions for determining the Project demand would be small, or provide substantial evidence to support these conclusory statements. As described in fuller detail in Section VIII, fires resulting from thermal runaway in large scale Li-ion batteries present a volatile risk. Additionally, the DEIR overstates the number of lithium-ion technologies that will be recycled. As the popularity of EV vehicles have skyrocketed, regulators and climate activists are ringing the alarm about the lack of preparedness for battery recycling and disposal, finding that recycling has not been widely used due to a number of challenges including cost, difficulty in extracting recyclable resources, and variations D7-11

[149] DEIR at 200.
[150] DEIR at 208.

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in technology which make it difficult to create efficient recycling systems.[151] Li-ion batteries have a limited lifespan and thus regulators are expecting an influx of dead batteries to enter the market in the coming years. These Project impacts will only be exacerbated by other past, present, and foreseeable future projects that will also increase the use of Li-ion batteries. D7-11

XIII. Alternatives

The DEIR concludes that Alternative 6.4.4 – No Changes to Prescriptive Compliance Path Options – would avoid the outcomes in Section 4.4 Energy (increased electricity demand) and Section 4.5 GHG Emissions (increased refrigerant use), but purports that because the Project alternative does not avoid significant adverse impacts (because the DIER analysis does not identify any), the adoption of this alternative is not required.[152] As demonstrated in the discussion in Section III above, the use of an impermissible baseline and failure to properly disclose and analyze the full scope of Project impacts has invalidated the Project analysis for Air Quality, GHG, Energy, Utilities and Service Systems, and Biological Resources. If the proper baseline reflecting existing conditions were used, and cumulative impacts were properly considered, the Project would likely result in significant impacts for all of these areas. D11-1 Additionally, irrespective of the baseline issue, the DEIR has failed to properly analyze impacts for multiple impact areas, as described above. For this reason, Alternative 6.4.4 may be an environmentally superior alternative to the Project. D11-2

In addition, contrary to the DEIR's assertion, the Project would also meet Objective 1 in addition to Objective 3.

- Objective 1 aims at "reducing the wasteful, uneconomic, inefficient, or unnecessary consumption of energy via the deployment of technically feasible and cost-effective technologies and measures." Alternative 6.4.4 would achieve this objective by permitting applicants the flexibility of choosing the most cost-effective and technologically feasible D11-3 technology for their individual projects. As demonstrated in Section VI above, the increased reliance on electricity may result in an inefficient, wasteful, uneconomic or unnecessary expenditure of energy, especially during peak load times. However, the Energy analysis relies on the use of an impermissible baseline, and further analyzes Project impacts based on seasonal loads, as opposed to peak loads as required by Appendix F. D11-4 Additionally, the GHG analysis is flawed not only because it uses an impermissible baseline, but fails to account for GHG emissions for energy sources that provide electricity, as well as an inadequate disclosure of impacts related to GWP refrigerants. Further There are a multitude of factors that may impact a an applicant's option for the most technically feasible and cost-effective technologies. D11-5

The DEIR thus must accurately analyze the Project's project-level and cumulative impacts and conduct a new comparison of those likely significant impacts with the reduced impacts likely D11-6

[151] Oberhaus, D., *The Race to Crack Battery Recycling - Before it's Too Late*, Wired (Nov. 30, 2020) https://www.wired.com/story/the-race-to-crack-battery-recycling-before-its-too-late/; *see also*, Morse, I., *Millions of electric cars are coming. What happens to all of the dead batteries?* Science Mag (May 20, 2021). https://www.sciencemag.org/news/2021/05/millions-electric-cars-are-coming-what-happens-all-dead-batteries (finding that its often cheaper for batterymakers to buy freshly mined materials than to use recycled materials).
[152] DEIR at 224.

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to occur under Alternative 6.4.4 and then determine whether Alternative 6.4.4 presents an environmentally superior alternative to the Project. D11-6 con't

XIV. Conclusion

While we commend California's goal to increase energy efficiency and address climate change, the Project may not do so at the cost of violating CEQA. The DEIR in its current form does not meet the standards required by CEQA for a number of reasons, including utilizing an invalid baseline which undermines the analyses for Air Quality, Energy, GHGs, Utilities and Service Systems, and Biological Resources; failing to adequate analyze and disclose the project's direct and reasonably foreseeable indirect impacts; and failing to fully address the broad scope of the Project's cumulative impacts. In order to comply with CEQA, the CEC must address the comments and issues raised in this letter and revise and recirculate the DEIR. D11-7

Sincerely yours,
HOLLAND & KNIGHT LLP

Jennifer L. Hernandez

Attachments

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Responses to Comment D: Jennifer L. Hernandez, Holland & Knight LLP

General Comments

D1-1: This comment asserts that the 2022 amendments would impose a higher cost burden on California's working-class communities of color or have a disparate impact on them. This comment is not supported by any evidence. Further, the comment raises purely economic and social concerns not part of the CEQA review of environmental impacts.

Substantial evidence under CEQA does not include argument, speculation, unsubstantiated opinion or narrative, evidence that is clearly inaccurate or erroneous, or evidence of social or economic impacts that do not contribute to, or are not caused by, physical impacts on the environment.[9] Under section 15131 of the CEQA Guidelines, economic and social impacts are not considered significant environmental effects. This comment is not directed at the adequacy or completeness of the Draft EIR analysis; therefore, no further response is required.

The Project would protect low-income consumers' utility bills over the life of a building. The Energy Code updates contain a set of efficiency performance metrics that provide builders with a framework for achieving efficiency based on climate zones. Time Dependent Valuation (TDV) is used as a participant cost effectiveness metric (or "common currency") for evaluating whether a Title 24 measure will save consumers money on their utility bill over the life of a new building. The values of TDV are constructed from a long-term forecast of hourly electricity, natural gas, and propane costs to building owners; these costs are consistent with the latest CEC forecasts and outlook for California's energy sectors. The time dependent nature of TDV reflects the underlying marginal cost of producing and delivering an additional unit of energy. (*Ibid.*) The TDV method encourages building designers to design buildings that perform better during periods of high energy cost. (E3. 2020, page 2)

9 Pub. Resources Code, § 21080(e)(2)

As noted in response to comment **D3-1** below, the Project will reduce electricity demand, especially during the critical summer peak (which avoids any contribution to the need to build new infrastructure that would need to be funded by utility ratepayers). The measures encouraged by the Project will result in short-term and long-term annual reductions in electricity consumption. This in turn reduces TDV costs well in excess of the costs of the measures. The reports referenced in Appendix D of the Draft EIR illustrate the underlying reduction in TDV costs that result in measure cost effectiveness. The spreadsheet referenced at the beginning of Appendix B of the Draft EIR (TN#239152), shows that the Project results in TDV savings, and hence utility bills, over the life of the building, for all Building Types and Measures (see "Combined All Buildings" tab, column P). As a result, the Project would protect low-income consumers from high utility costs over the life of the building.[10]

Further, the comment dismisses economic assistance programs as providing additional cost savings for qualified participants. Although the CEC neither endorses nor has determined the availability of the following programs, they nonetheless may provide further utility bill cost savings:

- The Low Income Home Energy Assistance Program (LIHEAP) is a federally funded program that provides assistance to eligible low-income households with the goal of managing and meeting their energy costs and immediate home heating and/or cooling needs. (LIHEAP 2021.)[11]
- The U.S. Department of Energy's Weatherization Assistance Program (WAP) helps reduce energy usage and costs by providing services intended to improve energy efficiency in the homes of eligible low-income households. (WAP 2021.)[12]
- There are no-cost energy efficiency program options, such as the Low-Income Weatherization Program (LIWP), which provides low-income households with solar photovoltaic systems and energy efficiency upgrades at no cost. LIWP reduces greenhouse gas emissions by saving energy and generating clean

10 E3. 2020. Energy+Environmental Economics (E3). Time Dependent Valuation of Energy for Developing Building Efficiency Standards -- 2022 Time Dependent Valuation (TDV) and Source Energy Metric Data Sources and Inputs. TN#233345. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=233345&DocumentContentId=65837

11 LIHEAP. California Department of Community Service and Development Programs Low Income Home Energy Assistance Program (LIHEAP). Available at https://www.csd.ca.gov/Pages/LIHEAPProgram.aspx. Accessed July 20, 2021.

12 WAP. The U.S. Department of Energy's Weatherization Assistance Program (WAP). Available at https://www.csd.ca.gov/Pages/Residential-Energy-Efficiency.aspx. Accessed July 20, 2021.

renewable power. LIWP also reduces energy expenses for low-income households, strengthening their economic security. (LIWP 2021.)[13]

- California Alternate Rates for Energy (CARE) program offers a 30-35% discount on electric bills and a 20% discount on natural gas bills. For the CARE Program, electrical companies with 100,000 or more customer accounts in California offer a 30% - 35% discount as required by Public Utilities Code Section 739.1. Electrical companies with fewer than 100,000 customer accounts in California offer a 20% discount. (CARE 2021.)[14]
- Customers of Southern California Edison, San Diego Gas and Electric Company, or Pacific Gas and Electric Company may qualify for the Family Electric Rate Assistance (FERA) program, which offers an 18% discount on electricity bills if the household income slightly exceeds the CARE allowances.[15]
- Under a utility's Energy Savings Assistance Program (ESAP), income-qualified customers may be eligible to receive energy-efficient appliances at no charge or a minimal charge. (ESAP 2021.)[16]

D1-2: See response to D1-1.

D1-3: This comment claims that the Draft EIR fails to adequately analyze all direct and indirect impacts and that it is impermissible under CEQA to defer analysis of impacts to a later project. The level of detail in the Draft EIR exceeds the requirements of CEQA.

CEQA Guidelines section 15146 delineates the level of specificity required in an EIR and that such specificity is tied to the degree of specificity in the underlying project. An EIR on a construction project necessarily has the most detail because the effects of the construction can be predicted with greater accuracy. The next level of specificity noted

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13 LIWP. California Department of Community Service and Development Programs Low Income Weatherization Program (LIWP). Available at https://www.csd.ca.gov/Pages/Low-Income-Weatherization-Program.aspx. Accessed July 16, 2021.

14 CARE. California Alternate Rates for Energy (CARE) program. Available at https://www.cpuc.ca.gov/consumer-support/financial-assistance-savings-and-discounts/california-alternate-rates-for-energy. Accessed July 20, 2021.

15 FERA. Family Electric Rate Assistance program. Available at https://www.cpuc.ca.gov/consumer-support/financial-assistance-savings-and-discounts/family-electric-rate-assistance-program. Accessed July 20, 2021.

16 ESAP. Utility's Energy Savings Assistance Program (ESAP). Available at https://www.sce.com/residential/assistance/energy-saving-program. Accessed July 20, 2021.

relates to adoption of a comprehensive zoning ordinance, which should focus more on the secondary effects.

The 2022 amendments are neither a construction project nor a zoning requirement. Rather, these amendments include a set efficiency performance metrics that provide builders with a framework for achieving efficiency based on climate zones. Given the nature of the project at issue, the level of detail required under CEQA is appropriately limited to reflect that the 2022 amendments do not approve any particular construction project and, thus, development specific impacts cannot be known. Such information would be part of the approval process by the local jurisdiction with project review authority.

Despite this limitation, the Draft EIR is based on detailed studies which are cited throughout the document and contained in the appendices that address state-wide construction projects. The fact that the commentor does not agree with a study or its conclusion does not mean that the Draft EIR is defective.[17]

D1-4: This comment alleges the Draft EIR is missing critical details and that its determinations are not based on substantial evidence. This comment is a generalization repeated in multiple other comments. See response to D1-3.

D1-5: This comment relates to the Notice of Preparation. Comments on the Notice of Preparation are not relevant to the comments collected on the Draft EIR. Under CEQA Guidelines section 15082, there is no requirement for an agency to either solicit comments from the public or to respond to comments on a Notice of Preparation. The purpose of the notice is to provide responsible and trustee agencies with an opportunity to inform the lead agency of potential environmental issues within the scope of expertise of the responsible and trustee agencies. The only agency to provide comments on the Notice of Preparation was the Native American Heritage Commission.

D1-6: This comment relates to the definition of "no significant impacts." Pages 4 and 5 of the Draft EIR identify and define the different impacts discussed in the document. The impacts are divided into the following: beneficial impacts, no impacts, less than significant impacts, less than significant impacts with mitigation and significant and unavoidable impacts. For each individual technical area, the document clearly identifies the type of impact.[18] Draft EIR concludes that all impacts are either beneficial or less than significant. The plain meaning of "no significant impact" includes anything below "significant" such as less than significant and there is no practical difference between the two phrases.

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17 See CEQA Guidelines, § 15151.

18 See Table 1-1 of the Draft EIR.

D1-7: This comment relates to the Draft EIR's reference to SB 100 and the SB 100 report and reliance on both sources to provide substantial evidence that SB 100 objectives will offset increased electricity demand resulting from the Project and that, therefore, the Project would not result in the construction, operation, and maintenance of utility-scale energy projects.

This comment is incorrect. The conclusion in the Draft EIR is that the Project will create a decrease in demand on an annual basis and that any potential seasonal increases in demand due to the use of electricity for space heating rather than natural gas will occur in winter when the system has more than enough excess capacity to meet that demand with existing and expected resources and therefore no additional generation is needed as a result of the 2022 amendments.

The SB 100 report identifies that many new renewable energy projects and related infrastructure will be needed to meet SB 100 goals. However, neither the Draft EIR nor the SB 100 report identify any need for new renewable energy projects and related infrastructure due to the Project. See response to comment D3-1 for a detailed response to the general comment, repeated in multiple sections, that incorrectly claims the Project will create increased electricity demand, which in turn results in a need for the construction of new generation facilities.

D1-8: In the Energy Resources section, the Draft EIR identifies the reductions in energy demand due to the Project for the first year of implementation – 2023. Although not explicitly stated in the Draft EIR, these reductions in energy demand continue throughout the implementation of the Project. In the Greenhouse Gas Emissions and Air Quality sections of the Draft EIR, the reductions in emissions are identified for 2025 – 2050 in 5-year increments. These reductions are directly attributable to and based on the reductions in electricity consumption and take into account the changes in the resource mix of the electricity system over time. Finally, in response to comment **D3-1**, CEC staff identified the expected reductions in electricity demand due to the project in 2030. As explained in that response, the estimate of those reductions is based on the same analytical framework used to evaluate the cost-effectiveness and energy consumption and associated environmental impacts of the Project. Thus, the commenter's statement that the Draft EIR only evaluates one year is not true.

<u>Project Description</u>

D2-1: The comment states that the Draft EIR contains a Project Description that is vague and lacks sufficient detail. The comment is a summary of detailed comments addressed below. See responses to comments **D2-4** through **D2-6**.

D2-2: The comment states that the Draft EIR uses an impermissible future conditions baseline or, alternatively, that it fails to provide justification for its chosen baseline. The comment is a summary of detailed comments addressed below. See responses to comments **D2-4** through **D2-6**.

D2-3: The comment states that the Draft EIR's baseline calculations are not supported with sufficient information for a clear and understandable analysis. The comment is a summary of detailed comments addressed below. See responses to comments **D2-4** through **D2-6**.

D2-4: No changes are required in response to this comment. The Project is described in 10 pages that provide detailed information about the development and application of the building standards, including compliance options. The section is consistent with all content requirements of CEQA Guidelines section 15124. The project description also identifies the ten categories of changes from the current standards that are reflected in the Energy Code updates. These ten categories include extensive energy efficiency in commercial and industrial buildings, including newly constructed buildings and alterations to existing buildings. This discussion provides detailed information about the prescriptive solar PV and battery storage requirements by building type. In addition to this discussion, detailed information about the building types and climate zones for which heat pump requirements apply is found in Appendix B of the Draft EIR, consistent with CEQA's preference that "highly technical and specialized analysis and data in the body of an EIR should be avoided through inclusion of supporting information and analyses as appendices to the main body of the EIR."[19] There is nothing "curtailed, enigmatic, or unstable" about the Draft EIR's description of the project nor does it fail to include relevant information. The commenter's assertions are unsupported statements that belie the actual contents of the Draft EIR.

Nor do the cases cited by the commenter support their allegations of an inadequate project description. In *Association of Irritated Residents*,[20] the court in fact *upheld* the EIR despite the fact that it failed to conduct a protocol-level survey for special-status animals. The court said, "CEQA does not compel a lead agency to conduct every recommended test and perform all recommended research to evaluate the impacts of a proposed project. The fact that additional studies might be helpful does not mean that they are required. [citations omitted.]"[21] Similarly, *Dry Creek*[22] involved a challenge to an EIR for failure to include a description of all elements of the project, a series of stream diversion structures. The court rejected the challenge and emphasized that the CEQA Guidelines require a "general" description of a

19 CEQA Guidelines, § 15147.

20 *Association of Irritated Residents v. County of Madera* (2003) 107 Cal. App. 4th 1383.

21 *Ibid.* at 1396.

22 *Dry Creek Citizens Coalition v. County of Tulare* (1990) 70 Cal. App. 4th 20.

project's characteristics.[23] Nor do *Laurel Heights*[24] and *County of Inyo*[25] support the commenter's assertions. The former case involved the lead agency's omission of information about future uses of the project being approved, and the latter involved a project description that varied from a minor increase in water extraction to a vastly larger project including percolation ponds, canals, a water conservation program, and other features. Commenter has not – and in fact cannot point – to any such omissions or variability in the Project description for this Draft EIR.

D2-5: No changes are required in response to this comment. The Draft EIR provides detailed technical information about what would trigger the likely use of a heat pump by building types and climate zone in Appendix B of the Draft EIR, as required by CEQA.[26] And the Project description portion of the Draft EIR clearly describes the changes to existing battery and PV requirements as well as the new battery and PV requirements on pages 42 to 44.

D2-6: See responses to specific allegations of insufficiency above in **D2-4** and **D2-5**.

D2-7: This comment states that the Draft EIR applies an impermissible CEQA baseline by using a projection of conditions expected when the project will first be implemented and suggests that that a different approach is compelled by CEQA Guidelines § 15125(a) and (e). The comment also suggests that the Draft EIR's discussion of the environmental setting for the Project was selected in order to mask true impacts from implementation of the Project.

No changes are required in response to this comment. The commenter's assertions mischaracterize the Draft EIR's discussion about baseline. To establish the baseline relied on in the Air Quality, Greenhouse Gas Emissions, Energy, and Utilities and Service Systems sections, the Draft EIR identifies the annual energy consumption for all building types under the current standards; this is an absolute value. The baseline is then created by multiplying this number by the number of building starts by building type anticipated in the first year of project implementation. This allows the CEC – and the public – to examine the impacts of the Project on the air quality and greenhouse gas levels (which vary over time and are on a long-term downward trend) predicted to occur at the time of implementation, taking into account the number of buildings expected to be built under the standards identified in the Project. CEQA Guidelines section 15125(a)(1) states, "[w]here existing conditions change or fluctuate over time, and where necessary to provide the most accurate picture practically possible of the

23 *Ibid.* at 28.

24 *Laurel Heights Improvement Association v. Regents of University of California* (1988) 47 Cal.3d 376.

25 *County of Inyo v. City of Los Angeles* (1977) 71 Cal.App.3d 185.

26 CEQA Guidelines, § 15147.

project's impacts, a lead agency may define existing conditions by referencing historic conditions, or conditions expected when the project becomes operational, or both, that are supported with substantial evidence" (emphasis added). Thus, the CEQA Guidelines distinguish a date-of-implementation baseline, which evaluates conditions projected to exist when the project will be implemented, from a "projected future conditions" baseline, which is only permitted if a demonstration is made consistent with CEQA Guidelines section 15125(a)(2). Notably, the comment does not dispute that the existing conditions for the project have "fluctuate[d] over time" or provide evidence to rebut Draft EIR's finding that a date-of-implementation baseline is necessary, for certain portions of the analysis, to provide the most accurate picture practically possible of the Project's likely impacts. The comment conveniently omits reference to this section and instead focuses on mischaracterizing the Draft EIR's baseline as something it is not. Pages 49 and 50 of the Draft EIR make it exceedingly clear that the Draft EIR is applying a baseline that is consistent with CEQA Guidelines section 15125(a)(1), not (a)(2). As the California Supreme Court has stated in *Neighbors for Smart Rail v. Exposition Metro Line Construction Authority*,[27] "a date-of-implementation baseline does not share the principal problem presented by a baseline of conditions expected to prevail in the more distant future following years of project operation—it does not omit impacts expected to occur during the project's early period of operation."

Second, the comment's reliance on CEQA Guidelines section 15125(e) and *Environmental Planning & Information Council v. County of El Dorado*[28] is misguided because the premise of the comments depends upon the false equivalence between a plan and a regulation. The 2022 Energy Code is a set of efficiency regulations that would apply to new buildings, but these regulations "would not cause new construction to occur within the state," "regulate where such construction occurs," or "change the application of zoning laws, land use restrictions, or any other laws that affect the siting of specific building projects."[29] CEQA Guidelines section 15125(e) only applies "[w]here a proposed project is compared with an adopted plan" (emphasis added). The immediately preceding subdivision of CEQA Guidelines section 15125(d), provides some examples of types of "plans," including "general plans, specific plans, and regional plans."[30] The comment's attempt to characterize the distinction between these types of

27 *Neighbors for Smart Rail v. Exposition Metro Line Construction Authority* (2013) 57 Cal.4th 439, 453.

28 *Environmental Planning & Information Council v. County of El Dorado* (1982) 131 Cal.App.3d. 350.

29 Draft EIR at 26.

30 The subdivision goes on to list examples of regional plans, including "applicable air quality attainment or maintenance plan or State Implementation Plan, area-wide waste treatment and water quality control plans, regional transportation plans, regional housing allocation plans, regional blueprint plans, plans for the reduction of greenhouse gas emissions, habitat conservation plans, natural community conservation plans and regional land use plans for the protection of the coastal zone, Lake Tahoe Basin, San Francisco Bay, and Santa Monica Mountains."

"plans" and regulations as "inconsequential" ignores the basic distinction that is repeated throughout the Draft EIR: as efficiency regulations, the focus of this Project is not on planning, causing, regulating, accommodating, or directing where and when future construction occurs, whereas the anticipation, planning, and avoidance of future environmental impacts and incompatible uses resulting from future development is the central purpose of most "plans."[31] Thus, the comment's characterization of this distinction as "inconsequential" would deviate from the CEQA statutes, Guidelines, and decades of case law. The only case cited in support of the applicability of CEQA Guidelines section 15125(e) to this Project, *Environmental Planning & Information Council v. County of El Dorado*, involved a county's adoption of amendments to its general plan, not a state regulatory agency's enactment of a regulation pursuant to legislative authority. Eliminating the distinction between a plan and a regulation, local ordinance, or other discretionary projects carried out or approved by public agencies would cause the exception contained within CEQA Guidelines section 15125(e) to swallow the rules spelled out in CEQA Guidelines section 15125(a). Thus, the Draft EIR correctly applied CEQA Guidelines section 15125 its discussion of the Project's CEQA baseline and environmental setting.

Finally, the statement that the Draft EIR's baseline was chosen "in order to avoid or mask true impacts from Project implementation" is argumentative and conjectural, not supported by substantial evidence, and contrary to the evidence in the record and the Draft EIR.

D2-8: This comment states that the Draft EIR's baseline is hypothetical and inconsistent with CEQA's requirement that lead agencies evaluate the effects of the project on the physical environment.

No changes are required in response to this comment. Several commenters raised this issue in comments on the Notice of Preparation, and the Draft EIR adequately addressed CEQA Guidelines section 15125(a)(3) arguments raised by commenters on pages 48 and 49:

> Hypothetical conditions, such as those that might be allowed but have never actually occurred under existing or previous iterations of the Energy Code, are not considered as part of the existing conditions for this EIR.[32] Rather, existing conditions are determined by looking at the differences between current conditions (with the 2019 Energy Code in effect) and conditions that will be changed as a result of implementation of the 2022 Energy Code. However, due to the fact that the impacts of the 2019 Energy Code occur throughout the state

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31 See Gov't. Code, §§ 65300 (requirement to prepare "a comprehensive, long-term general plan for the physical development of the county or city"); 65302 (required contents of general plans); 65450 et seq. (requirements for specific plans).

32 CEQA Guidelines, § 15125(a)(3).

> and stem from construction and use of thousands of individual building projects, it is not always possible to use actual historical data to establish existing conditions.[33] For those areas for which changes created by the 2022 Energy Code are quantified (as opposed to discussed qualitatively), this EIR utilizes a modeled baseline that incorporates the impacts of the 2019 Energy Code in 2023, when the new requirements of the 2022 Energy Code go into effect. Stated another way, for air quality, energy resources, greenhouse gas emissions, and utilities and services systems, the existing conditions described are those that would occur in 2023 under implementation of the 2019 Energy Code (including the number of building starts that would be subject to the 2019 Energy Code). For those areas for which changes were evaluated in a qualitative manner, including aesthetics, biological resources, hazards and hazardous materials, and wildfire, the EIR utilizes a default existing conditions baseline approach by comparing the potential impacts in each of these technical areas attributable to the project to the existing physical conditions within the state.

As noted in the Draft EIR, using the anticipated building starts and levels of greenhouse gases and criteria pollutants for the first year of implementation of the project is less hypothetical than assuming, counterfactually, that the impacts of the 2022 Energy Code would affect conditions in existence as of the date the NOP was published for this Draft EIR. It would be far more "hypothetical"—and inconsistent with CEQA Guidelines section 15125(a)(3)—for the Draft EIR to have evaluated the Project's statewide effects by assuming, for example, that the number of conditions present today would continue unchanged until the time of Project implementation in light of significant evidence to the contrary.[34]

Likewise, although the comment does not specify a preferred method of analysis, it appears to imply that the Draft EIR should have utilized baselines that would attribute to the Project much of the forecasted physical conditions, including "virtually all future growth and development," expected to occur in 2023 and subsequent years even if the Project is not approved. Such an approach is neither compelled by CEQA Guidelines section 15125(a)(3) nor the requirement that lead agencies consider the physical environmental conditions in describing a project's environmental setting and selecting a

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33 The Energy Code is implemented by individual building departments throughout the state. Because 2020 is the first full year for which the 2019 Energy Code was in effect, and the applicable Energy Code to a building project is determined at the time a building permit is issued, many buildings completed in 2020 would have been built in accordance with the 2016 Energy Code or earlier codes, rather than the 2019 Energy Code.

34 *Neighbors for Smart Rail v. Exposition Metro Line Construction Authority* (2013) 57 Cal.4th 439, 447. (The baseline used in an EIR "delineate[s] environmental conditions prevailing absent the project" and it is these conditions "against which predicted effects can be described and quantified.")

baseline.[35] As stated in the Draft EIR, the date-of-implementation baseline provides the most accurate picture practically possible of the Project's likely impacts and significant benefits to Californians for the technical areas in which it was employed because it provides the public with "detailed information about the effect which a proposed project *is likely to have on the environment*"[36] (emphasis added).

D2-9: This comment asserts that the baseline discussed in the Draft EIR would not pass muster as a "projected future conditions" baseline analyzed under the requirements of CEQA Guidelines section 15125(a)(2) that lead agencies only employ a "projected future conditions" baseline if they demonstrate "with substantial evidence that use of existing conditions would be either misleading or without informative value to decision-makers and the public."

No changes are required in response to this comment. As noted in the responses above, Draft EIR applies a baseline that is consistent with CEQA Guidelines section 15125(a)(1), not (a)(2). The analysis in this comment is thus inapposite given the selected approach, and the CEC declines to speculate as to whether the Draft EIR would also meet the requirements in CEQA Guidelines section 15125(a)(2), which is reserved for EIRs relying exclusively on future conditions "beyond the date of project operations." As noted in the Draft EIR, the "[u]se of a baseline based on conditions other than those at the time of implementation, such as a future baseline of 2030 or 2045, could 'mask or swamp the adverse effects seen in the shorter term.'[37] No such issue is present with the approach in this Draft EIR because it focuses on the first period of implementation for the project." Thus, the comment is premised on a misconstruction of the discussion in the Draft EIR.

This comment additionally notes that "[h]istorical statewide data is also publicly available at the Legislative Analyst's Office website and is regularly updated" and implies that the CEC either has or should have had access to 15-months' worth of building data regarding the effects of the 2019 Energy Code on the existing environment from the Legislative Analyst's Office (LAO). However, the link supporting

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35 *Association of Irritated Residents v. Kern County Bd. of Supervisors* (2017) 17 Cal.App.5th 708, 724, citing *Wal-Mart Stores, Inc. v. City of Turlock* (2006) 138 Cal.App.4th 273, 289 ("More specifically, the potential physical changes to the environment generally are 'identified by comparing existing physical conditions [(i.e., the baseline)] with the physical conditions that are predicted to exist at a later point in time, after the proposed activity has been implemented. The difference between these two sets of physical conditions is the relevant physical change' to the environment, part of which may be allocated to the project and part of which may be allocated to other causes.") (internal citations omitted).

36 Pub. Resources Code, § 21061.

37 *Neighbors for Smart Rail v. Exposition Metro Line Construction Authority* (2013) 57 Cal.4th 439, 456-57.

this claim is to a blog post on the LAO's website which contains a snapshot of single-family and multifamily building permits issued in May 2020. It is unclear how the commenter proposes that the CEC incorporate this information in formulating a superior baseline to that which is discussed in the Draft EIR, but the evidence submitted in this instance does not support the commenter's arguments. The Draft EIR's chosen baselines provide a far more accurate picture to the public of the project's likely impacts on the environment than a baseline based solely on building permits issued for May 2020 for a limited subset of building types that would be regulated by the 2022 Energy Code.

D2-10: The comment notes that there is a typo on Page 49 of the Draft EIR which omits Utilities and Service Systems from the list of sections analyzed in the Draft EIR using a date-of-implementation baseline and suggests that the Draft EIR should also have included Biological Resources among the sections identified in the project description as having used a quantitative date-of-implementation baseline. In response to this comment, the Draft EIR was revised on page 49 to include Utilities and Service Systems on the list from which it was inadvertently omitted and footnote 30 was added to page 49 of the Draft EIR to clarify that Section 4.3 Biological Resources relies on portions of the analyses undertaken in Section 4.2 Air Quality and Section 4.4 Energy Resources. These changes did not prevent meaningful participation in the review of the Draft EIR because the changes do not affect a material portion of the analyses of impacts in these sections. In fact, the analysis or conclusions in those sections correctly note that once the project is implemented, there will be reductions in natural gas, electricity use, and criteria pollutant emissions due to the Project, and the Project will not contribute to the development of new energy infrastructure. Hence, the changes do not meet any of the definitions of "significant new information" in CEQA Guidelines section 15088.5(a)(1)-(4) that would trigger recirculation of the Draft EIR.

Air Quality

D3-1:

I. Summary of Comment

This comment raises an issue that appears throughout the Holland and Knight comments on the Draft EIR – the Project's impact on electricity demand. In different places in the comments, the commenter makes various claims about the deficiency of the Draft EIR in identifying demand-related direct, indirect, or cumulative impacts on air quality, biological resources, energy resources, greenhouse gas emissions, utilities and service systems, and wildfire. In order to provide a single comprehensive answer to these related issues, the response to this question addresses all aspects of these claims made by the commenter. In brief, the commenter repeatedly states that the Energy Code updates will create increased electricity demand, which in turn results in a need for the construction of new generation facilities and supporting infrastructure and increased emissions from existing generation facilities. The commenter also claims that the Draft EIR fails to analyze impacts on peak and baseload demands, masking true impacts.

Examination of the evidence contained and cited in the Draft EIR demonstrates that this assertion is untrue. Moreover, none of the information cited by the commenter undermines the fundamental conclusions in the Draft EIR. In fact, all the evidence supports the following conclusions:

- The many measures of the Project, including extensive energy efficiency, photovoltaic and battery systems, and energy efficient heat pump baselines, in combination will create both short-term and long-term annual *reductions* in electricity consumption and associated greenhouse gas emissions.

- The Project will create both short-term and long-term *reductions* in electricity consumption during summer peak hours.

- In the first year of implementation, the Project could contribute to a very small (less than 0.5%) increase in electricity consumption during winter peak hours, but this incremental increase in demand easily can be met with existing resources expected to be in place at the time. By 2030, this very small increase in winter demand occurs later in the day than the systemwide peak. In that year, the Project results in a very small *reduction* in the systemwide demand during the winter day peak hour.

II. Methodology and Data Used to Develop and Analyze the Project

Attachment B to the Draft EIR - **Project Energy and Emissions Greenhouse Gas** Impacts - provides a summary and an overview of the workbook of spreadsheets used to compute the energy and emissions impacts (all show decreases from the baseline) reported in the Draft EIR. A hyperlink to the summary spreadsheet itself is found at the beginning of Appendix B.[38] These documents clearly demonstrate that the Project will reduce energy consumption and associated emissions on an annual basis.

As discussed in the Draft EIR, the analytical framework used to evaluate the cost-effectiveness and energy consumption and associated environmental impacts of the

38 In preparing responses to comments, CEC staff revisited the spreadsheet and (a) corrected several small errors in the calculation for emissions [see spreadsheet—TN#239152—tab "Combined All Buildings", cells D25 and D26 and tab "Criterial Pollutants", cells D40 to D43] and (b) reduced the estimated number of residential building starts in response to a comment indicating such a change is appropriate [see spreadsheet – TN#239152—new tab titled "ResCountDataEntry," cell C3]. These have been corrected in the EIR with Revisions. Although the values in the spreadsheet change slightly, the trends do not change and there is no change in the conclusion that the project creates reductions in electricity use, greenhouse gas emissions, criteria air pollutants, and toxic air contaminants.

Project is called "Time Dependent Valuation." The Draft EIR explains this analytical framework as follows (Draft EIR, page 95):

> Time dependent valuation (TDV) is the "common currency" adopted first by the CEC in 2003 as a result of the 2000 electricity crisis and updated every Energy Code cycle to reflect changes to energy systems resulting from adopted state energy policy. This enables time dependent valuation of all fuel types (natural gas, propane, and electricity) for the building standards, combining ***hourly*** increases and decreases in each of these fuel types into one overall energy metric. TDV creates the means to determine the value for all measures addressed by the standards, including efficiency, generation, storage, and demand response measures. (emphasis added)

TDV is firmly based on detailed area- and time-specific assessment of the impacts of the changes in energy use anticipated from the code change. It incorporates the forecasts of the expected capacity and resource mix of the electricity supply system annually until 2030 and also in 2045, including the impacts of SB 350. TDV results are based on a large number of individual electric generation system supply planning model runs and spreadsheets which are too voluminous to include in the Draft EIR itself. The methodology was discussed extensively during the pre-rulemaking process and the Draft EIR includes a citation and link to the TDV Report that explains in detail the methodology used in developing the hourly TDV values for the Project that were aggregated into the annual numbers presented in the summary spreadsheet.

The summary spreadsheet itself clearly shows that the Project's extensive energy efficiency requirements in commercial and industrial buildings, photovoltaic and battery systems in commercial and multi-family buildings, and efficient heat pump baselines combine to reduce both electricity demand from the grid and annual greenhouse gas emissions (Annual results are summed from hourly analysis; for example, see annual results on Row 19 on "Combined All Buildings—Compact" tab.).

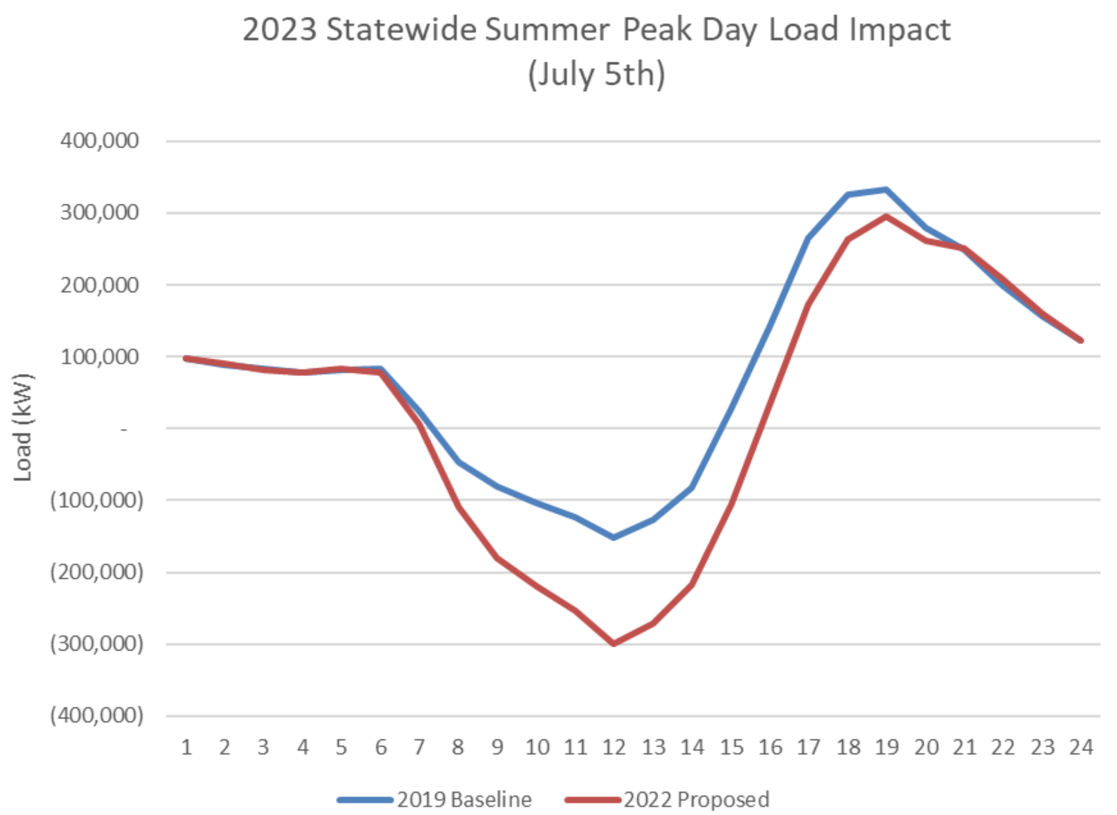
III. Detailed Response to Comments

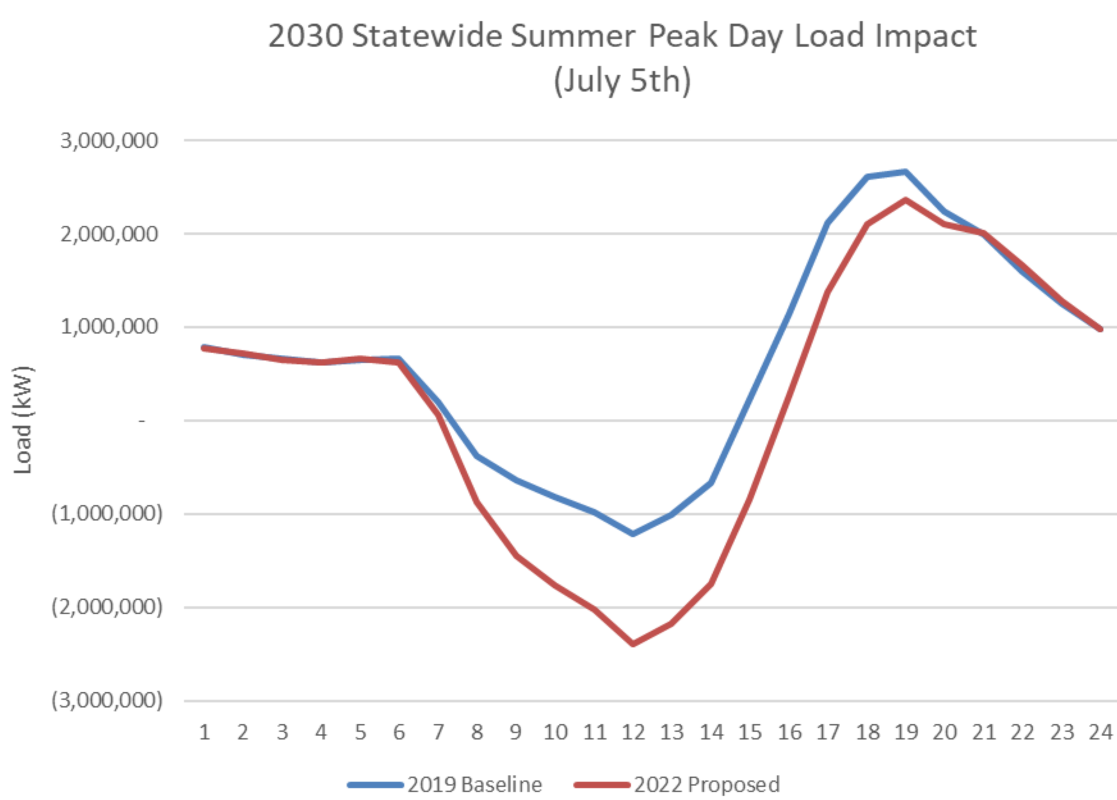
In order to respond to the commenter's comments related to the Project's impacts on peak electricity demand, CEC staff utilized the same data used to develop the TDV report (and reported in aggregated form in the summary spreadsheet) to provide a more detailed description of Project impacts, focusing on the incorrect assertions about seasonal supply and demand. This description, found below, disaggregates the annual numbers and quantifies the seasonal peak impacts in 2023 and 2030. It confirms the conclusions in the Draft EIR that the Project reduces annual electricity consumption and that in addition, the net effect of all measures in the Project during the summer peak hours is also a reduction in demand in both 2023 and 2030. Finally, it demonstrates that the Project has the potential to create a very small increase in electrical demand during the winter peak hours in 2023 (there is no such effect on winter peak demand in 2030) and compares winter peak to summer peak to demonstrate that winter peak is much lower than summer peak.

To quantify the Project's impact on seasonal peak demand, CEC staff prepared four graphs that compare energy consumption due to the Project with energy consumption under baseline conditions (the 2019 standards) in the first year of implementation and in 2030 for both summer and winter peak hours. The graphs demonstrate that the only potential increase in electricity demand during peak hours due to the Project is seen on the winter peak day in 2023. Then, there are two graphs summarizing the impact of the Project on aggregate statewide peak day demand in winter and in summer for both the first year of implementation and 2030. These graphs reinforce the conclusions in the Draft EIR that projected peak day demand in California is in the summer, and that it will be reduced by the Project. Moreover, the increase in winter peak day demand in 2023 due to the Project is almost too small to measure – on the order of a 135,000 kW increase compared to a 39,000,000 kW statewide peak winter day demand, which represents less than 0.5% of the total statewide winter peak day demand. The graphs further demonstrate that because the winter peak hour shifts to the afternoon by 2030, the small increases in demand associated with the Project in winter months no longer occur during the peak hour as they do in 2023 (i.e., the peak hour shifts, but the Project's impact on consumption does not), and overall electricity consumption in the peak hour is reduced by the Project. The statewide system is planned to meet the summer system peak (with an ample reserve margin). Since the winter peak loads are dramatically lower than the summer peak loads, the very small increase in winter peak in 2023 would not create a need for additional supply.[39]

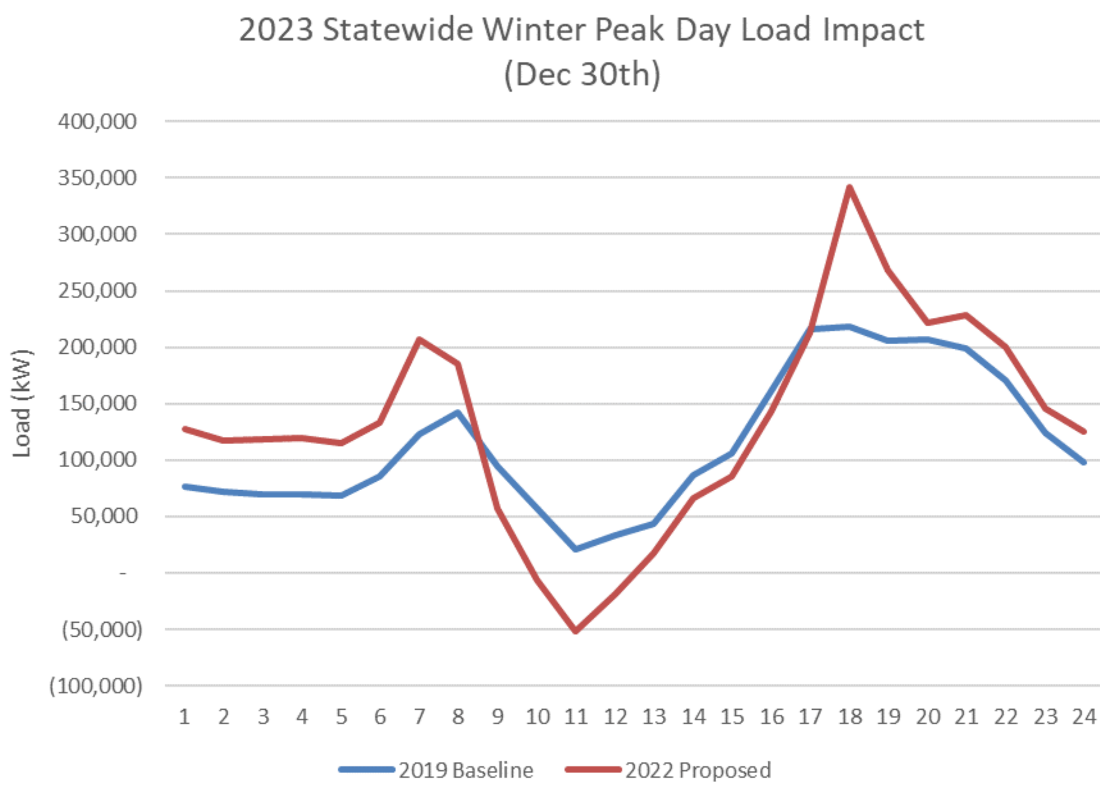
Statewide Summer Peak Day Load: The impact of the Project on the summer peak day varies by building type since each building type has a unique anticipated electricity consumption profile. In the graph below, the data from each building type is aggregated for July 5 in order to show the impact of the Project on the summer peak day. This day has the highest peak load of the year based on the weather conditions incorporated into the TDV methodology. Similar trends are found on all hot summer weekdays. This comparison shows that the Project lowers peak loads on the summer peak day relative to the baseline in both 2023 and 2030.

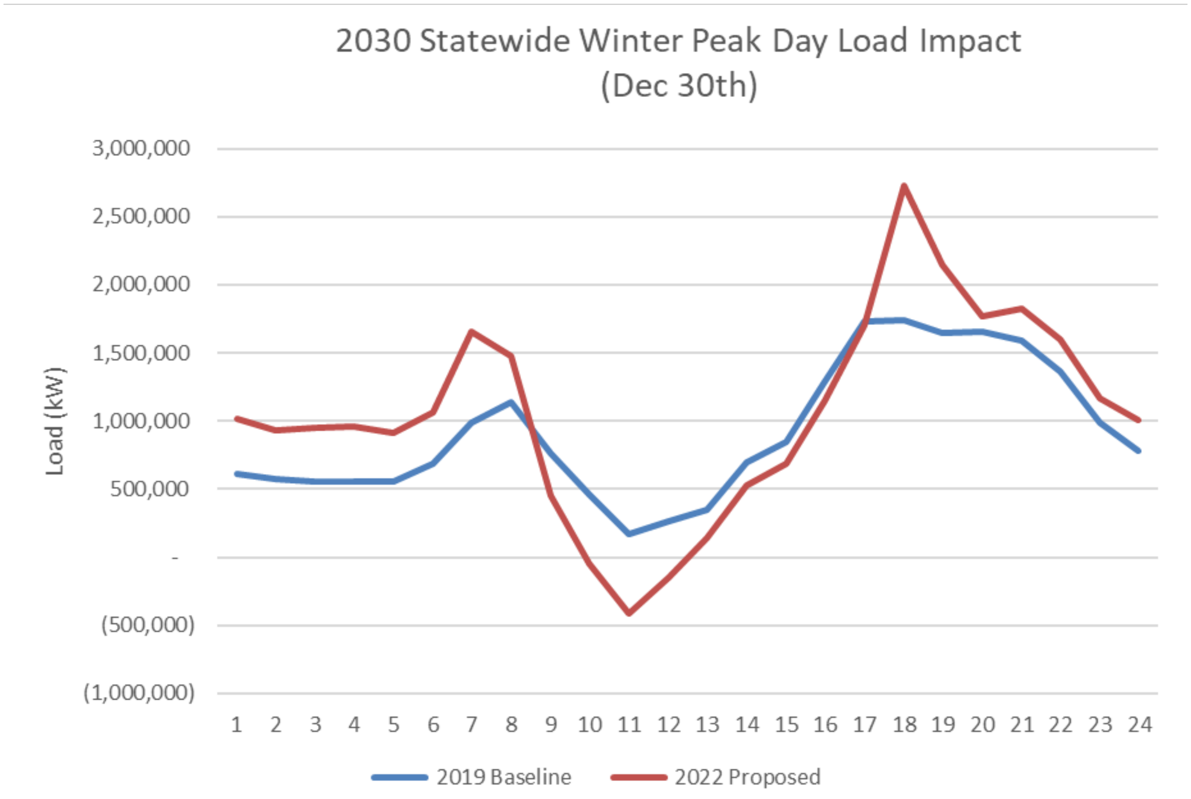
39 The data shown is for newly constructed buildings only and does not include data for alterations because although measures individually were evaluated using TDV, there is only aggregated annual data for alterations. This data captures all the major components of the Project that could possibly increase peak load – they are a "worst case" analysis of potential impact on peak load. However, the annual data for alterations would only decrease the peak load conclusions from the data shown and it is possible including alterations would lessen or eliminate the very small contribution to winter peak in 2023.


2023 Statewide Summer Peak Day Load Impact
(July 5th)
400,000
300,000
200,000
100,000
-
(100,000)
(200,000)
(300,000)
(400,000)
Load (kW)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
2019 Baseline
2022 Proposed

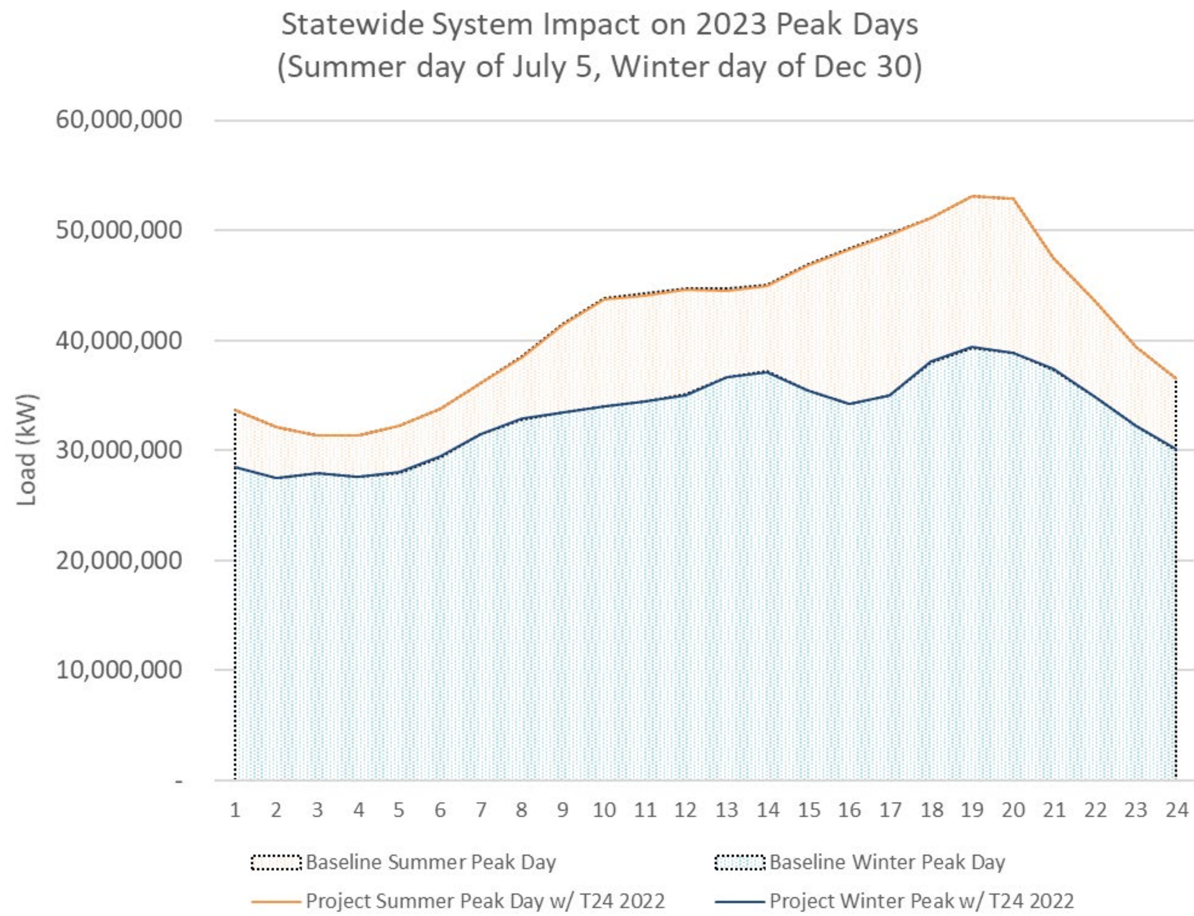

2030 Statewide Summer Peak Day Load Impact
(July 5th)
3,000,000
2,000,000
1,000,000
-
(1,000,000)
(2,000,000)
(3,000,000)
Load (kW)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
2019 Baseline
2022 Proposed

Statewide Winter Peak Day Load: The winter impact of the Project varies by building type since each building type has a unique anticipated electricity consumption profile. In the graph below, the data from each building type is aggregated for December 30 in order to show the impact of the Project on the winter peak day. This day has the highest peak load of the winter season based on the weather conditions incorporated into the TDV methodology. Similar trends are found on all cold winter days. This comparison shows modest increases in load in the early morning and evening hours, and lower loads in the middle of the day compared to the baseline in both 2023 and 2030.

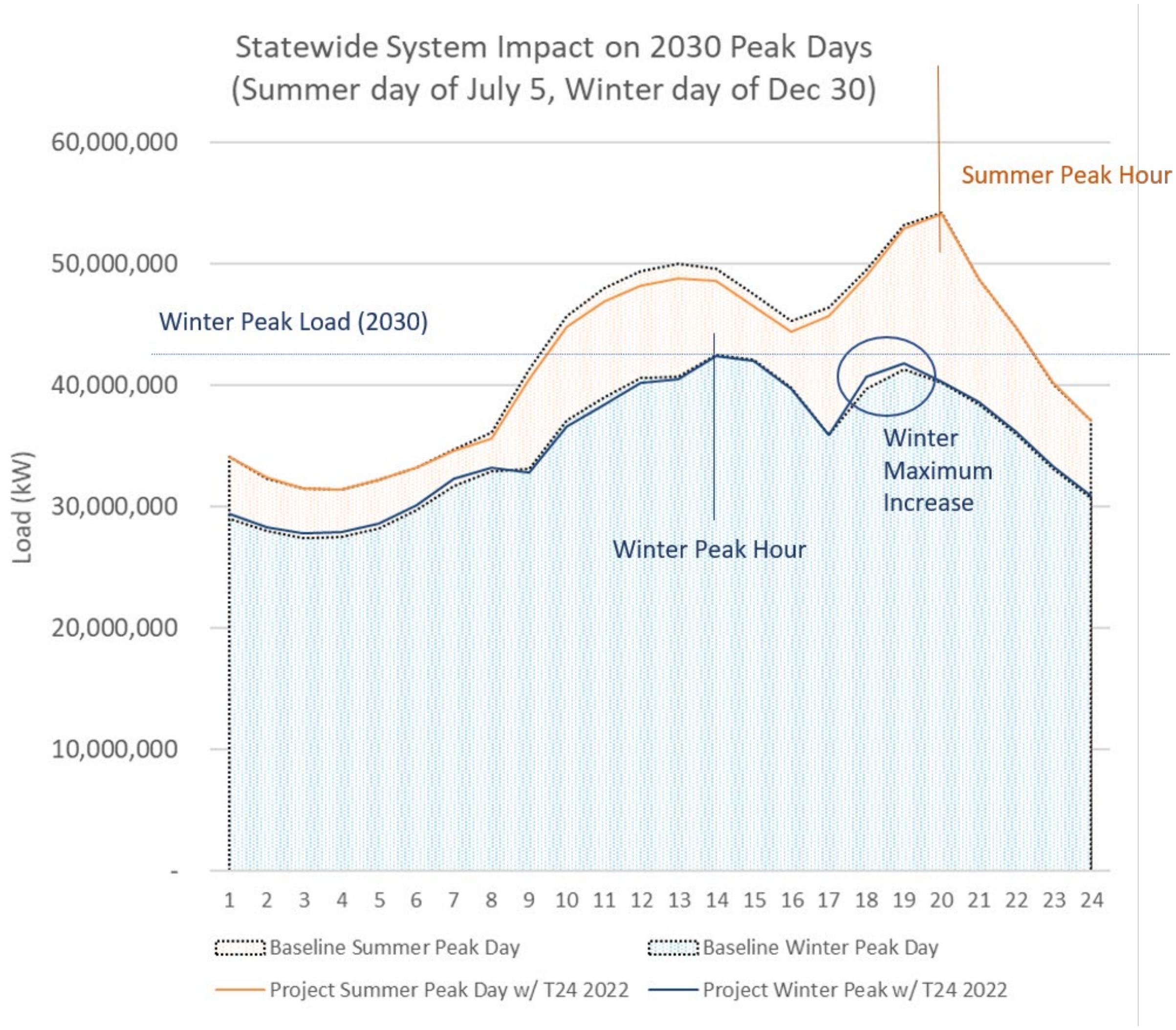




Statewide Electricity System Impact in 2023: The following graph shows the larger, forecasted hourly, statewide peak day loads for the system as a whole in summer (shaded orange area; includes blue area also) and winter (shaded blue area) in 2023 including the existing building standards (shown in dotted lines) compared to the forecast peak day load with the Project (shown in solid lines). This comparison shows first how little the electricity system summer and winter peak day loads would be anticipated to change in 2023 due to the Project (the lines virtually lie on top of each other), and also that the summer peak is much higher than the winter peak. The magnitude of the impact of a single year of the Project is very small relative to the statewide system loads. For example, the summer peak load is about 38,000 kW less due to the project relative to a peak of about 52,000,000 kW.



Statewide Electricity System Impact in 2030: The following graph shows forecasted, statewide peak day loads for the system as a whole for summer and winter in 2030, 8 years after adoption of the project. This approach shows the cumulative effect of the project over time. It confirms that the Project reduces summer loads by a very small amount. Although the winter evening load is slightly higher with the Project, it no longer occurs in the peak hour. The forecasted winter peak hour load in 2030 occurs in the afternoon. In that hour the Project reduces the peak demand by a very small amount.



IV. Cumulative Impacts

The commenter also states that the Draft EIR fails to take into account the cumulative impacts of the project in conjunction with the other projects that will increase demand, such as the adoption of Reach Codes, and the fact that Diablo Canyon Power Plant will shut down in 2024, removing a carbon-free generation source from California's electricity resource mix. The commenter is incorrect. The summary spreadsheet clearly shows that the anticipated Diablo Canyon shutdown is included in the analysis. The criteria air pollutant and greenhouse gas emissions increase above the emissions levels identified for the first year of implementation beginning in 2024, although not above the baseline. (See for example, "Criteria Pollutants" tab, Rows 16 and 17 as well as "CO2 Emissions" tab, Rows 4 and 5.) This relative increase is due to the shutdown of Diablo Canyon Power Plant. Similarly, the Draft EIR repeatedly acknowledges the other electrification efforts that are underway in the state, and the quantification of statewide demand presented in the final two charts above takes into account the cumulative demand and system reliability requirements necessary to meet the state's SB 350 goals, including increased building and transportation electrification and reduction in the greenhouse gas emissions of the State's electricity supply.

V. Holland & Knight References

The commenter cites a number of documents when addressing the project's impact on electricity demand. However, none of them undermine the conclusions in the Draft EIR that the Project decreases annual demand as well as peak demand (with a very small exception during winter peak hours at the beginning of implementation. For example, in the comments on Energy Impacts, Holland and Knight cite to a CEC Report: *Thermal Efficiency of Natural-Gas Fired Generation in California: 2019 Update*. But this report in fact bolsters the Draft EIR's conclusions by pointing to recent dramatic reductions in utilization of gas generation; this indicates there will be gas generation capacity available to meet the small, temporary increase in winter peak. (*See* e.g., Table 2, page 11 of the 2019 report.) Similarly, the UCLA Report, also cited in comments on Energy Impacts, was based on an aggressive electrification of all gas-using appliances for existing residential buildings. But as noted in the Draft EIR at pages 111 to 112, there is no requirement to electrify all appliances and the standards apply to new construction or certain types of remodeling. In fact, the UCLA study supports the 2022 standards by recommending at page 7 the use of heat pump water heaters, which the proposed standards encourage but do not require.

D3-2: Fire potential is discussed thoroughly in Responses **D7-4**, **D7-5,** and **D7-6**. As stated in those comments, it is extremely unlikely that battery use would cause fires, and if they did, they would be very infrequent, making any air quality analysis speculative.

D3-3: The Project will not result in a change in the quantity of new energy projects, nor will it change the operation or maintenance of energy projects. On an annual basis, and for much of each year, the Project will reduce electricity demand. See Response **D3-1** and **D3-6** – **D3-7**. There is no evidence that the Project's impacts on demand will create a need for new energy projects.

D3-4: The Project does not contribute to PSPS events; PSPS occur because of the risk of wildfires. The Project will reduce demand during summer peak. The only potential impact of the Project on diesel generator emissions during PSPS is to reduce them due to decreased load. (See Table 4.2-4 of the Draft EIR, identifying reduced annual air pollution emissions from 2025 through 2050.) The potential for the Project to cause fires to start is discussed in Response **D9-3**.

D3-5: Thermal runaway issues are addressed in response to comment **D7-4**. As discussed in that response, it is not reasonably foreseeable that the Project would cause thermal runaway and lead to fires and associated release of any toxic substances. Response to comments **D7-4**, **D7-5,** and **D7-6** for a more in-depth response to this comment.

D3-6: The Project does not create the need for new electrical capacity or infrastructure, as explained in response to comment **D3-1**. Rather, the Project reduces electrical demand in both the near- and long-term, thereby decreasing the need for new capacity or transmission and distribution lines. See response to comment **D3-1** for details.

D3-7: As discussed in detail in response to comment **D3-1**, The commenter's comment is not supported by any evidence. The Draft EIR analysis demonstrates that the Project will create decreased electricity use on an annual basis. See response to comment **D3-1**.

Staff has quantified the seasonal impacts qualitatively described in the Draft EIR using information underlying the identification of energy and environmental impacts already discussed in the proceeding. Specifically, TN#233345 (June 5, 2020), Figure 73 on page 126 represents how the Project is expected to affect short-term winter electricity demand. The Project is estimated to increase annual kWh for space heating by 43,215,114 kWh (TN#239152, adding kWh increases for space heating for single-family residences, multifamily residences and non-residence space heating) and the estimated capacity increase from maximum wintertime space heating with heat pumps is equal to 34,000 kW per year. The maximum wintertime electricity demand in the California Independent System Operator (ISO) is approximately 28,000,000 kW while the summertime demand is approximately 43,000,000 kW. While the analysis indicates that the project may increase electricity use on the peak winter day in 2023, the electricity system is designed to meet summer peak and there is no evidence that the additional 34,000 kW per year of wintertime demand in the evening on the peak day for space heating cannot be easily accommodated by the existing system.

This is not to say that there are not electricity shortages. The current electric grid is indeed "strained." However, shortages typically occur in summer and early fall, not in winter, in part because summer peak is so much higher than winter peak. It is important to note that the response to comment **D3-1** above demonstrates not only that annual and summer demand are decreased by the project, but that any impact on winter peak demand is both extremely small and temporary. It is not foreseeable that the Project would contribute to a need for new energy projects.

D3-8: The Project will neither increase PSPS events nor their impacts. PSPS are caused by risk of wildfires, not by more efficient buildings. See response to comment.

D9-3 for a more detailed reply. In fact, the Project will reduce the demand that may need to be met with emergency generation during PSPS.

D3-9: The air quality impacts associated with the Project are not related to PSPS events. Overall, the Project reduces emissions and any potential temporary increases in emissions would occur in winter, not during wildfire season. Emissions from operating emergency generators during PSPS events would occur whether or not the Project is approved, although decreases in demand created by the Project may reduce the amount of emergency generation required during PSPS. As shown in Table 4.2-4 of the Draft EIR, emissions due to the Project reduce annual air pollution emissions from 2025 through 2050.

D3-10: PSPS events are not related to the Project. Overall demand for electricity will be lower with the Project.

D3-11: The Project will not foreseeably lead to construction of new energy projects, as explained in response to comments **D3-1**, **D3-3,** and **D3-7**. Nor would it result in emissions of fugitive dust or exhaust from use of heavy-duty equipment used for such construction. Issues associated with increased battery uses and their ultimate fate are discussed in response to comments **D7-7**, **D7-8**, and **D7-9**. The project will not result in increased operational emissions or increased TAC emissions as discussed in response to comment **D3-1**.

Biological Resources

D4-1: This comment is a summary of more detailed comments in **D4-2** through **D4-5** regarding impacts on Biological Resources. See responses to comments **D4-2** through **D4-5**.

D4-2: This comment claims that "increased energy demand in electricity due to the Project will result in the development of energy projects to ensure that demand is met." This claim is inaccurate. The Project will not result in development of energy projects associated with increased electricity demand. As explained in detail in response to comment **D3-1**, for much of each year, the Project will reduce electricity demand. Thus, no change is necessary.

D4-3: This comment asserts that the Draft EIR "states that the Project would result in increased electricity consumption and that 'utility-scale projects are well documented to have various adverse impact on biota.'" This assertion is false and incorrectly links biological impacts from utility scale energy projects with the 2022 standards. In analyzing potential impacts to biological resources, the Draft EIR on page 69 states as follows: "the 2022 amendments, …would save approximately 27 million therms of fossil fuel natural gas and 1.4 billion kWh of electricity" in the first full year of implementation. Thus, the beneficial changes in energy demand attributable to the project are not likely to result in the development of future utility-scale renewable projects either directly or indirectly." As explained in detail in response to comment **D3-1**, the Project will reduce electricity consumption. Further, the Draft EIR's statement that utility-scale projects have various adverse impacts on biota was made solely to contrast with the scientific data available on distributed PV, such as rooftop solar. Since the 2022 standards will reduce electricity usage, the standards do not directly or indirectly induce utility scale PV and wind projects to be built, the impacts on biological resources of such facilities are not relevant to the 2022 standards. No changes are necessary.

D4-4: This comment challenges the analysis of potential impacts to biological resources because it states that the "Draft EIR only analyzes impacts related to rooftop solar, not any potential impacts from utility scale solar, wind, or battery projects." As discussed in detail in response **D3-1**, the Draft EIR analysis demonstrates that the Project would not cause a significant increase in electricity demand. As such, the Project would not result in construction of utility scale projects. The comment does not provide any evidence that the Project may result in significant environmental impacts on biological resources. Thus, no changes are necessary.

D4-5: This comment assumes the Project will create increased electricity demand, which in turn would result in a need for the construction of new generation facilities and supporting infrastructure, such as transmission lines. None of the information cited by commenter undermines or changes the fundamental conclusions in the Draft EIR. As stated in response **D3-1**, the Project will create "both short-term and long-term annual *reductions* in electricity consumption". While the conclusions of the cited study40 predict adverse impacts on rangeland, Important Bird Areas, and other sensitive habitat or wildlife species, these impacts are predicated on development of utility-scale projects (wind, solar, and geothermal)41 . The Project will not result in the construction of utility-scale projects and thus the impacts identified by the commenter are not relevant to the Project. Thus, no changes to the Draft EIR are necessary.

D4-6: This comment again (incorrectly) asserts that installation of new utility-scale projects would result from the project, thus resulting in 4-6 impacts. As the project will not lead to construction of new utility scale renewable energy projects, (explained in responses **D3-1**, **D4-3**, and **D4-5**), concomitant cumulative impacts would not result.

Energy Resources

D5-1: This comment is a summary of a more detailed comment addressed in **D5-5** regarding the peak and baseload demand analysis and **D5-12** through **D5-14** regarding heat pump efficiency assumptions made in the analysis.

D5-2: This comment is a summary of a more detailed comment addressed in **D5-5**.

D5-3: This comment is a summary of a more detailed comments addressed in **D5-6** through **D5-11**.

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40 Wu, G. et al. June 2019. Power of Place, Land Conservation and Clean Energy Pathways for California. Report. The Nature Conservancy. Available at https://www.scienceforconservation.org/assets/downloads/Executive_Summary_Power_of_Place.pdf.

41 Ibid at 6.

D5-4: This comment is a summary of a more detailed comments addressed in **D5-12** through D5-14.

D5-5: This comment reiterates an incorrect narrative that the project will result in additional electrical demand requiring new generation and other related infrastructure to be built. The comment also questions the baseline used in the Draft EIR. For a detailed discussion explaining why the Project will decrease demand, see response to comment D3-1. Decreased demand will not contribute to a need to build additional energy projects and infrastructure. See **D2-7** through **D2-9** for a detailed response to comments related to baseline.

As stated in the Draft EIR at page 89, Under Public Resources Code section 25402, the CEC is required to set building design and construction standards for new residential and nonresidential buildings, as well as alterations and additions to existing buildings, that increase efficiency in the use of energy. The project consists of amendments to the Energy Code that increase efficiency in new buildings and result in reductions in energy demand.

The Draft EIR at pages 94 to 98 included robust analysis showing that the 2022 amendments would result in lower energy use. The Draft EIR contains a qualitative discussion of the Project's impact on the peak day for both summer and winter, and identifies a reduction in demand on the summer peak day and a very small increase (less than 0.5% of the total statewide winter peak day demand) that could occur in the first year of implementation of the Project. Additional quantitative detail provided in the response to comment D3-1 above further demonstrates that this potential impact on winter peak demand disappears by 2030 and can be adequately met in the near term with excess generation capacity available in winter.

CEQA Guidelines section 15146 delineates the level of specificity required in an EIR and that such specificity is tied to the degree of specificity in the underlying project. An EIR on a construction project necessarily has the most detail because the effects of the construction can be predicted with greater accuracy. The next level of specificity noted relates to adoption of a comprehensive zoning ordinance, which should focus more on the secondary effects.

The proposed 2022 amendments are neither a construction project nor even a zoning requirement, but a set of efficiency performance metrics that provide builders with a framework for achieving efficiency based on climate zones. Given the nature of the project at issue, the level of detailed required under CEQA is appropriately limited to reflect that the proposed 2022 amendments do not approve any particular construction project but merely ensure that any such development will be more efficient than under the current standards.

D5-6: This comment incorrectly suggests that the Draft EIR was required under CEQA Guidelines Appendix F to assess impacts for all hours of the day, including peak and baseload times. For a detailed discussion regarding the hourly data that underlies the analysis found in the Draft EIR, see response to comment **D3-1**.

Appendix F does not require any particular analysis regarding peak or baseload. A project only needs to consider the potential significant energy implications of a project. In this case, the purpose – and effect - of the 2022 amendments is to reduce the energy consumption of new buildings. But as discussed in the response to **D3-1**, the data supporting Appendix B in the Draft EIR (identifying changes in energy consumption and concomitant air emissions) is based on demand for every hour of the year, including peak hours.

As noted in the Draft EIR at page 94 through 98, the 2022 amendments are expected to reduce electricity and fossil fuel natural gas usage when compared to continued compliance with the 2019 Energy Code requirements. Under the 2022 amendments, California buildings would consume approximately 198,200 GWh of electricity and 6.13 billion therms of fossil fuel natural gas in 2023 compared to approximately 199,200 GWh and 6.15 billion therms of electricity and fossil fuel natural gas, respectively, under the 2019 Energy Code. As shown in the Draft EIR at Table 4.4-1, on a statewide basis throughout 2023, all measures for newly constructed buildings and altered components of existing buildings collectively would save approximately 27 million therms of fossil fuel natural gas and 1.4 billion kWh of electricity.

D5-7: This comment relates to an unsupported statement that potential energy impacts are likely to be wasteful and inefficient because they would result in massive overbuilding of energy projects to support the increased energy consumption, particularly during peak load periods. The response to comment **D3-1** demonstrates that that the project will reduce demand and that any impact on peak demand is extremely small and temporary, and occurs in winter when excess capacity is available.

CEQA Guidelines section 15146 delineates the level of specificity required in an EIR and that such specificity is tied to the degree of specificity in the underlying project. An EIR on a construction project necessarily has the most detail because the effects of the construction can be predicted with greater accuracy. The next level of specificity noted relates to adoption of a comprehensive zoning ordinance, which should focus more on the secondary effects.

The proposed 2022 amendments are neither a construction project nor even a zoning requirement, but a set of efficiency performance metrics that provide builders with a framework for achieving efficiency based on climate zones. Given the nature of the project at issue, the level of detail provided in the Draft EIR appropriately reflects the effects of the Project on annual and seasonal peak day demand.

As noted in the Draft EIR at pages 94-98, the 2022 amendments will reduce electricity and fossil fuel natural gas usage when compared to continued compliance with the 2019 Energy Code requirements. Under the 2022 amendments, California buildings would consume approximately 198,200 GWh of electricity and 6.13 billion therms of fossil fuel natural gas in 2023 compared to approximately 199,200 GWh and 6.15 billion therms of electricity and fossil fuel natural gas, respectively, under the 2019 Energy Code. As shown in the Draft EIR at Table 4.4-1, on a statewide basis throughout 2023, all measures for newly constructed buildings and altered components of existing buildings collectively would save approximately 27 million therms of fossil fuel natural gas and 1.4 billion kWh of electricity.

Moreover, the UCLA study cited in the comment does not support the commenter's contention that the 2022 amendments would result in the need for the building of additional generation. The UCLA study was based on aggressive electrification of all gas-using appliances for existing residential buildings.

> *a sample that was specifically selected to be representative of communities with high proportions of renters and low-income families - household types which are known to be the most challenging, but also among the most important, to reach through decarbonization efforts. (page 2)*

But as noted in the Draft EIR at page 111, there is no requirement in the Project to electrify all appliances and the standards apply to new construction or certain types of remodeling. The UCLA study supports the 2022 amendments by recommending at page 7 the use of heat pump water heaters which the proposed standers encourage but do not require.

> *There are a number of concrete strategies which can be adopted to address these concerns. First, regarding peak electricity load growth, electrification initiatives should initially target natural gas end- use appliances which have the highest expected efficiency gains and whose anticipated time-of-use least coincides with periods of peak-electricity demand. New, highly efficient, hybrid heat-pump based electric water heating technologies represent a significant opportunity in this regard. These systems are both more energy efficient than their natural gas based counterparts and also provide interesting opportunities for the use of thermal energy storage to decouple the timing of energy usage from the timing of energy service delivery.*

The Draft EIR at page 94 states the measures will affect newly constructed buildings by adding new prescriptive and performance standards for electric heat pumps for space conditioning and water heating, as appropriate for the various climate zones in California.

D5-8: This comment contains a mix of statements found in references cited by the commenter related to intermittency of renewable resources, the construction of battery storage and a suggestion that the state would need to construct 100 times more hydrological storage. It is not clear what this set of comments has to do with the 2022 amendments because they in fact will reduce electricity demand and the need to construct additional generation. For a detailed response regarding the effect of the 2022 amendments on demand see response to comment **D3-1**.

D5-9: This comment contains a mix of statements related to adding new renewable resources to the state's capacity in order to meet climate change goals and identifies potential impacts of those projects on biological resources. It appears this comment supports the 2022 amendments since the standards will reduce electricity demand and thus reduce the need to construct new generation and related infrastructure. For a detailed response regarding the 2022 amendments on demand see response to comment **D3-1**.

D5-10: This comment incorrectly asserts the Draft EIR contains an underestimation of the Project's energy impacts and that increased electricity demand during peak load hours, results in a "wasteful, inefficient, or unnecessary consumption of energy resources." The comment also states the Draft EIR fails to explain how the Project's battery storage requirements for commercial buildings, will meet daily peak energy demands in the evenings when most people are in their homes, thereby masking a wasteful and inefficient use of intermittent energy sources.

For a detailed discussion regarding the peak demand analysis found in the Draft EIR, see response to comment **D3-1**. Examination of the evidence contained and cited in the Draft EIR demonstrates that the underlying assertions in this comment are untrue. Moreover, none of the information cited by commenter undermines the fundamental conclusions in the Draft EIR. In fact, all the evidence supports the following conclusions:

- The project will create both short-term and long-term annual *reductions* in electricity consumption.

- The project will create both short-term and long-term *reductions* in electricity consumption during summer peak hours.

  In the first year of implementation, the project could contribute to a very small (less than 0.5%) increase in electricity consumption during winter peak hours, but this incremental increase in demand easily can be met with existing resources expected to be in place at the time. By 2030, this very small increase in winter demand occurs later than the systemwide peak. In that year the project results in a very small reduction in the systemwide peak.

Attachment B to the Draft EIR - **Project Energy and Emissions Greenhouse Gas** Impacts - provides a summary and an overview of the workbook of spreadsheets used to compute the energy and emissions impacts (all show decreases from the baseline) reported in Draft EIR. The attachment cited and linked at the beginning of the Appendix provide detailed summary information about the energy impacts of each measure for each building type. The information commenter claims is missing is clearly identified in the Draft EIR.

D5-11: This comment again incorrectly suggests that only seasonal peak demands, rather than the daily peak demands were analyzed. For a detailed discussion regarding the peak demand analysis found in the Draft EIR, see response to comment **D3-1**.

D5-12 through D5-14: These comments all relate to the claim that the Draft EIR overstates the purported efficiencies from heat pump technologies due to the fact that their efficiency varies depending on a number of factors, including the temperature of water adjacent to the condenser, ambient air temperature and humidity, set point temperature, hot water draw profile, and operating mode. These comments also note that when temperature drops below 45ºF, or during large hot water draws events, a heat pump water heater (HPWH) will switch to electric resistance mode.

These are well-known aspects of HPWHs and were accounted for in the analysis found in the Draft EIR. The Residential Electric Baseline code change proposal (TN#237850) cited in Appendix D of the Draft EIR utilized the California Building Energy Code Compliance (CBECC) software to simulate energy consumption of these HPWH systems. The CBECC software accurately models HPWH equipment and account for these variables on a minute-by-minute basis. The HPWH model in this software also accounts for other factors such as tank stratification, number and position of resistance elements, and arrangement of the condensing coils. The CBECC software also includes a hot water draw profile that was defined based on analysis of more than 700 California single-family homes. The draw profile is a distributed set to simulate a wide range of magnitude and duration of hot water draw events. This allows CBECC to accurately simulate the performance of HPWHs under intense hot water draw events which might trigger the electric resistance elements.

CBECC continuously incorporated detailed calibrated HPWH models in the simulation, which are based on real tank and measured lab data. Each calibrated model is specific to the manufacturer and model and provides a much higher level of precision compared to only using the rated Uniform Energy Factor (UEF). Each simulation is performed using weather data specific to that climate zone, accounting for the climate diversity of the State. Finally, the hourly simulated kWh used by the HPWH is multiplied by the hourly TDV multiplier specific to the climate zone, accounting for all peak load impact of the HPWH.

The energy savings of HPWHs in the Draft EIR represents the sum of all of these factors, and it was shown to be cost effective.[42] The benefit savings were calculated using HPWH equipment on the market that minimally complies with the federal efficiency standard of 2.0 UEF.[43] Because of this, the energy savings figures in the Draft EIR are conservative.

Greenhouse Gas Emissions

D6-1: This comment is a summary of more detailed comments addressed in **D6-3** and **D6-8** regarding indirect and lifecycle emissions and **D6-9** regarding the reach and relevancy of proposed regulations for the future use of refrigerants.

D6-2: This comment is a summary of more detailed comments addressed in **D2-7** and **D2-8** regarding the baseline used to evaluate project impacts, **D6-3** regarding GHG emissions from sources of electricity, and D6-8 and D6-9 regarding impacts related to Global Warming Potential (GWP) refrigerants.

D6-3: This comment assumes that the Project will result in increased electricity usage, which is not the case. See response to comment **D3-1**, which explains why the Draft EIR provides substantial evidence supporting the conclusion that this Project will not cause or result in the construction of new generation facilities and supporting infrastructure or increased GHG emissions from existing generation facilities on an annual basis. While there may be increases in electricity use in winter months, the increases are outweighed by decreases the rest of the year. Given the nature of GHG emissions, there is no such thing as a seasonal impact.

The statement that "*an electric water heater would likely rely on a natural gas power plant to heat the water, and likely produce up to three times as much GHG emissions compared to a water heather that is directly powered by natural gas*" is not true. While natural gas water heaters have a Coefficient of Performance (COP) of 0.82, heat pump water heaters have a COP of 3.0 of higher; therefore, heat pump water heaters are more than three and half times more efficient than natural gas water heaters. And, as a result, heat pump water heaters generate fewer GHG emissions even accounting for powerplant conversion efficiencies. Second, for hours without solar resources, besides combustion turbines, there are still non-GHG emitting generation resources providing electricity to the grid, such as wind, hydro, and geothermal. Third, as explained above, the Draft EIR accounts for GHG emissions for every hour of the year by using the same supply resource mix and renewable energy procurement targets as were used to

42 CEC staff. 2021. California Energy Commission For The 2022 Update To The California Energy Code, Title 24, Part 6 Building Energy Efficiency Standards Residential Electric Baseline. California Energy Commission. TN#237850. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237850&DocumentContentId=71093.

43 Ibid.

determine the long-run marginal source energy; this analysis shows a reduction in GHG emissions when heat pump water heaters are used instead of natural gas water heaters. A quantification of the Project's impact on GHG emissions is found in the spreadsheet, TN#239152, included in Appendix B to the Draft EIR.

D6-4: See response to comment **D3-1**, which explains why the Draft EIR provides substantial evidence that this Project will not cause or result in the construction of new generation facilities and supporting infrastructure or increased GHG emissions from existing generation facilities on an annual basis. The Draft EIR does account for GHG emissions for every hour of the year by relying on the same supply resource mix and renewable energy procurement targets as was used to determine the long-run marginal source energy. Emissions are calculated and shown in the spreadsheet, TN#239152 (CO2 tab), and reported in Table 4.5-2 of the Draft EIR. The analysis assumes gradual decarbonization of California's electricity generation based upon the state's aggressive climate change goals and policies and identifies a net reduction in GHG emissions.

The spreadsheet, TN#239152, included in Attachment B of the Draft EIR, contains the details sought by the commenter. Once again, the CEC building standards simulation tools account for emissions for all hours of the year, taking into consideration the building loads and generation resources to meet electricity demand, including those that are on the margin for each hour of the year.

D6-5: Studies done for other states are not relevant to California. California already has one of the cleanest electric grids in the nation and the grid is becoming cleaner every year in response to policy goals such as RPS targets and SB 100.

California has a much milder winter climate than Maryland and many other states, which makes the comparison irrelevant. In colder climates there is increased reliance on inefficient "resistance heating" (COP of 1); in California, because of milder winters, heat pump technology can rely primarily on the more efficient "compression heating" that enjoys COP of 3.4 or greater. The CEC building code simulation programs consider all these heating appliances efficiency attributes using local temperature regimes by climate zone to calculate the hourly changes to capacity and energy demand and estimating associated annual emissions.

See also response to comment **D3-1**. The results clearly show that there is a very substantial reduction in annual GHG emissions due to 2022 amendments.

D6-6: As mentioned above in response to comment **D6-5**, the study done for Maryland is not relevant to California because of much milder winters in California and California's much cleaner electric grid, which will get even cleaner in the future in response to policy goals such as RPS targets and SB 100.

As stated in response to comment **D6-3**, natural gas furnaces have a COP of 0.82 while heat pump space heaters have a COP of 3.4 or higher; the higher COP of the heat pump combined with a cleaner California electric grid results in a reduction of GHG emissions from building equipped with heat pump space heaters compared to buildings equipped with natural gas furnace appliances, in the winter and throughout the year. See response to comment **D3-1** for a detailed discussion of how projected energy demand was analyzed. Appendix B of the Draft EIR shows that single-family, multifamily, and nonresidential buildings that are equipped with heat pump space heaters generate fewer GHG emissions than natural gas equipped buildings.

D6-7: The text is correct as stated on page 106 of the Draft EIR as revised and included Attachment A. The largest source of California GHG emissions is from transportation, followed by industrial activities and then electricity consumed in California, from both in-state and imported supplies of electricity. The commenter's statement that the report only accounts for in-state GHG emissions is also incorrect. The TDV analysis discussed in response to comment **D3-1** incorporates out-of-state resources within the Western Electric Coordinating Council, including emissions for both criteria pollutants and GHG.

D6-8: The GHG analysis in the Draft EIR is not flawed. It includes both "during life" leakage and "end-of-life" leakage. See TN#233345, Final 2022 TDV Methodology Report, Appendix A-3 for the details of how the emissions rates were determined. Note that Figure 68 in TN#233345 shows emissions during the assumed life and at end of life. The spreadsheet, (TN#239152), provided in Attachment B of the Draft EIR, provides additional details, including replacement at the end of an assumed 13-year life (for heat pump water heaters) and 15-year life (for heat pump space heaters). See spreadsheet tab "GWP Impact by Building Type", Row 9.

The GHG refrigerant analysis is explained in Appendix B, pages 250 to 259. The analysis assumptions are summarized in Appendix B, Table 1. The analysis assumes the heat pump refrigerant is R-410a (GWP = 4340) until 2025, R-32 after that (GWP = 2330). The analysis assumes that at the end of life, the replacement equipment would use low-GWP refrigerants, as explained in Appendix B, page 250. The analysis does assume that California Air Resources Board (CARB) would require R-32 effective in 2025. The most recent CARB regulations have a January 1, 2023 effective date for room/window and wall units and January 1, 2025 effective date for other equipment except for new variable refrigerant flow equipment, which has an effective date of January 1, 2026. As shown in Draft EIR Table 4.5-2 on page 114 of the Draft EIR, and as discussed below in response to comment **D6-9**, refrigerant GHG emissions are a very small fraction of total GHG emissions. Any GHG emissions increase resulting from a delay in the effective date of CARB's refrigerant regulations would be extremely small in comparison to all GHG emissions from the building sector. A delay in the effective date of the regulations would not change the direction of the GHG emissions trends.

D6-9: The analysis does not evade disclosing the Project's immediate impacts. The spreadsheet used to compute GHG emissions (TN#239152), included in Appendix B of the Draft EIR, includes computed results for each year from 2023 through 2052. Reviewers who wish to look at expected Project impacts for years not listed in Table 4.5-2 can look at the spreadsheet, but the future impacts will not differ significantly from results beginning in 2025 which are included in Table 4.5-2 of the Draft EIR. Five-year increments are shown in the table to document trends.

The analysis results in the spreadsheet, (TN#239152), included in Appendix B of the Draft EIR, are shown in the tab titled "CO2 Emissions." Results are shown for each year from 2023 through 2052. The results show 80.7 million metric tons of CO_2 equivalent in 2023, 80.0 million metric tons of CO_2 equivalent in 2024 and 79.4 million metric tons of CO_2 equivalent in 2025. The trend for the remainder of the years is consistent as shown in Table 4.5-2.

GHG emissions trends as shown in Table 4.5-2 are not significantly affected if CARB fails to adopt regulations to reduce refrigerant GHG requirements on the currently anticipated schedule. To show the effect of a delay, the analysis results have to be reported to three digits to the right of the decimal place and, although this would be false precision, we engage in this exercise below.

To illustrate, here are the refrigerant GHG emissions in million metric tons, using the corrected spreadsheet and assuming in the first data row that CARB maintains their regulatory adoption schedule, and in the second data row showing the increases if the regulatory schedule is delayed.

	2023	2025	2030	2035	2040	2045	2050
Current Regulations	0.012	0.036	0.097	0.157	0.217	0.277	0.338
Delayed Implementation	0.013	0.038	0.102	0.165	0.229	0.292	0.356
Difference	+0.001	+0.002	+0.005	+0.008	+0.012	+0.015	+0.018

As shown in the table, any delay in the date of implementation of the CARB regulations would not be significant and would not alter any of the environmental impact conclusions in the Draft EIR.

Hazards and Hazardous Materials

D7-1: The comment is a summary of detailed comments addressed below. See responses to comments **D7-2** through **D7-11**.

D7-2: This is a summary comment, the components of which are addressed in detail in responses **D7-3** through **D7-10** below. In this section the overarching premise set forth by the commenter is that CEQA requires a complete analysis of the available battery storage technology, the risk of product malfunctions, and impacts of future product disposal. As described further below, CEC staff did conduct this analysis but CEQA has no such requirement in regard to the 2022 amendments.

Section 15126.2 of the CEQA Guidelines provides a framework for an agency when considering the scope of an analysis:

> An EIR shall identify and focus on the significant effects of the proposed project on the environment. In assessing the impact of a proposed project on the environment, the lead agency should normally limit its examination to changes in the existing physical conditions in the affected area… Direct and indirect significant effects of the project on the environment shall be clearly identified and described, giving due consideration to both the short-term and long-term effects. The discussion should include relevant specifics of the area, the resources involved, physical changes, alterations to ecological systems, and changes induced in population distribution, population concentration, the human use of the land (including commercial and residential development), health and safety problems caused by the physical changes, and other aspects of the resource base such as water, historical resources, scenic quality, and public services.

Section 15151 of the CEQA Guidelines further elaborates on the parameters of an agency's analysis:

> An EIR should be prepared with a sufficient degree of analysis to provide decisionmakers with information which enables them to make a decision which intelligently takes account of environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is reasonably feasible.

As noted throughout the Draft EIR, and specifically on page 40, the 2022 amendments do not regulate the pace or location of any construction but instead requires that permitted construction that does occur meets specified energy efficiency standards. The project also does not entail the approval of any construction project, nor does it streamline or otherwise affect the CEQA review requirements for future discretionary construction projects to be reviewed by local lead agencies.

CEQA Guidelines section 15146 delineates the level of specificity required in an EIR and that such specificity is tied to the degree of specificity in the underlying project. An EIR on a construction project necessarily has the most detail because the effects of the construction can be predicted with greater accuracy. The next level of specificity noted relates to adoption of a comprehensive zoning ordinance, which should focus more on the secondary effects. The 2022 amendments are neither a construction project nor even a zoning requirement, but a set of efficiency performance metrics that provide builders with a framework for achieving efficiency based on climate zones. Given the nature of the project at issue, the level of detailed analysis required under CEQA is appropriately limited. CEQA does not require the CEC to speculate about the impacts of specific projects, particularly impacts that are highly locational and site-specific in nature. Despite this, the Draft EIR exceeded the requirements outlined in section 15146 by including robust analysis and discussion on the storage aspects of the 2022 amendments.

Under Public Resources Code section 25402(b)(3), the proposed standards must be cost-effective. Thus, the standards rely on an assessment of existing products already in the market to assess cost-effectiveness and feasibility of the efficiency standards. The standards do not require the installation of products, including battery systems, that are not already on the market or are otherwise experimental. Thus, any product installed in compliance with the proposed standards would be a commercially available consumer product that would have had to demonstrate adequate safety and functionality to be in the market. This is no different than buildings having commercially available heating and air conditioning systems, refrigerators, lighting products and plumbing.

Given the rule of reason set forth in section 15151 of the CEQA Guidelines and the regulatory nature of the project at issue, CEQA does not require the CEC in this Draft EIR to identify and discuss all potential battery technology that might be deployed at some future building project any more than there is a requirement to discuss all types of lighting or heating technology. Nor does CEQA require a discussion of the consequences of product malfunction whether from a manufacturing defect or improper operations.

The commenter requests the CEC consider the end-of-life implications of battery systems. The 2022 amendments do not approve any particular construction project or require a specific battery technology and, therefore, do not directly result in the generation of additional waste. For those construction projects that do incorporate a battery system, those electronic systems would be subject to waste disposal law in effect at the time the products need to be replaced. This is similar to how all materials used in the construction of buildings and equipment installed are disposed of. The 2022 amendments do not impact a jurisdiction's decision to allow for or limit new construction based on regional solid waste reduction goals and capacity.

Despite not being required under CEQA to extrapolate impacts to the degree requested by the commenter, as fully discussed below, the Draft EIR did go beyond the requirements of CEQA and provide substantial information on various aspects and characteristics of battery systems.

D7-3: The proposed standards are technology-neutral, which provides the most flexibility for those construction projects that will be incorporating storage. As noted on page 118 of the Draft EIR, lithium chemistry, especially lithium ion, is the most common battery type in the market with a number of companies offering products in various size configurations.

The dominance of Li-ion batteries is primarily due to current and future demand for electric vehicles, which far surpasses the anticipated need for batteries due to the proposed project. In addition, stationary uses, including building energy storage systems, are a potential "second life application" for electric vehicle batteries that are being actively pursued within California.[44]

The options discussed by the commenter are all also largely based on Li-ion chemistry that are comparable to those addressed in the Draft EIR. Three of the five listed technologies are sub-types of lithium-ion batteries, and a fourth is an analogous design using sodium: LFP is a lithium-ion battery that uses Lithium-phosphate as cathode material, NMC is a lithium-ion battery that uses Lithium, Manganese, and Cobalt as cathode material, and Lithium-Titanate is a lithium-ion battery that uses lithium-titanate nanocrystals instead of carbon on the surface of its anode. Sodium ion batteries are structurally identical to lithium-ion batteries, exchanging the lithium-ions used as charge carriers for sodium ions; they have the same physical design and the same general behavior during operation.

The comment does not submit any expert opinion supported by facts that is specific to the project, or the assertions in the comment, in support of its arguments.[45] Instead, the commenter bases their arguments about the alleged deficiencies in the Draft EIR on several academic papers regarding battery storage technologies. In one of the articles referenced in the comment,[46] they do not discuss the Redox or Sodium-ion battery technologies in detail because they are not the most common. In another website cited by the comment letter but not attached to the comment as a reference, the authors explain that the higher temperature, cost, and smaller storage capacity of redox batteries has limited their widespread use.[47] Similarly, it has been difficult to develop

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44 Ambrose, H. et al. May 2020. Battery Second-Life: Unpacking Opportunities and Barriers for the Reuse of Electric Vehicle Batteries. Report. Prepared for CalRecycle and the AB2832 Working Group. Available at https://equation.wpengine.com/wp-content/uploads/2020/05/AG-Reuse-Brief_5-12-F.pdf.

45 CEQA Guidelines, § 15384. ("Substantial Evidence shall include facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts[,]" but it does not include "[a]rgument, speculation, unsubstantiated opinion or narrative, evidence which is clearly erroneous or inaccurate . . .")

46 Clean Energy Reviews. Solar Battery Comparison Chart webpage at https://efiling.energy.ca.gov/GetDocument.aspx?tn=238765&DocumentContentId=72159. Pages 59 to 61 of an unnumbered PDF.

47 U.S. Department of Energy: Pacific Northwest National Laboratory. Energy Storage: Types of Batteries webpage. Available at https://energystorage.pnnl.gov/batterytypes.asp. Accessed July 20, 2021. ("These batteries have shown the ability to meet the challenge of integrating energy from renewable resources, such as solar and wind farms. For years, sensitivity to high temperature, high cost, and smaller storage capacity limited widespread use of these batteries.")

sodium ion batteries with sufficient energy density and long life to make them economically viable.[48] This supports the adequacy of the analysis in the Draft EIR.[49]

Staff is aware that Redox batteries are potentially able to provide building energy storage, and that containerized turnkey systems do exist.[50] However, the market survey cited in the code change proposal and document relied upon for the proposed new energy storage standards describes a large-scale storage market that is over 90 percent lithium-ion equipment and one percent flow battery equipment.[51] In an effort to fully respond to this comment, staff further verified the limited market uptake of this technology,[52][53] especially in comparison to lithium-ion batteries,[54] which led staff to conclude that it is speculative to assert that adoption of the project's building energy storage requirements would be reasonably likely to result in any additional deployment

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48 *Ibid.* ("**Sodium-Ion:** Sodium-ion batteries are highly efficient and relatively cheap, but developing such batteries with high energy density and a long life has been a challenge. Our researchers are working towards making sodium a viable replacement for lithium for grid energy storage by developing a protective layer to reduce consumption of sodium ions in the battery.")

49 CEQA Guidelines, § 15151.

50 See, e.g., E22. Vanadium Redox Flow Batteries. Available at https://energystoragesolutions.com/vanadium-redox-flow-batteries/. Accessed July 20, 2021.

51 Athalye, Rahul, John Arent, Roger Hedrick, Nikhil Kapur, Axaule Sultanova, Ben Lalor, Silas Taylor, et al. 2021. Building Energy Efficiency Measure Proposal to the California Energy Commission for the 2022 Update to the California Energy Code, Title 24, Part 6 Building Energy Efficiency Standards Nonresidential PV and Battery Storage. Report. Prepared by NORESCO and E3. Page 11. TN#237776. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237776&DocumentContentId=71014. Citing U.S. Energy Information Administration. July 2020. Battery Storage in the United States: An Update on Market Trends. Available at https://www.eia.gov/analysis/studies/electricity/batterystorage/pdf/battery_storage.pdf.

52 Allied Market Research. March 2020. Redox Flow Battery Market by Type (Vanadium and Hybrid) and Application (Utility Services, Renewable Energy Integration, UPS, and Others): Global Opportunity Analysis and Industry Forecast, 2019–2026. Report. Available at https://www.alliedmarketresearch.com/redox-flow-battery-market.

53 Markets and Markets. June 2021. Flow Battery Market with COVID-19 Impact, by Type (Redox Flow Battery, Hybrid Flow Battery), Material, Storage (Compact and Large scale), Application (Utilities, Commercial & Industrial, EV Charging Station), and Region - Global Forecast to 2026. Report. Available at https://www.marketsandmarkets.com/Market-Reports/flow-battery-market-82953888.html.

54 Wood, L. 2021. Lithium-Ion Battery Market Size, Share, COVID Impact Analysis and Forecast to 2027 (Apr. 6, 2021). Available at https://www.businesswire.com/news/home/20210406005647/en/2021-Lithium-Ion-Battery-Market-Size-Share-COVID-Impact-Analysis-and-Forecast-to-2027---ResearchAndMarkets.com.

of these systems. Thus, CEC staff concluded Redox systems did not merit further discussion in the Draft EIR.[55]

Similarly, one of the websites referenced in this comment also mentions lead acid batteries and indicates they are not in widespread use because they are not produced in quantities that make them competitive. Specifically, the website cited by the commenter states that "over recent years different variations of lithium-ion batteries have dominated due to the many benefits over lead-acid batteries including; lighter, modular, improved efficiency and longer life. Large companies such as LG and Samsung began releasing lithium-ion battery systems back in 2015, but the biggest boost in interest came with the announcement of the Tesla Powerwall; this was when home storage batteries really hit the mainstream."[56] This reference also supports staff's conclusion that deployment of alternative (non-lithium-ion) battery technologies would not occur at sufficient scale to merit a more extensive analysis of any environmental impacts related to this technology in the Draft EIR.

The U.S. Department of Energy Pacific Northwest National Laboratory website cited by the commenter[57] presents a summary of all the different types of batteries that are currently under research and development at the Pacific National Northwest National Laboratory to "push the boundaries of battery technology" and are not a representation of the current commercially available stationary battery technologies that may increase as a result of project implementation.[58]

Staff concludes that, given the market dominance of Li-ion batteries that is largely attributable to the electric car industry demand, it is reasonable to expect Li-ion battery storage will be the primary technology where it is reasonably foreseeable that increased deployment will result from project implementation. Accordingly, the Draft EIR properly focused its analysis of hazards and hazardous materials on Li-ion battery storage installations at the types of buildings where they would be required under the 2022 Energy Code.

D7-4: Even though under Appendix G of the CEQA Guidelines, there is no specific requirement to discuss the impacts from defective or misused consumer products whether those products are battery systems, water heaters or ovens, the Draft EIR at pages 119 and 120 does discuss battery characteristics including battery failures.

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55 CEQA Guidelines, § 15145.

56 Clean Energy Reviews. Battery Storage Introduction. Available at https://www.cleanenergyreviews.info/battery-storage. Accessed July 20, 2021.

57 U.S. Department of Energy: Pacific Northwest National Laboratory, Energy Storage. Types of Batteries webpage at https://energystorage.pnnl.gov/batterytypes.asp. Accessed July 20, 2021.

58 *Ibid.* (discussing research oriented towards making specific technologies "viable" as a replacement for lithium-ion battery storage).

Staff concurs that risk of fire from any source is a concern, even if as in this case the risks are not significant under CEQA. The commenter raises alarm about the risk of thermal runaway by citing an article[59] by an industry trade representative from Johnson Controls that states in part that "Gaseous suppression and water systems simply are not effective… The most effective method of extinguishing these fires requires large amounts of water applied for many hours or even days. In many locations, especially those that are remote or where water is scarce, this is not desirable or even achievable." The article goes on to describe how thermal runaway occurs and how lithium off-gas monitoring, which is one of several methods commercially available, can be used to prevent it. As discussed in Solar World Online,[60] "early detection systems have been developed that can now detect a unique pre-cursor event to thermal runaway – an off-gassing in the battery cell that occurs up to 30 minutes prior to a cascading failure. This distinctive and recognizable early warning sign enables the problem to be mitigated or the system shut down before thermal runaway can even begin." The California Building Code, however, also allows for the use of various methods to demonstrate that the potential hazards of thermal runaway, off-gassing, and explosions are reliably managed to ensure public safety. Currently, thermal runaway is typically detected by temperature rise of a cell, which occurs *before* significant off-gassing. Off-gassing can be sensed only after the cell overheats enough to breakdown and volatilize the electrolyte and then the container leaks or ruptures. Thermal sensing as a method of detecting runaway can occur sooner and is more robust than gas sensors. The problem with the off-gasses is that they are flammable, and when contained in a structure (outside of the cell itself) can lead to an explosion if they mix with fresh air and find an ignition source. This explosion hazard is often managed using flammable-gas sensors to trigger methods to prevent an explosion. There are various other ways to prevent thermal runaway, and not all of them rely on flammable-gas sensors. Other methods such as vented BESS containers, ventilation systems, pressure reliefs (or blowout panels), and chemical fire prevention/suppression systems can also provide reliable protection. Depending on the project and battery application, a battery management system can be designed to protect against not only thermal runaway but fire and explosion hazard as well.

In the Draft EIR at pages 119-120, staff provided analysis that adequately discloses and discusses the characteristics of the risk as cited by the commenter—thus, the commenter does not raise "new" risks that were not considered in the Draft EIR. Staff

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59 Elder, A. and Sandahl, D. May 2021. Preventing Thermal Runaway in Lithium-ion Energy Storage Systems webpage. Energy Storage News. Pages 144 to 155 of an unnumbered PDF. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=238765&DocumentContentId=72159.

60. Williams, Del. March 2020. Preventing thermal runaway before it begins through off-gas detection. News story. Solar Power World. Available at https://www.solarpowerworldonline.com/2020/03/preventing-thermal-runaway-before-it-begins-through-off-gas-detection/.

goes on to identify an extensive set of existing standards and regulatory programs that ensure both the risk of fire is minimal and the potential impacts from fire are less than significant. In fact, such fires are infrequent and unlikely to occur, and the commenter fails to acknowledge the safety measures in place to address those rare situations where a fire might occur.[61] As noted above, the 2022 amendments rely on the use of existing products in the market to meet the cost requirements of Public Resources Code section 25402(b)(3). The fact that the battery-related products are available in the market allows for a presumption that any particular battery system installed meets the relevant safety requirements and will function as expected. Under CEQA Guidelines section 15145, staff is not required to speculate that a developer will install some experimental technology with an untested risk for fire or reliability.

On page 123 of the Draft EIR, staff provides detailed discussion of standards and codes (including section citations) which notes that, depending on the lithium-ion battery storage system design, there are cell, module, rack, and enclosure and control system level standards that ensure safe operation. On pages 127 and 128 (CUPA Program) and 130 to 138 of the Draft EIR, the analysis goes on to discuss the regulatory framework at the local level that a responsible agency would implement to ensure the proper hazardous material management plans and fire response plans are in place for each project based on its specific design. As another journal article referenced by the commenter acknowledges, "…a wide range of different safety strategies are combined to achieve a sufficient level of safety."[62] The local agency plan and regulation process allows for the combination of appropriate safety strategies on a project specific basis. But, as the Draft EIR correctly concluded, a sufficient level of safety can and will be attained through the implementation of applicable codes and standards.

Also, as discussed in the commenter's reference regarding Li-ion batteries, "'In general, it's a very safe technology,' Ken Boyce, a principal engineer at product safety certification, testing and advisory firm UL LLC, said in an interview. Lithium-ion battery cells fail at a rate of only around one in every 12 million, he said."[63] As described in the Draft EIR on page 119, the 2022 amendments will make a small contribution related to

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61 While comment does state that "it is not unusual to see an evening news story highlighting another Li-ion product that has caught fire," this is unsubstantiated opinion which is not evidence surrounding the incidence of battery storage-induced fires at types of buildings subject to the 2022 Energy Code's battery storage requirements.

62 Diaz, L., et al. August 2020. Review - Meta-review of Fire Safety of Lithium-ion Batteries: Industry Challenges and Research Contributions. Journal of Electrochemical Society. Pages 93 to 94 of an unnumbered PDF. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=238924&DocumentContentId=72337.

63 S&P Global Market Intelligence. May 2019. Burning Concern: Energy Storage Industry Battles Battery Fires. Page 120 of an unnumbered PDF. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=238761&DocumentContentId=72167.

the overall numbers of batteries operating in the state, most of which will continue to be used in the transportation sector. As with any appliance when billions are installed, there is a potential for a product failure, but such failures allow for the development of improved products and safety features. This continued improvement is also occurring in the battery technology space.

While the commenter relies on unsubstantiated opinion in suggesting that "it is not unusual to see an evening news story highlighting another Li-ion product that has caught fire," staff notes that the same claim could be taken to mean that lithium-ion battery fires are rare enough to be newsworthy. Lithium-ion batteries used in stationary applications are also not subject to the level of risk of physical impact or penetration applicable to batteries in handheld consumer products or in electric vehicles, making the likelihood of accident or upset even more rare.

It is understood that with any developing technology we continue to learn about new methods and techniques to reduce risk and enhance safety, but the li-ion battery technology is mature enough to allow storage to be included in the 2022 amendments consistent with the Public Resources Code section 25402(b)(3). This is especially so given the regulatory safety framework that allows for operation of these systems, much like other building systems, with minimal risk: the low risk of thermal runaway combined with the efficacy of fire suppression equipment and techniques in the unlikely event of a fire is sufficient to minimize the impact of the installation and operations of a storage system. At table 4.6-1 in the Draft EIR, staff has provided a framework of the codes and standards, and regulatory programs that would apply to a given construction project approved by the local agency as appropriate based on the scope and design of the specific battery storage project for the building.

D7-5: As noted above in response **D7-2**, the 2022 amendments rely on the use of existing products in the market to meet the cost requirements of Public Resources Code section 25402(b)(3). The fact that the battery related products are available in the market, and have been for several years, allows for a presumption that any particular battery system installed meets the relevant safety requirements and will function as expected. Under CEQA Guidelines section 15145, staff is not required to speculate that a developer will install some experimental technology with an untested risk for fire or reliability, or that the battery installed will be the one in 12 million that may fail.

Even though the 2022 amendments do not result in the approval of any particular construction project or any battery backup system, staff did analyze fire-related risks and discuss examples where codes or standards would apply and how they protect against fire and safety risk. For example, at Page 120 of the Draft EIR staff explains "Safety standards such as Underwriters Laboratory 1642 (See also Table 4.6-1 below) ensure batteries meet minimum design specifications based on their intended use and are resistant to puncture, fire, or damage that could cause these hazardous effects." Also as discussed above. On pages 124, the applicable codes and sections of the code are identified for the reader. As noted above, under CEQA Guidelines section 15146, staff's analysis is necessarily more general and staff does not provide an exhaustive review of every standard or code related to battery systems, but rather provides a summary for the reader in the table which includes identification of the part of the system it addresses. This is meant to help the reader find more detailed information if needed. Ultimately, the specific safety codes and standards applicable to any specific development project fall under the jurisdiction of the local agency responsible for project permitting. There is no substantial evidence to support the assertion that increased use of batteries results in a significant adverse impact related to wildland fires.

D7-6: The Federal Emergency Management Agency (FEMA) reference cited does not provide information specifically indicating the Draft EIR is deficient in identifying the plans and procedures to respond to battery storage system fires and explosions. It is focused on addressing areas where additional research on fire prevention and suppression could be conducted. The Draft EIR has identified applicable codes and standards, and local, state, and federal fire safety and response programs an owner must comply with to ensure safe operation of a battery storage system. As discussed above, staff can rely on the premise that battery storage products available in the market will be installed and that those products are operated properly. In the Draft EIR staff outlined the currently accepted framework for response to battery storage system fires and explosion hazard. This potential impact has not been ignored, and future studies such as those funded by FEMA and the National Fire Protection Association (NFPA) may enhance response to fire hazard as the industry grows.

One reference cited by the commenter indicated, notably, that the NFPA, a leader in battery fire standard development, is updating standards to reflect lessons learned from battery fires and conducting training of responders to assist them in efficient and effective response.[64] Staff notes that subsequent to the publication of this article, in August 2019, NFPA published NFPA 855, Standard for the Installation of Stationary Energy Storage Systems. On the website where this publication can be purchased, NFPA states "The standard offers comprehensive criteria for the fire protection of ESS [energy storage system] installations based on the technology used in ESS, the setting where the technology is being installed, the size and separation of ESS installations, and the fire suppression and control systems in place. Additional considerations include ventilation, detection, signage, listings, and emergency operations responding to ESS emergencies."[65] This demonstrates the codes and standards are keeping pace with the

64 S&P Global Market Intelligence. May 2019. Burning Concern: Energy Storage Industry Battles Battery Fires. Page 121 of an unnumbered PDF. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=238761&DocumentContentId=72167.

65 NFPA Catalog, NFPA 855. Standard for the Installation of Stationary Energy Storage Systems. Available at https://catalog.nfpa.org/NFPA-855-Standard-for-the-Installation-of-Stationary-Energy-Storage-Systems-P20704.aspx. Accessed July 20, 2021.

technology and providing for safer operating conditions. To clarify and amplify this fact, CEC staff updated Table 4.6-1 on pages 124 of the Draft EIR to include NFPA 855 among the many standards that exist to ensure the safe operation of stationary battery energy storage systems.

D7-7: The commenter requests the CEC consider the end of life implications of battery systems. The proposed 2022 standards do not approve any particular construction project or require a specific battery technology and therefore do not directly result in the generation of additional waste. For those construction projects that do incorporate a battery system, either as a result of implementing the 2022 Energy Code or decisions by the developer, those electronic systems would be subject to waste disposal law in effect at the time the products need to be replaced. This is similar to how all materials used in the construction of buildings and appliances installed in buildings are disposed of. The 2022 amendments do not impact a jurisdiction's decision to allow for or limit new construction based on regional solid waste reduction goals and capacity. Despite this, the Draft EIR exceeded the requirements outlined in section 15146 of the CEQA Guidelines by including robust analysis and discussion on the topic of waste disposal in California and regionally in the Western U.S.

The commenter asserts that "the Draft EIR's analysis fails to discuss how much lithium or other hazardous materials are present in the batteries and need to be disposed of once the battery's life span is over." However, this misrepresents the analysis in the Draft EIR. The Draft EIR does not examine the potential for significant impact based on the absolute quantity of lithium present, but rather in relative terms of the marginal fraction of the lithium battery market, and therefore of the lithium battery waste stream, that would be attributable to the Project's energy storage standard. This methodology is a result of how Appendix G of the CEQA Guidelines indicates that lead agencies may consider whether a project would directly or indirectly create "a significant hazard to the public or the environment through the . . . disposal of hazardous materials." The finding in the Draft EIR was that the marginal change was not sufficient to rise to a level of significance.

The hazardous material present in the batteries in sufficient quantities to have at least a potential for significant environmental effect is its lithium compounds, and the potential volume that could result from adoption of the proposed requirement is the amount needed for the 300MW of storage capacity that is projected to result from the project in first three years as described in the Draft EIR – this provides the anticipated size of the waste stream.[66] Using data for the Tesla Powerwall Battery,[67] which is representative of a type of installation that would occur in accordance with the code updates, we can estimate the volume of waste that could be produced. A Powerwall battery with about 5 kw of continuous max power would measure about 0.17 cubic yards; to meet the demand for 300MW about 10,000 cubic yards of waste would need to be disposed. As discussed in the Draft EIR, the Kettleman Hills Facility was permitted for a 5.2 million cubic yard expansion for hazardous waste disposal. The 10,000 cubic yards needed for disposal would occupy less than two tenths of one percent of the permitted volume at this facility. This does not include the volume that is available at the Clean Harbors Buttonwillow Landfill Facility or other out of state waste disposal facilities that are available. As stated in the Draft EIR, disposal of the lithium-ion batteries installed due to 2022 amendments at the end of their useful life would not create a significant hazard to the public or the environment.

The commenter also asserts that, "As stated in the Draft EIR, current research and product data shows grid connected batteries could have a life of 7 to 10 years, depending on how well the battery is maintained. Presuming buildings have a lifespan of 30 years (using the same methodology as the GHG analysis), a battery could potentially be changed 3-4 times during a building's lifespan. Therefore, the Draft EIR must analyze the impacts associated with a high turnover rate of batteries." This statement is misleading and misunderstands the Draft EIR: a need to replace batteries at the end of the lifespan identified in the Draft EIR represents a normal (not "high") turnover rate, and the perspective of staff is that the battery storage requirement can be reasonably anticipated to result in a continuous waste stream based on the deployed capacities and estimated lifespans stated in the Draft EIR. The less than significant impacts from this waste stream to California are disclosed and analyzed in the Draft EIR.

D7-8: Staff recognizes there may be hurdles to implementing effective recycling programs and those are discussed in the analysis. There are no claims in the Draft EIR that there is, at present, adequate capacity to recycle all forecasted future demand for lithium batteries in California. Instead, the Draft EIR discloses only that, given the trends in policy development and forecasted growth in this market, it is reasonably

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66 Draft EIR. Pages 130 and 209. Citing Athalye, Rahul, John Arent, Roger Hedrick, Nikhil Kapur, Axaule Sultanova, Ben Lalor, Silas Taylor, et al. 2021. Building Energy Efficiency Measure Proposal to the California Energy Commission for the 2022 Update to the California Energy Code, Title 24, Part 6 Building Energy Efficiency Standards Nonresidential PV and Battery Storage. Report. Prepared by NORESCO and E3. TN#237776. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237776&DocumentContentId=71014.

67 Tesla. June 2019. Tesla Powerwall 2 Datasheet. Available at https://www.tesla.com/sites/default/files/pdfs/powerwall/Powerwall%202_AC_Datasheet_en_northamerica.pdf.

likely that there will be increases in recycling capacity by the time the first generation of batteries installed to comply with proposed code amendments become due for retirement.

Even in the unlikely scenario that recycling options remain limited at that time, there would be the option to safely dispose of them in a hazardous waste landfill. As discussed in the analysis, there would be sufficient permitted facilities to handle the anticipated volume and any impacts due to disposal in this manner would be less than significant.

The excerpt from the Markets and Markets (2020) report was not used as the sole source of information to demonstrate there will be adequate recycling facilities to accommodate the relatively low end-of-life demand attributable to the project; rather, it was intended simply as an example of how much of a market there may be for recycling. The GREET model referenced in the Draft EIR presents more quantitative evidence that recycling may be an economically viable option. The Draft EIR points out the American Battery Technology Corporation facility in Fernley, Nevada which will recycle as much as 20 percent of the battery waste that was generated in 2020. This speaks more to the adequacy of recycling facilities and represents a significant volume of battery waste that could be processed in the Western U.S. Additionally, as discussed on page 126 of the Draft EIR, AB 2832 required the Secretary for Environmental Protection to convene the Lithium-Ion Car Battery Recycling Advisory Group to review, and advise the Legislature on, policies pertaining to the recovery and recycling of lithium-ion batteries sold with motor vehicles. The bill requires the advisory group to consult with specified entities and, on or before April 1, 2022, to submit policy recommendations to the Legislature aimed at ensuring that as close to 100 percent as possible of lithium-ion batteries in the state are reused or recycled at end-of-life in a safe and cost-effective manner. These factors lead staff to conclude it is likely batteries will be repurposed and there will be adequate facilities to accomplish this preferred option.

D7-9: It is the policy of the state to reduce, reuse, and recycle. Staff provides an extensive discussion of battery recycling because it is currently an area where significant research and policy development is being undertaken to determine whether there is economic incentive to recycle and/or whether regulatory programs may be necessary to minimize waste and optimize management of used batteries. For example, the Draft EIR notes that a battery recycling facility proposed in Fernley, NV would initially be able to recycle about 20 percent of 2020 lithium-ion battery waste. Fernley would increase recycling capacity to 100,000 tons per year, or about 100 percent of 2020 lithium-ion battery waste. The potential ramp up of recycling capacity matches the timing of when batteries from the 2022 amendments would begin to retire and require recycling or disposal. Recycling of batteries would be an environmentally preferred option even though available evidence does not indicate that alternative disposal options would result in “a significant hazard to the public or the environment.”[68]

D7-10: This comment cites to a news report[69] on cobalt mining in the Congo and impacts related to miners suggesting that the Draft EIR must analyze these impacts in greater detail. No changes to the Draft EIR are required in response to this comment. Although the comment is not supported by substantial evidence that there is a link between the project and these foreign impacts, the comment also fails to link this article to mining-related impacts in California. Moreover, the Draft EIR’s analysis is supported by substantial evidence that there will be sufficient battery storage system availability to meet market needs once the project is implemented.[70] CEQA does not apply to or require the analysis of any portion of the project located outside of California.[71] Thus, this comment does not raise a significant environmental issue to which CEQA requires a response.[72]

D7-11: The commenter states the “Draft EIR fails to account for cumulative impacts associated with an increased reliance on Li-ion batteries,” including battery demand from the transportation sector.” However, pages 207 to 211 of the Draft EIR address cumulative impacts related to hazards and hazardous materials associated with Li-ion batteries in all applications. While the Draft EIR states that staff anticipates that the batteries will find some form of reuse or recycling, the Draft EIR also states that should this not be the case, existing hazardous disposal facilities have sufficient capacity and that no cumulative impact exists even if no reuse or recycling is assumed. The cumulative impacts analysis is also supported by evidence provided in Section 4.6 Hazards and Hazardous Materials.

The commenter objects to the conclusion in the Draft EIR that the increase in the number of lithium batteries attributable to the Project will be small in relation to the anticipated quantity of electric vehicle batteries, because the quantity of batteries is stated in terms of capacity and not in terms of either number of units or mass of

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68 CEQA Guidelines, Appendix G.

69 This article was also included in the Draft EIR. Page 120 and footnote 83.

70 Athalye, Rahul, John Arent, Roger Hedrick, Nikhil Kapur, Axaule Sultanova, Ben Lalor, Silas Taylor, et al. 2021. Building Energy Efficiency Measure Proposal to the California Energy Commission for the 2022 Update to the California Energy Code, Title 24, Part 6 Building Energy Efficiency Standards Nonresidential PV and Battery Storage. Report. Prepared by NORESCO and E3. Pages 14 to 15. TN#237776. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237776&DocumentContentId=71014.

71 CEQA Guidelines, § 15277.

72 CEQA Guidelines, § 15088 (“The lead agency shall respond to comments raising significant environmental issues received during the noticed comment period and any extensions and may respond to late comments.”)

lithium. The commenter does not assert in what way capacity is not an adequate description, noting that stationary battery projects are often described in terms of energy capacity and not specifically the number of cells or modules needed to achieve that capacity.

The comment also restates many of the same concerns that were addressed in the responses to comments above. For example, in response to comment **D7-7** above, CEC staff included an example of how small the volume of li-ion battery waste would be from the code updates by using characteristic data for the Tesla Powerwall Battery.[73] Estimates show the volume of waste would be a small fraction of the volume of waste disposal that is available for batteries regardless of whether EV batteries are the predominant source. As stated in the Draft EIR, disposal of the lithium-ion batteries installed due to 2022 Energy Code amendments at the end of their useful life would not create a significant direct or indirect cumulative hazard to the public or the environment. This analysis also assumes that all battery waste must be disposed when in fact there is significant evidence to suggest that won't be the case. In Response D7-8 above, staff points out evidence in the Draft EIR that demonstrates there is significant economic incentive and policy initiatives that suggest recycling of batteries will occur on a large scale as the code updates are implemented. The Draft EIR also points out the American Battery Technology Corporation facility in Fernley, Nevada which will recycle as much as 20 percent of the battery waste that was generated in 2020. This is applicable evidence of the adequacy of recycling facilities and represents a significant volume of battery waste that could be processed in the Western U.S.

As discussed in response to comment **D7-7**, the turnover rate for the batteries at the end of the lifespan identified in the EIR represents a normal (not "high") turnover rate, and the perspective of CEC staff is that the battery storage requirement can be reasonably anticipated to result in a continuous waste stream based on the deployed capacities and estimated lifespans stated in the Draft EIR. This spreads out the waste load over time allowing for development of recycling and or waste disposal procedures that would ensure there would be no significant cumulative impact from batteries required by the code updates coupled with EV and other battery waste and recycling requirements.

The comment also restates the concern for thermal runaway, but it is not clear how this represents a potentially significant cumulative impact. As discussed in the Draft EIR and reiterated in response to comment **D7-4**, the California Building Code allows for the use of various methods to demonstrate that the potential hazards of thermal runaway, off-gassing, and explosions are reliably managed to ensure public safety. As previously stated, there are various ways to prevent thermal runaway in stationary applications

73 Tesla. June 2019. Tesla Powerwall 2 Datasheet. Available at https://www.tesla.com/sites/default/files/pdfs/powerwall/Powerwall%202_AC_Datasheet_en_northamerica.pdf.

that are independent of and not "cumulative" to any thermal runaway situations involving mobile Li-ion battery applications, such as electric and hybrid vehicles. Depending on the project and battery application, a battery management system can be designed to protect against not only thermal runaway but fire and explosion hazard as well. The Draft EIR also identifies and discusses an extensive set of codes and standards that apply to battery storage systems and the comprehensive regulatory framework that ensures the risk from fire and explosion is less than significant.

Utilities and Service Systems

D8-1: This comment is a general summary of more detailed arguments by the commenter. See response to comment **D3-1**, which explains why the Draft EIR supports the conclusion that this project will not cause or result in the construction of additional energy projects and supporting infrastructure.

D8-2: See response to comment **D2-7** and **D2-8** for a detailed discussion of why the baseline chosen in the Draft EIR is appropriate. See response to comment **D3-1** for a detailed discussion explaining why the Draft EIR provides substantial evidence that this project will reduce electricity demand and not cause or result in the construction of additional energy projects and supporting infrastructure. Thus, no change is required.

D8-3: See response to comment **D3-1**, which explains why the Draft EIR provides substantial evidence that this project will create both short-term and long-term reductions in annual electricity consumption and consumption during peak summer hours and will not increase strain on the electrical grid. Thus, no change is required.

D8-4: This comment discusses state and local clean energy and greenhouse gas emission reduction policies and resiliency and capacity concerns associated with these policies. The Energy Commission disagrees that the project is responsible for resiliency and capacity changes to the electric grid associated with other state and local policies. State and local clean energy and greenhouse gas reduction policies are expected to be the main driver of changes to the electric grid. These state and local policies would result in changes to the electric grid regardless of the proposed project to amend the Energy Code.

See response to comment **D3-1**, which explains why the Draft EIR provides substantial evidence that this project will create both short-term and long-term reductions in annual electricity consumption and consumption during peak summer hours and will not increase strain on the electrical grid. Additionally, response to comment **D3-1** provides substantial evidence that the project's potential contribution to a small temporary increase in electricity consumption during peak winter hours can be met with existing resources; in the long run, the project creates a minor reduction in long-term electricity demand during winter day peak hours. The project reduces electricity demand and not does create or contribute to a need to modify the grid in any way. Thus, no change is required.

D8-5: See response to comment **D3-1**, which explains why the Draft EIR provides substantial evidence that this project will not increase strain on the electrical grid. Response to comment **D3-1** provides substantial evidence that the project will create both short-term and long-term reductions in annual electricity consumption and consumption during peak summer hours and a minor increase in short-term electricity consumption during peak winter hours, which can be met with existing resources, and a minor reduction in long-term electricity demand during peak day winter hours. The project would not contribute, either directly or cumulatively with other policies, to a need for the construction of new generation facilities or supporting infrastructure; thus, the project would not have a cumulative contribution to a significant adverse impact to utilities and service systems. See also Response D8-4 which discusses the effect of other clean energy and greenhouse gas reduction policies on this analysis. Thus, no change is required.

Wildfire

D9-1: The comment is a summary of detailed comments addressed below. See responses to comments **D9-2** through **D9-3**.

D9-2: This comment posits that the Draft EIR impermissibly omitted analysis of indirect wildfire impacts by not considering new utility infrastructure that the commenter believes will be constructed as a reasonably foreseeable indirect consequence of the Project's approval.

No changes are required in response to this comment. The sole evidence in support of this claim is a reference to Section IX of the comment, the portion of the comment devoted to the Utilities and Service Systems section of the Draft EIR. However, as noted above in the response to comment **D3-1**, the Draft EIR and supporting evidence in the record provides substantial evidence that the Project will reduce electricity demand and not cause or result in the construction of additional energy projects and supporting infrastructure. In fact, the only impact of the Project on wildfires is the fact that it reduces demand in summer when wildfires are likely to occur, thereby reducing the amount of load that may need to be shed with a PSPS. Accordingly, the comment does not present substantial evidence of a reasonably foreseeable indirect wildfire impact related to new utility infrastructure that was not contemplated by the Draft EIR.

D9-3: This comment implies that the project will indirectly cause or lead to more PSPS events and attendant safety issues related to prolonged power outages.

No changes are required in response to this comment. As with the prior comment, the commenter has not shown, with substantial evidence, that there is a causal link between the harms alleged to occur from the Project and the actual reasonably foreseeable effects of the Project as shown and supported with substantial evidence in the Draft EIR. As noted above in the response to comment **D3-1**, the Draft EIR and supporting evidence provides substantial evidence that the Project will reduce electricity demand and not cause or contribute to any strain on the electrical grid. This analysis directly contradicts the Holland & Knight comment letter assertion, which neither contained nor identified independent modeling or analysis, that the project will indirectly result in PSPS events related to increases in electricity demand. Furthermore, the commenter has not cited to any authority that suggests that the harms alleged to result from PSPS events, such as the temporary loss of access to telecommunications services, are physical changes to the environment caused by the project.[74] As a result, the comment's framing of the PSPS issue is erroneous and misleading.

The comment's assertion that the project will somehow exacerbate PSPS events is belied by the fact that a central component of the project is the requirement for new battery storage in many new building types, as discussed on pages 42 to 44 of the Draft EIR. These requirements will only improve the resilience of new buildings at which battery storage is required because battery storage systems can be used to partially power a building's essential communications, lighting, ventilation, and emergency systems during PSPS events and other background conditions affecting California residents.[75] Thus, the alternative implicitly supported by comments **D7-2** through **D7-10**—of not adopting the amendments set forth in Section 140.10(b) of the 2022 Energy Code—would actually preserve the status quo of PSPS conditions and impede progress towards climate resilience. Moreover, because the Project reduces demand in summer when wildfires are likely to occur, it in fact can reduce the amount of load that may need to be shed with a PSPS.

The comment states that "The Draft EIR fails to account for the fact that battery storage systems would only serve if a building has not burned down in a fire." This statement is misleading in two ways: any backup power system, including fossil fuel backup generators, would only serve a building if it has not caught fire, and any building that has burned down in a fire would by definition not benefit from receiving service from intact backup power resources. The comment does not provide substantive

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74 *Newtown Preservation Society v. County of El Dorado* (2021) 65 Cal. App. 5th 771, 279 Cal. Rptr. 3d 915, 928 (When evaluating wildfire impacts under CEQA, "[t]he question is not whether substantial evidence supports a fair argument that the proposed project will have significant impacts on resident safety and emergency evacuation . . . , the question is whether the project may have a significant effect on the environment."); Pub. Resources Code, § 21060.5 (defining "environment"); CEQA Guidelines, § 15382 (defining "significant effect on the environment"); CEQA Guidelines, § 15064(d)(1) (requiring lead agencies to focus on direct and reasonably foreseeable indirect "physical change[s] in the environment.").

75 Athalye, Rahul, John Arent, Roger Hedrick, Nikhil Kapur, Axaule Sultanova, Ben Lalor, Silas Taylor, et al. 2021. Building Energy Efficiency Measure Proposal to the California Energy Commission for the 2022 Update to the California Energy Code, Title 24, Part 6 Building Energy Efficiency Standards Nonresidential PV and Battery Storage. Report. Prepared by NORESCO and E3. Page 14. TN#237776. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237776&DocumentContentId=71014.

evidence that refutes staff's assessment that battery storage systems are less volatile than fossil fuel backup generators that would be installed in some fraction of buildings in the absence of required battery storage systems, nor staff's assessment that offsetting some installation of more volatile equipment results in beneficial impact.

The comment states that "The analysis also fails to explain if and how a battery storage system could provide energy for a long duration, as wildfires and PSPS events can leave customers without power for days." Battery storage systems paired with solar photovoltaic equipment can ensure that power generated while the sun is up can be stored and used while the sun is down, meaning that judicious use of site-generated electricity could allow a building to operate without grid-supplied power for extended durations. However, given that the ability of a building to provide its own power is heavily dependent on the configuration and operation of both their solar photovoltaic and battery storage equipment, the Draft EIR intentionally does not speculate about the amount of self-generation that would result from compliance with renewable and storage requirements. Thus, comment **D9-3** does not allege any deficiency with the Draft EIR that is recognized under CEQA.

<u>Environmental Justice</u>

D10-1: The comment is a summary of detailed comments addressed below. See response to comments **D10-2**.

D10-2: This comment states that increased electricity demand caused by the project will lead to higher energy bills, which will in turn cause public health impacts among those in poverty. This comment is similar to Holland & Knight's comments on the Notice of Preparation, where they stated, "Energy poverty, like housing poverty, is not simply an economic condition: it causes adverse environmental as well as public health impacts that must be evaluated under CEQA." CEC staff considered this comment in preparing the Draft EIR but ultimately disagreed that the commenter had sufficiently established that such impacts were not social or economic changes alleged to result from the Project. On pages 180 and 181 of the Draft EIR, CEC staff summarized the issue as follows:

> In response to the Notice of Preparation, two commenters expressed concerns about the amendments causing possible increases in construction costs and housing occupancy costs, such as energy bills. While these considerations were the subject of extensive discussion during the pre-rulemaking process and are addressed in measure proposals from Vertiv, the Statewide Codes and Standards Enhancement (CASE) initiative, and CEC staff reports, economic considerations such as this are beyond the scope of the CEQA analysis required to be conducted in this EIR. CEQA Guidelines, section 15131(a) states that "[e]conomic or social effects of a project shall not be treated as significant effects on the environment," although section 15131(b) states that "[e]conomic or social effects of a project *may be* used to determine the significance of physical changes caused by the project" (emphasis added). Even assuming commenters

are correct that some level of increase in housing construction or occupancy costs may be foreseeable in some future housing development projects under the 2022 Energy Code amendments, such costs are purely economic effects which would be associated with the specific future building design decisions of developers—and the specific use and behavior patterns of those building occupants—which would not be attributable to physical changes in the environment resulting from the amendments. The commenters have not submitted substantial evidence that the project is likely to result in potential economic effects or social changes on so great a scale that they would result in adverse physical changes *to the environment*, such as blight or urban decay.[76] Without a resulting substantial adverse physical effect on the environment, these are appropriately classified purely economic cost-impacts which would be absorbed by developers, occupants, and other market participants. Under CEQA, lead agencies are not required to reach a determination of significance based on such an assertion.

As Holland & Knight undoubtedly knows, "[e]conomic and social changes resulting from a project shall not be treated as significant effects on the environment" under CEQA.[77] An EIR is not the place for an evaluation of economic or social changes such as an increase in utility bills or energy use patterns caused by a Project unless it is clear that the economic or social change has the potential to cause or contribute to a significant and adverse physical change in the environment.[78] The key question, then, is whether Holland & Knight's comments and supporting materials in **D10-2** provide substantial evidence that the Project may result in economic or social changes that would cause significant physical changes in the environment. The answer is no.

Holland & Knight's comment follows the following logical pattern: California currently has both high rates of poverty and high electricity rates. High poverty rates are linked to poor health outcomes, and high utility bills exacerbate economic conditions for low-income families. Therefore, a Project that could result in higher utility bills must be

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76 See CEQA Guidelines, § 15384 ("Argument, speculation, unsubstantiated opinion or narrative, evidence which is clearly erroneous or inaccurate, or evidence of social or economic impacts which do not contribute to or are not caused by physical impacts on the environment does not constitute substantial evidence.") See, e.g., *Bakersfield Citizens for Loc. Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, 1213; *Chico Advocs. for a Responsible Econ. v. City of Chico* (2019) 40 Cal.App.5th 839, 847-49 (discussing *City of Bakersfield* and related cases involving social and economic concerns raised by petitioners).

77 CEQA Guidelines, § 15064(e).

78 *Ibid.* ("Where a physical change is caused by economic or social effects of a project, the physical change may be regarded as a significant effect in the same manner as any other physical change resulting from the project.").

linked to poor health outcomes. These poverty-linked poor health outcomes are the adverse environmental condition that the commenter argues must be analyzed in the Draft EIR. The lack of factual support for Holland & Knight's position reinforces that their comment and supporting materials do not provide substantial evidence that the 2022 Energy Code may result in economic or social changes that would cause significant physical changes in the environment.

The first sentence of the comment, "The Project would result in an increased demand in electricity and increased electricity costs," is not supported by an analysis of the Project but instead by two blog posts on Forbes.com.[79] The first Forbes.com blog post by Bryan Murray[80] is not focused at all on the Project or its effects on electricity demand or costs. Instead, it focuses on a single study from the Energy Policy Institute at Chicago that showed a link between Renewable Portfolio Standards and increases in utility retail prices. The comment and footnote contain no explanation of how this blog post or study indicate that the Project may result in an increase in electricity demand or costs in California, nor does it demonstrate that Project may result in economic or social changes that would cause significant physical changes in the environment result. The second Forbes.com blog post, by Robert Bryce,[81] levies criticism against what he terms "electrify everything" efforts and local bans on natural gas but does not analyze the Project or explain, with evidence, how the Project may result in an increase in electricity demand or costs in California. Thus, neither of these citations support Holland & Knight's contention that the Project would result in an increased demand for electricity and increased electricity costs.

The next sentence in the comment, alleging that "The Draft EIR prematurely concludes that such impacts would be 'purely economic effects' because it assumes that low-income households not only have access to electricity, but have the resources to pay for it," is a mischaracterization the Draft EIR. In no part of the excerpt above from pages 180 and 181, or any other part of the Draft EIR, does the analysis assume "that low-income households not only have access to electricity, but have the resources to pay for

79 Note that Forbes.com is not itself a news website, but instead utilizes a "contributor model" that allows thousands of contributors to post on the site without editorial review, fact-checking, or other oversight and are compensated for how much content they produce. *See* Bartlett, R. September 2013. The Forbes contributor model: Technology, feedback and incentives. News story. Available at https://www.journalism.co.uk/news/the-forbes-contributor-model-technology-feedback-and-incentives/s2/a554255/.

80 Murray, B. June 2019. *The Paradox of Declining Renewable Costs and Rising Electricity Prices*. News story. Forbes. Pages 198 to 205 of an unnumbered PDF. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=238757&DocumentContentId=72162.

81 Bryce, R. March 2021. Price Data Spotlights Regressive Nature of 'Electrify Everything' Effort. News story. Forbes. Pages 193 to 197 of an unnumbered PDF. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=238757&DocumentContentId=72162.

it." Furthermore, the Forbes.com blog post cited for this sentence reinforces the importance of efforts, such as the Project, to reduce greenhouse gas emissions to mitigate the climate crisis—it does not provide evidence that the Project will harm low-income households in California.[82]

The final sentence of the introductory paragraph argues that "The Project must analyze the reasonably foreseeable public health impacts that will result from an increased demand for electricity and rising energy costs that will disproportionately impact California's most vulnerable low-income and working-class communities." Although this is mostly a restatement of the commenter's belief that any Project that could result in higher utility bills must be linked to poor health outcomes which are required to be analyzed under CEQA, it is also accompanied by a reference to an article noting that "the institutions and systems that support existing fossil fuel regimes must be dismantled."[83] This article does not provide evidence that the Project would cause an increased demand for electricity, increased electricity costs, or public health impacts.

The second paragraph of this comment focuses on noting that poverty exists at significant rates in California, that utility rates in California are higher than the national average, and that rates are principally tied to fixed costs rather than consumption. With respect to the articles cited in support of California's poverty rates,[84][85] there is no reason to doubt their conclusions, but this is solely evidence of existing socioeconomic conditions within California—not evidence of a causal link to the Project. The Next 10 report cited in the comment discusses potential rate design reforms to make utility rates more equitable in California, but it is cited in a misleading way that obscures the fact that per capita residential energy use in California is lower than any state other than Hawaii in part due to the state's rigorous energy efficiency programs, including the

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82 Dolsack, N., et al. August 2020. Urban Heatwaves Are Worse For Low-Income Neighborhoods. News story. Forbes. Page 207 of an unnumbered PDF. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=238757&DocumentContentId=72162. (noting that "Climate change is leading to increased severity and frequency of heat waves, sea-level rise, and flooding due to heavy rainfall.")

83 Nature Energy. August 2020. Editorial: Energy Justice Toward Racial Justice. Page 3 of an unnumbered PDF. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=238758&DocumentContentId=72163.

84 Downs, R. September 2018. Census Bureau: California has the highest poverty rate in the U.S. UPI. Pages 6 to 11 of an unnumbered PDF. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=238758&DocumentContentId=72163.

85 Bohn, S., et al. July 2020. Just the Facts, Poverty in California. Public Policy Institute of California and Stanford Center and Poverty and Inequality. Pages 56 to 60 of an unnumbered PDF. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=238758&DocumentContentId=72163.

California Energy Code.[86] None of the citations in this paragraph support the commenter's contention that the Project would cause economic or social changes that would result in significant physical changes in the environment.

The third paragraph of this comment focuses on the severe health, environmental, and psychiatric conditions that are linked to poverty and thereby exacerbated by increased utility bills. Again, there is no reason to doubt the link between poverty and poor health outcomes, but the two reports cited, by Brown et al. and Ayala et al., do not provide evidence that the Project will in fact cause the consequences attributed to it by the commenter.

The fourth paragraph is a strawman argument that includes the false statement that the Draft EIR "tout[s] financial incentive or tax policies that will allegedly ease the burden on low-income households" and includes various citations to previous references in support of the commenter's critiques of financial incentives for energy-efficient appliances and tax credit programs. The Draft EIR does not include such statements, and the referenced materials do not provide substantial evidence that the Project may result in economic or social changes that would cause significant physical changes in the environment.

The fifth and final paragraph is a summation of the prior points raised in this comment with no new references cited. Because these conclusions are addressed in the responses to comments above, no further response is necessary.

<u>Alternatives</u>

D11-1: This comment reiterates earlier claims that the Draft EIR used an impermissible baseline and failed to properly disclose and analyze the impacts of the Project. As explained above in the responses to comments **D2-7** through **D2-9**, the Draft EIR makes it clear that the baseline applied is consistent with CEQA. Therefore, no changes are required in response to this comment.

D11-2: This comment states that the Draft EIR failed to properly analyze the impacts for "multiple impact areas, as described above" and suggests that Alternative 6.4.4 "may be an environmentally superior alternative to the Project." This statement about "multiple impact areas, as described above" is vague and not supported by any evidence; accordingly, it does not raise significant environmental issues or require a response.

The contention that Alternative 6.4.4 may be an environmentally superior alternative to the Project is premised upon the mischaracterizations of the Project's baselines noted in the response to **D11-1**. Because CEC staff disagrees with the premise that the Draft EIR employed an impermissible baseline, staff also disagrees with the reasons cited in

86 U.S. Energy Information Administration. February 2021. California State Energy Profile. Available at https://www.eia.gov/state/print.php?sid=CA#5.

support of Alternative 6.4.4 being potentially viewed as an environmentally superior alternative. As noted on page 229 of the Draft EIR, Alternative 6.4.4 would not lead to "the removal of inefficient fossil fuel-reliant prescriptive compliance options" and would allow "a 'business as usual' approach to the builder's ability to select between electric and mixed-fuel building designs when seeking project approval." Thus, this alternative is environmentally inferior because it would preserve the status quo for prescriptive compliance path options and greatly reduce the energy savings and GHG emissions benefits of the Project without avoiding any significant environmental impacts caused by the Project. No changes are required in response to this comment.

D11-3: This comment asserts that Alternative 6.4.4 meets Project Objective 1. This is not correct, and even if it were, the comment does not explain how an alternative that only meets two of four project objectives would not "fail[] to meet most of the basic project objectives."[87] Alternative 6.4.4 makes no change relative to existing Energy Code requirements with respect to prescriptive standards for space and water heating equipment and resulting performance targets for building energy use. Objective 1 is to "reduc[e] the wasteful, uneconomic, inefficient, or unnecessary consumption of energy", and to do so *via* "deployment of technically feasible and cost-effective technologies and measures." The comment's assertion that "permitting applicants the flexibility of choosing the most cost-effective and technologically feasible technology for their individual projects" fulfills this objective fundamentally misunderstands the objective, in that the objective is not itself cost effectiveness or technical feasibility but reduced energy consumption (accomplished in feasible and cost-effective ways). Further, applicants have "the flexibility of choosing the most cost-effective and technologically feasible technology for their individual projects" under the Project by complying based on building performance – use of gas equipment is not restricted under this compliance path. Therefore, the Draft EIR's conclusion that Alternative 6.4.4 is not an environmentally superior alternative and does not meet Objectives 1, 2, and 4 remains accurate.

D11-4: This comment asserts that "increased reliance on electricity may result in an inefficient, wasteful, uneconomic or unnecessary expenditure of energy, especially during peak load times." But the comment fails to explain in what way electricity use associated with a shift towards use of efficient electric equipment in place of equipment relying on combustion (natural gas or otherwise) would be inefficient, wasteful, uneconomic or unnecessary; at minimum, a shift towards use of electricity in place of combustion is necessary for advancing State goals and policies relating to reducing greenhouse gas emissions described in Section 4.5.2 of the Draft EIR, and the determination of cost effectiveness indicates that this energy use would not be uneconomic. This comment also asserts that the Draft EIR "analyzes Project impacts based on seasonal loads, as opposed to peak loads as required by Appendix F." The comment is incorrect: Appendix F does not require any specific categories of analysis,

87 CEQA Guidelines, § 15126.6(c).

but for an agency to consider potentially significant energy implications applicable or relevant to a project. As explained in the response to comment **D3-1**, the Draft EIR analyzes both seasonal and peak loads in considering the anticipated impacts of the Project. In fact, as noted in response to comment **D3-1** the data incorporated into the spreadsheets (Appendix B to the Draft EIR) used to compute the energy and emissions impacts reported in the Draft EIR demonstrate the following: (1) the Project will create both short-term and long-term annual *reductions* in electricity consumption and associated greenhouse gas emissions, (2) during the summer peak hours, the Project will create both short-term and long-term *reductions* in electricity consumption during summer peak hours an(3) during winter peak hours, an increase in electricity consumption on the winter peak day is almost imperceptible in the first year of implementation (2023), and by 2030 the Project results in a very small *reduction* in the systemwide winter day peak hour. Thus, no changes are required in response to this comment.

D11-5: This comment asserts that the Draft EIR's analysis of greenhouse gas impacts "fails to account for GHG emissions for energy sources that provide electricity." As explained in response to comment **D6-4**, the Draft EIR does account for GHG emissions for every hour of the year by using long-run marginal source energy as the metric for emissions, as described above in response to comment **D6-3**. Emissions are reported in Table 4.5-2 of the Draft EIR. The analysis assumes gradual decarbonization of California's electricity generation based upon the state's aggressive climate change goals and policies. Thus, substantial evidence supports the conclusion that the Draft EIR accurately accounts for emissions attributable to the marginal electricity generation under the Project. This comment also asserts that the Draft EIR's disclosure of impacts related to the GWP of refrigerants is inadequate. As explained in response to comment **D6-8**, the Draft EIR adequately assess potential impacts from GWP refrigerants and correctly concludes that refrigerant GHG emissions are a very small fraction of total GHG emissions.

Finally, this comment asserts that "[t]here are a multitude of factors that may impact an applicant's option for the most technically feasible and cost-effective technologies." Holland & Knight fails to recognize that Project's performance compliance path provides flexibility to choose technologies (implied to be natural gas or other combustion technologies) based on any factors that are relevant to a given project: while the Project's proposed changes to the Energy Code remove gas equipment options available under a prescriptive approach to compliance, they do not remove the ability to specify and install gas equipment under performance-based compliance.

Thus, no changes are required in response to these comments.

D11-6: This comment asserts that "[t]he Draft EIR […] must accurately analyze the Project's project-level and cumulative impacts and conduct a new comparison of those likely significant impacts with the reduced impacts likely to occur under Alternative 6.4.4 and then determine whether Alternative 6.4.4 presents an environmentally superior alternative to the Project." The Draft EIR already accurately analyzes the Project's project-level impacts per the sections noted in the responses to comments **D11-1**, **D11-2**, **D11-4**, and **D11-5**, and already accurately analyzes the Project's cumulative impacts as described in the responses to comments **D3-11, D4-6, D7-11, D8-5, D12-1, and D12-2**. Based on this, a new comparison is neither necessary or appropriate, as the same conclusion that Alternative 6.4.4 is not environmentally superior to the other alternatives (including the Project) would be reached. Thus, no changes are required in response to this comment.

D11-7: These comments are merely conclusory statements that briefly summarize the letter. Because these conclusions are addressed in the responses to comments above, no further response is necessary.

Cumulative Impacts

D12-1: This comment asserts that the Draft EIR must account for cumulative impacts on the grid from the Project and other state and local actions encouraging electrification. Section 5.3(b) of the Draft EIR already accurately analyzes the Project's cumulative impacts which are further described in the responses to comments **D3-1, D4-6, and D8-5.**

As detailed in Section 4.7 of the Draft EIR, the proposed project is expected to indirectly reduce electricity and natural gas usage on a statewide basis when compared to continued use of existing Energy Code requirements. In addition, the current capacity of in-state electricity generation is sufficient to meet the near term expected potential increase in electrical usage from heat pump technologies in certain buildings, as a result of the project.

Any assessment of energy resources and related utility infrastructure is cumulative by nature due to the fact that the grid system reflects an aggregation of energy usage in real time.

As discussed in Section 4.7 of the Draft EIR, the grid is transforming due to other laws and policies independent of the 2022 amendments. Steps that predate the implementation of the 2022 amendments, to ensure adequate utility resources, have already been taken through the California Public Utilities Commission's reliability proceedings. These proceedings include a 10-year-ahead look at system needs (reliability needs of the overall electric system); local needs (reliability needs specific to areas with transmission limitations); and flexibility needs (such as the resources needed to integrate renewables). Given that these planning processes have already considered and accommodated the states' near-term infrastructure and electrification directives, the project is not expected to have any direct or indirect effect on utility infrastructure and therefore will not be cumulatively considerable. Specifically, the responses to the foregoing comments about the direct impacts of the Project and show that the Project will create short-term and long-term annual reductions in electricity consumption. The demand for electricity to serve new construction and modifications or alterations to existing structures that may be constructed in conformity with the 2022 amendments will be met by existing facilities. facilities. Thus, no changes are required to the Draft EIR.

D12-2: This comment asserts that the Draft EIR must account for the pending shutdown of the Diablo Canyon nuclear facility and the cumulative impacts on the grid from the Project and the lost generation. The Draft EIR already accurately analyzes the Project's cumulative impacts as described in the responses to comments **D3-1, D4-6, and D8-5.** In specific, the responses above show the loss of Diablo Canyon but still establish the Project will not have an adverse impact on energy resources to meet anticipated demand.

2.7 Comment E: Matt Vespa, Earthjustice and Lauren Cullum, Sierra Club California

EARTHJUSTICE
BECAUSE THE EARTH NEEDS A GOOD LAWYER

SIERRA CLUB
CALIFORNIA

Docketed in 21-BSTD-02

July 8, 2021

Docket No. 21-BSTD-02

Letter E

California Energy Commission
1516 Ninth Street
Sacramento, California 95814

Re: Comments on the Draft Environmental Impact Report for the Proposed 2022 Update to Building Energy Efficiency Standards (Title 24, Part 6)

Earthjustice and Sierra Club appreciate the opportunity to provide comments on the Draft Environmental Impact Report ("DEIR") for the 2022 Update to the Building Energy Efficiency Standards ("2022 Building Code" or "Project") under the California Environmental Quality Act ("CEQA"). As set forth in our comments on the Notice of Preparation, all-electric buildings result in air quality, climate and public health benefits and are essential for California to meet its decarbonization objectives.[1] Earthjustice and Sierra Club continue to support a 2022 Building Code that assumes both heat pump space and water heating in standard building designs and at a minimum incorporates improvements identified in our June 3rd comments on the Draft Express Terms.[2] These DEIR comments focus on a series disingenuous claims in a May 21st letter submitted by Holland & Knight asserting that electrification would increase Project impacts.[3] E1-1

[1] Docket No. 21-BSTD-02, *Earthjustice and Sierra Club Scoping Comments*, TN #237462 (Apr. 15, 2021).

[2] Docket No. 21-BSTD-01, *NRDC, RMI, Sierra Club, Earthjustice Comments on Express Terms for 2022 Code*, TN #238139 (June 2, 2021) ("NOP Comments").

[3] Docket No. 21-BSTD-02, *Comments in Response to the Comment Letter Submitted by Earthjustice and Sierra Club for the 2022 Energy Efficiency Standards (TN # 237461)*, TN #237871 (May 21, 2021) ("Holland & Knight Letter"). While the Holland & Knight comments do not identify a particular client on behalf on whom the comments are submitted, Southern California Gas Company's most recent General Order 77-M reports indicate Holland & Knight is among the outside law firms it retains. *See* Vasquez & Company LLP, *San Diego Gas & Electric Company and Southern California Gas Company Independent Accountant's Report On Applying Agreed-Upon Procedures General Order No. 77-M Year Ended December 31, 2020*, at 32, https://www.socalgas.com/sites/default/files/SoCalGas_Annual_2020_REDACTED_GO-77-M.pdf.

Docketed in 21-BSTD-02

July 8, 2021

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1. Greenhouse Gas Benefits of Building Electrification.

Regarding the GHG benefits of all-electric construction, the Holland & Knight letter first takes issue with Sierra Club and Earthjustice's reliance on a 2019 Energy+Environmental Economics ("E3") Study finding that all-electric homes have lower GHG emissions than mixed fuel homes on the grounds that the study assumed low-GWP refrigerant use in 2030 and 2050. As an initial matter, the study found substantial GHG reductions from all-electric homes under 2020 conditions using refrigerants used today.[4] It is also reasonable to assume deployment of low-GWP refrigerants by 2030. The California Air Resources Board ("CARB") is required under Senate Bill 1383 (2016) to reduce emissions of hydrocarbon gases by 40 percent by 2030 and CARB is already working to achieve this mandate. Regarding air source heat pumps used for space heating and cooling, CARB is finalizing regulations requiring use of refrigerants with a GWP of no greater than 750,[5] far less than the GWP of the R-410A refrigerant referred to in the Holland & Knight letter. Moreover, because the air conditioning systems in mixed-fuel homes would have otherwise used similar refrigerants, there is little relative difference in emissions from refrigerant leakage when comparing mixed-fuel and all-electric homes since air source heat pumps provide both space heating and cooling and displace the need for the air conditioning systems used in mixed-fuel homes.

Contrary to the Holland & Knight letter's reference to a report from 2017 to support a general assertion that "not every end-use sector has low-GWP options commercially available today," the California Public Utilities Commission ("CPUC") has noted that "HWPH models that use R-744, which has a GWP of one, are [] available in the US market," are the primary refrigerant for split HPWH systems, and operate at higher efficiencies than R-134a, a higher-GWP HPWH refrigerant, in all temperature conditions.[6] The Holland & Knight letter also appears to question the veracity of Sierra Club and Earthjustice's comments noting the use of R-134a as the primary refrigerant currently used in HPWHs and the limited leakage during its operational lifetime. These same facts have been reaffirmed by the CPUC in its recent HPWH Staff Proposal, which similarly notes that R-134a is "the dominant refrigerant used in HPWHs" and "HPWH refrigerant leakage is minimal during installation and operation, as the units are factory-sealed at the manufacturing plant."[7] Holland & Knight also ignores the benefits of avoided methane leakage from all-electric homes. Holland & Knight's suggestion that GHG

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[4] E3, *Residential Building Electrification in California*, at vi (Apr. 2019) ("E3 Residential Building Electrification in California Report"), https://www.ethree.com/wp-content/uploads/2019/04/E3_Residential_Building_Electrification_in_California_April_2019.pdf.

[5] CARB, *Resolution 20-37: Proposed Amendments to Prohibitions on Use of Certain Hydorfluorocarbons in Stationary Refrigeration, Chillers, Aerosols-Propellants, and Foam End-Uses Regulation* (Dec. 10, 2020), https://ww3.arb.ca.gov/board/res/2020/res20-37.pdf.

[6] CPUC, *Administrative Law Judge's Ruling Providing Proposal, Requesting Comment, and Updating Procedural Schedule*, at 10–11 (Apr. 16, 2021), https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M377/K729/377729072.PDF.

[7] *Id.* at 10.

emissions of all-electric homes are higher than mixed fuel homes due to leakage of high global warming pollutants is without merit.

In addition, the Holland & Knight letter's reliance on several "studies" that purportedly refute the position that all-electric homes have lower GHG emissions than mixed-fuel homes is highly misleading. The letter's first citation is to an Opinion piece in a newspaper. As support for the statement that "converting fuels, such as natural gas, to electricity to meet home demands is less efficient than directly using natural gas and results in higher GHG emissions," the letter cites to a publication by Stanford's Natural Gas Initiative, whose members include ExxonMobil, American Petroleum Institute, and SoCalGas, which makes no such claim. Indeed, this publication was not a study, but rather a description of the results of a multi-player web-based game where participants "played the role of generating companies in electricity markets" exploring the continued need for gas-fired peaker plants under high-renewable penetrations. Similarly, the statement in the National Institute of Standards and Technology study that a mixed fuel home has lower environmental impacts compared 2015 International Energy Conservation Code ("IECC") compliant homes in Maryland. Not only is Maryland's grid substantially more carbon-intensive than California's, but 2015 IECC standards utilize much less efficient electric resistance water heating than the HPWHs contemplated under the 2022 Code. Reliance on this study is therefore wholly inapposite for evaluating impacts of all-electric construction in California. The Holland & Knight letter then wrongly claims that the CEC has shown that "California buildings that rely on natural gas generate substantially lower GHG emissions on average than buildings that rely on electricity" based on a CEC presentation finding that the number of hours of the year where electricity is cleaner than gas will increase from 40 percent in 2019 to 70 percent in 2030. The hours of the year where grid electricity is cleaner than gas is separate from the relative GHG emissions from mixed-fuel versus all electric buildings because heat pumps use much less energy than gas alternatives due to their superior efficiency. For example, under federal efficiency standards, gas furnaces must have an annual fuel utilization efficiency ("AFUE") of 80 percent, equivalent to a coefficient of performance ("COP") of 0.80.[8] In contrast, the minimum standard for a split system heat pump is a heating seasonal performance factor ("HSPF") of 8.2, or a COP of 2.4,[9] three times the efficiency of a gas furnace. As properly observed in Earthjustice and Sierra Club's NOP Comments, the superior

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[8] 10 C.F.R. § 430.32; Dandelion, Coefficient of Performance ("COP"), https://dandelionenergy.com/resources/coefficient-performance-cop (last visited June 5, 2021) (noting that AFUE and COP "are both calculated using a very similar division formula, the only difference being terminology.").

[9] *Id., See, e.g.,* Russell's, *HSPF: Compare the Ratings When You're Going for a Heat Pump System* (Sept. 15, 2011), https://www.russellshvac.com/2011/09/15/hspf-compare-the-ratings-when-youre-going-to-a-heat-pump-system#:~:text=If%20you%20want%20to%20compare%2C%20you%20can%20convert,2.93%20times%20as%20much%20energy%20as%20it%20consumes (HSPF converted to COP by multiplying HSPF by 0.293).

efficiency of HPWHs results in significant GHG savings compared to mixed-fuel homes, which will increase as the grid is increasingly decarbonized.

The Holland & Knight letter also grossly overstates the potential effect of electrification of new construction on peak electric demand by referring to studies examining electrification of California's entire building stock and ignoring low-carbon solutions that are already being implemented, such as increased energy storage deployment, that reduce the carbon intensity and need for gas-generation to meet electric demand during peak periods. In the Draft AB 3232 Assessment, the CEC evaluated the impacts of various building decarbonization scenarios, including a "moderate" scenario that assumed 100 percent electrification of new construction *and* 50 percent electrification upon appliance burnout and 5 percent early retirement of gas appliances.[10] Under this scenario, which included substantial additional electrification beyond new construction, the impact of winter and summer peak load was less than two percent.[11]

2. Public Health and Air Quality Benefits of Building Electrification.

The Holland & Knight letter critiques a study by Lin et al. ("Lin Study") which reviewed the links between gas stoves and childhood asthma and attempts to assert that gas appliances do "not contribute in any significant way to indoor air pollution."[12] In fact, the clear relationship between gas stoves, increased NO_2 levels in homes and increased incidence of asthma is thoroughly detailed in peer reviewed literature.[13] The Lin Study is peer-reviewed, well-executed and sound.[14] Furthermore, findings from additional studies are consistent with the conclusions found in the Lin Study.

The Lin Study is a robust analysis that reviewed 1,064 studies before arriving at its conclusions. This is in addition to other peer-reviewed literature that establishes a link between gas cooking and health effects. In 2016, the EPA made the conclusive finding that there is a causal relationship between short-term exposure to NO2 and respiratory effects such as asthma

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[10] CEC, *California Building Decarbonization Assessment - Draft Staff Report*, at 49 50 (May 2021), https://www.energy.ca.gov/event/workshop/2021-05/commissioner-workshop-draft-building-decarbonization-assessment.

[11] *Id.* at 228.

[12] Holland & Knight Letter at 12.

[13] Kathleen Belanger et al., *Household Levels of Nitrogen Dioxide and Pediatric Asthma Severity*, 24 Epidemiology no. 2, 320–330 (Mar. 2013) ("Belanger Study"), https://doi.org/10.1097/ede.0b013e318280e2ac; Docket No. 19-BSTD-03, *RMI, Redwood Energy, Guttman and Blaevoet, Mothers Out Front, NRDC, Sierra Club Response to SoCalGas on Indoor Air Quality*, TN #234934-1 (Sept. 28, 2020); Docket No. 19-BSTD-03, *RMI, Sierra Club CA, EHDD Architecture – EHDD Comments on Sept 30, 2020 Indoor Air Quality Workshop*, TN #235287 (Oct 16, 2020).

[14] Weiwei Lin et al., *Meta-Analysis of the effects of indoor nitrogen dioxide and gas cooking on asthma and wheeze in children*, 42 Int'l Journal of Epidemiology (Dec. 2013) ("Lin Study"), https://doi.org/10.1093/ije/dyt150.

attacks.[15] They also found there is likely to be a causal relationship between a long-term exposure to NO2 and respiratory effects including the development of asthma.

Meta-analyses, such as the Lin Study, aggregate multiple studies to provide a more precise estimate of the effect size, or the strength of the relationship between two variables (in this case, gas cooking and asthma). An advantage of the meta-analysis methodology is that it increases the generalizability of the results of individual studies. The results of the Lin Study support and build upon a previous meta-analysis conducted in 1992 by Hasselblad et al which, at that time, served as the basis for the World Health Organization (WHO) indoor and outdoor NO2 guideline.[16] Both the Lin and Hasselblad studies conclude that there is a relationship between gas cooking and respiratory effects, like asthma.

The Holland & Knight letter's reliance on a "much larger, international study" by Wong et al. that "detected no evidence of an association between the use of gas as a cooking fuel and either asthma symptoms or asthma diagnosis" does not withstand scrutiny.[17] When analyzing existing literature, it is extremely important to include studies that have measured concentrations of NO_2. Studies without direct NO_2 measurements have a greater risk of measurement error, due to the potential for higher exposure misclassification. For example, the Belanger Study is a key epidemiological study, a yearlong large prospectus study of 1,342 asthmatic children including four in-home NO_2 measurement periods. That direct measurement study found that when asthmatic children were exposed to low levels of NO2 concentrations (as low as 11ppb), their asthma got worse. In contrast, the cited Wong et al. study in the Holland & Knight letter is not based on measured concentrations of NO_2 in the home – it was based on survey data alone. This single study is based on a self-reported global survey in which the respondents were children aged 13–14 and parents of kids aged 6–7. A main factor that could mask an association between gas cooking and asthma is that the Wong study data combined 31 countries. By combining data from 31 countries, the differences across countries in housing characteristics, ambient temperatures, and ventilation may mask the association between gas cooking and asthma. Additionally, without better isolation between geographies and types of housing and associated ventilation, it is problematic to assume the global findings are applicable to California or the United States. In short, one cross-sectional study not specific to the United States does not call into question an entire body of scientific literature that has established a clear relationship between gas stoves and respiratory health effects.

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[15] U.S. EPA. *Integrated Science Assessment (ISA) for Oxides of Nitrogen – Health Criteria*, EPA/600/R-15/068 (Jan. 2016) https://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=310879.

[16] Vic Hasselblad et al., *Synthesis of environmental evidence: nitrogen dioxide epidemiology studies*, 42 Journal of Air and Waste Management, 662–71 (1992), https://www.tandfonline.com/doi/abs/10.1080/10473289.1992.10467018.

[17] Holland & Knight Letter at 12.

3. Construction and Operational Costs of All-Electric Homes.

Finally, the Holland & Knight letter makes the unsupported assertion that "[t]he Project will result in thousands of dollars in added costs for newly constructed homes, alterations, and additions making home ownership less attainable for working-class families and communities of color."[18] In fact, study after study has found all-electric homes are cheaper to build in part because they avoid the need for gas pipeline infrastructure.[19] As one builder recently stated in reporting by NPR, "his company only did its first all-electric building because an environmentally-minded developer forced them to. They thought it would cost a lot extra - turns out it's cheaper."[20] With regard to the cost of electricity, a recent study by the CPUC as part of an *en banc* by California's energy agencies on electric rates found that electrification *reduces* rates by increasing volumetric electric sales.[21] In contrast, delaying adoption of a strong electrification code until the 2025 code cycle would result in more than $1 billion of unnecessary spending on new gas connection infrastructure.[22] The CPUC study also found that all-electric new construction has equivalent energy costs to mixed-fuel homes with overall bill savings for all-electric retrofits.[23] Moreover, not only is heat pump space and water heating more efficient than gas alternatives, but because new construction now requires solar, operational costs of all-electric homes are further reduced because solar generation offsets additional electric load and complements technologies like HPWHs, which heat water for later use in the middle of the day and can be programmed to operate in even greater alignment with solar generation.

Thank you for your consideration of these comments.

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[18] Holland & Knight Letter at 13.

[19] E3 Residential Building Electrification in California Report at 55 (finding all-electric homes have "a capital cost advantage ranging from $3,000 to more than $10,000 over a mixed-fuel home" due to avoided gas infrastructure costs); RMI, *The Economics of Electrifying Buildings*, at 29 (2018), https://rmi.org/insight/the-economics-of-electrifying-buildings/.

[20] Dan Charles, *Cities' Goal to Lower Climate Emissions Could Be Blocked by Gas Utilities*, NPR (Feb. 23, 2021), https://www.npr.org/2021/02/23/970672290/cities-goal-to-lower-climate-emissions-could-be-blocked-by-gas-utilities.

[21] CPUC, *Utility Costs and Affordability of the Grid of the Future: An Evaluation of Electric Costs, Rates, and Equity Issues Pursuant to P.U. Code Section 913.1*, at 85 (Feb. 2021) ("rapid adoption of vehicle and building electrification technologies would likely have the benefit of reducing residential electric rates by 2030."), https://www.cpuc.ca.gov/uploadedFiles/CPUC_Website/Content/Utilities_and_Industries/Energy/Reports_and_White_Papers/Feb%202021%20Utility%20Costs%20and%20Affordability%20of%20the%20Grid%20of%20the%20Future.pdf.

[22] Denise Grab & Amar Shah, *California Can't Wait on All-Electric New Building Code*, RMI (July 28, 2020), https://rmi.org/california-cant-wait-on-all-electric-new-building-code/.

[23] CPUC, *Utility Costs and Affordability of the Grid of the Future*, at 81–82 (Feb. 20, 2021), https://www.cpuc.ca.gov/uploadedFiles/CPUC_Website/Content/Utilities_and_Industries/Energy/Reports_and_White_Papers/Feb%202021%20Utility%20Costs%20and%20Affordability%20of%20the%20Grid%20of%20the%20Future.pdf.

Dated: July 8, 2021

Sincerely,

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Responses to Comment E: Matt Vespa, Earthjustice and Lauren Cullum, Sierra Club California (TN#238749)

E-1: The letter indicates support for the Energy Code updates. The remaining sections of this comment letter are rebuttals to the May 21, 2021, letter submitted by Holland & Knight that commented on Earthjustice's comments on the Notice of Preparation. Because this letter makes no direct comments on the Draft EIR, no further response is necessary.

2.8 Comment F: Jennifer L. Hernandez, Holland & Knight LLP

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Letter F

May 21, 2021

Via Electronic Submission

Michael J. Sokol
California Energy Commission
Docket Unit, MS-4
Docket No. 21-BSTD-02
1516 Ninth Street
Sacramento, CA 95814-5512

Re: Comments in Response to the Comment Letter Submitted by Earthjustice and Sierra Club for the 2022 Energy Efficiency Standards (TN # 237462)

Dear Mr. Sokol,

This letter is submitted in response to the comment letter submitted by Earthjustice and Sierra Club (collectively "Commenters") on the Notice of Preparation ("NOP") for the California Energy Commission's ("CEC") proposed 2022 amendments to the California Building Efficiency Standards (the "Project") contained in Title 24, Part 6 of the California Code of Regulations. The letter submitted makes a number of incorrect assertions and claims regarding the CEC's obligations under the California Environmental Quality Act ("CEQA") (Pub. Res. Code § 21000 *et. seq.*), related to the anticipated environmental review for the Project.

- First, we agree that the environmental analysis needs to account for more than just the difference between the Project and the 2019 Building Efficiency Standards. However, like the NOP, the Commenters' claim that the environmental analysis should be limited in scope as the Project will only create impacts related to greenhouse gas ("GHG") emissions, energy, air quality, and public health fails to account for the "whole of the action" under CEQA, which requires the EIR to analyze the Project's reasonably foreseeable direct and indirect impacts.

- Second, the Commenters assert that the Project is required to "mitigate environmental impacts through the adoption of electric alternatives." While the Commenters never make clear whether they are advocating for electric-appliances in lieu of gas appliances (the "all-electric scenario") as an alternative to the Project or a mitigation measure, CEQA would not mandate an all-electric scenario under either circumstance. An all-electric scenario as an alternative is not environmentally superior and an attempt to require electric appliances as a mitigation measure would itself result in environmental impacts, potentially impacts that would exceed the Project itself, that must be analyzed under CEQA. The Commenters mistakenly assume that the adoption of electric alternatives in lieu of gas appliances would have fewer environmental impacts than a mixed-fuel scenario, despite numerous reports and studies that conclude the opposite.

- Lastly, the Commenters ignore the devastating impacts the Project would have on California's lower-income households and communities of color. Working-class households already pay a higher percentage of their income for energy as compared to wealthier households, and this will only be exacerbated if the Project mandates that households increase their reliance on electric-based technology.

The Commenters' misinterpretations and assumptions regarding impacts of both the Project and a potential all-electric scenario improperly limit what should be a robust CEQA process and Environmental Impact Report ("EIR") intended to inform government decision-makers and the public alike, of the full scale of the Project's environmental impacts.[1]

While California regulators consider themselves trendsetters on climate policy, they have done so on the backs of California's working class families and communities of color. As we have previously noted, California's regulatory climate programs have persistently and unlawfully engaged in a pattern of intentionally imposing higher cost burdens to California residents and citizens in areas with less costly, and less temperate climates, than coastal areas.[2]

Energy poverty is poised to join the ranks of housing poverty as a racially disparate harm intentionally inflicted on communities of color by California's climate regulators.[3] California has one of the highest poverty rates in the nation, and is estimated that more than *7 million California residents live in poverty.*[4] And despite the fact that on average, Californians use about half as much energy as the typical American household, electricity rates continue to rise.[5] While electricity rates went up 7.7 percent across all sectors in California between April 2019 and April 2020, residential customers were hit with a 13.4 percent increase over April 2019 prices.[6] Radical electricity rate increases place a higher cost burden on California's most economically-vulnerable communities and will be exacerbated by the Project, leaving households to choose between paying to cool their homes during a summer heat wave or paying for rent and other household necessities such as food, healthcare, and transportation. As we have previously

[1] Cal. Code. Regs., tit. 14 ("CEQA Guidelines"), § 15121(a).
[2] *See, e.g.,* Bryce, R., *How California Promotes Energy Poverty,* National Review Online (Aug. 3, 2015), https://www.manhattan-institute.org/html/how-california-promotes-energy-poverty-6168.html (finding that residents in Kings County, where the median household income is $48,133 paid more than twice as much for their electricity bills in 2013 compared to their Mill Valley residents, where the average median household income is $90,839).
[3] *Id.*
[4] U.S. Census Bureau, *The Supplemental Poverty Measure: 2018,* at 28 (Oct. 2019), https://www.census.gov/content/dam/Census/library/publications/2019/demo/p60-268.pdf.
[5] Bryce, R., *The High Cost of California Electricity Is Increasing Poverty,* FreOpp (July 3, 2020), https://freopp.org/the-high-cost-of-california-electricity-is-increasing-poverty-d7bc4021b705.
[6] *Id.*

commented, CEQA must analyze the direct and reasonably foreseeable indirect consequences the Project will have on communities of color and lower-income households.

Therefore, Holland & Knight further submits these comments in light of our commitment to the social and economic equity for California's working class families, who will undoubtedly suffer disparate impacts resulting from the Project.

I. The Commenters assert that the Project's environmental impacts are limited, however, CEQA requires an analysis of the "whole of the action", including the Project's reasonably foreseeable direct and indirect consequences.

We agree with the Commenters that the EIR should "assess the impacts of new construction under the proposed 2022 Building Code requirements compared to a scenario where the construction has not occurred."[7] However, the Commenters imply that the Project's impacts are limited to GHGs, energy, air quality, and public health. This is incorrect. As previously explained in our comment letter on the NOP, the EIR must also analyze all impacts related to additional infrastructure necessary to facilitate an all-electric scenario. This includes direct, indirect, and cumulative impacts resulting from an all-electric scenario, including impacts to utilities and service systems, energy-efficiency, public safety, wildfires, biological resources agricultural and forestry resources, air quality, GHG, and the social and economic impacts to California's working-class households and communities of color.[8]

As it relates to GHGs, rather than suggesting that the EIR must discuss the extent of the Project's direct and indirect impacts, the letter asserts "[t]he relevant question is whether the 2022 Building Code results in the deep GHG reductions necessary to address the climate crisis in light of the evolving regulatory and scientific understanding regarding the key role of building electrification in meeting those objectives," and whether the Project "is sufficient to protect public health in light of…new information."[9] This is based on a purported urgency to move forward with building electrification based on reports or policies that urge such an acceleration. While moving forward rapidly with building electrification is a laudable goal that may have some interplay with the required CEQA analysis, the limited scope of analysis suggested by the Commenters fails to acknowledge the extent of the Project's direct and reasonably foreseeable indirect impacts and is an incorrect interpretation of CEQA that fails to account for the "whole of the action" as defined by Cal. Code Regs., tit. 14 ("CEQA Guidelines"), § 15378(a).

In *California Unions for Reliable Energy v. Mojave Desert Air Quality Management District ("CURE"),* the Air District adopted a regulation to allow road paving project as offsets for particulate matter emissions from other sources.[10] The Air District took a stance similar to

[7] NOP Comment Letter from Commenters, to California Energy Commission (TN #237462) (Apr. 15, 2021), hereinafter "Electrification Comment Letter", https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=21-BSTD-02.
[8] NOP Comment Letter submitted by Holland & Knight LLP to Mr. M. Sokol, CEC (TN #237498) (Apr. 19, 2021), hereinafter "HK Comment Letter", https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=21-BSTD-02.
[9] Electrification Comment Letter at 4.
[10] *California Unions for Reliable Energy v. Mojave Desert Air Quality Management District* (2009) 178 Cal.App.4th 1225, 1230 *("CURE")*.

that suggested by the NOP, and implicitly supported by the Commenters, that the project's impacts were limited because the regulation did not "authorize any actual road paving… it cannot possibly have any environmental effects. Any future paving offsets will be subject to environmental review if and when the applicants seek them, but at this point, their environmental effects are speculative."[11] The court disagreed, finding that the regulation allowing road paving *may result in a number of direct and indirect impacts* on biological resources, including but not limited to: mortality due to road construction, increased frequencies of roadkill from vehicle travel on paved roads; noise pollution, soil disturbance and erosion, and increase of roadway pollutants and associated habitat loss, degradation and fragmentation; alteration of wildlife movement; changes in wildlife populations; and growth-inducing effects.[12] The court found that the agency failed to comply with CEQA because the approval of a regulation allowing road paving was the first step in a process of road paving occurring.

Similar to *CURE*, the adoption of the Project is the first step in a process which will lead to the construction of new buildings and alterations to existing buildings, leading to more demand for electricity, leading to the construction, installation, operation and maintenance of facilities, services, and utilities that would serve those buildings. An increased reliance on the electric grid and increased demand for electricity due to the Project would foreseeably trigger the need to install, operate, and maintain renewable energy sources, batteries and storage systems, and transmission and distribution lines, which would undoubtedly create other environmental impacts that would need to be analyzed in the EIR.[13] Multiple studies have shown that the state does not have a sufficient renewable energy supply to meet the state's *current demand*, and thus such impacts are reasonably foreseeable consequences of the Project.[14] Power outages that took place as recently as August 2020 were triggered by "insufficient resources" to meet the state's demand.[15] Other studies have estimated that in order to meet the state's mid-century targets based on reliance on wind and solar alone, the state would need to "deploy those sources at five times the best historic rate, every year for the next 25 years - the equivalent of nearly ten of the world's largest onshore or offshore windfarms *every year*."[16] Thus, the EIR must analyze the Project's direct and reasonably foreseeable indirect impacts, including impacts to utilities and service systems, energy-efficiency, public safety, wildfires, biological resources, agricultural and forestry resources, air quality, GHGs, and social and economic impacts.

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[11] *CURE* at 1230.
[12] *Id.*
[13] *See, e.g.*, HK Comment Letter.
[14] *See*, ScottMadden, *Informing the Transmission Discussion, A Look at Renewables Integration and Resilience Issues for Power Transmission in Selected Regions of the United States*, Executive Summary (Jan. 2020), https://www.scottmadden.com/content/uploads/2020/01/ScottMadden_WIRES_Informing-the-Transmission-Discussion_1-Executive-Summary_2020_0115.pdf.
[15] Letter from Marybel Batjer, President, California Public Utilities Commission ("CPUC"), Stehen Berberich, President and Executive Officer, California Independent System Operator ("CAISO"), and David Hochschild, Chair, CEC to Governor Gavin Newsom, at 2 (Aug. 19, 2020), https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/News_Room/NewsUpdates/2020/Joint%20Response%20to%20Governor%20Newsom%20Letter%20August192020.pdf.
[16] Clean Air Task Force, *Comments On SB 100 Joint Agency Report - Charting a Path to a 100% Clean Energy Future*, (Sept. 19, 2019) https://efiling.energy.ca.gov/GetDocument.aspx?tn=229800&DocumentContentId=61244. (emphasis in original).

Instead, the Commenters have attempted to limit the scope of environmental review by asserting a nonexistent legal standard under CEQA as to whether the Project "address[es] the climate crisis" and alleging that the "relevant question for the EIR is whether the 2022 Building Code is sufficient to protect public health in light of this new information."[17] This is simply contrary to statutory and legal authority that requires a more expansive and thorough analysis under CEQA. To provide a legally-sufficient analysis as required by CEQA, the environmental review must quantify the increased electricity demand that would be generated by the Project, assess how many additional generation, distribution, or transmissions assets may be needed to facilitate this increased demand, and fully explain and analyze the potential environmental impacts that would result from these actions.[18]

II. The Commenters assert that the adoption of electric alternatives will mitigate environmental impacts of the Project, however, they mistakenly assume that an all-electric scenario would have fewer environmental impacts than a mixed-fuel scenario, despite numerous reports and studies to the contrary.

Commenters assert that, to the extent the Project continues to allow gas appliances in standard building design, the Project would result in significant GHG, energy, air quality, and public health impacts that can be mitigated through the adoption of electric alternatives, including stating that the Project results in an "inefficient use of energy from continued reliance on gas appliances."[19] As a threshold matter, it is not clear whether the Commenters suggest the adoption of a project alternative or adoption of a mitigation measure that requires electric appliances in lieu of gas appliances (an "all-electric scenario"). In its letter, the Commenters appear to confuse the legal standard for these two separate EIR components by citing to authority regarding a lead agency's obligations as it relates to the discussion and adoption of project alternatives and mitigation measures in the same sentence, even though they are governed by separate legal standards.[20] While CEQA requires the discussion of project alternatives that offer substantial environmental advantages over the proposed project, CEQA does not require a lead agency to adopt a project alternative that does not reduce a project's environmental impacts.[21] In addition, CEQA requires that an EIR discuss mitigation measures that can minimize a project's significant environmental effects, but the effects of the mitigation measures themselves must also

[17] Electrification Comment Letter at 4.

[18] *See, Goleta Union School District v. Regents of University of California* (1995) 37 Cal.App.4th 1025 (requiring a proposed long range plan to analyze the plan's impacts on school overcrowding which may trigger the need for mitigation); *see also, El Dorado Union High School District v. City of Placerville* (1983) 144 Cal.App.3d 123 (holding that a project proposing residential development also needed to analyze project's impacts on the development on schools and overcrowding when there is substantial evidence indicating an impact on schools).

[19] Electrification Comment Letter at 4.

[20] *Id.,* at 11 citing to *Friends of Oroville v. City of Oroville* (2013) 219 Cal.App.4th 832 (an EIR must evaluate the feasibility of mitigation measures) and *Center for Biological Diversity v. San Bernardino Cty.* (2010) 185 Cal.App.4th 866 (discussing an EIR's evaluation of project alternatives).

[21] *Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 566; *Watsonville Pilots Assn. v. City of Watsonville* (2010) 183 Cal.App.4th 1059, 1089 (holding that EIR should identify alternatives that meet project objectives while reducing environmental impacts); *Citizens for E. Shore Parks v. State Lands Commission* (2011) 202 Cal.App.4th 549, 563 (alternative did not reduce any of the identified significant project impacts); *Mann v. Community Redev. Agency* (1991) 233 CA3d 1143 (proposed alternative not shown to be environmentally superior).

be analyzed and described.[22] The Commenters provide no reliable evidence that an all-electric scenario as a project alternative or a mitigation measure would result in fewer impacts to the environment than the Project itself, nor that electric appliances are more energy efficient or safer than natural gas ones, and there is substantial evidence, as explained below, that requiring an all-electric scenario would result in greater environmental impacts than the Project.

Impacts on GHG Emissions. The Commenters suggest that an all-electric scenario will unequivocally reduce GHG emissions "[b]ecause electric appliances result in significant reductions in GHG pollution that will increase as the grid becomes less carbon intensive, [the] adoption of electric appliances in the standard design for new construction would support a finding that GHG impacts from the 2022 Building Code are less than significant."[23] In an effort to establish that reliance on natural gas appliances will result in GHG impacts, Commenters offer statistical data relating to the number of gas customers added to the state, and the number of homes built with gas infrastructure in recent years, however these numbers fail to demonstrate that the continued ability to use natural gas appliances would result in significant GHG impacts.[24] The Commenters also attempt to downplay the environmental impacts associated with electric appliances and refrigerant leakage by asserting that the "risk of refrigerant leakage does not come close to offsetting the substantial GHG benefits from heat pump adoption…"[25] Not only does the Commenters' position fail to acknowledge the reasonably foreseeable impacts of the Project, but it also mischaracterizes the GHG impacts of electric-based technologies.

The Commenters rely upon a 2019 study conducted by Energy + Environmental Economics ("2019 E3 Study") to assert that building electrification reduces GHG emissions by approximately 30 to 60 percent. To demonstrate their point, Commenters simply provide a graph from the 2019 E3 Study, while providing no context regarding the assumptions made in the study. The graph purports to show that an all-electric scenario would result in a 45 percent reduction in GHG emissions by 2020, 61 percent by 2030, and 82 percent by 2050.[26] The results for 2030 and 2050 rely on an assumption that *next generation* low-GWP refrigerants are used in all applicable heat pump systems.[27] This assumption is flawed because it is unclear whether low-GWP technology is available for all heat pump technologies. The 2017 CARB Final Short-Lived Climate Pollutant Reduction Strategy ("SLCP Reduction Strategy") recognized that "significant research is underway to assess the safety and *feasibility* of low-GWP refrigerants in commercial refrigeration, commercial AC, and residential AC [and that] *not every end-use sector has low-GWP options commercially available today...*"[28] CARB's analysis also recognized that low-GWP technology is not always the most energy efficient as it can take more energy to

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[22] CEQA Guidelines §§ 15626.4(a)(1); 15126.4; *Stevens v. City of Glendale* (1981) 125 Cal.App.3d 986 (vacating certification of an EIR because agency adopted a mitigation measure that was not discussed in the EIR without considering whether a supplement to the EIR should have been prepared to examine the measure's impacts).
[23] Electrification Comment Letter at 6.
[24] *Id.*, at 5.
[25] *Id.*, at 7.
[26] E3, Residential Building Electrification in California, at iv (Apr. 2019), https://www.ethree.com/wp-content/uploads/2019/04/E3_Residential_Building_Electrification_in_California_April_2019.pdf.
[27] *Id.*
[28] CARB, Short-Lived Climate Pollutant Reduction Strategy, at 94 (March 2017), https://ww2.arb.ca.gov/sites/default/files/2020-07/final_SLCP_strategy.pdf (emphasis added).

achieve the same ends as traditional technology: "If energy consumption increases, the additional GHG emissions from electricity generation will defeat the purpose of the low-GWP requirements."[29] For these reasons, the conclusions in the 2019 E3 Study cannot be relied upon.

The Commenters also attempt to rely on a graph from a 2016 article to demonstrate that requiring heat pump technology will result in decreased GHG emissions, and thus allow the EIR analysis to conclude that GHG impacts are less than significant.[30] This graph cannot be relied upon because the article acknowledges that the "calculations do not reflect the lifecycle GHG emissions associated with the operation of each appliance over its expected life, nor does it reflect the hourly operation of the water heater."[31] In addition, studies have indicated that the GHG impacts of electric appliances fluctuate depending on the time of day, due to the source of the electricity. Household energy demand peaks in the morning and evening hours when intermittent renewable power, particularly solar, is unavailable. At these times, electric supplies must be produced from other sources, including natural gas-fired peaker plants. Converting fuels, such as natural gas, to electricity to meet home demands is less efficient than directly using natural gas and results in higher GHG emissions.[32] Several studies refute Commenters' claim that electric homes result in fewer GHG impacts. In fact, a Stanford University researcher has estimated that when renewable power is unavailable, such as during the evening hours, residential *electricity consumption produces three times more GHG emissions* than natural gas.[33] These findings refute the notion that GHG emissions from electric generation remains consistent throughout the day. Instead the use of heat pump technologies results in varying levels of GHG emissions, depending on a number of factors, including the time of use and the source of energy (e.g., solar, wind, gas-fired peaker plants) being converted to fuel the heat pump.

Further, a 2019 study published by the U.S. Department of Commerce, National Institute of Standards and Technology ("NIST") that analyzed energy use, environmental impacts, and economic performance of residential buildings using either electricity or natural gas for space and domestic water heating concluded that a natural gas-heated home is more economical, results in "lower environmental impacts across numerous impact categories," including lower GHG emissions, has a faster heating response time, and generates a greater level of indoor comfort than an all-electric residence. In particular, *GHG emissions were found to be higher in an all-electric home* because of the higher amount of fuels required to produce electricity for use in the home as compared with the use of natural gas equipment in a residence.[34] Although California

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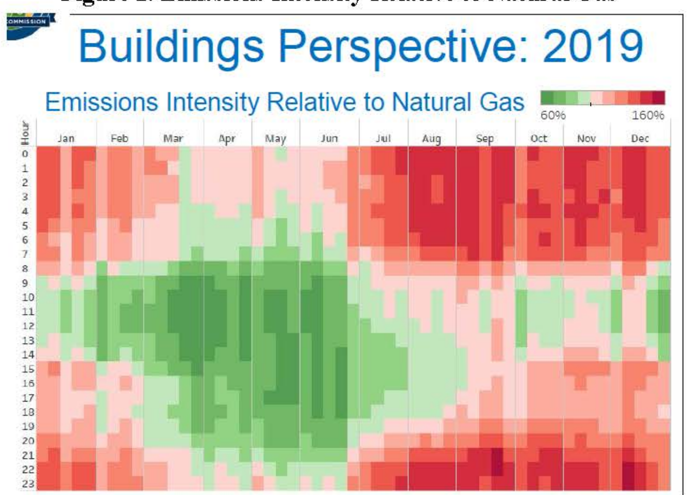
[29] *Id.*, at 94-95.
[30] Mahone, A., et al., *What If Efficiency Goals Were Carbon Goals*, American Council for an Energy-Efficient Economy, at 9-7, (2016), https://aceee.org/files/proceedings/2016/data/papers/9_284.pdf.
[31] *Id.,* at 7.
[32] *See, e.g.,* Thurber M., *Gas-fired generation in a high-renewables world*, Stanford University School of Earth, Energy & Environmental Sciences and Precourt Institute for Energy Natural Gas Initiative, NGI Research Brief (June 2018), https://ngi.stanford.edu/sites/g/files/sbiybj14406/f/NGI_Brief_2018-06_R3_Thurber.pdf.
[33] Kovscek, A. *Is a natural gas ban an "antidote to climate change"?*, San Jose Mercury News (Nov. 12, 2019), https://www.mercurynews.com/2019/11/12/6621534/.
[34] E. O'Rear, D., et al., *Gas vs electric: Heating system fuel source implications on low-energy single-family dwelling sustainability performance*, Journal of Building Engineering (Sept. 2019), https://tsapps.nist.gov/publication/get_pdf.cfm?pub_id=926046.

has a larger proportion of renewable utility-scale energy than Maryland, the CEC has shown that, consistent with the NIST study, in California buildings that rely on natural gas generate substantially lower GHG emissions on average than buildings that rely on electricity. As demonstrated in Figure 1, in 2018 the *CEC estimated that electricity use in buildings produces a greater level of GHG emissions than natural gas use for approximately 60 percent of the year*.[35] This is because natural gas results in lower GHG emissions during a significant majority of the morning and evening hours in all months, which are the periods of highest residential energy demand. The significantly lower GHG emissions in California buildings that rely on natural gas reflects the fact that, except during daytime hours from about March to June, intermittent solar and wind is insufficient to meet in-state building energy demand. When intermittent renewable energy is not available, electrical generation is less efficient and produces a greater level of GHG emissions than if the building were relying on natural gas.

Figure 1. Emissions Intensity Relative to Natural Gas[36]



The Commenters further attempt to downplay the potentially significant impacts that heat pump technology can have on GHG emissions by claiming that "the impact of refrigerant emissions from most heat pump technologies is relatively minor compared to the emissions benefits of avoiding gas combustion, even without accounting for methane leakage attributable to gas use."[37] Commenters rely on an email from a private party that purports that low-GWP heat pump technology is dominant in the marketplace and point to an example of one of the most advanced technologies used in heat pump water heaters ("HPHW") to demonstrate that the risks associated with refrigerant leakage are low. According to the unpublished email, HPHWs models

[35] CEC, Building Decarbonization, 2018 Update – Integrated Energy Policy Report, IEPR Workshop Presentation by M. Brook, at 16 (June 14, 2018), hereinafter "2018 Building Decarbonization Update."
[36] 2018 Building Decarbonization Update, at 16.
[37] Electrification Comment Letter at 8.

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that utilize a low-GWP refrigerant (R-134) also include design features that would discourage leakage during the HPHW's lifetime. Commenters assert on the basis of this sole example of low-GWP HPHW, that the risks associated with refrigerant leakage under a "worst-case scenario" would be minimal compared to gas water heaters (releasing 0.86 MT CO2e from HPHWs using low-GWP refrigerants versus 8.9 MT CO2e from a gas water heater).[38]

The assertions and conclusions made by commenters cannot be relied upon for several reasons. First, the Commenters merely rely upon one example of technology that utilizes low-GWP refrigerants to discuss impacts for all electric appliances that utilize refrigerants. This one example is not indicative of environmental impacts for all heat pump technology. Second, the Commenters ignore the reality that not all buildings will be equipped with the most up-to-date low-GWP technologies, or even that low-GWP technologies may not exist for many applications. The Commenters' analysis thus does not account for the installation or utilization of heat pump technologies that continue to rely on high-GWP refrigerants. These assumptions are not only inappropriate but can result in staggering differences in an environmental analysis. For example, R-410A is a high-GWP refrigerant that has commonly replaced older technologies that are associated with levels of higher ozone depletion. R-410A belongs to a group of hydrofluorocarbons ("HFC") that have a high-GWP that is *2,088 times that of* CO_2.[39] The use of heat pump technologies that utilize R-410A thus present significant potential environmental impacts if the systems leak during operation or at the end of their life cycle. Some estimates assume a leakage rate of three to five percent, which can present significant GHG impacts given the concentrated levels of CO_2.[40] An EIR analysis cannot simply overlook the substantial potential impacts associated with refrigerant leakage from heat pump systems and conclude that the adoption of such technologies would result in less than significant GHG impacts. For these reasons, the Commenters' assertion that an all-electric scenario would reduce the Project's GHG impacts to less than significant levels cannot be relied upon.

Energy Impacts. Like the Commenters we agree that the Project will result in energy impacts that must be analyzed by the EIR. However, the Commenters misinterpret CEQA, specifically Appendix F, to assert that the key purpose of an EIR's energy analysis is to demonstrate a "decreased reliance on fossil fuels." This is incorrect. Appendix G requires the EIR to analyze whether the Project would "[r]esult in [a] potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources…"[41] Further, Appendix F requires a more comprehensive discussion regarding a project's energy impacts, including but not limited to: (i) the project's energy requirements and energy use efficiencies by amount and fuel type; (ii) the project's effects on local and regional energy supplies and requirements for additional capacity; and (iii) the project's effects on peak and base period demands for electricity and other forms of energy.[42]

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[38] Electrification Comment Letter at 6.
[39] WSP, Importance of Refrigerants in Heat Pump Selection webpage, (Mar. 28, 2018), https://www.wsp.com/en-GB/insights/the-importance-of-refrigerants-in-heat-pump-selection.
[40] *Id.*
[41] CEQA Guidelines, Appendix G, Section VI. Energy; *see also,* CEQA Guidelines, Appendix F, Section I; Pub. Res. Code § 21100(b)(3).
[42] CEQA Guidelines, Appendix F, Section II.C.

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To support their position, Commenters once again point to heat pumps in an attempt to demonstrate the energy efficiencies of electric-based technologies by stating "heat pumps substantially reduce gas demand due to superior efficiency and reliance on electrical power from an increasingly decarbonized grid."[43] Commenters attempt to limit the discussion regarding the Project's energy impacts and efficiencies to GHG emissions resulting from gas use only, and conclude that the adoption of electric-based technologies will reduce gas consumption, thereby meeting the state's energy conservation goals. However, a recent study conducted by the UCLA Institute of Environment and Sustainability concluded "that aggressive electrification of residential end-use appliances has the potential to exacerbate daily peak electricity demand"[44] and that even if additional intermittent wind and solar generation capacity is deployed, and "[u]nder best case efficiency assumptions, full electrification is expected to increase daily peak loads, on average throughout the year, by 80%. Conversely, under worst case assumptions, daily peak loads are estimated to increase by an average of 265%."[45] Thus, even with the potential for energy efficiency stemming from the fuel switch, *the potential impacts on daily peak electricity loads are likely to be dramatic.*

Further, Commenters glaze over energy efficiency considerations associated with heat pump technologies by providing data associated with only the most "advanced" technologies available, and fail to account for the variable factors that affect the efficiency of heat pump technologies. For example, the efficiency of heat pump technologies varies depending on a number of factors, including the temperature of water adjacent to the condenser, ambient air temperature and humidity, set point temperature, hot water draw profile, and operating mode.[46] While all of these factors impact efficiency, ambient air temperatures or colder climates can have major efficiency implications. This is because, rather than generating heat, heat pump technologies use electricity to move heat from a cool space to a warm space, much like a refrigerator. HPHWs will only operate in heat pump or hybrid mode if the ambient temperature of the air entering the water heater is between approximately 45°F and 110°F. When the temperature of the incoming air drops below 45°F, the HPHW will switch into electric resistance mode which reduces the efficiency of the unit.[47] California is home to no less than half a dozen climate regions in which temperatures fall below 45°F or less during winter months.[48] Given the state's climate diversity, which ranges from dry desert, mild coastal, to cold mountainous regions, it would be unreasonable to assume that energy efficiency rates for HPHW would be

[43] Electrification Comment Letter at 8.

[44] Fournier, D., et al., *Implications of the timing of residential natural gas use for appliance electrification efforts, Environmental Research Letters 15*, no. 12, UCLA Institute of Environment and Sustainability, at 1 (Nov. 2020) , https://iopscience.iop.org/article/10.1088/1748-9326/aba1c0/pdf

[45] *Id.,* at 5.

[46] U.S. Department of Energy Office of Energy Efficiency & Renewable Energy, *Energy Savings and Breakeven Cost for Residential Heat Pump Water Heaters in the United States,* at 12 (July 2013), https://www.nrel.gov/docs/fy13osti/58594.pdf.

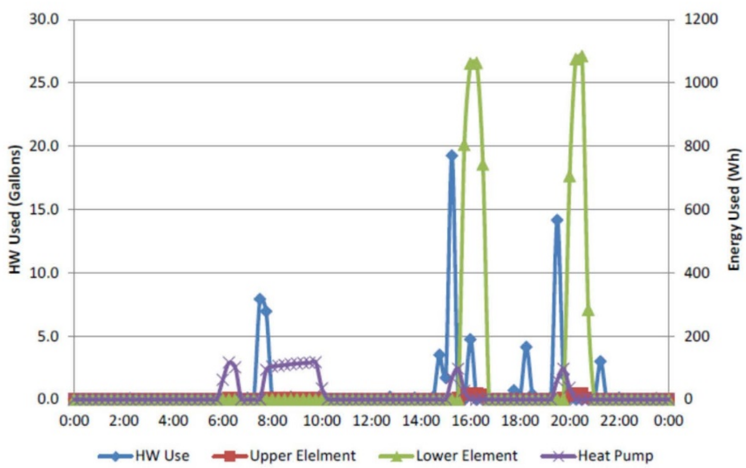
[47] U.S. Department of Energy Office of Energy Efficiency & Renewable Energy, *Measure Guideline: Heat Pump Water Heaters in New and Existing Homes*, at 8 (Feb. 2012), hereinafter "*Heat Pump Water Heaters in New and Existing Homes*," https://www.nrel.gov/docs/fy12osti/53184.pdf.

[48] These regions include 2, 11, 12, 13, 14, and 16. Pacific Energy Center, *Guide to California Climate Zones and Bioclimatic Design* (Oct. 2006), https://www.pge.com/includes/docs/pdfs/about/edusafety/training/pec/toolbox/arch/climate/california_climate_zones_01-16.pdf.

consistent statewide or that such technologies would be energy efficient in colder regions. The loss of efficiency in cooler climates is demonstrated in a 2013 study conducted by the National Renewable Energy Laboratory ("NREL"), which highlights the fact that areas such as the Pacific Northwest are particularly susceptible to higher energy impacts resulting from heat pump technologies. The report concluded that in homes in cooler climate zones, it "can take up to three times as much energy for the [electric resistance] heating equipment to meet the space heating load imposed by HPWH on the conditioned space."[49] Because of these operational limitations, HPHWs are intended for warmer climate zones, whereas the potential environmental benefits of this technology would be canceled out in other, less temperate climate zones.[50]

In addition, hot water demand also affects heat pump's energy efficiency. As common sense would dictate, electricity consumption increases with overall water consumption. However, as demonstrated in Figure 2 below, if the hot water demands are intense, a hybrid HPHW will revert into electric resistance mode, which consumes at least as twice as much electricity when compared to heat pump mode and would therefore greatly exacerbate or increase energy impacts.[51]

Figure 2. Electricity Demand for HPHWs Relying On Electric Resistance[52]



[49] U.S. Department of Energy Office of Energy Efficiency & Renewable Energy, *Energy Savings and Breakeven Cost for Residential Heat Pump Water Heaters in the United States*, at 27 (July 2013), https://www.nrel.gov/docs/fy13osti/58594.pdf.

[50] A 2018 study from Rocky Mountain Institute ("RMI") found that the trend for electric heating is most popular in temperate and warmer climates. Over 50 percent of homes in the states of Florida, South Carolina, Arizona, Louisiana, Alabama, Tennessee, North Carolina, Texas, Washington, and Mississippi rely on electric heating, while the states with the least reliance on electric heating are in colder climates, including Rhode Island, New Hampshire, Michigan, Maine, and Vermont. RMI, *The Impact of Fossil Fuels in Buildings: A Fact Base*, at 58-59 (Dec. 2019), https://lpdd.org/wp-content/uploads/2020/03/Building-Electrification-fact-base-report.pdf.

[51] *Heat Pump Water Heaters in New and Existing Homes* at 5.

[52] *Heat Pump Water Heaters in New and Existing Homes* at 7.

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Without a diversity of energy options available to consumers, the reliance on electric-based technologies during peak usage hours, when consumers are most likely to be in need of hot water and other heating needs to perform household functions, will increase. Additionally, because the efficiency of heat pump technology is strongly dependent on ambient temperature, any analysis of such technologies must account for the state's diversity of climate zones. For these reasons, it is unreasonable to assume that an all-electric scenario would unequivocally reduce impacts to energy to less than significant levels as purported by the Commenters.

Health and Air Quality Impacts. The Commenters assert that the use of gas appliances, in particular gas stoves, pose air quality impacts to residential users. Their position relies heavily on two reports sponsored by the Sierra Club, one from UCLA and another sponsored in partnership with the Rocky Mountain Institute ("RMI"), which suggest a causal relationship between gas stoves and childhood asthma. However, reliance upon these reports is misplaced for the reasons set forth below. Moreover, other studies have shown that using indoor natural gas appliances does not contribute in any significant way to indoor air pollution and that the use of natural gas appliances does not impose appreciable health and safety risks beyond those imposed by electric appliances.

Both the UCLA and RMI reports rely on a 2013 meta-analysis ("Lin Study") that looked at 19 epidemiological studies[53] to conclude that gas cooking has a "clear association" with an increased risk of asthma. However, the Lin Study's conclusion is questionable because the underlying studies did not sufficiently account for confounding factors. Nine of the 19 studies did not account for tobacco smoke, and 4 did not adjust for any confounding factors at all. It is also worth noting that 74 percent (14 out of 19) of the epidemiological studies compiled and evaluated by the Lin Study were conducted prior to 2000, when a greater proportion of residences likely had gas stoves with gas-fed pilot lights. Nevertheless, *all six* of the studies that addressed North America found *no association* between gas stoves and asthma in children. And the only California study, which followed 3,535 children with no history of asthma from 1993 to 1998, likewise found no evidence of an association between children who lived in homes with gas stoves and asthma diagnosis.[54] Indeed, the Lin Study's conclusion is contradicted by a much larger international study also published in 2013, which "detected no evidence of an association between the use of gas as a cooking fuel and either asthma symptoms or asthma diagnosis."[55] That study, the International Study of Asthma and Allergies in Children ("International Study"), collected data from 510,000 children between 1999 and 2004 – as compared to 66,000 children from 1972 to 2009 for the Lin Study. And while the Lin Study failed to account for confounding variables, the International Study adjusted "for sex, region of the world, language, gross national income, maternal education, parental smoking, and six other subject-specific covariates."

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[53] Lin W., et al., *Meta-analysis of the effects of indoor nitrogen dioxide and gas cooking on asthma and wheeze in children*, Int. J. Epidem., at 42:1724–37 (Dec. 2013).
[54] McConnell R., et al., *Indoor risk factors for asthma in a prospective study of adolescents*, Epidemiology, 13:288–95 (May 2002), https://pubmed.ncbi.nlm.nih.gov/11964930/.
[55] Wong, G.W.K, et al., *Cooking fuels and prevalence of asthma: a global analysis of phase three of the International Study of Asthma and Allergies in Childhood ("ISAAC"),* Lancet Respir Med. (July 2013), at 1:386-94.

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Because the Lin Study is more limited in scope, uses older data and is subject to several methodological deficiencies, it is not reasonable to continue to rely on its conclusions, particularly in light of the contradictory conclusions made by the International Study. Therefore, it is unreasonable for Commenters to rely upon the UCLA and RMI analyses as a basis to continue to suggest that the use of natural gas has a "clear association" with health and safety concerns.

II. The Commenters ignore the disproportionate impact the Project will have on working-class families and communities of color.

There is a significant failure across the board to recognize the causal relationship between the physical changes that will result from the Project's increased reliance on the electric grid and the social and economic impacts the Project will have on California's consumers, disparately impacting communities of color and working class families. CEQA Guidelines § 15131(b) states that "[e]conomic or social effects of a project may be used to determine the significance of physical changes caused by the project. For example, if the construction of a new freeway or rail line divides an existing community, the construction would be the physical change, but the social effect on the community would be the basis for determining that the effect would be significant."

California already suffers from the highest poverty rates in the U.S.[56] The Project's increased reliance on electricity will exacerbate costs that have been steadily increasing for years, to which "lower- and average-income households bear a greater burden."[57] Between 2019-2021 alone, price increases for three of the state's largest investment-owned-utilities[58] have sky-rocketed by 20 percent.[59] These increases have the most significant impact on low- to middle-income households, which tend to pay a higher percentage of their income for energy compared to wealthier households.[60] Additionally, studies have found that California's "low income and environmental justice communities…continue to experience high energy costs and energy insecurity, as well as high rates of disconnection when households [cannot] afford their bills."[61] The Project will result in thousands of dollars in added costs for newly constructed homes, alterations, and additions making home ownership less attainable for working-class families and communities of color. The Project EIR must disclose and analyze this impact.

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[56] Downs, R., *Census Bureau: California has the highest poverty rate in the U.S.*, UPI (Sept. 13, 2018), https://www.upi.com/Top_News/US/2018/09/13/Census-Bureau-California-has-highest-povertyrate-in-US/1611536887413/.
[57] Energy Institute at Haas, UC Berkeley, *Designing Electricity Rates for An Equitable Energy Transition: Executive Summary*, at 4, (Feb. 23, 2021), https://www.next10.org/publications/electricity-rates.
[58] These include Pacific Gas & Electric, Southern California Edison, and San Diego Gas & Electric .
[59] CPUC, Utility Costs and Affordability of the Grid of the Future: An Evaluation of Electric Costs, Rates, and Equity Issues Pursuant to P.U. Code Section 913.1 (Feb. 2021), https://www.cpuc.ca.gov/uploadedFiles/CPUC_Website/Content/Utilities_and_Industries/Energy/Reports_and_White_Papers/Feb%202021%20Utility%20Costs%20and%20Affordability%20of%20the%20Grid%20of%20the%20Future.pdf.
[60] Drehbol, A., et al., *How High Are Household Energy Burdens? An Assessment of National and Metropolitan Energy Burdens across the United States*, American Council for an Energy-Efficient Economy (Sept. 10, 2020), https://www.aceee.org/research-report/u2006.
[61] Greenlining Institute, Affordable Clean Energy, https://greenlining.org/our-work/energy/affordable-clean-energy/.

III. Conclusion

The EIR must analyze Project impacts against the existing physical environment; however, the Commenters have failed to acknowledge that CEQA requires an analysis of the "whole of the action." The Commenters' position fails to account for all reasonably foreseeable direct and indirect impacts of the Project, including economic and social impacts to disadvantaged communities. Further, CEQA does not require the adoption of an all-electric scenario as either a project alternative or a mitigation measure because it would not result in an environmentally superior project nor result in fewer environmental impacts than the Project itself. We continue to urge the CEC not to abandon its responsibilities pursuant to CEQA, and ensure that the EIR contains a thorough analysis as required by law.

Sincerely yours,

Jennifer L. Hernandez

HOLLAND & KNIGHT LLP

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Responses to Comment F: Jennifer L. Hernandez, Holland & Knight LLP

F-1: This comment was submitted to respond to comments submitted by Earthjustice and Sierra Club (TN#237462) regarding the Environmental Impact Report Notice of Preparation.

Comment TN#237871 from Jennifer L. Hernandez, Holland & Knight LLP, was submitted on May 21, 2021 after the release of the Draft EIR. However, these comments focused on the Notice of Preparation and comments submitted by Earthjustice and Sierra Club (TN#237462) on the Notice of Preparation.

Under the CEQA Guidelines, section 15082, there is no requirement for an agency to either solicit comments from the public or to respond to comments on a Notice of Preparation. The purpose of the notice is to provide responsible and trustee agencies with an opportunity to inform the lead agency of potential environmental issues within the scope of expertise of the responsible and trustee agencies. The only agency to provide comments on the Notice of Preparation was the Native American Heritage Commission. No additional responses are required.[88]

88 As JA-8 requirements for ceiling fan light kits are already preempted due to the action of federal law, acknowledging that preemption in Table 150.0-A is not a change from existing conditions. Staff did clarify the phrasing of that entry in the table to make the relationship to preempting federal law more explicit.

CALIFORNIA ENERGY COMMISSION

Chapter 3

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CALIFORNIA ENERGY COMMISSION

Attachment A

Draft EIR With Revisions

Draft EIR With Revisions

Revised Draft EIR begins on the next page.

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CALIFORNIA ENERGY COMMISSION

California Energy Commission

Draft Environmental Impact Report

Amendments to the Building Energy Efficiency Standards (2022 Energy Code)

May 19, 2021
Docket Number 21-BSTD-02 | CEC-400-2021-007-D
State Clearinghouse Number 2021030504

CALIFORNIA ENERGY COMMISSION

Table of Contents

Chapter 1

Executive Summary

Executive Summary

This summary is provided in accordance with Section 15123 of the California Environmental Quality Act (CEQA)[1] Guidelines (CEQA Guidelines),[2] which states that an environmental impact report (EIR) "shall contain a brief summary of the proposed actions and its consequences. The language of the summary should be as clear and simple as reasonably practical." This summary includes:

1. A description of the project;
2. The environmental impacts of the project and recommended mitigation measures, if applicable;
3. Areas of controversy known to the California Energy Commission (CEC) including issues raised by agencies and the public; and
4. Identification of the alternatives evaluated and of the environmentally superior alternative.

1.1 Project Description Summary

The Warren-Alquist Act establishes the CEC as California's primary energy policy and planning agency.[3] The CEC is required to adopt regulations to reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy, including the energy associated with the use of water, and to manage energy loads to help maintain electrical grid reliability."[4] This is done through amendments to the Building Energy Efficiency Standards contained in the California Code of Regulations, Title 24, Part 6 (hereinafter, the "Energy Code") on a three-year cycle. The Energy Code includes energy efficiency standards applicable to the construction of new buildings and additions and alterations to existing buildings. The CEC is required to adopt or revise

1 Pub. Resources Code § 21000 et seq. (The CEQA statutes generally require state and local government agencies to inform decision makers and the public about the potential environmental impacts of proposed projects and to reduce those environmental impacts to the extent feasible.)

2 Cal. Code of Regs., tit. 14, § 15000 et seq. (Guidelines) (Details the protocol by which state and local agencies comply with CEQA requirements.) Hereinafter the Guidelines are cited as "CEQA Guidelines, § ____."

3 Pub. Resources Code § 25000 et seq.

4 Pub. Resources Code §§ 25402(a)-(b).

standards that shall be cost-effective when taken in their entirety and when amortized over the economic life of the structure compared with historic practice.[5]

This draft environmental impact report (Draft EIR) evaluates the potential environmental impacts of the proposed triennial update to the Energy Code. The proposed amendments to the Energy Code is the "project" evaluated under the CEQA and hereinafter will be referred to throughout this EIR as the "2022 amendments" or "Energy Code updates." Since this project is a change to existing building design and construction requirements applicable statewide, for purposes of this Draft EIR and the analyses herein, the boundary of the project area is the boundary of the state of California as set forth in the California Constitution and state statutes.

The project is the latest triennial update to the Energy Code. The amendments, if adopted, would be incorporated into the 2022 edition of the Energy Code, and become effective on January 1, 2023. As in prior updates to the Energy Code, the proposed Energy Code updates include numerous changes to the existing 2019 Energy Code. These amendments include new or updated standards to increase efficiency of different building systems and pieces of equipment.

The following is a summary of the 2022 amendments that the CEC proposes to the Energy Code:

- Revise the prescriptive compliance path available for building projects to include only heat pump technology in specific circumstances;
- Revise the "standard design" used for the modeling-based performance compliance path available for building projects to establish the performance baseline based on heat pump technologies in specific circumstances;
- Revise existing residential energy efficiency standards for solar photovoltaic (PV) systems, including battery storage and associated compliance options;
- Establish new prescriptive solar PV and battery requirements for the following newly constructed nonresidential building types: high-rise multifamily, hotel-motel, tenant-space, office, medical office or clinic, restaurant, grocery store, retail store, school, and theater/auditorium/convention center buildings;
- Establish new requirements that mixed fuel buildings be electric ready, meaning that electrical connections and other features needed to allow use of non-combustion equipment options are installed at the time of initial construction;
- Establish new energy efficiency standards for lighting, envelope (e.g., exterior walls, windows, roofs, and floors), and space conditioning systems serving controlled environment horticulture spaces;

5 Pub. Resources Code § 25402(b)(3).

- Revise energy efficiency standards for commercial and industrial process loads, including computer room air conditioning, refrigerated areas, fan systems, compressed air systems, and steam traps;
- Revise nonresidential and multifamily efficiency standards for building envelopes; fan and duct systems; heating, ventilation and air conditioning (HVAC) controls; boilers and service water heating systems; indoor and outdoor lighting systems; and grid integration equipment such as demand responsive controls;
- Revise minimum standards for residential kitchen ventilation; and
- Revise and enhance requirements relating to duct sealing and ventilation.

The following is a summary of the statutory objectives guiding the 2022 amendments:

> **Objective 1**: Reducing the wasteful, uneconomic, inefficient, or unnecessary consumption of energy via the deployment of technically feasible and cost-effective technologies and measures;
>
> **Objective 2**: Reducing wasteful, uneconomic, inefficient, or unnecessary consumption of energy and maintaining grid reliability by increasing deployment and utilization of distributed, on-site renewable energy equipment and increasing the percentage of energy consumption from new residential and nonresidential buildings which is able to be served by renewable energy equipment;
>
> **Objective 3**: Reducing the wasteful, uneconomic, inefficient, or unnecessary consumption of energy by ensuring that newly constructed buildings designed for use of natural gas equipment include wiring and other design features necessary to allow future use of electric equipment when it becomes cost-effective and technically feasible to do so; and
>
> **Objective 4**: Reducing wasteful, uneconomic, inefficient, or unnecessary consumption of energy and maintaining grid reliability by improving the ability of buildings to engage in and benefit from energy storage and load management.

In addition, the Energy Code updates are consistent with and support other important statewide goals for the decarbonization of California's economy.

1.2 Summary of Environmental Impacts and Mitigation Measures

Table 1-1, presented at the end of this chapter, provides a summary of the environmental impacts for the proposed 2022 amendments that are evaluated in this Draft EIR. The table provides the level of significance of the impact and recommended mitigation measures, if any. Impacts are categorized as follows:

- **Beneficial Impact**: a positive impact on the environment. Beneficial impacts are distinct from "no impact" in that the environment is affected, however the change is not a significant impact under CEQA as the term "significant effect on the environment" is defined as "a substantial, or potentially substantial, *adverse* change in…physical conditions affected by the project…"[6]

- **No Impact**: no impact on the environment.
- **Less Than Significant Impact**: no substantial adverse impact on the environment, although a less than significant adverse impact may occur; or an adverse impact on the environment that would be potentially significant but can be eliminated or reduced to a less than significant level through compliance with existing federal, state, and local laws and regulations.
- **Less Than Significant with Mitigation**: a significant adverse impact on the environment that would be reduced to a less than significant level through implementation of feasible mitigation measures.
- **Significant and Unavoidable Impact**: a significant adverse impact on the environment that cannot be eliminated or reduced to a less than significant level through implementation of feasible mitigation measures. In some cases, mitigation may be available to lessen a given impact, but the residual effects of that impact would continue to be significant even after implementation of mitigation measures.

1.3 Summary of Known Areas of Controversy

In accordance with Public Resources Code section 21092 and CEQA Guidelines Section 15082, the CEC issued a Notice of Preparation on March 18, 2021, seeking input from responsible and trustee agencies and the general public regarding the scope and content of environmental areas in the EIR. CEC staff also hosted a virtual scoping meeting on April 9, 2021, during which environmental areas with potential significant impacts were discussed and comments heard. The CEC accepted comments on the scope of EIR between March 19, 2021, and April 23, 2021. In total, seven comment letters were received. Areas of controversy reflected in these comments include, but are not limited to, the following:

- Need for an appropriate baseline;
- Potential impacts to agriculture and forestry resources, air quality, biological resources, energy, greenhouse gas emissions, population and housing, utilities and service systems, and wildfire;
- All-electric building requirements as an alternative to the proposed amendments;
- Concerns with the proposed amendments for lighting; and
- Tribal consultation in compliance with Assembly Bill (AB) 52 and Senate Bill (SB) 18.

6 CEQA Guidelines, § 15382.

Areas of controversy that fall within the scope of CEQA are addressed in this Draft EIR and its appendices. Issues that fall outside the scope of CEQA are not evaluated in this Draft EIR.

1.4 Summary of Issues to be Resolved

1.4.1 Alternatives to the Project

CEQA requires that an EIR identify alternatives to the project as proposed and evaluate their comparative merits. CEQA Guidelines Section 15126.6 states that an EIR must describe a "reasonable range of potentially feasible alternatives," focusing on those that "would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant environmental effects of the project." Based on the requirements of CEQA and the summary of environmental impacts presented above, this EIR describes and analyzes five alternatives to the proposed project. A summary of project alternatives follows. The full analysis of project alternatives is provided in **Chapter 6 Alternatives**, along with a description of other alternatives considered but not carried forward for full analysis.

- **Alternative 1: No Project Alternative:** Assumes that the 2022 amendments will not be adopted and that the existing 2019 Energy Code will continue to be used until the next triennial update period in 2025.
- **Alternative 2: No Prescriptive Solar Alternative:** Adopts the proposed 2022 amendments but excludes the minimum prescriptive requirements for certain nonresidential buildings to install solar PV equipment.
- **Alternative 3: No Prescriptive Battery Storage Alternative:** Adopts the 2022 amendments without the minimum prescriptive requirements for certain nonresidential buildings to install battery storage equipment.
- **Alternative 4: No Removal of Prescriptive Compliance Path Options:** Adopts the proposed 2022 amendments with the exception of amendments that would remove gas-related options for prescriptive compliance with Energy Code requirements.
- **Alternative 5: Electric Space and Water Heating Alternative:** Amends the Energy Code to use energy efficient, heat pumps in newly constructed buildings for space heating and water heating, both prescriptively and through performance-based compliance. This alternative would result in greater electricity demand by newly constructed buildings and greater reductions in exposure to on-site combustion gases than the project.

Alternative 1 (No Project)

Under this alternative, the 2019 Energy Code will continue to be used with no amendments until the next triennial update in 2025 when additional amendments may be considered.

Alternative 2 (No Prescriptive Solar)

Under this alternative, the proposed amendments to the Energy Code that comprise the project would be pursued with the exception of new prescriptive minimum standards for inclusion of solar PV equipment in specified newly constructed nonresidential buildings. Lack of a prescriptive requirement would result in fewer PV systems being installed at newly constructed buildings built during the three years that the 2022 Energy Code would be in effect. Electricity needs for powering equipment or charging energy storage devices that would be served through PV systems would instead be sourced from electric utilities. This alternative was found not to be environmentally superior and does not meet the project's core objective of effecting consumption of energy and grid reliability by increasing deployment and utilization of distributed, on-site renewable energy equipment.

Alternative 3 (No Prescriptive Battery Storage)

Under this alternative, the proposed amendments to the Energy Code that comprise the project would be pursued with the exception of new prescriptive minimum standards for inclusion of onsite battery storage equipment in specified newly constructed nonresidential buildings, resulting in fewer battery storage systems being installed at newly constructed buildings built during the three years that the 2022 Energy Code would be in effect. Fewer battery storage systems will reduce the ability of buildings to shift energy usage by storing energy for use at times when energy costs are higher or less renewable energy is available. This alternative was found not to be environmentally superior and does not meet the project's core objective of improving the ability of buildings to engage in and benefit from energy storage and load management.

Alternative 4 (No Removal of Prescriptive Compliance Path Options)

Under this alternative, the proposed amendments to the Energy Code that comprise the project would be pursued with the exception of removing existing prescriptive compliance options for the use of natural gas equipment. As a result, buildings constructed during the three-year period that the 2022 Energy Code is in effect would be allowed to continue to use the prescriptive compliance pathway when using natural gas equipment that are less efficient than heat pumps for that end use. In contrast, the Energy Code updates require that buildings use the performance compliance pathway when using less efficient natural gas equipment. Alternative 4 is expected to result in a higher number of less efficient gas space heating and water heating equipment installed and smaller number of efficient heat pump space heating and water heating equipment installed when compared to the proposed project. This alternative was found not to be environmentally superior and does not meet the project's core objectives of affecting consumption of energy through the deployment of feasible cost-effective, energy efficient technology or increase the percentage of energy consumption from new residential and nonresidential buildings which is able to be served by renewable energy equipment.

Alternative 5 (Electric Space and Water Heating)

Under this alternative, the Energy Code would require that more space and water heating loads be served by electric heat pump equipment . During the three-year period that the 2022 Energy Code is in effect only heat pump space and water heating equipment would be used as the basis of the performance and prescriptive standards. This alternative would potentially amplify both negative and positive impacts identified in this EIR, but because of lack of market experience and performance data, evaluation of cost-effectiveness and technical feasibility would not be determinable for some applications. This alternative would also incur adverse economic and housing impacts. This alternative was found to not meet the project's core objective of deployment of technically feasible and cost-effective technologies and measures.

1.4.2. Environmentally Superior Alternative

CEQA Guidelines Section 15126.6 calls for the identification of an environmentally superior alternative in an EIR and further states that, "if the environmentally superior alternative is the 'no project' alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives."

Analysis of the project indicates that the 2022 amendments is not expected to result in significant environmental impacts. Additionally, there is no clear environmentally superior alternative to the project among the alternatives identified. However, identified alternatives result in infeasibility, failure to meet project objectives, or both. In this case the 2022 amendments are considered to be the superior option due to the less than significant environmental impacts and ability to meet project objectives.

Table 1-1 Summary of Impacts and Mitigation

CEQA Criterion	Level of Significance Prior to Mitigation	Mitigation	Level of Significance After Mitigation
Aesthetics			
4.1.3-a Have a substantial adverse effect on a scenic vista?	No Impact	None required	No Impact
4.1.3-b Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	No Impact	None required	No Impact

4.1.3-c In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	Less than significant	None required	Less than significant
4.1.3-d Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	Less than significant	None required	Less than significant
Agriculture and Farmland			
4.9.1-a Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	No Impact	None required	No Impact
4.9.1-b Conflict with existing zoning for agricultural use, or a Williamson Act contract?	No Impact	None required	No Impact
4.9.1-c Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public	No Impact	None required	No Impact

Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?			
4.9.1-d Result in the loss of forest land or conversion of forest land to non-forest use?	No Impact	None required	No Impact
4.9.1-e Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	No Impact	None required	No Impact
Air Quality (including Public Health)			
4.2.5-a Conflict with or obstruct implementation of the applicable air quality plan?	Less than significant, Beneficial Impact	None required	Less than significant, Beneficial Impact
4.2.5-b Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	Beneficial Impact	None required	Less than significant, Beneficial Impact
4.2.5-c Expose sensitive receptors to substantial pollutant concentrations?	Less than significant, Beneficial Impact	None required	Less than significant, Beneficial Impact

4.2.5-d Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	Beneficial Impact	None required	Less than significant, Beneficial Impact
Biological Resources			
4.3.3-a Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	Less than significant, Beneficial Impact	None required	Less than significant, Beneficial Impact
4.3.3-b Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	No Impact	None required	No Impact
4.3.3-c Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	No Impact	None required	No Impact
4.3.3-d Interfere substantially with the	No Impact	None required	No Impact

movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?			
4.3.3-e Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	No Impact	None required	No Impact
4.3.3-f Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	No Impact	None required	No Impact
Cultural and Tribal Cultural Resources			
4.9.2-a Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	No Impact	None required	No Impact
4.9.2-b Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to §15064.5?	No Impact	None required	No Impact
4.9.2-c Disturb any human remains, including those interred outside of formal cemeteries?	No Impact	None required	No Impact

4.9.2-d Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?	No Impact	None required	No Impact
4.9.2-e A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?	No Impact	None required	No Impact
Energy and Energy Resources			
4.4.3-a Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	Less than significant	None required	Less than significant
4.4.3-b Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	Less than significant	None required	Less than significant
Geology and Soils			

4.9.3-a Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	No Impact	None required	No Impact
ii. Strong seismic ground shaking?	No Impact	None required	No Impact
iii. Seismic-related ground failure, including liquefaction?	No Impact	None required	No Impact
iv. Landslides?	No Impact	None required	No Impact
4.9.3-b Result in substantial soil erosion or the loss of topsoil?	No Impact	None required	No Impact
4.9.3-c Be located on geologic units or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	No Impact	None required	No Impact
4.9.3-d Be located on expansive soil, as defined in Section 1803.5.3 of the California Building Code (2010), creating	No Impact	None required	No Impact

substantial direct or indirect risks to life or property?			
4.9.3-e Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	No Impact	None required	No Impact
4.9.3-f Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	No Impact	None required	No Impact
Greenhouse Gas Emissions			
4.5.3-a Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	Less than significant, Beneficial Impact	None required	Less than significant, Beneficial Impact
4.5.3-b Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	Less than significant	None required	Less than significant
Hazards and Hazardous Materials			
4.6.3-a Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	Less than significant	None required	Less than significant
4.6.3-b Create a significant hazard to the public or the	Less than significant	None required	Less than significant

environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			
4.6.3-c Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	Less than significant	None required	Less than significant
4.6.3-d Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	No Impact	None required	No Impact
4.6.3-e For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	No Impact	None required	No Impact
4.6.3-f Impair implementation of or physically interfere with an adopted emergency response plan or	Less than significant	None required	Less than significant

emergency evacuation plan?			
4.6.3-g Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	Less than significant	None required	Less than significant
Hydrology and Water Quality			
4.9.4-a Violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	No Impact	None required	No Impact
4.9.4-b Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	No Impact	None required	No Impact
4.9.4-c Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or through the addition of impervious surfaces in a manner which would: i. result in substantial erosion or siltation, on- or offsite;	No Impact	None required	No Impact
ii. substantially increase the rate or amount of surface runoff in a manner which	No Impact	None required	No Impact

would result in flooding on- or offsite;			
iii. create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	No Impact	None required	No Impact
iv. impede or redirect flood flows?	No Impact	None required	No Impact
4.9.4-e Conflict with or obstruct implementation of water quality control plan or sustainable groundwater management plan?	No Impact	None required	No Impact
Land Use and Planning			
4.9.5-a Physically divide an established community?	No Impact	None required	No Impact
4.9.5-b Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	No Impact	None required	No Impact
Mineral Resources			
4.9.6-a Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	No Impact	None required	No Impact
4.9.6-b Result in the loss of availability of a locally important mineral resource recovery site delineated on	No Impact	None required	No Impact

a local general plan, specific plan or other land use plan?			
Noise			
4.9.7-a Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	No Impact	None required	No Impact
4.9.7-b Generation of excessive ground-borne vibration or ground-borne noise levels?	No Impact	None required	No Impact
4.9.7-c For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	No Impact	None required	No Impact
Population and Housing			
4.9.8-a Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through	No Impact	None required	No Impact

extension of roads or other infrastructure)?			
4.9.8-b Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	No Impact	None required	No Impact
Public Services			
4.9.9-a Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services: i.Fire protection?	No Impact	None required	No Impact
ii.Police Protection?	No Impact	None required	No Impact
iii.Schools?	No Impact	None required	No Impact
iv.Parks?	No Impact	None required	No Impact
v.Other public facilities?	No Impact	None required	No Impact
Recreation			
4.9.10-a Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility	No Impact	None required	No Impact

would occur or be accelerated?			
4.9.10-b Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?	No Impact	None required	No Impact
Transportation			
4.9.11-a Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	No Impact	None required	No Impact
4.9.11-b Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	No Impact	None required	No Impact
4.9.11-c Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	No Impact	None required	No Impact
4.9.11-d Result in inadequate emergency access?	No Impact	None required	No Impact
Utilities and Service Systems			
4.7.3-a Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or	Less than significant	None Required	Less than significant

telecommunications facilities, the construction or relocation of which could cause significant environmental effects?			
4.7.3-b Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	Less than significant, Beneficial Impact	None Required	Less than significant, Beneficial Impact
4.7.3-c Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	Less than significant, Beneficial Impact	None Required	Less than significant, Beneficial Impact
4.7.3-d Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	Less than significant	None Required	Less than significant
4.7.3-e Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	Less than significant	None Required	Less than significant
Wildfire			
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:			

4.8.3-a Substantially impair an adopted emergency response plan or emergency evacuation plan?	No Impact	None required	No Impact
4.8.3-b Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	No Impact	None required	No Impact
4.8.3-c Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	Less than significant	None required	Less than significant
4.8.3-d Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	No Impact	None required	No Impact
Mandatory Findings of Significance			
5.3-a Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining	Less than significant, Beneficial Impact	None required	Less than significant, Beneficial Impact

levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?			
5.3-b Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	Less than significant	None required	Less than significant
5.3-c Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	Less than significant	None required	Less than significant

Chapter 2

Introduction

Introduction

This Draft EIR evaluates the potential environmental impacts of the 2022 amendments. It has been prepared in accordance with the requirements in Public Resources Code sections 21000-21177 and the CEQA Guidelines Sections 15000-15387. The CEC is the lead agency under CEQA for consideration of this EIR and potential project approval.

2.1 Purpose and Intended Use of this EIR

CEQA requires that public agencies consider the potentially significant adverse environmental effects of projects over which they have discretionary approval authority before approving those projects. The preparation of an EIR is required whenever a project may result in a significant adverse environmental impact.[7] An EIR is an informational document used to inform public agency decision makers and the general public of the significant environmental effects of a project, identify possible ways to mitigate or avoid the significant effects, and describe a range of reasonable alternatives to the project that could feasibly attain most of the basic objectives of the project while substantially lessening or avoiding any of the significant environmental impacts. Public agencies are required to consider the information presented in the EIR when determining whether to approve a project.

The CEC is the lead agency, as defined by CEQA, for this EIR because it will consider approval of the project. Other public agencies with jurisdiction over the project are listed below in Section 2.3, "Agency Roles and Responsibilities."

2.2 Scope of the Draft EIR

The project is the 2022 amendments to the Energy Code. The 2022 amendments would add to existing building design and construction requirements in the 2019 Energy Code. The 2022 amendments, if adopted, would be incorporated into the 2022 edition of the Energy Code and become effective on January 1, 2023. The 2022 Energy Code would apply to newly constructed buildings and additions and alterations to existing buildings.

While the 2022 Energy Code would apply to new construction, it would not cause new construction to occur within the state. The Energy Code also does not regulate where such construction occurs nor does it change the application of zoning laws, land use restrictions, or any other laws that affect the siting of specific building projects. Rather, the Energy Code is a set of design and construction requirements that apply when a builder requests a building permit from a local jurisdiction to begin construction (i.e., the Energy Code provides conditions attached to the permit to construct a building or

7 CEQA Guidelines, § 15064(f)(1).

make improvements to an existing building). As such, adopting 2022 amendments do not directly cause any changes to the environment. Its effects are indirect, as builders and manufacturers respond to new requirements.

Under CEQA, the degree of specificity required in a EIR corresponds to the degree of specificity involved in the underlying activity which is described in the EIR.[8] CEQA provides that an EIR on a project such as the adoption or amendment of comprehensive zoning ordinance or a local general plan should focus on the secondary effects that can be expected to follow from the adoption, or amendment, but the EIR need not be as detailed as an EIR on the specific construction projects that may follow.[9] The analysis in this Draft EIR addresses broad regulations that do not approve the construction of specific building projects, so a general level of detail is appropriate. However, this Draft EIR makes a rigorous effort to evaluate potential significant adverse impacts and beneficial impacts of the regulatory program and contains as much information about those impacts as is currently available, without being unduly speculative.

The scope of analysis in this Draft EIR is intended to help focus public review and comments on the project and ultimately to inform the CEC of the environmental benefits and adverse impacts before CEC action on the 2022 amendments. This analysis focuses on reasonably foreseeable potentially significant adverse and beneficial impacts on the physical environment resulting from compliance with the project. The term "compliance" refers to the reasonably foreseeable activities that may occur in response to the provisions in the 2022 amendments the Energy Code, including the mandatory (i.e., compliance with regulatory requirements) and optional aspects of the project (i.e., compliance by using either a prescriptive set of measures or performance-based compliance, which achieves the same performance as the prescriptive set of measures but does not mandate the use of any specific technology).

A determination of which impacts would be potentially significant was made for this project based on research and analysis of the relevant project during the preparation of this Draft EIR, as well as on the comments received as part of the public scoping process (Appendix A). The CEC has determined that the project will have less than significant impacts on aesthetics, air quality, biological resources, energy, greenhouse gas emissions, hazards and hazardous materials, utilities and services systems, and wildfire, which are addressed in detail in this Draft EIR.

Based on research and analysis of the relevant project during the preparation of this Draft EIR, as well as on the comments received as part of the public scoping process (Appendix A), the CEC has determined that the following resources would not experience any significant impacts: agriculture and forest resources, cultural and tribal

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8 CEQA Guidelines, § 15146.

9 Ibid.

resources, geology and soils, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, and transportation.

Chapter 4, "Environmental Setting, Impacts, and Mitigation" provides the analysis, as required by CEQA, that explains why the project will have no or less-than-significant impacts on the aforementioned resources.

2.3 Agency Roles and Responsibilities

The CEC has the exclusive authority to adopt energy efficiency standards for buildings, which are located in the Energy Code. As the lead agency under CEQA, the CEC is responsible for considering the EIR and determining if the proposed 2022 amendments to the Energy Code should be approved.

Under CEQA, a responsible agency is a public agency which proposes to carry out or approve the project, for which the lead agency is preparing or has prepared an EIR.[10]

Any adoption of building standards by any state agency is subject to approval by the California Building Standards Commission, making them a responsible agency for this project.

A trustee agency is a state agency that has jurisdiction by law over natural resources that are held in trust for the project of the state of California.[11] The California Department of Fish and Wildlife is California's trustee agency for the state's fish, wildlife, and plant resources, and it may consider and comment on this Draft EIR in fulfillment of its duties. No other agency is expected to use the EIR, and no other permits or approvals are necessary for the 2022 amendments to be incorporated into the Energy Code.

2.4 CEQA Public Review Process

2.4.1 Notice of Preparation

The purpose of a Notice of Preparation (NOP) is to provide sufficient information about the project and its potential environmental impacts to allow agencies and interested parties the opportunity to provide a meaningful response related to the scope and content of the EIR, including mitigation measures that should be considered and alternatives that should be addressed.[12] Comments submitted in response to the NOP are used by the lead agency to identify broad topics to be addressed in the EIR.

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10 CEQA Guidelines, § 15381.

11 CEQA Guidelines, § 15386.

12 CEQA Guidelines, § 15082(b).

In accordance with CEQA Guidelines Section 15082, the CEC issued a NOP on March 18, 2021, to inform public agencies and the general public of the preparation of this Draft EIR for the project and to invite comments on the scope and content of the document (Appendix A). The CEC submitted the NOP to the State Clearinghouse, which then distributed the NOP to potential responsible and trustee agencies (State Clearinghouse #2021-030504); posted the NOP on the CEC's website at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237212&DocumentContentId=70393; and e-mailed the NOP to all persons subscribed to the following CEC service lists: Building Energy Efficiency Standards. In addition, the CEC mailed the NOP directly to the California Air Resources Board (CARB) Major Industrial Projects, CARB Atmospheric sciences and Climate Strategies Branch, CARB Research Planning, Administration, and Emissions Mitigation Branch, Department of Toxic Substance Control, State Water Resources Control Board (SWRCB) Division of Water Quality, California Department of Fish and Wildlife Habitat Conservation Planning, Department of Parks and Recreation, Department of Water Resources, California Natural Resources Agency, Department of General Services, Division of the State Architect, California Department of Transportation District 3, California Public Utilities Commission (CPUC), California Governor's Office of Emergency Services, Office of Historic Preservation, California Native American Heritage Commission, and the California Building Standards Commission. The CEC circulated the NOP for a 30-day review period, starting on March 18, 2021. The CEC accepted comments submitted through April 23, 2021.

In accordance with CEQA Guidelines Section 15082(c), the CEC issued a notice for a virtual scoping meeting for the Draft EIR on March 30, 2021. CEC staff hosted this virtual scoping meeting on April 9, 2021. During this meeting, CEC staff discussed environmental areas with potentially significant impacts and members of the public provided comments on the scope of the environmental areas in the EIR. CEC staff reviewed and considered the oral comments heard during the virtual meeting and written comments received during the NOP comment period. The comments are addressed as appropriate in the applicable technical section in this Draft EIR. **Appendix A** contains the written comment letters submitted during the NOP comment period. The comments the CEC received related to the NOP and the location of any response in this Draft EIR are summarized in **Table 2.1**.

Table 2-1
Comment Letters and Discussion Location in this Draft EIR

NOP Comment Letter	Comment/Topic	Addressed in Draft EIR Chapter
Letter 1 Earthjustice and Sierra Club	Appropriate baseline Impacts to Air Quality, Energy, Greenhouse Gas Emissions All-electric building alternative to the proposed amendments	Chapter 3 Chapter 4 Chapter 6
Letter 2 Holland & Knight	Appropriate baseline Impacts to Agriculture and Forestry Resources, Air Quality, Biological Resources, Energy, Greenhouse Gas Emissions, Population and Housing, Utilities and Service Systems, Wildfire	Chapter 3 Chapter 4
Letter 3 Jon McHugh, PE	Proposed amendments for lighting Additional building efficiency measures not evaluated	Chapter 4 Chapter 6
Letter 4 Jim Stewart, PhD	Proposed amendments for lighting Additional building efficiency measures not evaluated	Chapter 4 Chapter 6
Letter 5 Sierra Club CA	Proposed amendments for lighting Additional building efficiency measures not evaluated	Chapter 4 Chapter 6
Letter 6 Southern California Gas Company	Impacts to Air Quality, Energy, Greenhouse Gas Emissions, Population and Housing, Utilities and Service Systems, Wildfire	Chapter 4
Letter 7 Native American Heritage Commission	Tribal consultation in compliance with AB 52	Chapter 4

2.4.2 Draft EIR

The CEC is circulating this Draft EIR for a 45-day period of review and comment by the general public, interested parties, agencies, and organizations. In accordance with CEQA Guidelines Section 15087(a), the CEC has provided public notice of availability of this Draft EIR (hereinafter "Notice") to all persons and organizations that have previously requested such notice in writing by emailing the Notice to all persons subscribed to the following CEC service lists: Building Energy Efficiency Standards.

CEQA Guidelines Section 15087(a) also requires that the Notice be given by at least one of the following procedures:

(1) Publication at least one time in a newspaper of general circulation in the area affected by the proposed project. If more than one area is affected, the notice shall be provided in the newspaper of largest circulation from among the newspapers of general circulation in those areas.

(2) Posting of notice by the public agency on and off site in the area where the project is to be located.

(3) Direct mailing to the owners and occupants of property contiguous to the parcel or parcels on which the project is located. Owners of such property shall be identified as shown on the latest equalized assessment roll.

To comply with section 15087(a), the CEC published the Notice in the Los Angeles Times on May 20, 2021. In accordance with CEQA Guidelines Section 15087(e)-(f), the CEC submitted the Draft EIR to the State Clearinghouse to distribute to state agencies for review.

In addition, as encouraged by CEQA Guidelines Section 15087(d), the CEC posted the Draft EIR to the project's docket at https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=21-BSTD-02 and hardcopies are available at the following locations for review:

California Energy Commission
1516 Ninth Street
Sacramento, California 95814-5512

During the 45-day public comment period, written comments on the Draft EIR's accuracy and completeness may be submitted to the CEC. Written comments (including via email) must be received by **5:00 p.m. on July 8, 2021**.

The CEC encourages use of its electronic commenting system. To submit written comments electronically, visit the e-commenting page at https://efiling.energy.ca.gov/Ecomment/Ecomment.aspx?docketnumber=21-BSTD-02. Enter contact information and a comment title describing the subject of the comment(s). Comments may be included in the "Comment Text" box or attached as a downloadable, searchable document in Microsoft® Word or Adobe® Acrobat®. The maximum file size allowed is 10 MB.

Please note that written comments, attachments, and associated contact information (including address, phone number, and email address) will become part of the public record with access available via any internet search engine.

Written comments may be submitted by email. Include docket number 21-BSTD-02 and 2022 Energy Code Update CEQA Documentation in the subject line and email to docket@energy.ca.gov.

A paper copy of written comments may be sent to:

California Energy Commission
Docket Unit, MS-4
Docket No. 21-BSTD-02
1516 Ninth Street
Sacramento, California 95814-5512

2.4.3 Final EIR

After the end of the 45-day public comment period, CEC staff will evaluate and prepare proposed responses to comments received on environmental issues. Consistent with CEQA Guidelines Section 15088(b), the CEC will provide written proposed responses to commenting agencies by at least 10 days before any action is taken on the Final EIR or project. The Final EIR (containing this Draft EIR and the Responses to Comments document) will then be considered for certification and approval by the CEC Commissioners at a CEC business meeting.

The level of detail contained throughout this Draft EIR is consistent with CEQA Guidelines Section 15151 and court decisions, which provide the standards of adequacy on which this Draft EIR is based. The Guidelines state as follows:

> An EIR should be prepared with a sufficient degree of analysis to provide decision makers with information which enables them to make a decision which intelligently takes account of the environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is reasonably feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The courts have looked not for perfection but for adequacy, completeness, and a good faith effort at full disclosure.[13]

As such, the standards for adequacy provide that an EIR can be certified if: (1) the EIR provides sufficient analysis to allow decisions to be made regarding the proposed project with consideration given to its environmental impacts; (2) the EIR shows a good faith effort at full disclosure of environmental information. If the CEC Commissioners find that the Final EIR is adequate, complete, and a good faith effort at full disclosure," the CEC Commissioners may certify the Final EIR in accordance with CEQA.

13 CEQA Guidelines, § 15151.

2.5 Organization of this EIR

This EIR is organized into six chapters, as described below:

- Chapter 1 Executive Summary. This chapter provides a concise overview of the proposed project; a brief overview of the potential environmental impacts analyzed and mitigation measures to reduce or eliminate these impacts; areas of known controversy and issues to be resolved; and project alternatives.
- Chapter 2 Introduction. This chapter describes the purpose, intent, and scope of the EIR; identifies the roles and responsibilities of the lead agency and responsible and trustee agencies; explains the environmental review process, including the preparation of the NOP, Draft EIR, and Final EIR; and provides the organization of the EIR.
- Chapter 3 Project Description. This chapter provides a description of the project; presents the location of project; identifies the objectives sought by the project; discusses the project's technical, economic, and environmental characteristics; identifies the intended uses of the EIR by the lead agency and responsible and trustee agencies; and describes the environmental setting of the project.
- Chapter 4 Environmental Setting, Impacts, and Mitigation. This chapter describes the environmental setting; discusses the regulatory setting; and analyzes the potential environmental impacts of the project and identifies if mitigation measures are necessary to reduce potentially significant impacts to less than significant levels. The analysis is organized in the following environmental resource topics derived from CEQA Appendix G:

  4.1 Aesthetics

  4.2 Air Quality

  4.3 Biological Resources

  4.4 Energy Resources

  4.5 Greenhouse Gas Emissions

  4.6 Hazards and Hazardous Materials

  4.7 Utilities and Service Systems

  4.8 Wildfire

  Chapter 4 also includes resource topics that have no potential to cause or otherwise result in environmental impacts. These are grouped together in section 4.9 of this chapter, titled Technical Areas Not Affected.
- Chapter 5. This Chapter includes other subjects identified as "Other CEQA-Required Discussions." The subjects include analysis of environmental justice (EJ) issues; and Mandatory Findings of Significance, including analysis of the

project's potential contribution to cumulative impacts, with discussions of each of the technical areas in sections 4.1 through 4.8. The subjects in this chapter are organized as follows:

5.1. Environmental Justice

5.2 Growth Inducing Impacts

5.3. Mandatory Findings of Significance

- Chapter 6. This chapter includes a discussion of a reasonable range of alternatives to the proposed project which could feasibly avoid or lessen the proposed project's potentially significant impacts and evaluates the comparative merits of the alternatives by assessing the extent to which the alternatives could meet the basic project objectives.
- Chapter 7. This chapter provides the list of preparers of this Draft EIR, including CEC's technical staff and other CEC staff.
    - Appendices. The Appendices to this Draft EIR are organized as follows:
        - Appendix A. Notice of Preparation & Public Comments
        - Appendix B. Project Energy & Greenhouse Gas Emissions Impacts
        - Appendix C. HERS Registrations, 2013 & 2016 Energy Codes Cycles
        - Appendix D. Documents Relied Upon for 2022 Energy Code Rulemaking

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Chapter 3

Project Description

Project Description

3.1 Introduction

This chapter provides a detailed description of the CEC's Energy Code updates. For the purposes of this Draft EIR, the CEC considers the 2022 amendments to be the "project" evaluated under CEQA. CEQA defines a "project" as a discretionary action that has the potential to result in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment.[14] Here, the implementation and compliance actions taken in response to the proposed amendments to the Energy Code have the potential to result in either a direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment.

The 2022 amendments would add to existing building design and construction requirements to the 2019 Energy Code and support the state's energy efficiency, reliability, and clean energy goals, policies, and mandates. The amendments would increase the deployment of on-site renewable energy generation, reduce carbon emissions from new buildings, reduce growth in energy demand, increase energy demand flexibility, maintain grid reliability, and ensure that California buildings are as energy efficient as is found to be technically feasible and cost-effective. This chapter describes the project's location, objectives, and technical, economic, and environmental characteristics, as well as the intended use of this EIR and the environmental setting.

3.2 Project Location

The project is a change to existing requirements for building design and construction that are applicable statewide. For purposes of this EIR and the analyses herein, the boundary of the project area is the boundary of the state of California as set forth in the California Constitution and state statutes.

3.3 Statement of Project Objectives

The Warren-Alquist Act[15] establishes the CEC as California's primary energy policy and planning agency. Public Resources Code section 25402(a)-(b) requires the CEC to adopt regulations to "reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy, including the energy associated with the use of water, and to manage energy loads to help maintain electrical grid reliability." The CEC satisfies this requirement through updates to the Energy Code contained in California Code of

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14 CEQA Guidelines, § 15378.

15 Pub. Resources Code § 25000 et seq.

Regulations, Title 24, Part 6. The Energy Code includes the energy efficiency requirements applicable to the construction of new buildings and additions and alterations to existing buildings.

The CEC updates the Energy Code on a three-year cycle as part of the California Building Standards Code. The project is the latest triennial update to the Energy Code. The proposed amendments, if adopted, would be incorporated into the 2022 edition of the Energy Code and become effective on January 1, 2023. The CEC released the proposed amendments for public review and comment on May 7, 2021, with a deadline for written comments of June 21, 2021. Requirements for rulemaking under the Administrative Procedures Act include a 45-day public review period for the proposed changes, and either a 15-day or 45-day review period for any substantial revisions made as a result of consideration of received comments, prior to adoption of the proposed changes. The proposed amendments to the Energy Code may therefore be revised in response to public input throughout the public review process prior to consideration for adoption by the CEC. At the time of publication of this draft EIR, staff is anticipating at least one set of revisions to the 2022 amendments to result from the public review process.

The overall purpose of the 2022 amendments is to employ technically feasible and cost-effective technologies and measures "to reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy, including the energy associated with the use of water, and to manage energy loads to help maintain electrical grid reliability" consistent with the statutory direction in the Warren-Alquist Act.

The following specific objectives, derived from the statutory mandate, guided development of the 2022 amendments:

> **Objective 1**: Reducing the wasteful, uneconomic, inefficient, or unnecessary consumption of energy via the deployment of technically feasible and cost-effective technologies and measures;
>
> **Objective 2**: Reducing wasteful, uneconomic, inefficient, or unnecessary consumption of energy and maintaining grid reliability by increasing deployment and utilization of distributed, on-site renewable energy equipment and increasing the percentage of energy consumption from new residential and nonresidential buildings that can be served by renewable energy equipment;
>
> **Objective 3**: Reducing the wasteful, uneconomic, inefficient, or unnecessary consumption of energy by ensuring that newly constructed buildings designed for use of natural gas equipment include wiring and other design features necessary to allow future use of electric equipment when it becomes cost-effective and technically feasible to do so; and
>
> **Objective 4**: Reducing wasteful, uneconomic, inefficient, or unnecessary consumption of energy and maintaining grid reliability by improving the ability of buildings to engage in and benefit from energy storage and load management.

Based on the evidence in the rulemaking record,[16] the CEC has determined that the project will provide benefits to the state by slowing energy demand growth, reducing the depletion of resources, improving grid reliability, minimizing costs, and reducing threats to the state's environmental quality.

In addition, the project is consistent with and supports other important statewide goals for the decarbonization of California's economy. These efforts include, but are not limited to, the following:

SB 1078 (Chapter 516, Statutes of 2002) established the Renewable Portfolio Standards (RPS) for electricity supply. The RPS establishes increasingly progressive renewable energy procurement requirements for the state's electricity load-serving entities, which include retail sellers of electricity and local publicly owned utilities. To meet the RPS procurement requirements, load-serving entities must generally demonstrate that they procured specified types and quantities of electricity products from eligible renewable energy resources. As of 2020, utilities in California are required to demonstrate procurement of renewable energy resources sufficient to meet 33 percent of each utility's retail sales. By 2030, this requirement increases to 60 percent of each utility's retail sales.

The California Global Warming Solutions Act of 2006 (AB 32, Núñez, Chapter 488, Statutes of 2006) includes several legislative findings relating to climate change and establishes a goal of reducing California's greenhouse gas (GHG) emissions to 1990 levels by 2020 — a reduction of approximately 15 percent below emissions projected as a "business as usual" scenario at the time of its adoption.

AB 758 (Skinner, Chapter 470, Statutes of 2009) begins with the legislature recognizing "the significant energy savings and greenhouse gas emission reductions inherent in the state's existing residential and nonresidential building stock," and "the need to establish a comprehensive energy efficiency program to capture these reductions." The bill requires that the CEC "develop a comprehensive program to achieve greater energy savings in the state's existing residential and nonresidential building stock."

AB 2514 (Skinner, Chapter 469, Statutes of 2010) requires that the CPUC establish targets for energy storage procurement by load-serving entities in California and requires local publicly owned utilities to develop their own energy storage procurement targets and report to the CEC on their progress toward meeting those targets. As a result of this bill, the CPUC issued Decision 13-10-040, which set an AB 2514 energy storage procurement target of 1,325 megawatts (MW) by 2020.

The Clean Energy and Pollution Reduction Act of 2015, also referred to as SB 350 (de León, Chapter 547, Statutes of 2015), established California's 2030 greenhouse gas reduction target of 40 percent below 1990 levels. To achieve this goal, SB 350 set

16 2022 Energy Code Update Rulemaking, 21-BSTD-001. Available at https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=21-BSTD-01.

specific 2030 targets for energy efficiency and renewable electricity, among other actions aimed at reducing greenhouse gas emissions across the energy and transportation sectors. Relative to buildings, SB 350 codifies a goal of "doubl[ing] the energy efficiency savings in electricity and natural gas final end uses of retail customers through energy efficiency and conservation.[17]"

Executive Order B-30-15 directs state agencies to implement measures to reduce GHG emissions 40 percent below their 1990 levels by 2030 and to achieve a goal of an 80 percent GHG reduction by 2050.

SB 32 (Pavley, Chapter 249, Statutes of 2016) updated the Global Warming Solutions Act of 2006 to reduce the state's GHG emissions to 40 percent below 1990 levels by 2030. This goal was reinforced by AB 3232 (Friedman, Chapter 373, Statutes of 2018) which required the CEC to assess costs and opportunities to reduce GHG emissions from residential and commercial buildings by 40 percent of 1990 levels by 2030 at the lowest possible cost.

The 100 Percent Clean Energy Act of 2018 (SB 100, De León, Chapter 312, Statutes of 2018) establishes a target for renewable and zero-carbon resources to supply 100 percent of retail sales and electricity procured to serve all state agencies by 2045. The bill also increases the state's RPS to 60 percent of retail sales by December 31, 2030 and requires all state agencies to incorporate these targets into their relevant planning. The statute calls upon the CEC, and other sister agencies, to use programs under existing statutes to achieve this policy.

Zero-Emission Buildings and Sources of Heat Energy (AB 3232, Friedman, Chapter 373, Statutes of 2018) requires the CEC to assess the potential for the state to reduce the emissions of greenhouse gases from the state's residential and commercial building stock by at least 40 percent below 1990 levels by January 1, 2030. The bill states that decarbonizing California's buildings is essential to achieve the state's greenhouse gas emission reduction goals at the lowest possible cost. The bill establishes that it is the intent of the Legislature to achieve significant reductions in the emissions of greenhouse gases by the state's residential and commercial building stock by January 1, 2030.

On September 10, 2018, former Governor Brown issued Executive Order B-55-18. This executive order directed the CARB to work with other state agencies to identify and recommend measures to achieve carbon neutrality as soon as possible, and no later than 2045, and to maintain and achieve negative emissions thereafter. To implement this executive order, CARB is conducting a series of workshops on the transition to low carbon fuels across all sectors and considerations for associated infrastructure to achieve Statewide carbon neutrality.

17 Clean Energy and Pollution Reduction Act of 2015. Chapter 547 § 2. Available at https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB350.

SB 49 (Skinner, Chapter 697, Statutes of 2019) requires that the CEC adopt energy efficiency standards to manage energy loads to help maintain electrical grid reliability. The bill requires the CEC to adopt, by regulation, and periodically update, standards for appliances to facilitate the deployment of flexible demand technologies.

Executive Order N-19-19 calls for a concerted commitment and partnership by government, the private sector, and California residents to reach some of the strongest climate goals in the world, and requires every aspect of state government to redouble its efforts to reduce greenhouse gas emissions and mitigate the impacts of climate change while building a sustainable, inclusive economy.

Executive Order N-79-20 requires sales of all new passenger vehicles to be zero-emission by 2035, all medium-and heavy-duty vehicles by 2045 for all operations where feasible, drayage trucks and by 2035.

AB 2514 (Skinner, Chapter 469, Statutes of 2010) requires that the CPUC establish targets for energy storage procurement by load-serving entities in California and requires local publicly owned utilities to develop their own energy storage procurement targets and report to the CEC on their progress toward meeting those targets. As a result of this bill, the CPUC issued Decision 13-10-040, which set an AB 2514 energy storage procurement target of 1,325 MW by 2020.

3.4 Project Technical, Economic, and Environmental Characteristics

Due to population growth, every year in California a multitude of new buildings are constructed, added on to, or remodeled. The Energy Code does not regulate the pace or location of construction but instead requires that permitted construction that does occur meets specified energy efficiency standards. The project also does not entail the approval of any construction project, nor does it streamline or otherwise affect the CEQA review requirements for future discretionary construction projects to be reviewed by local lead agencies. Lastly, the project does not mandate or otherwise require the use of electricity or prohibit the use of natural gas for end uses within buildings (e.g., space and water heating). Rather, newly constructed buildings comply with the proposed amendments by using either a prescriptive set of measures or performance-based compliance, which achieves the same performance as the prescriptive set of measures but does not mandate the use of any specific technology.

As in prior updates to the Energy Code, the 2022 amendments include numerous changes to the 2019 Energy Code. These amendments include new or updated standards to increase efficiency of different building systems and pieces of equipment. These changes are the result of new technologies, new industry standards, advances in the CEC's understanding of existing technologies, and new state laws, regulations, and policies. The changes reflect the CEC's most current understanding of the technological, economic, and environmental research in the building efficiency field. Examples of innovative new standards included in the proposed amendments to the Energy Code include establishing standards for controlled environment horticulture spaces, separate standards for commercial cooling equipment using transcritical carbon dioxide (CO_2) as a refrigerant, and updates to lighting standards to keep pace with the evolution of light-emitting diode (LED) lighting and smarter and more interconnected controls.

A document containing an underline/strikethrough version of the 2019 Energy Code which reflects the proposed 2022 amendments is available at the Energy Commission's 2022 Energy Code webpage at https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2022-building-energy-efficiency. This document and its appendices are hereby incorporated by reference as part of this draft EIR.

The principal Energy Code updates, which are analyzed in this EIR to the extent they may cause direct or indirect effects on the environment, are summarized as follows:

1. Revise the prescriptive measure-based compliance path available for building projects to include only heat pump technology in specific circumstances.

The Energy Code includes a set of prescriptive compliance options that allow builders to comply by using methods demonstrated to be energy efficient. A builder that chooses the prescriptive approach does not need to model the performance of the building using a software program or application. These prescriptive options also establish the "standard design" that is used for calculating the performance target for performance-based compliance. Due to the efficiency of heat pump technology, prescriptive options are being narrowed to require either heat-pump-based space heating or water heating, or both. Gas furnaces and water heaters may still be installed using performance-based compliance.

2. Revise the "standard design" used for the modeling-based performance compliance path available for building projects so that buildings are held to a single performance baseline based on heat pump technologies in specific circumstances.

Public Resources Code sections 25402 subdivisions (a)-(b) and 25402.1 emphasize the importance of building design and construction flexibility by requiring the CEC to establish performance standards, in the form of an "energy budget" based on the energy consumption per square foot of floor space. For this reason, the Energy Code also includes a performance option that allows builders complete freedom in their designs provided the building achieves the same overall efficiency as an equivalent building using the prescriptive option. However, due to the efficiency of heat pump technology, buildings that were previously held to fuel-specific performance targets (meaning that a proposed mixed fuel building would be compared to a mixed fuel "standard design" and an electric building compared to an electric "standard design"), are proposed to be held to a single target, based on the performance of a heat-pump-based "standard design." This does not prohibit the use of any specific fuel source or equipment, however buildings that elect to use equipment that is less efficient than available heat-pump-based equipment may have to make additional improvements to the building's efficiency to offset the increase in energy use. This supports the objective of reducing the unnecessary or wasteful consumption of energy.

3. Revise existing residential energy efficiency requirements for solar PV systems, including battery storage, and associated compliance options.

The updates for single-family residential and for multifamily residential of three or fewer stories do not directly change minimum solar PV system size. Instead, the concept of solar access roof area has been clarified, exceptions meant to address cases where the amount of roof area or the total required size of the system is too small to be feasible or cost-effective have been clarified, and an exception relating to snow loads has been added. Battery ready requirements have also been proposed for these building types. Use of storage technologies supports the objectives of reducing unnecessary or wasteful energy consumption and maintaining electric grid reliability.

4. Establish new prescriptive solar PV and battery storage requirements for multifamily buildings with more than three habitable stories, and certain newly constructed nonresidential building types: hotel-motel, unleased tenant spaces, offices, medical offices or clinics, restaurants, grocery stores, retail stores, schools, warehouses, and theater/auditorium/convention center buildings.

Use of PV and storage technologies supports the objectives of reducing unnecessary or wasteful energy consumption and maintaining electric grid reliability. Sizes of minimum solar PV arrays (in kilowatt (kW)) and minimum supporting battery storage (BS) (in kilowatt hours (kWh)) for prototypical buildings are as follows:

Table 3.4-1

Photovoltaic System Size by Climate Zone

PV size in kW per CZ	CZ 1	CZ 2	CZ 3	CZ 4	CZ 5	CZ 6	CZ 7	CZ 8
High-Rise Residential (10 stories, 94,000 sqft)	171	208	171	208	171	208	208	208
Mid-Rise Residential (4 stories, 113,000 sqft)	206	250	206	250	206	250	250	250
Large Office (12 stories, 499,000 sqft)	1291	1561	1291	1561	1291	1561	1561	1561
Medium Office (3 stories, 53,000 sqft)	136	165	136	165	136	165	165	165
Small Office (1 story, 5,500 sqft)	14	17	14	17	14	17	17	17
Large Retail (1 story, 240,000 sqft)	629	698	629	698	629	698	698	698
Medium Retail (1 story, 25,000 sqft)	65	72	65	72	65	72	72	72
Small Retail (1 story, 9,000 sqft)	25	27	25	27	25	27	27	27
Large School (1 story, 211,000 sqft)	268	344	268	344	268	344	344	344
Small School (1 story, 24,000 sqft)	31	40	31	40	31	40	40	40
Warehouse (1 story, 52,000 sqft)	20	23	20	23	20	23	23	23

PV size in kW per CZ (cont.)	CZ 9	CZ 10	CZ 11	CZ 12	CZ 13	CZ 14	CZ 15	CZ 16
High-Rise Residential	208	208	208	208	208	208	261	171
Mid-Rise Residential	250	250	250	250	250	250	313	206
Large Office	1561	1561	1561	1561	1561	1561	1895	1291
Medium Office	165	165	165	165	165	165	200	136
Small Office	17	17	17	17	17	17	21	14
Large Retail	698	698	698	698	698	698	847	629
Medium Retail	72	72	72	72	72	72	87	65
Small Retail	27	27	27	27	27	27	33	25
Large School	344	344	344	344	344	344	519	268
Small School	40	40	40	40	40	40	60	31
Warehouse	23	23	23	23	23	23	30	20

Table 3.4-2
Battery Storage System Size by Climate Zone

BS size in kWh per CZ	CZ 1	CZ 2	CZ 3	CZ 4	CZ 5	CZ 6	CZ 7	CZ 8
High-Rise Residential	176	214	176	214	176	214	214	214
Mid-Rise Residential	210	255	210	255	210	255	255	255
Large Office	0	2700	2234	2700	2234	2700	2700	2700
Medium Office	0	277	229	277	229	277	277	277
Small Office	0	25	21	25	21	25	25	25
Large Retail	673	747	673	747	673	747	747	747
Medium Retail	67	74	67	74	67	74	74	74
Small Retail	23	25	23	25	23	25	25	25
Large School	0	622	485	622	485	622	622	622
Small School	0	77	60	77	60	77	77	77
Warehouse	0	21	19	21	19	21	21	21

BS size in kWh per CZ (cont.)	CZ 9	CZ 10	CZ 11	CZ 12	CZ 13	CZ 14	CZ 15	CZ 16
High-Rise Residential	214	214	214	214	214	214	268	176
Mid-Rise Residential	255	255	255	255	255	255	320	210
Large Office	2700	2700	2700	2700	2700	2700	3278	2234
Medium Office	277	277	277	277	277	277	336	229
Small Office	25	25	25	25	25	25	31	21
Large Retail	747	747	747	747	747	747	907	673
Medium Retail	74	74	74	74	74	74	90	67
Small Retail	25	25	25	25	25	25	31	23
Large School	622	622	622	622	622	622	939	485
Small School	77	77	77	77	77	77	116	60
Warehouse	21	21	21	21	21	21	28	19

5. Establish new requirements that mixed fuel buildings with residential dwellings be electric ready, meaning that electrical connections and other features needed to allow use of non-combustion equipment options are installed at the time of initial construction.

This proposal requires that for each natural gas or propane furnace, cooktop or clothes dryer serving an individual dwelling unit, an appropriately sized 240-volt branch circuit be installed to facilitate future use of equivalent electric equipment. This requirement also extends to common area clothes dryers in multifamily buildings. This requirement supports the goal of ensuring that buildings can be easily retrofitted to take advantage of more efficient electric technology when feasible and cost-effective, thereby supporting energy efficiency and grid reliability objectives.

6. Establish new energy efficiency standards for lighting, envelope, and space conditioning systems serving controlled environment horticulture spaces.

The new standards proposed for controlled environment horticulture spaces permit the use of efficient high-pressure sodium and LED lighting while ruling out less efficient lighting types, require that dehumidification systems either include heat recovery or meet U.S. Department of Energy consumer product standards, require minimum U-factors for opaque wall and greenhouse fenestration assemblies, and ensure that space heating equipment meets applicable equipment standards. This requirement supports the objective of reducing unnecessary or wasteful use of energy.

7. Revise energy efficiency standards for commercial and industrial process loads, including, computer room air conditioning, refrigerated areas, fan systems, compressed air systems, and steam traps.

The new standards state that computer room space conditioning system design must prevent simultaneous heating and cooling of the same air, and if humidification is provided then it must be adiabatic. Systems with a capacity exceeding 60,000 btu/h must incorporate variable-speed fans. Computer room economizers must meet cooling or heating loads at adjusted supply air temperatures, and an option has been added to cover refrigerant-based economizing.

Computer room uninterruptible power supplies are proposed to be held to minimum performance standards consistent with Energy Star guidelines.

Refrigeration systems using transcritical CO_2 are held to proposed minimum efficiency standards, consistent with standards applicable to systems using traditional refrigerants.

Compressed air systems larger than specified size thresholds are required to incorporate an energy and air demand monitoring system, and separately to appropriately size and leak-test compressed air piping. Exceptions relating to alterations have also been clarified.

Laboratory exhaust requirements relating to use of anemometers has been clarified, and language added to account for (and thereby permit) sonic anemometers.

Steam systems above a certain size that use steam traps are proposed to incorporate monitoring sensors that report when a steam trap has failed, thus reducing the amount of time before a problem is detected and repaired.

Overall, these measures reduce energy waste (for example, by preventing failed steam traps from going undetected) and inefficiency (for example, by establishing minimum standards for uninterruptible power supplies and transcritical CO2 systems, and updating standards for computer room space conditioning systems, compressed air systems and laboratory exhaust systems), consistent with Objective 1.

8. Revise nonresidential and multi-family efficiency standards for building envelopes (e.g., exterior walls, windows, roofs, and floors), fan and duct systems, HVAC controls, boilers and service water heating systems, indoor and outdoor lighting systems, and grid integration equipment such as demand responsive controls.

The proposed revisions to existing energy efficiency standards for nonresidential and multifamily buildings reduce the amount of energy consumed by the building, and also ensure that demand response controls and other load management controls and tools are installed where they are able to be effective and in ways that allow them to be effective. They therefore support Objectives 1 and 4.

9. Revise minimum standards for residential kitchen ventilation.

Residential kitchen ventilation minimum airflow rates are being increased to a minimum level determined to be necessary to avoid reactions to pollutants by sensitive populations. Energy utilized for the purpose of ventilation must result in an adequate level of ventilation in order to have been used efficiently; insufficient or otherwise ineffectual level of ventilation is wasteful, inefficient and uneconomic, even if the quantity of energy spent is less (in absolute terms) than what is needed to provide adequate ventilation. Based on recent research from Lawrence Berkeley National Laboratory (LBNL)[18], the proposed revisions will increase the minimum level of performance for kitchen range hoods to what is shown to be necessary for them to be effective at their purpose. This supports Objective 1.

10. Revise requirements relating to duct sealing and ventilation.

These revisions relate to installation and acceptance testing procedures, meaning the step-by-step procedures used by installers to seal ducts to the level of air tightness required by the Energy Code and used by technicians to detect leaks after installation. Improved procedures support the objective of reducing unnecessary or wasteful use of energy by reducing the likelihood of errors during installation and, when errors none the less occur, reducing the likelihood that they escape detection and correction.

3.4.1 15-Day Express Terms

On July 13, 2021, CEC staff published a Notice of 15-day Public Comment Period[19] and a set of 15-day express terms for the 2022 Energy Code,[20] which contains revisions to the original express terms published on May 6, 2021. The revisions are noted in double underline and double strike through. The 15-day express terms reflect CEC staff's consideration of public comments on the original express terms, and the majority of the main project components described above and analyzed in Chapter 4 are unaffected by the 15-day express terms. Section 1.5 of the Final EIR, to which this Draft EIR is appended, contains a summary of the notable changes in the 15-day express terms as

18 2022 Energy Code Update Rulemaking, 21-BSTD-01, TN#235047. Available at https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=21-BSTD-01.

19 CEC staff. 2021. Notice of 15-day Public Comment Period. TN#238839. CEC. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=238839.

20 CEC staff. 2021. 15-Day Express Terms 2022 Energy Code - Residential and Nonresidential. TN#238848. CEC. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=238848.

they relate to the analysis in the Draft EIR. CEC staff has evaluated the entirety of the changes in the 15-day language and concluded that the changes have no potential to cause any unidentified environmental impact and that, with the incorporation of numerical changes to sections 4.2, section 4.4, section 4.5, section 4.7 and Appendix B of the Draft EIR caused by a modification to Section 150.1 of the Express Terms, the analysis in Draft EIR does not need to be changed.

3.5 Intended Uses of This EIR

As the lead agency pursuant to the CEQA, the CEC is responsible for the preparation of this EIR. The CEC will use this EIR in support of its discretionary decision to adopt the Energy Code updates. It is expected that the California State Building Standards Commission, as the sole responsible agency affected by this project, will rely on the CEC's EIR in part in conjunction with their review and approval of the adopted amendments. The California Department of Fish and Wildlife is California's trustee agency for the state's fish, wildlife, and plant resources, and it may consider and comment on this Draft EIR in fulfillment of its duties. No other agency is expected to use the EIR, and no other permits or approvals are necessary for the 2022 amendments to be incorporated into the Energy Code.

In developing the EIR, consultation was only required with tribes that have requested such engagement. No other review or consultation is required.

3.6 Environmental Setting

Under CEQA, the environmental setting of a project is generally the physical environmental conditions in the vicinity of the project as they exist at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced.[21] However, CEQA does not mandate strict adherence to this default rule.[22] Lead agencies may consider historic conditions pre-dating the commencement of the environmental analysis[23] or near-term projected

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21 CEQA Guidelines, § 15125(a)(1).

22 *Communities for a Better Environment v. S. Coast Air Quality Management District* (2010) 48 Cal. 4th 310, 328 ("[A]n agency enjoys the discretion to decide, in the first instance, exactly how the existing physical conditions without the project can most realistically be measured, subject to review, as with all CEQA factual determinations, for support by substantial evidence.").

23 CEQA Guidelines, § 15125(a)(1). ("Where existing conditions change or fluctuate over time, and where necessary to provide the most accurate picture practically possible of the project's impacts, a lead agency may define existing conditions by referencing historic conditions, or conditions expected when the project becomes operational, or both, that are supported with substantial evidence."); See also *Association of Irritated Residents v. Kern County Board of Supervisors* (2017) 17 Cal.App.5th 708, 723-31 (upholding a lead agency's use of a historic baseline due to fluctuations in refinery operations).

future conditions, such as forthcoming conditions expected to be present at the date the project is implemented or operational,[24] in providing the public with information about a project's environmental setting. Lead agencies may also consider projections of longer-term environmental conditions to supplement an EIR and fully illustrate the anticipated effects of a project over time.[25] However, an exclusive reliance on a future-conditions description of the environmental setting requires a demonstration by the lead agency that the use of existing conditions "would be either misleading or without informative value to decision-makers and the public."[26]

The environmental setting described in an EIR by the lead agency will normally constitute the baseline physical conditions by which the lead agency determines whether an impact is significant.[27] The environmental setting for this project consists of the state of California's existing built environment (i.e., the buildings already constructed and in use, or currently under construction, throughout the state) as well the natural conditions existing within the state, including the existing conditions of "land, air, water, minerals, flora, fauna, noise, objects of historic or aesthetic significance."[28] For all buildings for which a building permit was issued after January 1, 2020, the 2019 Energy Code sets the current minimum energy efficiency standards for residential and nonresidential building design and construction occurring in California.[29] The 2019 Energy Code will continue to apply until at least December 31, 2022, and in the event the project is not approved, the 2019 Energy Code will continue to govern the physical condition of new buildings in California for the foreseeable future.

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24 Ibid; See also *Neighbors for Smart Rail v. Exposition Metro Line Construction Authority* (2013) 57 Cal.4th 439, 453 ("[W]e find nothing precluding an agency from employing, under appropriate factual circumstances, a baseline of conditions expected to obtain at the time the proposed project would go into operation.").

25 *Neighbors for Smart Rail v. Exposition Metro Line Construction Authority* (2013) 57 Cal.4th at 513; See also *Center for Biological Diversity v. Department of Fish & Wildlife* (2015) 62 Cal.4th 204, 224–25, as modified on denial of rehearing (Feb. 17, 2016).

26 *Neighbors for Smart Rail v. Exposition Metro Line Construction Authority* (2013) 57 Cal.4th at 513; See also CEQA Guidelines, § 15125(a)(2).

27 CEQA Guidelines, § 15125(a).

28 Pub. Resources Code § 21060.5. ("'Environment' means the physical conditions which exist within the area which will be affected by a proposed project, including land, air, water, minerals, flora, fauna, noise, objects of historic or aesthetic significance.")

29 Both the 2019 and proposed 2022 Energy Codes are regulations that, although applicable statewide, are not general, specific, regional, or any other types of "plans," as those terms are used in CEQA; See also, e.g., CEQA Guidelines, §§ 15125(d), (e), 15166; See also *Environmental Planning and Information Council v. City of El Dorado* (1982) 131 Cal.App.3d 350, 359.

Hypothetical conditions, such as those that might be allowed but have never actually occurred under existing or previous iterations of the Energy Code, are not considered as part of the existing conditions for this EIR.[30] Rather, existing conditions are determined by looking at the differences between current conditions (with the 2019 Energy Code in effect) and conditions that will be changed as a result of implementation of the 2022 Energy Code. However, due to the fact that the impacts of the 2019 Energy Code occur throughout the state and stem from construction and use of thousands of individual building projects, it is not always possible to use actual historical data to establish existing conditions.[31] For those areas for which changes created by the 2022 Energy Code are quantified (as opposed to discussed qualitatively), this EIR utilizes a modeled baseline that incorporates the impacts of the 2019 Energy Code in 2023, when the new requirements of the 2022 Energy Code go into effect. Stated another way, for air quality, energy resources, greenhouse gas emissions, and utilities and services systems, the existing conditions described are those that would occur in 2023 under implementation of the 2019 Energy Code (including the number of building starts that would be subject to the 2019 Energy Code). For those areas for which changes were evaluated in a qualitative manner, including aesthetics, biological resources,[32] hazards and hazardous materials, and wildfire, the EIR utilizes a default existing conditions baseline approach by comparing the potential impacts in each of these technical areas attributable to the project to the existing physical conditions within the state.

The use of a modeled date-of-implementation baseline to analyze impacts to air quality, energy resources, ~~and~~ greenhouse gas emissions, and utilities and service systems is critical to providing the most accurate picture practically possible of the project's likely

30 CEQA Guidelines, § 15125(a)(3).

31 The Energy Code is implemented by individual building departments throughout the state. Because 2020 is the first full year for which the 2019 Energy Code was in effect, and the applicable Energy Code to a building project is determined at the time a building permit is issued, many buildings completed in 2020 would have been built in accordance with the 2016 Energy Code or earlier codes, rather than the 2019 Energy Code.

32 Although **Section 4.3 Biological Resources** includes a qualitative description of the environmental setting and baseline, the analysis of impacts beginning on p. 83 of the DEIR relies on portions of the analysis contained in **Section 4.2 Air Quality** and **4.4 Energy Resources** to support the section's finding that the project would cause less than significant biological resources impacts. The inclusion of these cross-references in Section 4.3 does not change the overall qualitative analytical approach, and baseline biological resources conditions were not described using a modeled date-of-implementation baseline in a comparable manner to existing air quality, energy resources, greenhouse gas emissions, and utilities and services systems conditions.

impacts and significant benefits to Californians.[33] First, 2023 is the first full calendar year that the 2022 Energy Code amendments would take effect. The modeling captures changes – such as changes in the state's resources mix and construction starts – that will have occurred to the environmental setting by the effective date of these regulations. Thus, this modeled description of the "current conditions" expected in 2023 provides the clearest picture of the prevailing physical conditions likely to be affected by buildings constructed in 2023 and beyond, allowing a comparison of conditions both with and without the project. Such an approach obviates the need to assume, counterfactually, that the impacts of the 2022 Energy Code would affect conditions in existence as of the date the NOP was published for this EIR.[34]

Second, the 2023 date-of-implementation methodology applied in these sections is supported by data from reports submitted to the CEC as a part of the rulemaking proceeding for the proposed 2022 amendments (**see Appendices B and D**). Building construction starts were determined following a methodology described in a memo to the CEC (CASE Memo, 2021). <u>Annual single-family residential construction starts were reduced in response to comments on the DEIR in order to better incorporate historical new construction starts for single-family residences in California.</u> Use of a baseline based on conditions other than those at the time of implementation, such as a future baseline of 2030 or 2045, could "mask or swamp the adverse effects seen in the shorter term."[35] No such issue is present with the approach in this EIR because it focuses on the first period of implementation for the project.

Finally, the use of a full calendar year to demonstrate the effects of the 2022 Energy Code relative to the continuation of the 2019 Energy Code is critical to providing an accurate assessment of the project's potential environmental impacts because construction, energy production, meteorological and climatological conditions fluctuate over the course of a year, with corresponding effects on air quality, energy resources, and greenhouse gas emissions. As a simple example, a building would be expected to use less energy for heating during a day in May than a day in November, and more energy for heating on a rainy or snowy day than a sunny day in any month. Thus, using conditions that exist on a single date, such as the date of the NOP publication, could skew data and result in modeling results that over- or under-estimate potential effects of the project. A full year approach is necessary to ensure a complete understanding of

33 CEQA Guidelines, § 15125(a)(1); See also Pub. Resources Code § 21061 ("The purpose of an environmental impact report is to provide public agencies and the public in general with detailed information about the effect which a proposed project *is likely to have on the environment*" [emphasis added].)

34 *Neighbors for Smart Rail v. Exposition Metro Line Construction Authority* (2013) 57 Cal.4th at 452.

35 Ibid. At 456-57.

the anticipated energy use of a given building (and the effects of required efficiency features on its energy use).

Further information about environmental setting is provided in each of the following sections to document the methodologies utilized and the necessity for conducting these analyses in this manner.

3.7 References

CEC staff. 2021. Express Terms 2022 Energy Code, Title 24 Parts 1 and 6. California Energy Commission. TN#237717. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237717.

CEC staff. 2021. Notice of Proposed Action – 2022 Energy Code Changes. California Energy Commission. TN#237719. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237719&DocumentContentId=70946.

CEC staff. 2021. Initial Statement of Reasons 2022 Energy Code Proposed Changes. California Energy Commission. TN#237785. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237785&DocumentContentId=71025.

CEC staff. 2021. Form 399 for the Proposed 2022 Energy Code. California Energy Commission. TN#237722. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237722&DocumentContentId=70943.

CEC staff. 2021. Form 399 Narrative Memorandum. California Energy Commission. TN#237721. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237721&DocumentContentId=70944.

CASE. 2021. Statewide CASE Team Construction Forecast Methodology. Memo. Codes and Standards Enhancement Team. TN#237851. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237851&DocumentContentId=71094.

CALIFORNIA ENERGY COMMISSION

Chapter 4

Environmental Setting, Impacts, and Mitigation

Environmental Setting, Impacts, and Mitigation

As described in **Chapter 3 Project Description**, the CEC proposes to adopt the 2022 amendments, which contain a set of proposed revisions to the 2019 Energy Code intended to require newly constructed buildings to employ technically feasible and cost-effective technologies and measures to reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy, including the energy associated with the use of water, and to manage energy loads to help maintain electrical grid reliability, consistent with the statutory direction in the Warren-Alquist Act.

This chapter provides an environmental analysis of the physical impacts that could occur as a result of implementing the Energy Code updates. The chapter is organized into separate sections for each technical area selected for analysis, as listed below.

- 4.1 Aesthetics
- 4.2 Air Quality
- 4.3 Biological Resources
- 4.4 Energy Resources
- 4.5 Greenhouse Gas Emissions
- 4.6 Hazards and Hazardous Materials
- 4.7 Utilities and Service Systems
- 4.8 Wildfire

The following subsections are included in each resource section:

- **Environmental Setting** describes the existing or baseline conditions of the resources in the study area (California).
- **Regulatory Setting** describes existing plans, policies, statutes, and regulations relevant to the topic area and the project.
- **Environmental Impacts and Mitigation Measures** describes the methodology and criteria used to determine the significance of potential impacts, using the questions in CEQA Guidelines, Appendix G. For each potential impact, a significance determination is made (no impact, less than significant impact, less than significant impact with mitigation, or significant and unavoidable impact).

A discussion of the project's potential contribution to cumulative impacts addressing each of the topic areas in sections 4.1 through 4.8, is included in the Mandatory Findings of Significance section of **Chapter 5 Other CEQA Discussions**.

Several additional technical areas were evaluated by CEC technical staff, who concluded that there is no substantial evidence that the new measures included in the 2022 amendments would have the potential to cause or otherwise result in environmental impacts. These are grouped together in Section 4.9 of this chapter, titled **Technical Areas Not Affected**. For each of these technical areas, this EIR provides a brief statement of the reasons for concluding the project would not result in environmental impacts, using questions from Appendix G of the CEQA Guidelines.[36] These areas include the following:

- 4.9.1 Agriculture and Forestry Resources
- 4.9.2 Cultural and Tribal Cultural Resources
- 4.9.3 Geology and Soils
- 4.9.4 Hydrology and Water Quality
- 4.9.5 Land Use and Planning
- 4.9.6 Mineral Resources
- 4.9.7 Noise
- 4.9.8 Population and Housing
- 4.9.9 Public Services
- 4.9.10 Recreation
- 4.9.11 Transportation

36 Pub. Resources Code § 21100(c). (EIRs shall "contain a statement briefly indicating the reasons for determining that various effects on the environment of a project are not significant and consequently have not been discussed in detail in the environmental impact report."); See also CEQA Guidelines § 15128. ("An EIR shall contain a statement briefly indicating the reasons that various possible significant effects of a project were determined not to be significant and were therefore not discussed in detail in the EIR.")

4.1 Aesthetics

This section describes the project's environmental and regulatory setting and discusses potential aesthetic impacts on the existing landscape[37] associated with adoption of the 2022 amendments. These amendments focus on updating regulatory standards and compliance options related to building energy efficiency. The Energy Code updates would not approve or result in additional specific construction projects or otherwise impact the rate of building construction. The 2022 amendments would have no or less than significant impacts on aesthetics.

4.1.1 Environmental Setting

The 2019 Energy Code are a set of regulations that require energy efficient designs, features, equipment, and practices in new construction and certain additions and alterations to buildings within California. While most of the 2022 amendments exclusively affect building interiors and have no impact on aesthetics, prescriptive solar PV, battery energy storage, and energy efficient outdoor lighting requirements could alter the visual characteristics of specified new buildings within the state. As these 2022 amendments apply statewide, the environmental setting of the Energy Code updates is the entire state of California.

Though this project does not have a specific location or direct that future buildings be constructed in specific parts of the state, the requirements in the 2022 amendments would apply equally to new buildings whether they are located in urbanized or non-urbanized areas, areas with scenic vistas and scenic highways, or any other areas of the state. To focus on changes that would be attributable to the project, this section evaluates the potential for increases in statewide adverse aesthetic impacts from the 2022 amendments compared to the existing state of aesthetic impacts associated with buildings in California under the current building design and construction requirements of the 2019 Energy Code.

4.1.2 Regulatory Setting

Federal

No federal regulations related to aesthetics apply to the project.

37 Hull, R. and G. Revell. 1989. (Landscape is defined as, "The outdoor environment, natural or built, which can be directly perceived by a person visiting and using that environment. A scene is the subset of a landscape which is viewed from one location (vantage point) looking in one direction."); See also Daniel and Vining. 1983. and Amir and Gidalizon. 1990. ("The term landscape clearly focuses upon the visual properties or characteristics of the environment, these include natural and man-made elements and physical and biological resources which could be identified visually; thus, non-visual biological functions, cultural/historical values, wildlife and endangered species, wilderness value, opportunities for recreation activities and a large array of tastes, smells and feelings are not included.").

State

California Scenic Highway Program. The California Scenic Highway Program is contained in a provision of the Streets and Highways Code (sections 260 through 263) and was enacted in 1963. Under it, the Legislature has the established the state's responsibility to preserve and enhance the natural beauty of California adjacent to the state highway system in specified areas.

Local

Many cities and counties throughout California include policies in general plans, specific plans, and other planning documents intended to promote the preservation of scenic areas, to mitigate potential adverse aesthetic impacts, or to locate projects in such a manner as not to cause aesthetic impacts. Cities and counties have also adopted zoning ordinances with lighting, design, and other restrictions on the aesthetic character of the new buildings in their jurisdictions.

4.1.3 Environmental Impacts and Mitigation Measures

a. Would the project have a substantial adverse effect on a scenic vista?

Neither CEQA nor the CEQA Guidelines provide a clear-cut definition of what constitutes a scenic vista. Lead agencies may look to local planning thresholds for guidance when defining the visual impact standard for the purpose of CEQA,[38] as many cities and counties in California have adopted general plans, specific plans, zoning codes, and other planning documents that may provide guidance, with which future buildings would need to comply. The 2022 amendments do not affect the ability of local lead agencies to enforce and implement these policies and ordinances which specify, and support the preservation of, local scenic vistas.

The 2022 amendments do not direct where new buildings would be constructed and do not include any provisions or exceptions specific to scenic vistas that incentivizes or otherwise increases the likelihood that future building projects would be sited, designed, or constructed in such a way as to adversely affect scenic vistas. Therefore, there would be no impacts on scenic vistas from the 2022 amendments.

Required Mitigation Measures: None.

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38 A public view can be defined as the visible area from a location where the public has a legal and physical right of access to real property (e.g., city sidewalk, public park, town square, state highway). CEQA Guidelines Appendix G Environmental Checklist Form, I. Aesthetics, c. states "Public views are those that are experienced from publicly accessible vantage point."

b. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

Neither CEQA nor the CEQA Guidelines provide a clear-cut definition of what constitutes a scenic resource. A scenic resource may be described as a widely recognized natural or man-made feature tangible in the landscape (e.g., a scenic resource designated in an adopted federal, state, or local government document, plan, or regulation, a landmark, or a cultural resource [historic values however differ from aesthetic or scenic values]). The CEC focused its evaluation on whether the 2022 amendments would substantially damage—eliminate or obstruct—the public view[39] of a scenic resource, and whether the Energy Code updates might indirectly result in future projects being situated so that they change the visual aspect of a scenic resource by being different or in sharp contrast. The 2022 amendments do not direct where new buildings would be constructed and do not include any provisions or exceptions specific to scenic resources that incentivizes or otherwise increases the likelihood that future building projects would be sited, designed, or constructed in such a way as to substantially damage scenic resources. Therefore, there would be no impacts on scenic resources from the 2022 amendments.

Required Mitigation Measures: None.

c. Would the project, in non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

Public Resources Code section 21071 defines an "urbanized area" as an incorporated city that either has a population of (1) at least 100,000 persons or (2) less than 100,000 persons if the population of that city and not more than two contiguous incorporated cities combined equals at least 100,000 persons, or an unincorporated area satisfying this criteria and additional criteria.[40] If a site-specific project is within an urbanized area, the applicable question in c. above requires review of the affected local government's adopted General Plan, specific plan, local coastal plan (if any), and the municipal code (e.g., zoning) sections governing scenic quality. If the project is within a non-urbanized area, the applicable question asks would the project substantially

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39 A public view can be defined as the visible area from a location where the public has a legal and physical right of access to real property (e.g., city sidewalk, public park, town square, state highway). CEQA Guidelines Appendix G Environmental Checklist Form, I. Aesthetics, c. states "Public views are those that are experienced from publicly accessible vantage point."

40 Pub. Resources Code § 21071. (Specific requirements applicable to unincorporated areas.)

degrade the existing visual character or quality of public views of the site and its surroundings.

For a local agency to conduct this evaluation, aerial, surface, and street view imagery, site and vicinity photographs, area maps, architectural renderings of the project, building elevations, site plans, local government planning documents, and other information are necessary. Also, the distance of the public view between the project site and objects of aesthetic significance would need to be considered.

The prescriptive changes to the use of solar PV and batteries at specified nonresidential buildings, and the energy efficiency changes to exterior lighting on nonresidential buildings and multi-family residences, would result in marginal alterations to the visual characteristics of specified new buildings within the state, but not to a degree where the visual character and quality of the public views would be substantially degraded. Furthermore, the 2022 amendments do not curtail the ability of local lead agencies to enforce and implement policies and ordinances to protect the visual character or quality of views. Local lead agencies retain their discretionary authority to impose mitigation on or consider alternatives to future projects in order to avoid site-specific aesthetic impacts, or conflicts with applicable zoning and other regulations governing scenic quality, associated with future development projects. Therefore, there would be less than significant impacts on scenic resources from the 2022 amendments.

Required Mitigation Measures: None.

d. **Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?**

Light pollution is "[t]he inappropriate or excessive use of artificial light ...." (IDA 2021). Light pollution "occurs when outdoor lighting is misdirected, misplaced, unshielded, excessive or unnecessary. As a result, light spills unnecessarily upward and outward, causing glare, light trespass, and a nighttime urban 'sky glow' overhead, indicating wasted energy and obscuring the stars overhead." (DSS 2017) In addition, there is reflectivity. Reflectivity "... does not create its own light. It borrows light from another source. The borrowed light waves strike an object and 'bounce' from it. The reflectance of the object–how bright it shines–depends on the intensity of the light striking it and the materials from which it is made." (3M 2004)

The energy efficiency changes to outdoor lighting would not cause the light to be brighter than current 2019 Energy Code requires. Cities and counties have also adopted zoning ordinances with respect to controlling lighting to ensure that outdoor light is not misdirected, misplaced, unshielded, excessive, or unnecessary for the new buildings in their jurisdictions.

The Energy Code updates would induce an increase in the number of surfaces that could cause glare in the state as the 2022 amendments include the new prescriptive solar PV requirements for newly constructed nonresidential buildings (specifically for high-rise multifamily, hotel-motel, tenant space, office, medical office, clinic, retail, grocery stores, restaurants, schools, theatres, auditoriums and convention centers). PV panels are a net absorber of light, reducing and redirecting net sunlight that shines on them. Modern PV panels reflect as little as 2 percent of incoming sunlight, about the same as water, but less than soil and wood shingles (NREL 2018). PV panels do not generate their own light. Any perceived glare would be temporary (a few minutes) as the reflected beam of the sun moves. For these reasons, new PV requirements contained in the 2022 amendments would not create a new source of substantial light or glare that would affect day or nighttime views.

Moreover, under the California Government Code section 65850.5(a), "it is the policy of the state to promote and encourage the use of solar energy systems and to limit obstacles to their use." The Energy Code updates are consistent with and further the purpose of California Government Code section 65850.5, which also provides that it is the "intent of the Legislature that local agencies not adopt ordinances that create unreasonable barriers to the installation of solar energy systems, including, but not limited to, design review for aesthetic purposes, and not unreasonably restrict the ability of homeowners and agricultural and business concerns to install solar energy systems." The California Legislature has also demonstrated its intent that CEQA not be used as a barrier to the installation of rooftop solar in most instances by enacting the statutory exemption in Public Resources Code section 21080.35 in 2011, which exempts from CEQA most installations of solar energy systems on the roofs of existing buildings and existing parking lots.

Since the 2022 amendments would not create a new source of substantial light or glare that would affect day or nighttime views, the project's impacts would be less than significant.

Required Mitigation Measures: None.

4.1.4 References

Amir and Gidalizon 1990 – S. Amir and E. Gidalizon (Amir and Gidalizon). *Expert-based method for the evaluation of visual absorption capacity of the landscape*. *Journal of Environmental Management*, Vol. 30, No. 3, April 1990, cited by *The James Hutton Institute*, August 12, 2014. Accessed on September 4, 2019. Available at http://www.macaulay.ac.uk/-ccw/task-two/evaluate.html.

Daniel and Vining 1983 – Terry C. Daniel and Joanne Vining. (Daniel and Vining). *Behaviour and the Natural Environment*, Plenum Press, New York, 1983, "Methodological Issues in the Assessment of Landscape Quality," cited by *The James Hutton Institute*, August 12, 2014. Accessed on September 4, 2019. Available at http://www.macaulay.ac.uk/-ccw/task-two/evaluate.html.

Hull and Revell 1989 – R. Bruce Hull and Grant R.B. Revell (Hull and Revell). *Issues in sampling landscapes for visual quality assessments*, Landscape and Urban Planning, Vol. 17, No. 4, August 1989, pp. 323-330 cited by The James Hutton Institute, August 12, 2014. Accessed on September 4, 2019. Available at http://www.macaulay.ac.uk/ccw/task-two/evaluate.html.

IDA 2021 – International Dark-Sky Association (IDA). Accessed on April 23, 2021. Available at https://www.darksky.org/our-work/grassroots-advocacy/resources/glossary/.

NREL 2018 – National Renewable Energy Laboratory (NREL). By: Megan Day and Benjamin Mow. July 31, 2018. *Research and Analysis Demonstrate the Lack of Impacts of Glare from Photovoltaic Modules*. Available at https://www.nrel.gov/state-local-tribal/blog/posts/research-and-analysis-demonstrate-the-lack-of-impacts-of-glare-from-photovoltaic-modules.html.

3M – 3M Traffic Safety Systems Division (3M). Reflectivity, 2004. Accessed on May 8, 2017. Available at http://multimedia.3m.com/mws/media/295767O/reflectivity-flyer.pdf.

4.2 Air Quality

This section describes the project's environmental and regulatory setting and discusses potential air quality emissions impacts associated with adoption of the 2022 amendments to the Energy Code. This section also addresses the public health impacts associated with the anticipated emissions from the project. These 2022 amendments focus on updating regulatory standards and compliance options related to building energy efficiency. The 2022 amendments would not approve or result in additional specific construction projects or otherwise impact the rate of building construction. The 2022 amendments would have no significant impacts on California's air quality.

4.2.1 Environmental Setting

The 2022 amendments cover the entire state; therefore, the environmental setting incudes the 35 air districts throughout the state which regulate air quality on a regional basis and develop plans to meet air quality standards. The setting also includes the air monitoring stations deployed throughout the state to measure air pollution. Pollutants in the ambient air can cause health problems, especially for children, the elderly, and people with heart or lung problems. Healthy adults may experience symptoms during periods of intense exercise. Pollutants can also cause damage to vegetation, animals, and property.

Pollutants of particular concern that can impact public health and the environment and are found within the state include the following:

Ozone. Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and that can cause substantial damage to vegetation and other materials. Ozone is not emitted directly into the atmosphere but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and oxides of nitrogen (NOx), including NO_2. ROG and NOx are known as precursor compounds for ozone. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight.

People most at risk for adverse health effects from breathing air containing ozone include people with asthma, children, older adults, and people who are active outdoors, especially outdoor workers. Children are at greatest risk from exposure to ozone because their lungs are still developing and they are more likely to be active outdoors when ozone levels are high, which increases their exposure. Studies show that children are no more or less likely to suffer harmful effects than adults; however, children and teens may be more susceptible to ozone and other pollutants because they spend nearly twice as much time outdoors and engage in vigorous activities compared to adults. Children breathe more rapidly than adults and inhale more pollution per pound of their body weight than adults and are less likely than adults to notice their own symptoms and avoid harmful exposures (U.S. Environmental Protection Agency (EPA) 2016).

Particulate Matter. PM10 and PM2.5 represent size fractions of particulate matter that can be inhaled into air passages and the lungs and can cause adverse health effects. Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly or can contain adsorbed and absorbed gases (e.g., chlorides or ammonium) that may be injurious to health. Particulates can also damage materials and reduce visibility.

Nitrogen Dioxide. Breathing air with a high concentration of NO_2 can irritate airways in the human respiratory system. Such exposures over short periods (as represented by the 1-hour standards) can cause respiratory symptoms (such as coughing, wheezing or difficulty breathing) and aggravate respiratory diseases, particularly asthma, leading to hospital admissions and visits to emergency rooms. Longer exposures to elevated concentrations of NO_2 (as represented by the annual standards) may contribute to the development of asthma and potentially increase susceptibility to respiratory infections. People with asthma, as well as children and the elderly, are generally at greater risk for the health effects of NO_2.

Carbon Monoxide. CO is a pollutant that is a product of incomplete combustion and is mostly associated with motor vehicle traffic. High CO concentrations develop primarily during winter when periods of light winds combine with the formation of ground level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air temperatures. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia.

Sulfur Dioxide. SO_2 is produced through combustion of sulfur-containing fuels such as coal. SO_2 is also a precursor to the formation of atmospheric sulfate and particulate matter (PM10 and PM2.5) and contributes to potential atmospheric sulfuric acid formation that could precipitate downwind as acid rain.

Lead. Lead has a range of adverse neurotoxin health effects and, in the past, was predominately released into the atmosphere primarily via the combustion of leaded gasoline. The phase-out of leaded gasoline has resulted in significant decreased levels of atmospheric lead.

4.2.2 Regulatory Setting

The air quality evaluation below assesses the degree to which the 2022 amendments to the Energy Code would potentially cause a significant impact according to CEQA guidelines established by the state of California. The CARB is responsible for achieving air quality requirements in California. In addition, local air districts are also responsible for attainment and maintenance of the federal and state ambient air quality standards (AAQS) and associated program requirements within their district.

The air quality evaluation addresses both emissions of criteria pollutants (which have health-based standards) and toxic air contaminants (which are identified as potentially harmful even at low levels and for which reference exposure levels or health-based ambient air quality standards have not been established).

Federal

Clean Air Act. The federal Clean Air Act (CAA) establishes the statutory framework for regulation of air quality in the United States. Under the CAA, the U.S. EPA oversees implementation of federal programs for permitting new and modified stationary sources, controlling toxic air contaminants, and reducing emissions from motor vehicles and other mobile sources.

Title I (Air Pollution Prevention and Control) of the federal CAA requires establishment of National Ambient Air Quality Standards (NAAQS) for criteria pollutants, air quality designations, and plan requirements for nonattainment areas. States are required to submit a state implementation plan (SIP) to the U.S. EPA for areas in nonattainment with NAAQS. The SIP, which is reviewed and approved by the U.S. EPA, must demonstrate how state and local regulatory agencies will institute rules, regulations, and/or other programs to attain NAAQS over time.

Prevention of Significant Deterioration (PSD) is a federal program for federal attainment areas. The purpose of the federal PSD program is to ensure that attainment areas remain in attainment of NAAQS based upon a proposed facility's annual potential to emit. If annual emissions of a proposed project are less than prescribed amounts, a PSD review is not required.

National Emission Standards for Hazardous Air Pollutants (HAPs) are addressed in CAA section 112[41]. The CAA defines HAPs as a variety of substances that pose serious health risks. Direct exposure to HAPs has been shown to cause cancer, reproductive effects or birth defects, damage to brain and nervous system, and respiratory disorders. Categories of sources that cause HAP emissions are controlled through separate standards under CAA Section 112: National Emission Standards for Hazardous Air Pollutants (NESHAP). These standards are specifically designed to reduce the potency, persistence, or potential bioaccumulation of HAPs. New sources that emit more than ten (10) tons per year of any specified HAP or more than 25 tpy of any combination of HAPs are required to apply Maximum Achievable Control Technology (MACT).

The 2022 amendments are not expected to affect federal clean air programs operating under the CAA.

State

The CARB is the primary administrator of California's federal CAA compliance efforts, while local air quality districts administer air rules and regulations at the local and

41 Hazardous Air Pollutants, 42 U.S.C. § 7412.

regional levels. CARB is also responsible for California's state regulated air quality management, including establishment of California Ambient Air Quality Standards (CAAQS) for criteria air pollutants, mobile source/off-road equipment/portable equipment emission standards, portable equipment registration, GHG regulations, as well as oversight of local or regional air quality districts and preparation of implementation plans, including regulations for stationary sources of air pollution.

California Health and Safety Code section 39606 requires the CARB to adopt ambient air quality standards at levels that adequately protect the health of the public, including infants and children, with an adequate margin of safety. Ambient air quality standards define clean air (CARB 2020c).

Air Toxic "Hot Spots" Information and Assessment Act. The Air Toxic "Hot Spots" Information and Assessment Act, also known as AB 2588, identifies Toxic Air Contaminant[42] (TAC) hot spots where emissions from specific stationary sources may expose individuals to an elevated risk of adverse health effects, particularly cancer or reproductive harm. Many TACs are also classified as HAPs. AB 2588 requires that a business or other establishment identified as a significant stationary source of toxic emissions provide the affected population with information about health risks posed by their emissions. The 2022 amendments are not expected to affect air toxic hot spots.

Asbestos Airborne Toxic Control Measure (ATCM) for Construction, Grading, Quarrying, and Surface Mining Operations. CARB has established the Asbestos ATCM for Construction, Grading, Quarrying, and Surface Mining Operations to minimize the generation of asbestos from earth disturbance or construction activities. The Asbestos ATCM applies to any project that would include sites to be disturbed in a geographic ultramafic rock unit area or an area where naturally occurring asbestos (NOA), serpentine, or ultramafic rocks are determined to be present. The amendments to the Energy Code are not expected to affect asbestos-containing materials.

Criteria Pollutant Evaluation. The CARB and U.S. EPA have both established ambient air quality standards (AAQS) for criteria pollutants. While both state and federal AAQS apply to every location in California, typically the state standards are lower (i.e., more stringent) than federal standards.

The U.S. EPA has set NAAQS for ozone (O_3), carbon monoxide (CO), NO_2, particulate matter less than or equal to 10 microns (PM10), fine particulate matter less than or equal to 2.5 microns (PM2.5), sulfur dioxide (SO_2), and lead (Pb). These pollutants are commonly referred to as "criteria pollutants." Primary standards were set to protect public health; secondary standards were set to protect public welfare against visibility impairment, damage to animals, crops, vegetation, and buildings. In addition, CARB has

42 Substances Identified as Toxic Air Contaminants, Cal. Code of Regs., tit. 17, § 93000; See also Public Health and Welfare, 42 U.S.C. § 7412(b) also included in California Health and Safety Code §39655(a).

CAAQS for these pollutants, as well as for sulfate (SO_4), visibility reducing particles, hydrogen sulfide (H_2S), and vinyl chloride. The standards currently in effect in California are shown below in **Table 4.2-1**.

Air monitoring stations, usually operated by local air districts or CARB, measure the ambient air to determine an area's AAQS attainment status. Depending on the pollutant, the time period over which these pollutants are measured varies from 1-hour to 3-hours, to 8-hours, to 24-hours and to annual averages. Most criteria pollutants have ambient standards with more than one averaging time. Pollutant concentrations are expressed in terms of mass of pollution per unit volume of air, typically using micrograms for the mass portion of the expression and cubic meters of air for the volume, or "micrograms per cubic meter of air, expressed as "$\mu g/m^3$." The concentration can also be expressed as parts of pollution per million parts of air, or "ppm."

Some forms of air pollution are primary air pollutants, which are gases and particles directly emitted from stationary and mobile sources. Other forms of air pollution are secondary air pollutants that result from complex interactions between primary pollutants, background atmospheric constituents, and other secondary pollutants. Some pollutants can be a combination of both primary and secondary formation, such as PM2.5 (particulate matter with an aerodynamic diameter less than 2.5 micrometer [µm]). The primary pollutant component of PM2.5 is directly emitted, such as from the stack of diesel-fueled engines, and the secondary pollutant component of PM2.5 is formed in the air by transformation of NOx and sulfur oxides (SOx) gases into PM2.5 particles. In this case, the NOx and SOx emissions are called precursors to the formation of the secondary aerosol pollutant.

Table 4.2-1

Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards [a]	National Standards [b] Primary	National Standards [b] Secondary
O_3	1hour	0.09 ppm (180 μg/m^3)	—	Same as Primary Standard
O_3	8hour	0.070 ppm (137 μg/m^3)	0.070 ppm (137 μg/m^3)	Same as Primary Standard
PM10	24hour	50 μg/m^3	150 μg/m^3	Same as Primary Standard
PM10	Annual Mean	20 μg/m^3	—	Same as Primary Standard
PM2.5	24hour	—	35 μg/m^3	Same as Primary Standard
PM2.5	Annual Mean	12 μg/m^3	12 μg/m^3	15 μg/m^3
CO	1hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	—
CO	8hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	—
NO_2	1hour	0.18 ppm (339 μg/m^3)	100 ppb (188 μg/m^3) [c]	—
NO_2	Annual Mean	0.030 ppm (57 μg/m^3)	0.053 ppm (100 μg/m^3)	Same as Primary Standard
SO_2 [d]	1hour	0.25 ppm (655 μg/m^3)	75 ppb (196 μg/m^3)	—
SO_2 [d]	3hour	—	—	0.5 ppm (1,300 μg/m^3)
SO_2 [d]	24hour	0.04 ppm (105 μg/m^3)	0.14 ppm (for certain areas) [d]	—
SO_2 [d]	Annual Mean	—	0.030 ppm (for certain areas) [d]	—

Notes: ppm=parts per million; ppb = parts per billion; μg/m^3 = micrograms per cubic meter; mg/m^3 = milligrams per cubic meter; "—" = no standard

a California standards for O_3, CO (except 8-hour Lake Tahoe), SO_2 (1 and 24 hour), NO_2, and particulate matter (PM10, PM2.5, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded.

b National standards (other than O_3, particulate matter (PM), NO_2 [see note c below], and those based on annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 μg/m^3 is equal to or less than one. For PM2.5, the24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.

c To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb.

d On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

Source: CARB 2016

California is divided into 35 local air districts. CARB oversees activities within local districts. CARB develops guidance for these local air districts, and both CARB and the local agency work together to develop rules and regulations in the district that are intended to reduce emissions to meet or maintain both the CAAQS and the NAAQS. Areas that meet the AAQS based upon air monitoring measurements made by either the local district or CARB are classified as "attainment areas" if measured concentrations are below NAAQS and areas that have monitoring data that exceed NAAQS are classified as "nonattainment areas." An area can be classified as attainment for some pollutants and nonattainment for others. Even for the same pollutant, an area can be attainment for one averaging time and nonattainment for another. Attainment areas develop maintenance plans to avoid becoming nonattainment.

Air districts adopt rules, regulations, and attainment and maintenance plans aimed at protecting public health and reducing emissions. Air districts incorporate these requirements into SIP for areas that do not meet NAAQS. SIPs include components developed by local districts in consultation with CARB, which must approve them before sending them to the U.S. EPA for federal approval. Once a SIP is approved by the U.S. EPA, the requirements in the SIP become federally enforceable. The state and local districts also develop plans to attain CAAQS.

Non-Criteria Pollutant Evaluation

Non-criteria pollutants that are typically evaluated are airborne toxic pollutants identified to have potential harmful human health impacts. Evaluations assess the potential risks from toxic air contaminants (TACs) and hazardous air pollutants (HAPs). TACs include toxic air pollutants identified by the state and HAPs include toxic air pollutants identified at the federal level. Most toxic air pollutants do not have AAQS; however, AAQS have been established for a few TACs.

According to section 39655 of the California Health and Safety Code, a TAC is "an air pollutant which may cause or contribute to an increase in mortality or an increase in serious illness, or which may pose a present or potential hazard to human health." In addition, substances which have been listed as federal HAPs pursuant to section 7412 of Title 42 of the United States Code are TACs under the state's air toxics program pursuant to section 39657 (b) of the California Health and Safety Code. CARB formally made this identification on April 8, 1993[43].

Odor Impact Evaluation

Aside from criteria air pollutants and TACs, impacts may arise from other emissions, notably related to odor. The 2022 amendments are not expected to affect these other emissions sources.

Attainment Status and Air Quality Plans

As noted above, the U.S. EPA, CARB, and the local air districts classify an area as attainment, unclassified, or nonattainment. The classification depends on whether the monitored ambient air quality data show compliance, insufficient data are available, or non-compliance with the federal ambient air quality standards, respectively. Much of California is not in attainment of one or more AAQS and the CARB and local air districts have ongoing plans to attain AAQS in the future. Reducing criteria pollutant emissions from the building sector by implementing the 2022 amendments to the Energy Code will assist these regions in their efforts to improve local air quality.

4.2.3 Methodology to Assess Impacts

The 2022 amendments to the Energy Code include measures that will reduce energy use in newly constructed and altered single-family, multifamily, and nonresidential buildings. These measures will affect these buildings by adding new prescriptive and performance standards for electric heat pumps for space conditioning and water heating, as appropriate for the various climate zones in California; requiring PV and battery storage systems for multifamily and selected nonresidential buildings;

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43 Hazardous Air Pollutants Identified as Toxic Air Contaminants, Cal. Code of Regs., tit 17 § 93001. (California Office of Environmental Health Hazard Assessment, 2020).

establishing efficiency measures for lighting, building envelope and HVAC systems; and making covered process load improvements.

The 2022 amendments expand building "alteration measures" that improve the energy use of existing buildings. These requirements improve the energy performance of "altered components" in existing buildings, when owners are required to pull building permits and meet building code requirements that specifically apply to them. The amendments expand alteration measures to many different altered components, including the building envelope, lighting, heating, ventilation and air conditioning components, and water heating systems, and process loads.

The 2022 amendments would take effect on January 1, 2023. Overall, the 2022 amendments are expected to reduce electricity and fossil fuel natural gas (and propane) use when compared to continued use of existing Energy Code requirements. Under the 2022 amendments, on a statewide basis by 2024, all measures for newly constructed buildings and altered components of existing buildings, collectively would save approximately ~~33~~ <u>27</u> million therms of fossil fuel natural gas and ~~1.3~~ <u>1.4</u> billion kWh of electricity, which result in net reductions of NOx and SOx emissions beginning by the end of 2023. See **Tables 4.2-2** and **4.2-3** for emissions and emissions reductions in California buildings expected as a result of the 2022 amendments.

<u>Tables 4.2-2 and 4.2-3 below include updates from the Draft EIR for the annual number of newly constructed single-family residences in response to comments received from ConSol Company. Specifically, the number of annual new single-family residential construction starts was reduced from 119,045 units per year to 58,052 units per year to better incorporate historical new construction starts for single-family residences.</u>

<u>Tables 4.2-2 and 4.2-3 also include minor changes due to switching the prescriptive requirements for climate zone 10 from heat pump space heating to heat pump water heating. See Final EIR, Section 1.5, Project Updates, discussing Section 150.1 for the basis of this change.</u>

As described more fully in **Chapter 3 Project Description**, this EIR utilizes a modeled baseline for four technical areas to identify the environmental setting in 2023, when the requirements of the 2022 amendments would take effect.

This modeled baseline forecasts the number of anticipated building construction starts for year 2023 and the anticipated criteria air pollution emissions from those new buildings, which would be subject to the 2019 Energy Code if the project is not approved. The results of the forecast are then compared to the criteria air pollution emissions from the new buildings that would be constructed in 2023 under the 2022 amendments to provide information about potential impacts on air quality if the project is approved.

The calculated criteria air pollutant emissions from the avoided fuel use and from the marginal MWh generated over the life of the building standard are limited to NOx and SOx. These two pollutants are representative of, or proxies for, the suite of criteria air pollutant emissions that are generally associated with fuel combustion. Further, the fuel use and criteria emissions are also proportional to TAC emissions associated with fuel combustion. Reductions in fuel use and criteria emissions would lead to proportional reductions in TAC emissions, which are therefore not separately calculated or shown.

Table 4.2-2
Typical NOx Emissions from California's Building Sector
For 2019 (BAU) and 2022 Energy Code
(in lbs/year and tons/year)

	BAU (1) **(2019 Energy Code)**	**2022 (2) Energy Code**	**Program Reductions**
Newly Constructed Buildings Single Family Heat Pumps (standard design)(lbs/year)	112,871 ~~231,467~~	77,754 ~~158,319~~	38,117- ~~73,148~~
Newly Constructed Buildings Multifamily (includes Heat Pumps, Photovoltaics/Batteries, and Efficiency Upgrades) (lbs/year)	67,766	59,486	8,280 (a)
Newly Constructed Buildings Nonresidential Upgrades (includes Heat Pumps, Photovoltaics/Batteries and Efficiency Upgrades) (lbs/year)	132,115	99,848	32,266 (b)
Newly Constructed Buildings Covered Processes (lbs/year)	1,083,761	1,039,030	44,730
Alterations to Existing Buildings Nonresidential (lbs/year)	16,665,112	16,590,667	74,445
Alterations to Existing Buildings Single family residences (lbs/year)	22,039,635	22,028,493	11,142
Alterations to Existing Buildings Multifamily (lbs/year)	5,321,924	5,320,093	1,830
Totals (lbs/year)	**45,423,183** **~~45,541,780~~**	**45,212,372** **~~45,295,937~~**	**210811** **~~245,843~~**
Totals (tons/year)	22,712 ~~22,771~~	22,606 ~~22,648~~	105 ~~123~~

(1) "BAU" values represent emissions in a typical future year, starting in 2023. BAU assumes the 2019 Energy Code remains in effect and the 2022 Energy Code is not implemented.

(2) "2022" represents emissions in future years, starting in 2023 and assuming the 2022 Energy Code is in full effect for one full year.

(a) Multifamily Program Reductions in lbs/year are as follows: Heat Pumps = 3,934; Photovoltaics/Batteries = 1,608; Efficiency Upgrades = 2,738

(b) Nonresidential Upgrades Program Reductions in lbs/year are as follows: Heat Pumps = 11,382; Photovoltaics/Batteries = 6,951; Efficiency Upgrades = 13,933

Table 4.2-3
Typical SOx Emissions from California's Building Sector
For 2019 (BAU) and 2022 Energy Code
(in lbs/year and tons/year)

	BAU (1) (2019 Energy Code)	**2022 (2) Energy Code**	**Program Reductions**
Newly Constructed Buildings Single Family Heat Pumps (standard design) (lbs/year)	88,242 ~~180,961~~	49,807 ~~107,203~~	38,434 ~~73,758~~
Newly Constructed Buildings Multifamily (includes Heat Pumps, Photovoltaics/Batteries, and Efficiency Upgrades) (lbs/year)	50,688	44,103	6,585 (a)
Newly Constructed Buildings Nonresidential Upgrades (includes Heat Pumps, Photovoltaics/Batteries and Efficiency Upgrades) (lbs/year)	88,119	66,488	21,631 (b)
Newly Constructed Buildings Covered Processes (lbs/year)	876,669	845,794	30,875
Alterations to Existing Buildings Nonresidential (lbs/year)	11,655,919	11,598,236	57,683
Alterations to Existing Buildings Single family residences (lbs/year)	18,848,244	18,843,822	4,422
Alterations to Existing Buildings Multifamily (lbs/year)	4,639,754	4,638,452	1,302
Totals (lbs/year)	**36,247,635** **~~36,340,354~~**	**36,086,703** **~~36,144,098~~**	**160,932** **~~196,256~~**
Totals (tons/year)	18,124 ~~18,170~~	18,043 ~~18,072~~	80 ~~98~~

(1) "BAU" values represent emissions in a typical future year, starting in 2023. BAU assumes the 2019 Energy Code remains in effect and the 2022 Energy Code is not implemented.

(2) "2022" represents emissions in future years, starting in 2023 and assuming the 2022 Energy Code is in full effect for one full year.

(a) Multifamily Program Reductions in lbs/year are as follows: Heat Pumps = 4,047; Photovoltaics/Batteries = 78; Efficiency Upgrades = 2,459

(b) Nonresidential Upgrades Program Reductions in lbs/year are as follows: Heat Pumps = 11,640; Photovoltaics/Batteries = 339; Efficiency Upgrades = 9,653

Changes in criteria air pollutants emissions from the amendments were calculated for the building stock affected by the 2022 amendments. The amendments would affect building combustion of fuels for water heating, space conditioning, and cooking. The 2022 amendments would decrease natural gas, propane and electricity consumption on an annual basis in newly constructed buildings while potentially shifting peaks in electricity consumption for certain seasons, relative to what would have occurred if the buildings were built under the existing building standards. The criteria air pollutant emission reductions from fossil fuel for water heating or space conditioning replaced by heat pumps can be directly calculated based on emission factors and the reduced therms of natural gas used. The net emissions reductions by power plants attributable to the overall decrease in grid electricity use (after accounting for the potential shifts in peak electricity consumption) can be similarly calculated using emissions factors representing California's electricity generation resource mix.

The project could create a potential for seasonal air pollutant criteria emissions to increase from portions of the electricity generation sector despite the 2022 amendments resulting in an annual net decrease in electricity consumption for the newly constructed and altered buildings and an overall decrease in associated emissions. The increased electricity used due to the increased replacement of on-site fossil fuel with electric heat pumps for space heating in the cooler months of the year may result in new peaks of electricity demand and generation in those months. In the near term, existing in-state under-utilized electric sector capacity is projected to be available to meet an increase in winter demand when zero carbon emitting capacity is unavailable. Considering the long-term impacts of this project, meeting SB 100 objectives will ensure any seasonal near-term increases in utilization of current carbon emitting capacity will be offset by renewable energy and other zero carbon energy sources.[44]

Complicating the calculations of criteria air pollutant emissions with the shift of electricity demand to cooler months are the aggressive renewable (i.e., non-fuel combustion generation) targets that California has adopted. Today's mix of renewable, fossil, hydroelectric and nuclear fueled power plants have a set of average criteria air pollutant emission factors. However, even those emission factors vary over each day, month, season, and drought. Further, tomorrow's generation mix will be different again as new renewable generation resources are deployed and existing resources are retired as California moves towards meeting its renewable and zero carbon energy resources goals. The CEC has extensively modeled the generation resources to calculate the marginal MWh emissions for each hour of the day and for the MWhs attributed to the new building subject to the 2022 amendments. The calculations incorporate the expected pathway of the resource mix to the 2045 renewable and zero carbon energy

44 CEC. California Energy Commission Renewable Energy Tracking Progress at https://www.energy.ca.gov/sites/default/files/2019-12/renewable_ada.pdf. p.2.

mix. As the system gets “cleaner” the average criteria air pollutant emissions per MWh decrease.

Net changes in criteria air pollutant emissions due to the 2022 amendments were calculated out to 2052 for the building sector. The data in the table below are for both existing and new California building stock. Net criteria air pollutant emissions, and TACs by proxy, would decrease statewide in each year the 2022 amendments to the Energy Code are in place.

Emissions for 2024 were obtained for the existing California building stock using emissions factors from the U.S. Environmental Protection Agency’s Continuous Emissions Monitoring System (CEMS) for the California building sector (E3 2020, page 104).

Future values were developed by incorporating the trend in decreasing carbon intensity (i.e., reduction of fuel combusted) of statewide electricity production between 2019 and 2052, along with an assumed decrease in carbon intensity (the decarbonization of pipeline natural gas through the addition of biogas and renewable hydrogen) of the natural gas used in the state (E3 2020, page 105). The 2022 amendments would reduce natural gas use (and to some extent, propane) for water and space heating in new construction in California by the increase use of electric heat pumps for space heating in some climate zones in California and for water heating in other climate zones. This would decrease natural gas and propane consumption in new construction while correspondingly increasing electricity consumption.

The data in **Table 4.2-4** below show the net of the decrease in NO_x and SO_x emissions associated with reduced fuel use and annual electricity consumption in new construction. Trends for other criteria pollutants and TACs are expected to be similar to these two representative criteria pollutants. <u>Table 4.2-4 includes updates due to the change in new single-family building standards noted above in Tables 4.2-2 and 4.2-3 and updated values correcting a minor double-counting error that was discovered while preparing responses to comments. The corrected cell equations are identified by comments in the final spreadsheet (TN#239152) and the updated values are in the tables below. Table 4.2-4 also includes minor changes due to switching the prescriptive requirements for climate zone 10 from heat pump space heating to heat pump water heating. See Final EIR, Section 1.5, Project Updates, discussing Section 150.1 for the basis of this change.</u>

Table 4.2-4
California's Entire Building Sector Emissions of NOx and SOx (Tons/year)

Pollutant	2025	2030	2035	2040	2045	2050
NOx	22,036 ~~22,243~~	21,849 ~~21,482~~	21,318 ~~0,688~~	20,860 ~~20,010~~	20,489 ~~9,469~~	20,005 ~~18,751~~
SOx	22,468 ~~22,412~~	22,067 ~~21,820~~	21,664 ~~21,227~~	21,265 ~~20,639~~	20,871 ~~20,058~~	20, 470 ~~19,468~~

The values in **Table 4.2-4** above show the trend expected to result from all 2022 amendments. They include the effect of reducing the carbon intensity of both electricity and natural gas used in buildings built and altered after the 2022 amendments go into effect on January 1, 2023. The table does not account for the effect of decarbonization of pipeline natural gas on the portion of existing buildings not altered, so the emission reductions shown are conservative. Actual reductions are expected to be greater than shown.

The net reduction in criteria air pollutant emissions is an environmental benefit to the state and reflects the compounding benefits of decarbonizing our energy end use sectors to address global climate change, while at the same time realizing reductions that address our persistent air pollution problems. There is no doubt that locations that tend to have California's sunny climate and mountainous topography exacerbate regional air quality problems, resulting in continuing need to directly reduce criteria air pollutant emissions to improve air quality.[45]

Additionally, the decrease of fossil fuel use in newly constructed and altered buildings would result in a reduction of criteria air pollutant emissions from an area source. An area source, compared to a point source of air pollution, is more indeterminate of location, such as a highway, dirt road, forest fire, or tilled field. Or, for example, a neighborhood of water heater stacks would be an area source. Most area sources are aggregations of a multitude of small sources, but often relatively uncontrolled and located at ground level near receptors like humans with the potential for higher impacts.

A concurrent potential increase in criteria air pollutant emissions in some months would result from increase generation tied to the proposed increase use of electric heat pumps. The current proportion of the California generation resources mix that is fossil fuel would likely share some of the increased generation demand, resulting in an increase of criteria air pollution emissions in some months at these point sources. However, like most point sources in California, power plants are subject to stringent

45 Nathanson, Jerry A. "Pollution." Britannica. Available at https://www.britannica.com/contributor/Jerry-A-Nathanson/4206.

best available emission control technologies, monitoring, reporting and ongoing maintenance to ensure constant compliance. And, unlike area sources, emissions are emitted at elevated temperatures and velocities, and from a tall stack, resulting in dispersion of the air pollutants before they can reach ground level receptors.

The fossil fueled power plants are licensed for operation up to a permitted number of hours per year, and emissions per hour, day or year. These permit requirements reflect the approved plans adopted by local air districts to achieve and maintain ambient air quality standards. The 2022 amendments would increase electricity use in the fall, winter, and spring seasons for heating, and year-round for water heating. Because of the dynamic nature of California's wholesale energy market and the moment-to-moment decisions made by the Independent System Operator it is impossible to estimate whether, where, or when any increases would occur, how much they would be, and of what duration, rendering any analysis of any impacts from these potential increases to be speculative.[46] However, they would not cause the power plants to exceed their emissions limits or any limits on hours of operations.

In 2001, the fleet average capacity factor of the natural gas power plants in California was 45 percent. By 2018, the fleet average capacity was only 26 percent, meaning that there is underutilized permitted capacity available to maintain the grid reliability with clean, efficient generation (Nyberg 2020, page 10) as renewables continue to be added. The change in capacity factor of the fossil plants correlates with large past and continuing additions of renewable generation throughout California, at the grid level and behind the meter. In particular, the nearly 20,000 MW of in-state combined cycle units (about half the existing fossil fleet) were only operating at about 40 percent capacity factor (Nyberg 2020, page 10). These units are typically permitted for 100 percent capacity factor, while operating near 60 percent energy conversion efficiency (from fuel input to electricity output).

Lastly, most of the existing fossil fueled power plants were required to obtain offsets, for some of their criteria air pollutant emissions to obtain and maintain their operating permits. Offsets are generated through cleaning up or shutting down existing point sources, and because air districts typically require a greater than 1:1 offset ratio, they provide the air basin reductions in emissions and improve air quality. Because of the dynamic nature of California's wholesale energy market and the moment-to-moment decisions made by the California Independent System Operator it is impossible to estimate whether, where, or when any increases would occur, how much they would be, and of what duration, rendering any analysis of impacts of these potential increases

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46 California ISO. About Us, Our Business webpage at http://www.caiso.com/about/Pages/OurBusiness/Default.aspx. ("Every five minutes, the ISO forecasts electrical demand and dispatches the lowest cost generator to meet demand while ensuring enough transmission capacity for delivery of power.") Last accessed May 15, 2021.

to be speculative[47]. However, increases of operating levels of existing permitted fossil units would not add emissions to an air basin that were not modeled and permitted.

4.2.4 Indoor Air Quality

The 2022 amendments improve the rate of removal of cooking-generated gases and aerosols generated when cooking indoors and lead to lower concentrations of PM2.5 and NO_2 in the indoor environment compared to the 2019 Energy Code. Cooking-related air pollution is associated with various health risks, and there is a growing body of research that highlights the health impacts from cooking-related pollution[48]. Cooking over any type of cooktop (natural gas or electric) releases ultrafine and fine particles such as PM2.5, as well as other irritants and potentially harmful gases including formaldehyde, acetaldehyde, acrolein, and polycyclic aromatic hydrocarbons (Singer and Chan 2021).

The 2022 amendments improve upon the 2019 Energy Code requirements regarding indoor air quality associated with indoor cooking by increasing the air handling capacities of range hoods to remove cooking-related air pollution (CASE 2020). Specifically, the amendments would increase airflow rates of residential kitchen range hoods to a minimum level. The amendments build upon recent research from LBNL that estimated the minimum cooktop range hood capture efficiency needed to maintain fine particulate matter (PM2.5) and nitrogen dioxide (NO_2) concentrations at acceptable levels. Capture efficiency and exhaust volume flows are specified depending on the square footage of the dwelling unit. The capture efficiency test method is new and manufacturer organizations are in the process of establishing rating points for capture efficiency.

4.2.5 Environmental Impacts and Mitigation Measures

Appendix G of the state CEQA Guidelines provides that a project would result in a potentially significant impact on air quality if it would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Result in other emissions (such as those leading to odors affecting a substantial number of people).

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47 Ibid.

48 Seals, Brady and Andee Krasner. 2020. Gas Stoves: Health and Air Quality Impacts and Solutions. Report. Rocky Mountain Institute. Available at https://rmi.org/insight/gas-stoves-pollution-health/.

a. **Would the project conflict with or obstruct implementation of the applicable air quality plan?**

The 2022 amendments are regulatory changes and do not approve any construction projects or regulate the rate and quantity of new building construction. The 2022 amendments would result in a net decrease in criteria pollutant and TAC emissions statewide. The 2022 amendments also would not affect the ability for local air districts to impose air quality requirements on construction projects.

The 2022 amendments contain provisions that are expected to potentially cause a change from using natural gas (or in some cases, propane) for water and space heating in new construction in California to the use of electric heat pumps for space heating in some climate zones in California and for water heating in other climate zones. The decrease of natural gas and propane consumption in new construction would increase winter electricity consumption for heat pump operations, while other program elements reduce electricity consumption. Overall, on an annual basis, the 2022 amendments will reduce both electricity and natural gas consumption. However, on a seasonal basis there may be an increase in, or a shift to, wintertime electrical (megawatt) demand. This seasonal demand is expected to be met with existing capacity. Overall, the 2022 amendments would result in a net decrease in criteria pollutant and TAC emissions statewide. Improvements in building envelope, increases in equipment efficiencies, and other requirements included in the Energy Code updates will also decrease overall energy use compared to the existing 2019 Energy Code. Therefore, the impacts from the 2022 amendments would be less than significant and positive which would support, not obstruct, the implementation of any air quality plan.

Required Mitigation Measures: None

b. **Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?**

On an annual basis, the energy efficiency requirements set forth in the 2022 amendments would reduce electricity and natural gas and propane usage and the emissions of criteria pollutants and TACs compared to existing Energy Code requirements. Based on this reduction, the 2022 amendments would result in a net reduction of criteria air pollutant emissions statewide. There may be some short-term wintertime increases due to seasonal issues as discussed in “a” above, but such impacts would be within allowable permit limits and will be less likely to occur over time as the electricity demand becomes more fully served by renewable technologies. Therefore, the impacts from the 2022 amendments would be less than significant and due to the positive impacts from reduced emissions of criteria pollutants, would not result in a cumulative considerable net increase of any criteria pollutant.

The 2022 amendments would improve indoor air quality associated with cooking within enclosed spaces such as kitchens and there would be no cumulatively considerable impacts.

Required Mitigation Measures: None.

c. **Would the project expose sensitive receptors to substantial pollutant concentrations?**

The 2022 amendments are regulatory changes and do not approve any construction project or regulate the rate and quantity of new building construction. The 2022 amendments also do not affect the ability for local air districts and jurisdictions to impose air quality requirements on construction projects to reduce the exposure to substantial pollutants by sensitive receptors.

Overall, as stated above in "a" and "b" on an annual basis, the 2022 amendments are expected to reduce electricity and fossil fuel natural gas (and propane) use when compared to continued use of existing Energy Code requirements. In addition, short-term emissions are expected to be within permit limits. This will result in net reductions of NOx and SOx emissions beginning by the end of 2023.

The 2022 amendments would also improve indoor air quality associated with cooking within enclosed spaces such as kitchens and this improvement over the existing Energy Code would help to prevent sensitive receptors from being exposed to substantial pollutant concentrations.

Therefore, the impacts from the 2022 amendments would be less than significant and due to the positive impacts from reduced emissions of criteria pollutants, would not expose sensitive receptors to substantial pollutants.

Required Mitigation Measures: None

d. **Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?**

The 2022 amendments are regulatory changes and do not approve any construction projects or regulate the rate and quantity of new building construction. The 2022 amendments also do not affect the ability for local air districts and jurisdictions to impose air quality requirements on construction projects to reduce the exposure to substantial pollutants by sensitive receptors.

The 2022 amendments would improve indoor air quality associated with cooking within enclosed spaces such as kitchens and there would be no adverse odor impacts.

Therefore, the impacts from the 2022 amendments would be less than significant and due to the positive impacts from reduced emissions of criteria pollutants, would not result in other emissions adversely affecting a substantial number of people.

Required Mitigation Measures: None

4.2.6 References

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4.3 Biological Resources

This section describes the environmental and regulatory setting related to biological resources in the state and discusses impacts associated with the project. The analysis in this section concludes that the 2022 amendments would have no or less than significant impacts on biological resources.

4.3.1 Environmental Setting

The 2019 Energy Code are a set of regulations that require energy efficient designs, features, equipment, and practices in new construction and certain additions and alterations to buildings within California. While most of the 2022 amendments would have no impact or beneficial effects on biological resources, some of the requirements, such as prescriptive solar PV and battery energy storage requirements, would alter the external characteristics of specified new buildings within the state in a manner that could potentially result in foreseeable direct or indirect impacts to biological resources. As these 2022 amendments apply statewide, the environmental setting of the Energy Code updates is the entire state of California. To focus on changes that would be attributable to the project, this section evaluates the potential for increases in statewide biological resources impacts from the proposed 2022 amendments compared to the existing state of biological resources impacts associated with buildings in California under the current building design and construction requirements of the 2019 Energy Code.

4.3.2 Regulatory Setting

Federal

Endangered Species Act (16 U.S.C., § 1530 et seq., and 50 CFR, part 17.1 et seq.). The Endangered Species Act (ESA) designates and provides for protection of threatened and endangered plant and animal species and their critical habitat. Its purpose is to protect and recover imperiled species and the ecosystems on which they depend. It is administered by the United States Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS). The USFWS is responsible for terrestrial and freshwater organisms; MFS is responsible for marine wildlife such as whales and anadromous fish (such as salmon). Species may be listed as endangered or threatened. All species are defined to include subspecies, varieties, and for vertebrates, distinct population segments. The ESA protects endangered and threatened species and their habitats by prohibiting the "take" of listed animals and the interstate or international trade in listed plants and animals, including their parts and products, except under federal permit. Take may be obtained through Section 7 consultation (between federal agencies) or a Section 10 Habitat Conservation Plan.

Migratory Bird Treaty Act (16 U.S.C., §§ 703-711). The Migratory Bird Treaty Act (MBTA) makes it illegal to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid federal permit. The USFWS has authority and responsibility for enforcing the MBTA.

State

California Endangered Species Act (Fish and Game Code sections 2050-2098). The California Endangered Species Act (CESA) of 1984 states that all native species of fish, amphibians, reptiles, birds, mammals, invertebrates, and plants, and their habitats, threatened with extinction and those experiencing a significant decline which, if not halted, would lead to a threatened or endangered designation, will be protected and preserved. CESA prohibits the take of any species of wildlife designated by the California Fish and Game Commission as endangered, threatened, or candidate species. The California Department of Fish and Wildlife (CDFW) may authorize the take of any such species if certain conditions are met. These criteria are listed in Title 14 of the California Code of Regulations, section 783.4 subdivisions (a) and (b). For purposes of CESA "take" means to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.[49]

California Fish and Game Code. The administering agency for the Fish and Game Code sections discussed above is CDFW.

- Section 3503: This section makes it unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto.
- Section 3503.5: This section makes it unlawful to take, possess, or destroy any birds in the orders Falconiformes and Strigiformes or to take, possess, or destroy the nest or eggs of any such bird.
- Section 3513: This section protects California's migratory birds by making it unlawful to take or possess any migratory nongame bird as designated in the MBTA or any part of such migratory nongame birds.

4.3.3 Environmental Impacts and Mitigation Measures

a. **Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?**

Implementation of the Energy Code updates would not substantially affect protected species, either directly or through habitat modification. As shown in **Tables 4.2-1** through **4.2-3** in **Section 4.2 Air Quality**, the 2022 amendments would result in the reduction of ambient criteria pollutants, such as nitrogen oxides and sulfur dioxides.

49 Fish & G. Code § 86.

Such amendments do not adversely impact biological resources, as they would reduce the adverse effects of nitrogen deposition and other environmentally harmful emissions that could result from new construction and building modifications if the Energy Code updates are not adopted. These emissions adversely affect flora and fauna by disrupting normal ecological function: promoting invasive and/or weedy growth by process of outcompeting native plants (CEC 2006); detrimentally affecting associated native species such as pollinators (butterflies and bees, etc.) (Hoover 2012); diminishing populations of sensitive and rare plant species (Valliere et al. 2017); and harming the wildlife that depends on these habitats and food sources to survive (Hernandez et al. 2017). Therefore, the 2022 amendments would yield a positive environmental impact.

The new prescriptive solar PV requirements for newly constructed buildings, including high-rise multifamily, hotel-motel, tenant-space, office, medical office or clinic, restaurant, grocery store, retail store, school, and theater/auditorium/convention center buildings, would increase the number of surfaces that may attract birds, bats, and other species (invertebrates) and cause a potentially significant adverse environmental impact to those species.

While utility-scale projects are well documented to have various adverse impacts on biota (Kosciuch et al. 2020), little scientific data is available on distributed PV, such as rooftop solar, to suggest that distributed PV would have comparable biological resources impacts. Moreover, **Section 4.4 Energy** indicates that the 2022 amendments, including the distributed PV and battery storage requirements and other efficiency requirements, "would save approximately ~~33~~ 27 million therms of fossil fuel natural gas and ~~3~~ 1.4 billion kWh of electricity" in the first full year of implementation. Thus, the beneficial changes in energy demand attributable to the project are not likely to result in the development of future utility-scale renewable projects either directly or indirectly.

The 2022 amendments do not direct where new buildings should be constructed and do not include provisions or exceptions that would make it more likely for new buildings to be sited, designed, or constructed in ecologically-rich areas or in such a way as to introduce new or additional adverse effects on candidate, sensitive, or special-status species relative to buildings constructed under the 2019 Energy Code or earlier Energy Codes. Therefore, implementation of the 2022 amendments into foreseeable future buildings would have less than significant impacts on protected species, as would any future habitat modification resulting from the project's beneficial effects on ambient air quality.

Required Mitigation Measure: None

b. **Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?**

The 2022 amendments do not include any provisions or exceptions that would cause regulated buildings to be more likely to be sited, designed, or constructed in such a way as to adversely affect riparian habitat or other sensitive natural communities. Therefore, there would be no impact to riparian habitat or other sensitive natural communities from the proposed amendments.

Required Mitigation Measure: None

c. **Would the project have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) either individually or in combination with the known or probable impacts of other activities through direct removal, filling, hydrological interruption, or other means?**

The 2022 amendments do not include any provisions or exceptions that would cause regulated buildings to be more likely to be sited, designed, or constructed in such a way as to adversely affect federally protected wetlands through direct removal, filling, hydrological interruption, or by other means. Therefore, there would be no impact to federally protected wetlands from the proposed amendments.

Required Mitigation Measure: None

d. **Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of wildlife nursery sites?**

The 2022 amendments do not include any provisions or exceptions that would cause new buildings to be more likely to be sited, designed, or constructed in such a way as to interfere with the movement of native resident species or with established migratory wildlife corridors or impede native nurseries. Therefore, there would be no impact to native fish or wildlife species or established wildlife corridors or wildlife nurseries from the proposed amendments.

Required Mitigation Measure: None

e. **Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?**

The 2022 amendments do not induce or incentivize regulated buildings to be designed, sited, or constructed in such a way that they would conflict local policies or ordinances protecting biological resources. Therefore, there would be no impact to local policies or ordinances protecting biological resources from the proposed amendments.

Required Mitigation Measure: None

f. **Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Communities Conservation Plan, or other approved local, regional, or state habitat conservation plan?**

The 2022 amendments do not induce or incentivize regulated buildings to be designed, sited, or constructed in such a way that they would conflict with habitat conservation plans. Therefore, there would be no impact to an adopted Habitat Conservation Plan, Natural Communities Conservation Plan, or other approved local, regional, or state habitat conservation plan from the proposed amendments.

Required Mitigation Measure: None

4.3.4 References

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4.4 Energy Resources

This section describes the project's environmental and regulatory setting and analyzes the potential impacts to energy and energy resources from the 2022 amendments and is prepared pursuant to Section 15126.2(b) and Appendices F and G of the CEQA Guidelines. The analysis concludes that the adoption of the 2022 amendments would not result in inefficient, wasteful, and unnecessary consumption of energy. The 2022 amendments would have less than significant impacts on California's energy resources.

4.4.1 Environmental Setting

Energy Types and Sources

California's electricity system consists of a diverse mix of natural gas, petroleum, renewable, hydroelectric, and nuclear generation resources. In 2019, 63 percent of the state's electricity retail sales came from non-fossil fuel sources, including large hydropower, nuclear, solar, wind, geothermal, and biomass energy generation. One-third of the energy consumed in California is produced by combusting fossil fuel natural gas.[50] The amount of electricity generation from natural gas plants was 91 gigawatt-hours (GWh) in 2018, a decrease of roughly 22 percent, from 117 GWh in 2009.

California has added large amounts of renewable generation to its electricity system. Solar generation represents the largest portion of renewable generation currently consumed in California. Solar and wind generation together account for more than 62 percent of all renewable energy generation, not including behind-the-meter (BTM) or off-grid generation. The CEC estimates that 36 percent of California's 2019 retail electricity sales were provided by RPS-eligible renewable energy sources. In 2019, the estimated total renewable generation, including out-of-state generation delivered to California and BTM solar generation, was 105,559 GWH.[51]

Energy Use for Buildings

In 2019, residential and non-residential buildings represented approximately 69 percent of California's electricity consumption,[52] and 53 percent of California's fossil fuel natural gas consumption.[53] The 2019 Residential Appliance Saturation Survey (RASS) estimated that the fossil fuel natural gas combusted in statewide households results from the

50 CEC. California Energy Commission Renewable Energy Tracking Progress at https://www.energy.ca.gov/sites/default/files/2019-12/renewable_ada.pdf.

51 Ibid.

52 CEC. Electricity Consumption by Entity webpage at http://www.ecdms.energy.ca.gov/elecbyutil.aspx.

53 CEC. Gas Consumption by Entity webpage at http://www.ecdms.energy.ca.gov/gasbyutil.aspx.

following three end uses: water heating at 59 percent, space heating at 32 percent, and cooking at 5 percent.[54]

As described more fully in **Chapter 3 Project Description**, this EIR utilizes a modeled baseline for four technical areas that incorporates the impacts of the 2019 Energy Code in 2023, when the requirements of the proposed 2022 amendments would take effect. This modeled baseline forecasts the number of anticipated building construction starts for year 2023 and the anticipated consumption of energy resources from those new buildings, which would be subject to the 2019 Energy Code if the project is not approved. The results of the forecast are then compared to the anticipated consumption of energy resources from the new buildings constructed in 2023 under the 2022 Energy Code to provide information about potential impacts on energy resources if the project is approved.

4.4.2 Regulatory Setting

Federal

Energy Policy Act of 1992. The Energy Policy Act of 1992 establishes a process by which each state is required to review and potentially update its state energy code whenever national model energy standards (ANSI/ASHRAE/IES Standard 90.1 for nonresidential buildings and the International Energy Conservation Code for residential buildings) are updated. The statute requires each state to certify to the U.S. Department of Energy that it has reviewed the updated national model energy standard and its determination of whether the state energy code meets or exceeds the updated national model energy standards. The CEC has made this certification for the 2019 Energy Code.

State

Warren-Alquist Act. Public Resources Code section 25402(a)-(b), requires the CEC to adopt regulations "to reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy, including energy associated with the use of water, in new residential and new nonresidential buildings, and to manage energy loads to help maintain electrical grid reliability." The CEC accomplishes this in large part through the adoption of building standards and appliance efficiency standards. The building standards are adopted every three years as part of the California Building Standards Commission's triennial update cycle, whereas appliance efficiency standards are adopted intermittently as standards development is completed. Both sets of standards are required to be technically feasible and cost-effective.

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54 CEC. [2019 California Residential Appliance Saturation Survey (RASS) webpage](http://www.ecdms.energy.ca.gov/elecbyutil.aspx) at http://www.ecdms.energy.ca.gov/elecbyutil.aspx. (The CEC is conducting a 2019 RASS with results expected in 2021.)

2019 Building Energy Efficiency Standards (2019 Energy Code). The 2019 Building Energy Efficiency Standards, in California Code of Regulations, Title 24, Part 6, establish a range of mandatory and prescriptive energy efficiency measures for newly constructed residential and nonresidential buildings, as well as additions and alterations to existing buildings, to reduce wasteful, uneconomical, and unnecessary uses of energy, thereby reducing the rate of growth of energy consumption, prudently conserving energy resources, and assuring that statewide environmental, public safety, and land use goals are met. This code cycle-initiated focus on the decarbonization of buildings with the introduction of solar PV system requirements for newly constructed low-rise residential buildings. It also introduced the recognition of battery storage systems and demand flexibility options in the form of compliance credits, encouraging the design and installation of systems that support the decarbonization of buildings and grid stability.

SB 1078. California Renewable Portfolio Standards Program (SB 1078, Chapter 516, Statutes of 2002) established the RPS for electricity supply. The RPS required that retail sellers of electricity, including publicly owned utilities and community choice aggregators, provide 20 percent of their supply from renewable sources by 2017. As of 2020, utilities in California are required to demonstrate procurement of renewable energy resources sufficient to meet 33 percent of each utility's retail sales. By 2030, this requirement increases to 60 percent of each utility's retail sales. The RPS affects the impacts of the Energy Code by increasing the percentage of renewable generation consumed in the state, which has a different operational and environmental profile than non-renewable sources.

AB 32. In 2006, the California State Legislature enacted the Global Warming Solutions Act of 2006, or AB 32, which provides the framework for regulating GHG emissions in California. This law requires the CARB to design and implement emission limits, regulations, and other measures such that statewide GHG emissions are reduced in a technologically feasible and cost-effective manner to 1990 levels by 2020.

SB 350. The Clean Energy and Pollution Reduction Act of 2015 (SB 350, de León, Chapter 547, Statutes of 2015) called for a new set of objectives in clean energy, clean air, and pollution reduction for 2030 and beyond. These objectives included increasing the procurement of electricity from renewable sources from 33 percent to 50 percent and establishing targets to achieve a cumulative doubling of energy efficiency savings in electricity and natural gas final end uses of retail customers by 2030 through energy efficiency and conservation by 2030. The Building Energy Efficiency Standards were the first effort mentioned by the statute to contribute to doubling efficiency to accomplish climate change objectives. SB 350 also modified the direction of AB 758 related to the Energy Efficiency Action Plan.

AB 758. The California Energy Efficiency Action Plan (AB 758 Skinner, Chapter 470, Statutes of 2009), as further modified by SB 350, requires the CEC to develop and periodically update an action plan to increase energy efficiency savings in new and existing buildings. On December 11, 2019, the CEC adopted the California 2019 Energy Efficiency Action Plan (2019 Action Plan) to serve as the state's most recent policy map for increasing energy efficiency. The 2019 Action Plan includes strategies for achieve a statewide doubling of energy efficiency savings from electricity and natural gas end uses by 2030. It also addresses financing mechanisms, resiliency, multifamily building energy efficiency, building decarbonization, industrial and agricultural energy efficiency, use of energy data to better design and target efficiency, demand response measures, and barriers and opportunities to expand low-income and rural residents' access to energy efficiency and renewable energy. The Action Plan recognized that going forward to full decarbonization of the state's economy (pursuant to Executive Order B-30-15), energy efficiency can and must play a central role. Building decarbonization must be built from three components: a clean supply of energy, high levels of energy efficiency, and demand flexibility. Distributed energy resources (DERs), including behind-the-meter solar generation, energy efficiency, demand response (DR), electricity storage, and electric vehicles (EVs), represent significant opportunities for demand flexibility, especially when coupled with advanced communications and automated controls. Providing building decarbonization pathways in the building standards for new construction and retrofits was highlighted by the Action Plan. AB 758 does not impose specific regulatory requirements.

Executive Order B-30-15. On April 29, 2015, Governor Brown issued Executive Order B-30-15, directing state agencies to implement measures to reduce GHG emissions 40 percent below their 1990 levels by 2030 and to achieve the previously-stated goal of an 80 percent GHG reduction by 2050.

AB 32 Scoping Plan & Update. Part of CARB's direction under AB 32 was to develop a Scoping Plan that contains the main strategies California will use to reduce GHG emissions that cause climate change. CARB first approved the AB 32 Scoping Plan in 2008 and released its first update in 2014. The Scoping Plan includes a range of GHG reduction actions, which include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, market-based mechanisms such as a cap-and-trade system, and an AB 32 cost of implementation fee regulation to fund the program. In December 2007, CARB set the statewide 2020 emissions limit, defined as reducing emissions to 1990 levels, at 427 million metric tons of carbon dioxide equivalent (CO_2e) ($MMTCO_2e$). The May 2014 First Update to the Climate Change Scoping Plan adjusted the 1990 emissions estimate and the statewide 2020 emissions limit goal to 431 $MMTCO_2e$ (CARB 2014). The California Building Energy Efficiency Standards have been identified as a key means of accomplishing climate change GHG reductions in the Scoping Plan.

SB 32 and AB 197. On September 8, 2016, SB 32, codified as Section 38566 of the Health and Safety Code, was enacted. It extends California's commitment to reduce GHG emissions by requiring the state to reduce statewide GHG emissions by 40 percent below 1990 levels by 2030. A companion bill, AB 197, assures that the state's implementation of its climate change policies is transparent and equitable, with the benefits reaching disadvantaged communities.

SB 100. The 100 Percent Clean Energy Act of 2018 (SB 100, De León, Chapter 312, Statutes of 2018) established a nation-leading target for renewable and zero-carbon resources to supply 100 percent of retail sales and electricity procured to serve all state agencies by 2045, displacing fossil fuel consumption within the state. SB 100 also increased the state's RPS target to 44 percent of retail sales by December 31, 2024, 52 percent by December 31, 2027, and to 60 percent by December 31, 2030, and requires all state agencies to incorporate these targets into their relevant planning.

AB 3232. Zero-Emission Buildings and Sources of Heat Energy (AB 3232, Friedman, Chapter 373, Statutes of 2018) requires the CEC to assess the potential for the state to reduce the emissions of greenhouse gases from the state's residential and commercial building stock by at least 40 percent below 1990 levels by January 1, 2030. The bill states that decarbonizing California's buildings is essential to achieve the state's greenhouse gas emission reduction goals at the lowest possible cost. The bill establishes that it is the intent of the Legislature to achieve significant reductions in the emissions of greenhouse gases by the state's residential and commercial building stock by January 1, 2030.

Executive Order B-55-18. On September 10, 2018, former Governor Edmund Brown signed Executive Order B-55-18 which set a goal of statewide carbon neutrality by 2045 and net negative emissions thereafter. The Building Energy Efficiency Standards are one means among many that will be required to successfully meet this worldwide, groundbreaking goal. The 2022 amendments to the Energy Code are a first step to shift towards efficient heat pumps, which will enable decarbonization at the building site in support of this Executive Order.

Executive Order N-79-20. On September 23, 2020, Governor Gavin Newsom signed Executive Order N-79-20 requiring sales of all new passenger vehicles to be zero-emission by 2035, all medium-and heavy-duty vehicles by 2045 for all operations where feasible, drayage trucks and by 2035.

Integrated Energy Policy Report. SB 1389 (Chapter 568, Statutes of 2002) requires the CEC to conduct assessments and forecasts of all aspects of energy industry supply, production, transportation, delivery and distribution, demand, and prices. The CEC uses these assessments and forecasts to develop and evaluate energy policies and programs that conserve resources, protect the environment, ensure energy reliability, enhance the state's economy, and protect public health and safety.[55] The CEC includes these energy policy recommendations in its biennial Integrated Energy Policy Report (IEPR) that is issued in odd-numbered years with update reports in even-numbered years.

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55 Pub. Resources Code § 25301(a).

The 2019 IEPR, adopted by the CEC on February 20, 2020, placed special emphasis on building decarbonization. The IEPR stated the following: "Leveraging the decarbonization of the electricity system by transitioning space and water heating in buildings toward highly efficient electric appliances, coupled with strategies to enable greater ability to shift when energy is consumed, will be key to reducing emissions from buildings." "Codes and standards development will continue to be a significant pathway for change and improvement." "Future code updates will aim to enable … highly efficient, low-carbon pathways for newly constructed … buildings." (2021 SB 100 Joint Agency Report.)

SB 100 Report. On March 15, 2021, the CEC, CPUC, and CARB published the first joint agency examining how the state's electricity system can become carbon free by 2045 as required by SB 100. The report recognized that all other actions required to accomplish California's society-wide 2045 carbon neutrality goal established by Executive Order B-55-18 must be addressed by the SB 100 2045 carbon free grid, including all vehicle and building decarbonization actions that will be taken by 2045. This would include 100 percent vehicle electrification pursuant to Executive Order N-70-20, all building decarbonization achieved through efficient electric technologies through all building code updates between now and 2045, and the much greater electrification that would be needed to decarbonize the existing building stock. The joint agencies completed a robust analysis of the massive grid improvements that will be necessary to accomplish that. Those improvements include tripling the current capacity of renewable generation that exists in California, including a major expansion of customer owned renewable generation, as well as of utility-scale renewable generation. The improvements also include an expansion of battery resources in the state by 8 times. A major improvement in the demand flexibility of California's buildings will be extremely important to achieving a reliable grid. Customer owned batteries will be an important factor in achieving that. The report cited the important ongoing role of the Building Energy Efficiency Standards in achieving climate change GHG goals through energy efficiency, onsite PV generation, and demand flexibility through battery storage and other means.

Local

Pursuant to Public Resources Code section 25402.1(h)(2) and California Code of Regulations, Title 24, Part 1, sections 10-106, cities and counties may adopt local building energy efficiency standards that reduce energy consumption levels below those set in the state building energy efficiency standards so long as these local standards are cost-effective. After action by local jurisdiction, the CEC must determine whether to approve the changes. Once approved by the CEC, these local energy efficiency standards are implemented in lieu of the Energy Code and represent an important tool for local jurisdictions to meet their specific GHG reduction goals.

Local ordinances have acted as a bellwether for statewide standards, serving as laboratories by providing a place to test market readiness of technologies not mandated by the Energy Code. They drive innovation and can bring down the cost of efficient building technologies. To date, 37 local ordinances that exceed California's 2019 Energy Code have been approved by the CEC.[56] Nineteen of these ordinances have all-electric requirements.[57]

4.4.3 Environmental Impacts and Mitigation Measures

Appendix G of the CEQA Guidelines establishes that a project would result in a potentially significant impact on energy resources due to:

- Wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation; or
- Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

In addition to addressing energy impacts in Appendix G, the CEQA Guidelines in Section 15126.2(b) and Appendix F identify specific energy impacts that a project may have, which are analyzed below as applicable to the 2022 amendments.

a. **Would the project result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?**

Pursuant to Public Resources Code section 25402, the CEC is required to set building design and construction standards for new residential and nonresidential buildings, as well as alterations and additions to existing buildings, that increase efficiency in the use of energy. The project consists of amendments to the Energy Code. The amendments will not result in the approval of any specific construction project. However, because the amendments may change the type and amount of energy consumption in new buildings anticipated to be constructed, this EIR evaluates whether the amendments would result in potentially significant impacts due to wasteful, inefficient, or unnecessary consumption of energy resources compared to new buildings anticipated to be constructed under the current 2019 Energy Code.

1. **The project's energy requirements and its energy use efficiency by amount and fuel type.**

The 2022 amendments include measures that will reduce energy use in single-family, multifamily, and nonresidential buildings. These measures will affect newly constructed buildings by adding new prescriptive and performance standards for electric heat pumps for space conditioning and water heating, as appropriate for the various climate zones in California, requiring PV and battery storage systems for multifamily and selected nonresidential buildings, and establishing efficiency measures for lighting,

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56 Local Ordinances Exceeding the 2019 Energy Code, Docket 19-BSTD-06. Available at https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=19-BSTD-06.

57 Ibid.

building envelope (e.g. insulation in walls, floors, and floors, window improvements, roofing product heat rejection improvements), HVAC, and ventilation for indoor air quality (IAQ). The measures will also require making improvements to reduce the energy loads of certain covered processes, which involves equipment covered by the Energy Code that is not related to the occupant needs in the building, such as refrigeration equipment in refrigerated warehouses, systems serving controlled environment horticulture spaces, or air conditioning for computer equipment in data processing centers.

The Energy Code updates also affect certain types of existing buildings. Specifically, the 2022 amendments expand building "alteration measures" that improve the energy use of existing buildings. These requirements improve the energy performance of "altered components" in existing buildings, which are required to pull building permits and meet building code requirements that specifically apply to them. The 2022 amendments expand alteration measures to many different altered components, including the building envelope, lighting, HVAC, water heating systems, and equipment serving covered processes.

The Energy Code updates would take effect on January 1, 2023. Overall, the 2022 amendments are expected to reduce electricity and fossil fuel natural gas usage when compared to continued compliance with the 2019 Energy Code requirements. Under the 2022 amendments, California buildings would consume approximately ~~198,600~~ 198,200 GWh of electricity and ~~6.14~~ 6.13 billion therms of fossil fuel natural gas in 2023 compared to approximately ~~199,500~~ 199,200 GWh and ~~6.17~~ 6.15 billion therms of electricity and fossil fuel natural gas, respectively, under the 2019 Energy Code. As shown on Table 4.4-1 below, on a statewide basis throughout 2023, all measures for newly constructed buildings and altered components of existing buildings collectively would save approximately ~~33~~ 27 million therms of fossil fuel natural gas and ~~1.3~~ 1.4 billion kWh of electricity.

These measures would save 45 billion-time dependent valuation (TDV, kBTU) in 2023. Time dependent valuation (TDV) is the "common currency" adopted first by the CEC in 2003 as a result of the 2000 electricity crisis and updated every Energy Code cycle to reflect changes to energy systems resulting from adopted state energy policy. This enables time dependent valuation of all fuel types (natural gas, propane, and electricity) for the building standards, combining hourly increases and decreases in each of these fuel types into one overall energy metric. TDV creates the means to determine the value for all measures addressed by the standards, including efficiency, generation, storage, and demand response measures.[58]

While PV and battery storage systems, envelope efficiency measures, and covered process load improvements reduce the use of natural gas, electricity, and TDV energy across all building types, the new prescriptive and performance standards for heat pump technology for water and space heating is expected to result in a modest increase in the total electricity consumed in affected buildings. However, as indicated in Table 4.4-1 below, the increase in electricity resulting from heat pumps would be more than offset by the natural gas savings in the same buildings as shown by the TDV savings. As noted in Table 4.4-1, TDV values are positive for all buildings with space or water heating heat pumps in the standard design.

Table 4.4-1 includes updates from the Draft EIR for the annual number of newly constructed single-family residences in response to comments received from ConSol Company. Specifically, the number of annual new single-family residential construction starts was reduced from 119,045 units per year to 58,052 units per year to better incorporate historical new construction starts for single-family residences. Table 4.4-1 also includes minor changes due to switching the prescriptive requirements for climate zone 10 from heat pump space heating to heat pump water heating. See Final EIR, Section 1.5, Project Updates, discussing Section 150.1 for the basis of this change.

58 E3. 2020. Time Dependent Valuation of Energy for Developing Building Efficiency Standards -- 2022 Time Dependent Valuation (TDV) and Source Energy Metric Data Sources and Inputs. Energy+Environmental Economics. TN#233345 Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=233345&DocumentContentId=65837.

Table 4.4-1

2022 Energy Code First Year Therms, kWh, and TDV Savings

Building Types and Measures	Therms	kWh	TDV, kBTU
Newly Constructed Single Family Heat Pump Measures	6,186,178 ~~12,685,939~~	-61,067,031 ~~-125,227,444~~	259,199 ~~531,549~~
Newly Constructed Multifamily Heat Pump Measures	696,820	-6,715,355	38,181,271
Newly Constructed Nonresidential Heat Pump Measures	2,003,424	-15,451,367	90,885,902
Newly Constructed Multifamily Solar PV System + Battery Storage	0	89,670,588	2,067,940,104
Newly Constructed Nonresidential Solar PV System + Battery Storage	0	363,116,456	8,398,509,628
Newly Constructed Multifamily Efficiency – All Prototypes	420,348	3,393,407	276,449,300
Newly Constructed Nonresidential Efficiency – All Prototypes	1,621,790	107,381,502	2,104,611,447
Newly Constructed Covered Processes	5,186,000	348,338,000	10,268,754,846
Alterations Single Family – All Buildings	701,000	189,720,000	7,368,900,000
Alterations Multifamily – All Buildings	219,112	13,047,528	510,978,915
Alterations Nonresidential – All Buildings	9,769,295	381,396,210	13,952,395,356
Grand Totals – All Buildings	26,803,967 ~~33,303,728~~	1,412,829,938 ~~1,348,669,525~~	45,077,865,968 ~~45,078,138,318~~

Source: Appendix B

The electricity savings from measures for both newly constructed buildings and alterations to existing buildings, including PV and battery storage, efficiency measures, and reductions in covered process loads, would strongly outweigh the relatively small increase in electricity used by heat pumps of approximately ~~147~~ 83 million kWh, resulting in a net statewide electricity reduction of ~~1.3~~ 1.4 billion kWh in 2023. As such, the project does not result in wasteful, inefficient, or unnecessary consumption of energy. Given that the 2022 amendments would result in an overall reduction in the use of energy resources, in the form of both electricity and natural gas, the project's impacts on energy resources is less than significant.

Required Mitigation Measures: None

2. **The effects of the project on local and regional energy supplies and on requirements for additional capacity.**

The project is a change to existing building design and construction requirements that are applicable statewide. The 2022 amendments will increase electrification of new buildings while reducing the use of natural gas within the state by providing a mix of requirements and incentives for builders to install efficient electric appliances. Therefore, over time, the project does have a potential to indirectly impact the mix of energy supply in the state.

Independent of the project, California's electric utilities are required to steadily increase supply and capacity to shift to renewable energy resources and greater use of electricity as identified in the laws and policies noted in the Regulatory Setting. These include increasing the amount of renewable and zero carbon energy sources required by SB 100 and the state's RPS requirements. The RPS requires load serving entities (LSEs) in the state to achieve escalating procurement targets. LSEs were required to procure increasing amounts of renewable electricity each year ramping up to achieve at least 33 percent of retail sales by December 31, 2020 increasing to 60 percent by 2030. After 2030, the 60 percent RPS requirement continues along with the added SB 100 goal to supply renewable and zero-carbon resources for the remaining 40 percent of California delivered electricity. SB 100 will impact the implementation of electric power facilities through 2045. The SB 100 Joint Agency Report: Charting a path to a 100 percent Clean Energy Future, estimates an increased utility-scale capacity of 145 GW by 2045, which includes in state and out of state renewable sources and energy storage.[59]

In addition, the Integrated Resource Plan and Long Term Procurement Plan (IRP-LTPP) adopted by the CPUC as a part of their implementation of SB 350 includes requirements

59 CEC, CPUC, CARB. 2021. California Energy Commission SB 100 Joint Agency Report Achieving 100 Percent Clean Electricity in California: An Initial Assessment. Report. p. 75. TN#237167. Available at https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=19-SB-100.

relating to RPS targets applicable to IOUs[60], and PUC Section 9621 requires POUs to adopt an IRP that ensures the POU procures at least 50 percent eligible renewable energy resources by 2030, consistent with PUC Article 16 (commencing with Section 399.11)[61].

Therefore, given the existing increase in renewable energy resources and the decrease in energy demand the project will have over the existing standards, the project would have less than significant impacts on local or regional energy supplies or capacity.

Required Mitigation Measures: None

3. **The effects of the project on peak and base load period demands for electricity and natural gas.**

The project will not increase summer peak demand due to the energy efficiency improvements and new PV and battery system requirements. Use of heat pump equipment for space heating does not alter anticipated electricity demand for space cooling, and the improved building energy efficiency associated with the 2022 amendments will reduce total demand and peak demand relative to the environmental setting.

Any winter peak demand impacts from this project can be met with existing in-state under-utilized thermal capacity[62]. The California thermal fleet is becoming more efficient over time.[63] The expected incremental winter capacity from this project is small enough to not trigger the use of any of California's less efficient thermal generation. During the winter period, this project is expected to only utilize the unused capacity from the most efficient thermal capacity. At the same time any increases in electricity demand this project creates also increases the eligible retail sales for which California utilities will have to procure renewable energy generation in order to comply with RPS targets. Considering the long-term impacts of this project, SB 100 objectives will ensure any near-term increases in utilization of current carbon emitting capacity will be offset by renewable energy and other zero carbon energy sources. This supports the conclusion that the 2022 amendments to the Energy Code do not result in wasteful,

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60 CPUC. Integrated Resource Plan and Long Term Procurement Plan webpage at https://www.cpuc.ca.gov/irp/.

61 CEC. Publicly Owned Utility Integrated Resource Plan webpage at https://www.energy.ca.gov/rules-and-regulations/energy-suppliers-reporting/clean-energy-and-pollution-reduction-act-sb-350-0. (See Publicly Owned Utility Integrated Resource Plan Submission and Review Guidelines – PDF)

62 CEC Staff. 2020. Thermal Efficiency of Natural Gas-Fired Generation in California: 2019 Update. Staff report. TN#233380. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=233380&DocumentContentId=65895.

63 Ibid. See Figure 1.

inefficient, or unnecessary consumption of energy, and impacts on energy resources are less than significant.

Required Mitigation Measures: None

b. Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

The project would not conflict or obstruct a state or local plan setting forth renewable energy or energy efficiency requirements. The amendments include requirements for newly constructed buildings, including new prescriptive and performance standards for electric heat pump technology for space or water heating, requiring PV and battery storage systems for high-rise residential and selected nonresidential buildings, establishing efficiency measures for lighting, building envelope and HVAC, and making covered process load improvements, as well as requirements to improve the energy performance of altered components in existing buildings. All these measures are consistent with the CEC's responsibility to set building design and construction standards that increase efficiency in the use of energy and with the state's goal to decarbonization of energy use in new and existing buildings.

Cities and counties may adopt local building energy efficiency ordinances that reduce energy consumption levels even lower than the statewide standards set in the Energy Code, so long as these local ordinances are cost-effective. Thus, local jurisdictions can establish more stringent standards in the form of local reach codes for increased energy efficiency, renewable energy, or increased reliance on electric technologies. Forty-two local jurisdictions have adopted local ordinances that exceed California's 2019 Energy Code.

Given that the 2022 amendments to the Energy Code further state and local plans for renewable energy and energy efficiency, the project's impact on energy resources is less than significant.

Required Mitigation Measures: None

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4.5 Greenhouse Gas Emissions

This section describes the project's environmental and regulatory setting and discusses potential GHG emissions impacts associated with 2022 amendments to the Energy Code using the approach to determining the significance of impacts from GHG emissions specified in CEQA Guidelines section 15064.4. The 2022 amendments focus on updating regulatory standards and compliance options related to building energy efficiency. The 2022 amendments would not approve or result in additional specific construction projects. Overall, the amendments that comprise the Energy Code updates would have no significant impacts on California's GHG emissions.

Global warming is a public health and environmental concern around the world. As global concentrations of atmospheric GHGs rise, increases in global temperatures, weather extremes, and air pollution concentrations also occur. Global warming and climate change have been observed to contribute to poor air quality, rising sea levels, melting glaciers, stronger storms, more intense and longer droughts, more frequent heat waves, increases in the number of wildfires and their intensity, and other threats to human health (Intergovernmental Panel on Climate Change (IPCC) 2007).

4.5.1 Environmental Setting

Unlike emissions of criteria and toxic air pollutants, which can have potential local or regional direct impacts, emissions of GHGs can have a much broader, global indirect impact. Global warming associated with the "greenhouse effect" is a process whereby GHGs accumulating in the atmosphere contribute to an increase in the temperature of the earth's atmosphere. The anthropogenic GHGs that contribute to global warming and climate change include CO_2, methane (CH_4), nitrous oxide (N_2O), black carbon, and fluorinated gases (F-gases). The F-gases are hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). These GHGs are attributable in large part to anthropogenic, or human, activities associated with transportation, industrial/manufacturing, utility, residential, commercial, and agricultural sectors (CARB 2014, page 14). The anthropogenic GHGs that contribute to global warming and climate change include CO_2, CH_4, N_2O, black carbon, and F-gases. The F-gases are HFCs, PFCs, and SF_6.

Each GHG has its own potency and effect upon the earth's energy balance, expressed in terms of a global warming potential (GWP), with CO_2 being assigned a value of 1. Specifically, the GWP is a measure of how much energy the emissions of one ton of a gas will absorb over time, relative to the emissions of one ton of CO_2. The larger the GWP, the more that a given gas warms the earth compared to CO_2 over the same time period, usually 100 years. The F-gases are sometimes called high-GWP gases because, for a given amount of mass, they trap substantially more heat than CO_2. For example, according to the Fifth Assessment Report (AR5) of the IPCC 2013, CH_4 has a GWP of 28 over 100 years, which means that it has a global warming effect 28 times greater than CO_2 on an equal-mass basis (CARB 2014, page 16).

To analyze GHG impacts when multiple GHGs are involved, gases other than carbon dioxide must be converted into their CO_2e. The CO2e for a source is obtained by multiplying each quantity of emitted GHG by its GWP and then adding the results together to obtain a single, combined emission rate representing all emitted GHGs in terms of CO_2e.

California and the United States contribute to global GHG emissions. The total gross California GHG emissions in 2016 were about 430 million metric tons of carbon dioxide equivalent ($MMTCO_2e$) emissions (CARB 2018). The largest source of GHG emissions in California is transportation, followed by industrial activities and in state and out of state electricity generation (CARB 2018). In 2016, total gross U.S. greenhouse gas emissions were about 6,510 $MMTCO_2e$ (U.S. EPA 2018).

4.5.2 Regulatory Background

Federal

Endangerment Finding and Cause or Contribute Finding. In April 2007, the U.S. Supreme Court held that GHG emissions are pollutants within the meaning of the Clean ACAA). In reaching its decision, the Court also acknowledged that climate change results, in part, from anthropogenic causes.[64] The Supreme Court's ruling paved the way for the regulation of GHG emissions by the U.S. EPA under the CAA.

In response to this Supreme Court decision, on December 7, 2009, the U.S. EPA Administrator signed two distinct findings regarding GHGs under the CAA, section 202(a):

- Endangerment Finding: That the current and projected concentrations of the GHGs in the atmosphere threaten the public health and welfare of current and future generations; and
- Cause or Contribute Finding: That the combined emissions of GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution, which threatens public health and welfare.

U.S. EPA has also enacted regulations for GHG reporting, the phase-out and banning of high global warming potential chemicals, and stationary GHG emissions source permitting. However, the amendment to the Energy Code would not be subject to any of these federal regulations.

64 *Massachusetts et al. v. Environmental Protection Agency* (2007) 549 U.S. 497.

State

SB 1078. California Renewable Portfolio Standards Program[65] established the RPS for electricity supply. The RPS required that retail sellers of electricity, including publicly owned utilities and community choice aggregators, provide 20 percent of their supply from renewable sources by 2017. As of 2020, utilities in California are required to demonstrate procurement of renewable energy resources sufficient to meet 33 percent of each utility's retail sales. By 2030, this requirement increases to 60 percent of each utility's retail sales. The RPS affects the impacts of the Energy Code by increasing the percentage of renewable generation consumed in the state, which has a different operational and environmental profile than non-renewable sources.

Global Warming Solutions Act of 2006. In 2006, the California State Legislature enacted the Global Warming Solutions Act of 2006, or AB 32, which provides the framework for regulating GHG emissions in California. This law requires the CARB to design and implement emission limits, regulations, and other measures such that statewide GHG emissions are reduced in a technologically feasible and cost-effective manner to 1990 levels by 2020.

Regulation for the Mandatory Reporting of Greenhouse Gas Emissions. One key regulation resulting from AB 32 was CARB's Regulation for the Mandatory Reporting of Greenhouse Gas Emissions, which came into effect in January 2009. It requires annual GHG emissions reporting from electric power entities, fuel suppliers, CO_2 suppliers, petroleum and natural gas system operators, and industrial facilities that emit 10,000 $MTCO_2e$/yr from stationary combustion or process sources.

AB 32 Scoping Plan & Update. Part of CARB's direction under AB 32 was to develop a Scoping Plan that contains the main strategies California will use to reduce GHG emissions that cause climate change. CARB first approved the AB 32 Scoping Plan in 2008 and released its first update in 2014. The Scoping Plan includes a range of GHG reduction actions, which include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, market-based mechanisms such as a cap-and-trade system, and an AB 32 cost of implementation fee regulation to fund the program. In December 2007, CARB set the statewide 2020 emissions limit, defined as reducing emissions to 1990 levels, at 427 million metric tons of CO_2e ($MMTCO_2e$). The May 2014 First Update to the Climate Change Scoping Plan adjusted the 1990 emissions estimate and the statewide 2020 emissions limit goal to 431 $MMTCO_2e$ (CARB 2014). The California Building Energy Efficiency Standards have been identified as a key means of accomplishing climate change GHG reductions in the Scoping Plan.

SB 2. In April 2011, SB 2 of the First Extraordinary Session (SB X1-2) was signed into law. SB X1-2 expressly applies the new 33 percent Renewables Portfolio Standard by

65 Senate Bill 1078 (Sher, Chapter 516, Statutes of 2002).

December 31, 2020, to all retail sellers of electricity and established renewable energy standards for interim years prior to 2020.

Executive Order B-30-15. On April 29, 2015, former Governor Brown issued Executive Order B-30-15, directing state agencies to implement measures to reduce GHG emissions 40 percent below their 1990 levels by 2030 and to achieve the previously-stated goal of an 80 percent GHG reduction by 2050.

SB 32 and AB 197. On September 8, 2016, SB 32, codified as Section 38566 of the Health and Safety Code, was enacted. It extends California's commitment to reduce GHG emissions by requiring the state to reduce statewide GHG emissions by 40 percent below 1990 levels by 2030. A companion bill, AB 197, assures that the state's implementation of its climate change policies is transparent and equitable, with the benefits reaching disadvantaged communities.

SB 350. On October 7, 2015, SB 350 was signed into law, establishing new clean energy, clean air, and greenhouse gas reduction goals for 2030 and beyond. SB 350 increases California's renewable electricity procurement goal from 33 percent by 2020 to 50 percent by 2030.

Short Lived Climate Pollutant Reduction Strategy. In an effort to best support reduction of GHG emissions consistent with AB 32, CARB released the Short Lived Climate Pollutant (SLCP) Reduction Strategy in March 2017. This plan, required by SB 1383,[66] establishes targets for statewide reductions in SLCP emissions of 40 percent below 2013 levels by 2030 for methane and hydrofluorocarbons and 50 percent below 2013 levels by 2030 for anthropogenic black carbon (CARB 2017b). The SLCP Reduction Strategy was integrated into the 2017 update to CARB's Scoping Plan.

2017 Scoping Plan Update. CARB updated the AB 32 Scoping Plan in 2017 (CARB 2017a). This update is guided by the goal of achieving California GHG emissions 40 percent below 1990 emissions by 2030. CARB is also working to achieve carbon neutrality by 2045 to implement the former governor's Executive Order B-55-18.

SB 100. The 100 Percent Clean Energy Act signed into law on September 10, 2018, advances the state's RPS target to 44 percent of retail sales by December 31, 2024, 52 percent by December 31, 2027, and to 60 percent by December 31, 2030 and requires all state agencies to incorporate these targets into their relevant planning. SB 100 also established a target for renewable and zero-carbon resources to supply 100 percent of retail sales and 100 percent of electricity procured to serve all state agencies by December 31, 2045.

AB 3232. Signed into law on September 13, 2018, AB 3232 requires the CEC to assess the potential for the state to reduce the emissions of greenhouse gases from the state's residential and commercial building stock by at least 40 percent below 1990 levels by

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66 Senate Bill 1383 (Lara, Chapter 395, Statutes of 2016).

January 1, 2030. The bill states that decarbonizing California's buildings is essential to achieve the state's greenhouse gas emission reduction goals at the lowest possible cost. The bill establishes that it is the intent of the Legislature to achieve significant reductions in the emissions of greenhouse gases by the state's residential and commercial building stock by January 1, 2030.

Executive Order B-55-18. On September 10, 2018, former Governor Brown issued Executive Order B-55-18. This executive order directed CARB to work with other state agencies to identify and recommend measures to achieve carbon neutrality as soon as possible, and no later than 2045, and to maintain and achieve negative emissions thereafter.

Executive Order N-19-19. On September 20, 2019, Governor Gavin Newsom signed Executive Order N-19-19, in the face of inaction on climate change from the federal government, calling for a concerted commitment and partnership by government, the private sector, and California residents to reach some of the strongest climate goals in the world. The Order required every aspect of state government to redouble its efforts to reduce greenhouse gas emissions and mitigate the impacts of climate change while building a sustainable, inclusive economy.

Executive Order N-79-20. On September 23, 2020, Governor Gavin Newsom signed Executive Order N-79-20 requiring sales of all new passenger vehicles to be zero-emission by 2035, all medium-and heavy-duty vehicles by 2045 for all operations where feasible, and drayage trucks by 2035.

2019 Integrated Energy Policy Report. The 2019 IEPR, adopted by the CEC on February 20, 2020, placed special emphasis on building decarbonization. The IEPR stated the following: "Leveraging the decarbonization of the electricity system by transitioning space and water heating in buildings toward highly efficient electric appliances, coupled with strategies to enable greater ability to shift when energy is consumed, will be key to reducing emissions from buildings." "Codes and standards development will continue to be a significant pathway for change and improvement." "Future code updates will aim to enable … highly efficient, low-carbon pathways for newly constructed … buildings."

2021 SB 100 Joint Agency Report: ***Achieving 100 Percent Clean Electricity in California: An Initial Assessment.*** On March 15, 2021 the CEC, CPUC, and CARB published the first joint agency examining how the state's electricity system can become carbon free by 2045 as required by SB 100. The report recognized that all other actions required to accomplish California's society wide, 2045 carbon neutrality goal established by Executive Order B-55-18 must be addressed by the SB 100 2045 carbon free grid, including all efforts to vehicle and building decarbonization actions that will be taken by 2045. This would include 100 percent vehicle electrification pursuant to Executive Order N-79-20, all building decarbonization achieved through efficient electric technologies through all building code updates between now and 2045, and the much greater electrification that would be needed to decarbonize the existing building stock.

The joint agencies completed a robust analysis of the massive grid improvements that would be necessary to accomplish that. Those improvements include tripling the current capacity of renewable generation that exists in California, including major expansion of customer owned renewable generation as well as of utility-scale renewable generation. The improvements also include expansion of battery resources in the state by eight times. Extremely important to achieving a reliable grid will be major improvement in the demand flexibility of California's buildings; customer owned batteries will be an important factor in achieving that. The report cited the important ongoing role of the Building Energy Efficiency Standards in achieving climate change GHG goals through energy efficiency, onsite PV generation, and demand flexibility through battery storage and other means.

4.5.3 Environmental Impact and Mitigation Measures

Appendix G of the CEQA Guidelines establishes that a project would result in potentially significant GHG impacts if it would:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

Significance Criteria

The principal guidance for determining the significance of GHG emissions impacts is CEQA Guidelines section 15064.4. Under Section 15064.4, a lead agency "*shall* make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate, or estimate the amount of greenhouse gas emissions from a project." Once a project's GHG emissions are quantified, the lead agency has the discretion to analyze those emissions either quantitatively, qualitatively, or both.[67] Section 15064.4 further provides that a lead agency should focus its analysis on the reasonably foreseeable incremental contribution of the project's emissions to the effects of climate change and consider a timeframe that is appropriate for the project.[68] The agency's analysis also must reasonably reflect evolving scientific knowledge and state regulatory schemes.[69] The analysis can also utilize a model or methodology to estimate greenhouse gas emissions resulting from a project, at the discretion of the lead agency, "to enable decision makers to intelligently take into account the project's incremental contribution to climate change."[70] Finally, Section 15064.4 includes a nonexclusive list of

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67 CEQA Guidelines, § 15064.4(a).

68 CEQA Guidelines, § 15064.4(b).

69 Ibid.

70 CEQA Guidelines, § 15064.4(c).

factors a lead agency should consider when determining the significance of a project's impacts from GHG emissions on the environment:

(1) The extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting;

(2) Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project; and

(3) The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions.[71]

In analyzing the potential GHG emissions impacts from the 2022 amendments, the CEC has undertaken both a quantitative and a qualitative approach. Because the CEC is not aware of any threshold of significance that would apply to the project, the focus of this analysis is on the first and third of these factors.

a. Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

The use of California buildings results in GHG emissions from on-site combustion of fuels for water and space heating and for cooking. Additionally, on-site electricity use can result in the generation and distribution of electricity at renewable and fossil-fuel power plants, resulting in GHG emissions.

The 2022 amendments include measures that will reduce energy use in single-family, multifamily, and nonresidential buildings. These measures will:

(1) Affect newly constructed buildings by adding new prescriptive and performance standards for electric heat pumps for space conditioning and water heating, as appropriate for the various climate zones in California,

(2) Require PV and battery storage systems for newly constructed multifamily and selected nonresidential buildings,

(3) Update efficiency measures for lighting, building envelope, HVAC, and

(4) Make improvements to reduce the energy loads of certain equipment covered by (i.e., subject to the requirements of) the Energy Code that perform a commercial process that is not related to the occupant needs in the building (such as refrigeration equipment in refrigerated warehouses, or air conditioning for computer equipment in data processing centers).

As described more fully in the **Chapter 3 Project Description**, this EIR utilizes a modeled baseline to conduct a quantitative GHG analysis that incorporates the impacts

71 CEQA Guidelines, § 15064.4(b); See also *Association of Irritated Residents v. Kern County Board of Supervisors* (2017) 17 Cal.App.5th 708, 733-734.

of the 2019 Energy Code in 2023, when the requirements of the proposed 2022 amendments would take effect. This modeled baseline forecasts the number of anticipated building construction starts for year 2023 and the anticipated GHG emissions from those new buildings, which would be subject to the 2019 Energy Code if the project is not approved. The results of the forecast are then compared to the GHG emissions from the new buildings constructed in 2023 under the 2022 Energy Code to provide information about potential impacts on GHG emissions if the project is approved.

Under the amendments, on a statewide basis in the year 2023, all measures for newly constructed buildings and altered components of existing buildings, collectively, would save approximately ~~33~~ <u>27</u> million therms of fossil fuel natural gas and ~~1.3~~ <u>1.4</u> billion kWh of electricity, which result in net reductions of GHG emissions for 2023. (See **Table 4.5-1**.)

The project's net reduction in emissions was determined based on analysis of the carbon intensity of the current and future electricity systems, including the trend in decreasing carbon intensity of the statewide electricity production between the base year of 2019 and 2045 (the target year for SB 100 for fully transitioning to renewable sources for commercially produced electricity), consistent with state policies described above. In addition, the analysis assumes a decrease in carbon intensity of the natural gas used in the state. Specifically, renewable gas is blended into the retail gas pipeline, reaching 10 percent biogas by 2030 and 20 percent by 2050. In addition, pipeline natural gas is assumed to have 7 percent hydrogen by 2050. This blend is used for retail natural gas consumption but not in the natural gas used for electricity generation. (See E3 2020, p. 104.)

The 2022 amendments are expected to cause a change in the source of power for water and space heating in new construction. Currently, natural gas and propane are used primarily for these purposes. Under the 2022 amendments, electric heat pumps for space heating in some building applications and climate zones in California and for water heating in building applications and climate zones are expected to be the primary method used to comply with the amended building standards. This change in fuel source would decrease natural gas and propane consumption in new construction while correspondingly increasing electricity consumption across all resource technologies and fuels. The table below show the expected net change due to the proposed project, reflecting an overall increased use of electricity and a decreased use of fossil fuels.

<u>**Table 4.5-1** below include updates from the Draft EIR for the annual number of newly constructed single-family residences in response to comments received from ConSol Company. Specifically, the annual number of new single-family residential construction starts was reduced from 119,045 units per year to 58,052 units per year to better incorporate historical new construction starts for single-family residences. **Table 4.5-1** also includes minor changes due to switching the prescriptive requirements for climate</u>

zone 10 from heat pump space heating to heat pump water heating. See Final EIR, Section 1.5, Project Updates, discussing Section 150.1 for the basis of this change.

Table 4.5-1
Typical Greenhouse Gas Emissions (1) from California's Building Sector For 2019 (BAU) and 2022 Energy Code
(in metric tons of carbon dioxide equivalent emissions per year)

	BAU (2) (2019 Energy Code)	**2022 (3) Energy Code**	**Program Reductions**
New Construction Single Family Heat Pumps (standard design)	170,759 ~~350,175~~	144,765 ~~300,295~~	25,994 ~~49,880~~
New Construction Multifamily (includes Heat Pumps, Photovoltaics/Batteries, and Efficiency Upgrades)	110,925	98,806	12,119 (a)
New Construction Nonresidential Upgrades (includes Heat Pumps, Photovoltaics/Batteries and Efficiency Upgrades)	387,784	325,786	61,998 (b)
New Construction Covered Processes	1,863,742	1,781,051	82,691
Alterations to Existing Buildings Nonresidential	40,642,011	40,527,486	114,525
Alterations to Existing Buildings Single Family Residences	31,202,701	31,170,114	32,587
Alterations to Existing Buildings Multifamily Residences	6,957,567	6,953,236	4,331
Totals (metric tons CO2e)	**81,335,489** ~~**81,514,905**~~	**81,001,245** ~~**81,156,775**~~	**334,244** ~~**358,130**~~
Totals (million metric tons CO2e)	81.34 ~~81.51~~	81.00 ~~81.16~~	0.33 ~~0.36~~

(1) These values include carbon dioxide emissions and methane, converted to carbon dioxide equivalents.
(2) "BAU" values represent emissions in a typical future year, starting in 2023. BAU assumes the 2019 Energy Code remains in effect and the 2022 Energy Code is not implemented.
(3) "2022" represents emissions in future years, starting in 2023 and assuming the 2022 Energy Code is in full effect for one full year.
(a) Multifamily Program Reductions in metric tons of CO2e are as follows: Heat Pumps = 2,388; Photovoltaics/Batteries = 6,757; Efficiency Upgrades = 2,974
(b) Nonresidential Upgrades Program Reductions in metric tons of CO2e are as follows: Heat Pumps = 7,164; Photovoltaics/Batteries = 29,208; Efficiency Upgrades = 25,626

In addition to considering the immediate impacts of the proposed 2022 amendments, the CEC analyzed the impacts from increased electricity use. The increased use of electricity would occur while there is a corresponding reduction in CO_2e emissions due to decreased natural gas and propane used for space and water heating. **Table 4.5-2** shows net changes in emissions of GHG emissions associated with the generation of electricity and the refrigerants (high GWP gases) used in heat pumps for heating and cooling compared to those resulting from air conditioning alone. The total shows that the net effect is a statewide reduction in GHG emissions from the base year in 2019 through 2050. See Appendix B for a more detailed description of the effects of 2022 amendments that are summarized in the table below. Values in **Table 4.5-2** were also updated to correct a minor double-counting error that was discovered while preparing responses to comments. The corrected cell equations are identified with comments in the final spreadsheet (TN#239152) and the updated values for both the change in the number of annual starts in single-family housing and the resolution of the double-counting error are in the table below. **Table 4.5-2** also includes minor changes due to switching the prescriptive requirements for climate zone 10 from heat pump space heating to heat pump water heating. See Final EIR, Section 1.5, Project Updates, discussing Section 150.1 for the basis of this change.

Table 4.5-2

Changes in Gross Greenhouse Gas Emissions

From California's Building Sector (Million Metric Tons CO2e)

GHG Emission Sources	2025	2030	2035	2040	2045	2050
Natural gas and electricity emissions from space and water heating	80.00 ~~79.46~~	78.44 ~~77.10~~	76.76 ~~74.52~~	75.74 ~~72.99~~	75.56 ~~72.78~~	74.31 ~~70.89~~
Heat pump refrigerant leaks (high GWP gases)	0.04 ~~0.06~~	0.10 ~~0.16~~	0.16 ~~0.27~~	0.22 ~~0.37~~	0.28 ~~0.47~~	0.34 ~~0.58~~
Total GHGs	80.03 ~~79.52~~	78.54 ~~77.26~~	76.91 ~~74.79~~	75.95 ~~73.36~~	75.84 ~~73.26~~	74.65 ~~71.46~~

(1) The columns may not add exactly due to rounding of values from the source spreadsheet.

Therefore, the project would result in a reduction of GHGs and thus would have a less than significant impact on the emissions of GHGs.

Required Mitigation Measures: none.

b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

For the determination of whether the amendments would conflict with any plan, policy, or regulation adopted for the purpose of reducing GHG emissions, the CEC performed a qualitative analysis. As described above, the state of California has adopted a suite of laws and regulations to address the global nature of the issue of GHG emissions and climate change, including the Global Warming Solutions Act of 2006 (AB 32) (2020 target),[72] AB 32 2008, 2014, and 2017 Scoping Plans (2020 and 2030 targets),[73] Executive Order B-30-15 (2030 and 2050 targets),[74] RPS,[75] Clean Energy and Pollution Reduction Act of 2015 (SB 350),[76] SB 32 (2030 targets),[77] and the 100 Percent Clean Energy Act of 2018 (SB 100) (2026, 2030, 2045 targets).[78] Each of these has been considered in detail and is more thoroughly discussed in the regulatory setting above, and many of these plans and policies have specifically cited the Building Energy Efficiency Standards as a critical part of meeting the state's GHG reduction goals. In combination, the programs and policies resulting from these laws have led and will continue to lead to significant vehicle and building decarbonization within California. The 2022 amendments support and further California's plans, policies, and regulations adopted for the purpose of reducing GHGs and mitigating the effects of climate change. The 2022 amendments accomplish this by reducing the reliance of California buildings on natural gas and propane to provide space and water heating for residential and nonresidential uses, expanding distributed PV generation and battery storage, and introducing numerous new building energy efficiency measures. As shown above in **Tables 4.5-1** and **4.5-2**, the project would result in reductions of GHG emissions compared to inaction and the continuation of the existing Energy Code. Therefore, the 2022 amendments would not have a significant impact on GHG emissions and would not conflict with any plan, policy, or regulation that would further reduce GHG emissions.

Required Mitigation Measures: none.

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72 Health & Saf. Code § 38500 *et seq*.

73 *Center for Biological Diversity v. Department of Fish & Wildlife* (2015) 62 Cal.4th 204, 253-254.

74 Pub. Util. Code, § 399.11 et seq.

75 Ibid.

76 Senate Bill 350 (de Leon, Chapter 547, Statutes of 2015); See also Pub. Util. Code, § 9621 et seq.

77 Senate Bill 32 (Pavley, Chapter 249, Statutes of 2016); See also Gov. Code, § 14000.6 et seq.

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The Climate Registry (TCR). 2018. 2018 Climate Registry Default Emission Factors. Report. Available at https://www.theclimateregistry.org/wp-content/uploads/2018/06/The-Climate-Registry-2018-Default-Emission-Factor-Document.pdf. Accessed May 2021.

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4.6 Hazards and Hazardous Materials

This section describes the 2022 amendments' environmental and regulatory setting and discusses potential direct and indirect impacts associated with the Energy Code updates specific to hazards and hazardous materials.

4.6.1 Environmental Setting

The 2022 amendments are a set of regulations that require energy efficient designs, features, equipment, and practices in new construction and additions and alterations occurring within California. As these amendments apply statewide, the setting of the 2022 amendments to the Energy Code is the entire state of California. As California's population grows, every year hundreds of thousands of new buildings are constructed, added on to, or remodeled. The 2022 amendments do not regulate the pace of construction but instead requires that construction that does occur meets specified energy efficiency standards. Therefore, to focus on changes that would be attributable to the 2022 amendments, this chapter evaluates the potential for increases in statewide hazards and hazardous materials from the proposed 2022 amendments compared to the existing state of hazards and hazardous materials associated with buildings in California under the current building design and construction requirements of the 2019 Energy Code.

Changes in Demand for Energy Storage and Lithium Ion Batteries

The proposed Energy Code changes 2022 amendments would incorporate battery storage systems into specific nonresidential, high-rise residential, hotel, and motel building requirements.[79] Battery storage equipment relies most commonly on use of lithium ion batteries for their operation (NREL 2019). Currently, the Energy Code does not require battery storage for these kinds of buildings, although some buildings in California are being built with lithium ion battery storage in absence of any requirements to incorporate this technology. According to the California Solar and Storage Association (CALSSA), more than 10,000 California customers installed battery storage systems for a combined 138 MW of installed energy storage in 2019. This 2019 figure reflects a 27 percent increase from 2018 and approximately triple the energy storage capacity installed in 2017. (~~CEC 2021~~Athalye et al. 2021). Other estimates of recent small-scale (less than 1 MW) distributed energy storage installation in recent years have been even higher, including one report that the total installed capacity of small-scale distributed energy storage in 2018 was 234 MW, with about half of this coming from the commercial sector (Athalye et al. 2021). The CPUC, under the authority granted by AB 2514, has additionally established an energy storage procurement target of 1,325 MW by 2020. Some of this procurement is already being

79 CEC Staff. 2021. Express Terms 2022 Energy Code, Title 24 Parts 1 and 6. California Energy Commission. Section 140.10, Table 140.10-B, p. 314. TN#237717. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237717.

met by utility procurement of small commercial or behind the meter storage similar to that which would be implemented in accordance with the Energy Code updates. California is in line to meet the mandate by 2024, about the time the Energy Code updates would be implemented. The Energy Code updates' requirement to include these systems in specified buildings can be reasonably anticipated to result in marginal increases in production of lithium ion batteries and routine transport of lithium ion batteries to such construction projects, and recycling or disposal of batteries after their useful life. This would also likely result in a slight increase in generation of hazardous waste, statewide, which could potentially increase the incidence of exposure to battery-related hazardous wastes.

Even with this growth in demand for stationary energy storage, the number of lithium ion batteries required to meet the demand for compliance with the proposed 2022 amendments is expected to be small compared to those needed for electrification of the transportation sector. In September 2020, Tesla stated that to meet their 2030 car production targets they would need 9 times more lithium than the world produced in 2019. Steward et al., 2019, show projections of generation from lithium ion batteries for different applications. Their data shows that lithium ion batteries for the transportation sector (i.e., electric vehicles and buses) are expected to dominate the lithium ion batteries market in the coming years. The trend capacity of lithium ion batteries for transportation is about 75 percent of the total projected to 2025. Other uses such as utility scale and commercial/residential batteries make up the rest (Steward et al, 2019). Therefore, it is anticipated there would only be a marginal increase in lithium ion battery production, use, transport, and disposal attributable to the proposed 2022 amendments over existing conditions. Sizes of minimum solar PV arrays (in kW) and minimum supporting BS (in kWh) for prototypical buildings are identified in Chapter 3 Project Description. System sizes depend on type of building and climate zone the building will be located in.

Lithium Ion Battery Characteristics

In general, a Lithium ion (Li-ion) battery is a rechargeable type of battery consisting of three major functional components: a positive electrode made from metal oxide separated by a thin permeable membrane from a negative electrode made from carbon; and electrolyte solution made from lithium. Lithium ions move from negative to positive electrode during discharging and in the opposite direction when charging. There are five major Li-ion battery sub-chemistries that are commercially available. They are: 1. Lithium Nickel Cobalt aluminum (NCA) 2. Lithium Nickel Manganese cobalt (NMC) 3. Lithium Manganese oxide (LMO) 4. Lithium titanate oxide (LTO) 5. Lithium-iron phosphate (LFP). Li-ion batteries are used as an electrode material for electric vehicles and stationary energy storage facilities due to their low cost, thermal stability, abundance, and lack of toxicity.

Li-ion batteries are ubiquitous throughout consumer and commercial products, and compliance with existing federal and state laws allows them to be safely transported, used, and recycled. Li-ion batteries are, however, regulated as a hazardous material under the U.S. Department of Transportation's Hazardous Materials Regulations.[80]

Li-ion batteries used for industrial and commercial applications must meet stringent testing and safety standards. The failure rates of these types of batteries is relatively low. Improper management of Li-ion batteries could, however, pose an environmental hazard and be a concern for public safety. There have also been cases of non-certified batteries for consumer products, such as vape pens and hoverboards, igniting fires and causing safety concerns.

There are two basic types of battery failures. One involves the processes related to the electrode, permeable membrane or separator, and electrolyte interaction. These failures often involve a recall to correct a manufacturing defect or design flaw. The other is a random event or unique set of circumstances that are due to accidental conditions. It may be a stress event like charging at sub-freezing temperature, overheating in an enclosure, vibration, or perforation of the battery casing due to an unforeseen event. Failures can ignite fires that can be especially difficult to extinguish as temperatures can rapidly increase to up to 500 degrees Celsius (932 degrees Fahrenheit) as a result of interactions between a battery's cathodes and anodes (Battery University, 2018a). The likelihood to overheat or ignite is increased if the batteries are poorly packaged, damaged, or exposed to a fire or a heat source. Although rare, Li-ion batteries are also susceptible to thermal runaway, a chain reaction leading to a violent release of its stored energy.

Lithium is the lightest solid metal. It can be absorbed into the body by inhalation of its aerosol and by ingestion and is corrosive to the eyes, skin, and respiratory tract. Lithium reacts violently with strong oxidants, acids, and many compounds (hydrocarbons, halogens, halons, concrete, sand, and asbestos) causing a fire and explosion hazard. In addition, lithium reacts with water, forming highly flammable hydrogen gas and corrosive fumes of lithium hydroxide. Lithium hydroxide represents a potentially substantial environmental hazard, particularly to water organisms. Li-ion batteries also contain potentially toxic materials including heavy metals, such as copper and nickel, and organic chemicals, like toxic and flammable electrolytes (Zeng et al., 2015). Safety standards such as Underwriters Laboratory 1642 (See also Table 4.6-1 below) ensure batteries meet minimum design specifications based on their intended use and are resistant to puncture, fire, or damage that could cause these hazardous effects. In addition, battery makers are continuing to improve manufacturing methods to enhance safety and increase operating life to make them more competitive.

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80 U.S. Department of Transportation. [Hazardous Materials Regulations webpage](https://www.phmsa.dot.gov/lithiumbatteries) at https://www.phmsa.dot.gov/lithiumbatteries. (49 Code of Federal Regulations, Parts 171-180.)

Lithium Recycling and Disposal

Spent Li-ion batteries that are ready for recycling or disposal are considered 'universal wastes' which includes wastes that contain mercury, lead, cadmium, copper and other substances hazardous to human and environmental health. This characterization generally applies to common examples of universal wastes including televisions, computers, computer monitors, batteries, and fluorescent lamps. In California, universal wastes must either be sent directly to an authorized recycling facility or to a universal waste consolidator for shipment to an authorized recycling or hazardous waste disposal facility.

At the Battery Sustainability Summit in December 2020, American Battery Technology Company stated that 11 million metric tons of Li-ion batteries would be reaching the end of life by 2030. They also pointed out, however, that in 2020 less than 5 percent of the 100,000 tons of disposed Li-ion batteries were recycled (American Battery Technology Co - CTO Ryan Melsert - Battery Recycling an in-depth review. Sep 28, 2020[81]). This means that much of the waste was disposed in landfills or is being stockpiled by owners and transfer facilities. In California, Li-ion batteries installed due to the 2022 amendments if not recycled would be disposed in hazardous waste landfills in California or would be shipped out to other states at the end of their useful life. There are currently two hazardous waste landfills that can be used for disposal in California: the Clean Harbors Buttonwillow Landfill Facility and the Waste Management Kettleman Hills Facility. In 2014, the [Kettleman Hills Facility was approved] for a 5.2 Million cubic yard expansion (available at https://www.epa.gov/ca/kettleman-hills). Even with the expansion, California operates near capacity for hazardous waste disposal, and hazardous waste is regularly sent to other states like Arizona, Nevada, and Utah for disposal. This can increase the cost of disposal.

Li-ion batteries are relatively expensive largely due to the cost to produce the metals used in their construction. The most expensive metal of Li-ion batteries is cobalt, which is found in higher performing batteries. The complex processes needed to construct Li-ion batteries also add to the cost. Because of the metals content there is significant value in spent Li-ion batteries; however, since the structure of the battery is complex it can be difficult to efficiently recover the valuable components.

There are recycling facilities that will take Li-ion batteries for recycling but many do not have economically feasible methods for production of high-quality material for reuse. This stems in part from the design of recycling facilities, which may not be specific to Li-ion batteries. Handling of batteries requires discharge, proper storage, and manual disassembly of some components. Costs for consumables coupled with waste disposal required at the end of the process add to the challenges of recycling. Once the metals

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81 American Battery Technology Company. 2020. Battery Recycling an in-depth review. Available at https://www.youtube.com/watch?v=W68VRWhGglY.

are recovered, they are often of such low purity that they cannot be reused in batteries. They go to lower value uses such as greases and glass.

Recycling companies that specialize in metals recovery may use methods such as pyrometallurgy and hydrometallurgy, which rely on thermal and aqueous processes, respectively, to obtain metals from the cathode while the remainder of the battery is lost. Direct recycling involves reconditioning by removing the cathode and anode and placing them in a new battery. Costs and efficiencies for these methods vary. Argonne National Laboratory (January 25, 2018) has conducted modeling analysis considering the full life cycle cost of batteries. Their preliminary findings estimate that a lithium ion battery cell with a recycled cathode could cost 5 percent, 20 percent and 30 percent less than a new cell using pyrometallurgy, hydrometallurgy and direct recycling routes, respectively, according to estimates from Argonne's Greenhouse gases, Regulated Emissions and Energy use in Transportation (GREET) model recycling parameters.[82] That same cell could consume 10 percent, 20 percent and 30 percent less energy, respectively. Additionally, the model considers transportation-related costs and environmental factors, which can help steer the development of a recycling infrastructure. These findings suggest there are environmental and public health benefits that could be incorporated into the value of recycling. Such findings could also be used for development of national or state policies to encourage or require recycling.

Given the current and future volume of batteries that are and will be available, much research is being conducted in this field and significant opportunity for growth in recycling is expected. Markets and Markets (2020) shows the lithium-ion battery recycling market is estimated at $1.5 billion in 2019 and projected to grow from $12.2 billion in 2025 to $18.1 billion by 2030, at a compound annual growth rate of 8.2 percent from 2025 to 2030. They also point out that most battery manufacturing companies have already started recycling Li-ion batteries as there is low accessibility for some of the raw materials such as lithium and cobalt.

The need for recycling may also be driven by the need to secure a stable and consistent supply chain in the U.S. In their Mineral Commodities Summary Report for 2020, USGS shows less than 1 percent of the manganese, nickel, cobalt, and lithium that could be used for batteries was produced in the U.S. Cobalt is the most expensive of the metals and primarily comes from Congo in Africa.[83]

4.6.2 Regulatory Setting

The 2022 amendments do not require the siting, construction, or operation of a project at a specific site, including near or on hazardous waste sites, airports, schools,

82 Argonne National Laboratory. GREET Model webpage at https://greet.es.anl.gov/.

83 Frankel, Todd. September 20, 2016. "The Cobalt Pipeline." News article. Washington Post. Available at https://www.washingtonpost.com/graphics/business/batteries/congo-cobalt-mining-for-lithium-ion-battery/.

emergency evacuation routes or areas where there is increased hazard from wildfire. The amendments would apply to future development projects throughout California that would be granted land development permits from a lead agency after complying with the CEQA, if necessary, and applicable local ordinances.

Local agencies are primarily responsible for enforcing the California Building Standards Code, and ensuring specific projects meet all applicable code requirements such as those found in the Fire, Electrical, and Energy Code. Local agencies are also empowered to make changes to their own building codes to deviate from the California Building Code and impose more restrictive building standards, including but not limited to green building standards, when reasonably necessary for local climatic, geological, or topographical conditions, provided they make those findings required by state building standards law.[84]

Codes and Standards Applicable to Lithium Ion Batteries

There are numerous codes and standards that would apply to installation and operation of lithium battery storage systems at the specified nonresidential, high-rise residential, hotel, and motel buildings set forth in the amendments to the Energy Code. In Article 480 and 706, the California Electrical Code includes requirements for battery storage systems in general and batteries specifically. Section 1206 of the California Fire Code includes standards specifically for fire protection of electrical energy storage systems. The CPUC also implements Interconnection Electric Rule 21 which is a tariff that describes the interconnection, operating and metering requirements for generation facilities and storage to be connected to a utility's distribution system. The tariff provides customers wishing to install generating or storage facilities on their premises with access to the electric grid while protecting the safety and reliability of the distribution and transmission systems at the local and system levels.

Other national and international standards and codes that may apply include those shown in Table 1 below. These standards and codes are designed to ensure safe and reliable operation of electrical systems such as those related to the installation and operations of battery storage systems.

84 Health & Saf. Code §§ 18941.5, 17958.5, and 17958.7; See also Cal. Code of Regs., tit. 24, Part 1, §§ 1.1.8 and 1.8.6.

TABLE 4.6-1
Standards and Codes That May Apply to Lithium Ion Battery Storage Systems

System or Equipment	Standards and Codes
Installation of Stationary Energy Storage Systems	National Fire Protection Association (NFPA) 855
Inverter, Converter, Controllers & Interconnection System Equipment	Underwriters Laboratory (UL) 1741 (Inverter only)
Interconnecting Distributed Resources with Electric Power Systems	Institute of Electrical and Electronics Engineers (IEEE) 1547
Seismic Rating	California Building Code zone designation based on project location - Section 1705A.13.3
Communication	Federal Communications Commission Part 15B Class A
Wire sizing, fuses, and circuit breakers.	National Electric Code 2011 National Fire Protection Association (NFPA) 70
Sizing of a fire suppression system	NFPA 2003
Transportation	UN Manual of Tests and Criteria (UN) Section 38.3, and Department of Transportation, PHMSA Class 9
Harmonic Control in Electrical Power Systems	IEEE 519
Signage of Hazardous Materials for Emergency Response	NFPA 704
Product Safety Signs and Labels	American National Standards Institute (ANSI) Z535
Transformer Standards	ANSI C57
Surge Withstand Capabilities	ANSI C37
Battery Cell safety	UL1642, International Electrotechnical Commission62133, and UN38.3
Battery Module safety	UL1973 and UN38.3

Numerous laws and regulations have also been developed to regulate the management of hazardous materials such as lithium ion batteries. As a result, the storage, use, generation, transport, and disposal of hazardous materials and waste are highly regulated, and compliance with this regulatory framework will reduce or avoid potential environmental impacts associated with hazardous materials. A summary of key regulations and policies is presented below.

Federal

Resource Conservation and Recovery Act. The federal Toxic Substances Control Act (1976) and the Resource Conservation and Recovery Act of 1976 (RCRA) established a program administered by the U.S. EPA for the regulation of the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA was amended in 1984 by the Hazardous and Solid Waste Act, which affirmed and extended the "cradle to grave" system of regulating hazardous wastes. The use of certain techniques for the disposal of some hazardous wastes was specifically prohibited by the Hazardous and Solid Waste Act.

Comprehensive Environmental Response, Compensation, and Liability Act. Congress enacted the federal CERCLA, including the Superfund program, on December 11, 1980. This law provided broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. CERCLA established requirements concerning closed and abandoned hazardous waste sites; provided for liability of persons responsible for releases of hazardous waste at these sites; and established a trust fund to provide for cleanup when no responsible party could be identified. CERCLA also enabled the revision of the National Contingency Plan, which provides guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, and/or contaminants. The National Contingency Plan also established the National Priorities List. CERCLA was amended by the Superfund Amendments and Reauthorization Act on October 17, 1986.

Hazardous Materials Transportation Act (HMTA). Transportation of chemicals and hazardous materials is regulated by the U.S. Department of Transportation (DOT) under the Hazardous Materials Transportation Act (HMTA). Hazardous materials regulations for the types of containers, labeling, record keeping, and other requirements for the commercial movement of materials are contained in the Code of Federal Regulations (49 CFR, §§ 171-177 and 350-399). Transportation requirements vary with the hazard class of each hazardous material.

Federal Aviation Administration Regulations. The Federal Aviation Administration (FAA) has promulgated regulations and policies to protect the safety and compatibility of aircraft operations. Foremost is Part 77 of Federal Aviation Regulations (FAR Part 77), "Objects Affecting Navigable Airspace," which sets forth standards and review requirements for protecting the airspace near airports, particularly by restricting the height of potential structures and minimizing other potential hazards (such as reflective surfaces, flashing lights, and electronic interference) to aircraft approaching or departing an airport. Under FAR Part 77, the FAA must be notified of proposed structures within an extended zone defined by an imaginary slope that radiates out several miles from an airport's runways. Any proposed structure, including buildings, trees, poles, antennae, and temporary construction cranes, which would penetrate this slope, or which would stand 200 feet or more in height irrespective of location relative to an airport, must be submitted to the FAA for an aeronautical review. As the FAA does not have authority to approve or disapprove a proposed off-airport land use, it is the responsibility of local land use jurisdictions to ensure that proposed development complies with the FAR Part 77 notification requirements and resulting FAA-issued determinations (the FAA does have the authority to protect the airspace by modifying flight procedures if feasible and/or restricting use of the airport). The FAA also has policies discouraging potential hazardous wildlife attractants near airports, such as landfills, other trash processing facilities, and waste-water treatment facilities.

State

California Environmental Protection Agency. The California Environmental Protection Agency (CalEPA), created in 1991, unified California's environmental authority in a single cabinet-level agency and brought the CARB, SWRCB, Regional Water Quality Control Boards (RWQCBs), Department of Toxic Substance Control (DTSC), Office of Environmental Health Hazard Assessment, and Department of Pesticide Regulation under one agency. These agencies under the CalEPA "umbrella" provide protection of human health and the environment and ensure the coordinated deployment of state resources. Their mission is to restore, protect and enhance the environment, to ensure public health, environmental quality, and economic vitality.

Department of Toxic Substances Control. DTSC is a department within CalEPA and is the primary agency in California that regulates hazardous waste, cleans up existing contamination, and looks for ways to reduce the hazardous waste produced in California. DTSC regulates hazardous waste in California primarily under the authority of RCRA and the California Health and Safety Code. Other laws that affect hazardous waste are specific to handling, storage, transportation, disposal, treatment, reduction, cleanup, and emergency planning.

Public Resources Code, Article 3, commencing with Section 42450.5.

(AB 2832, Dahle. Recycling: lithium-ion vehicle batteries: advisory group)

These sections of the Public Resources Code required the Secretary for Environmental Protection to convene the Lithium-Ion Car Battery Recycling Advisory Group to review, and advise the Legislature on, policies pertaining to the recovery and recycling of lithium-ion batteries sold with motor vehicles. The bill requires the advisory group to consult with specified entities and, on or before April 1, 2022, to submit policy recommendations to the Legislature aimed at ensuring that as close to 100 percent as possible of lithium-ion batteries in the state are reused or recycled at end-of-life in a safe and cost-effective manner. Although the focus of this group is on vehicle applications, the group's recommendations may contain policies that could also address the reuse and recycling batteries from stationary applications.

The California Hazardous Waste Control Law. CalEPA administers the California Hazardous Waste Control Law to regulate hazardous wastes. The Hazardous Waste Control Law lists 791 chemicals and about 300 common materials that may be hazardous; establishes criteria for identifying, packaging and labeling hazardous wastes; prescribes management controls; establishes permit requirements for treatment, storage, disposal and transportation; and identifies some wastes that cannot be disposed of in landfills.

Department of Resource Recovery and Recycling (CalRecycle). CalRecycle is a department within CalEPA that oversees the state's waste management, recycling, and waste reduction programs. CalRecycle was established in 2010 to replace the California Integrated Waste Management Board. CalRecycle and DTSC share responsibility in implementing regulations in Title 14, Division 7 of the California Code of Regulations for the Electronic Waste Recycling Act of 2003. Certain portions of the electronic waste stream are defined and the systems to recover and recycle them are administratively regulated beyond the universal waste rules that apply to material handling. CalRecycle also enforces California's Mandatory Commercial Recycling Law which requires businesses and other public entities to recycle as much of the waste they generate as possible. The purpose of the program is to reduce GHG emissions by diverting commercial solid waste to recycling efforts and to expand the opportunity for additional recycling services and recycling manufacturing facilities in California.

California Occupational Safety and Health Administration. California Occupational Safety and Health Administration (Cal OSHA) is the primary agency responsible for worker safety related to the handling and use of chemicals in the workplace. Cal OSHA standards are generally more stringent than federal regulations. The employer is required to monitor worker exposure to listed hazardous substances and notify workers of exposure (Title 8, Cal. Code Regs., §§ 337, 340). The regulations specify requirements for employee training, availability of safety equipment, accident-prevention programs, and hazardous substance exposure warnings.

Department of California Highway Patrol. Department of California Highway Patrol is the primary agency responsible for enforcing the regulations related to the transport of hazardous materials on California roads and highways (Title 13, Cal. Code Regs., §§ 1160-1167).

Local

Certified Unified Program Agency (CUPA) Program. The CUPA program was created by SB 1082 (1993) to consolidate, coordinate, and make consistent the administrative requirements, permits, inspections, and enforcement activities for several environmental and emergency management programs. The unified program is intended to provide relief to businesses complying with the overlapping and sometimes conflicting requirements of formerly independently managed programs. A CUPA is a local agency certified by CalEPA to implement and enforce six state hazardous waste and hazardous materials regulatory management programs. These are typically organized as follows:

1. The Hazardous Waste Generator (HWG) program and the Hazardous Waste Onsite Treatment activities;[85]
2. The Aboveground Storage Tank (AST) program Spill Prevention Control and Countermeasure Plan requirements;[86]
3. The Underground Storage Tank (UST) program;[87]
4. The Hazardous Materials Release Response Plans and Inventory (HMRRP) program;[88]
5. California Accidental Release Prevention (CalARP) program;[89] and
6. The Hazardous Materials Management Plans and the Hazardous Materials Inventory Statement (HMMP/HMIS) requirements.[90]

These programs provide for comprehensive identification, characterization, planning, tracking, response, and remediation of hazardous materials due to the maintenance, storage, spill, leakage, or discharge to the environment. They also address strategies for communities to reduce hazardous material use and to recycle or reuse products containing hazardous substances.

4.6.3 Environmental Impacts and Mitigation Measures

Appendix G of the CEQA Guidelines provides that a project would result in a significant impact related to hazards and hazardous materials if the project would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;

85 Health and Saf. Code, Division 20, Chapter 6.5; Cal Code of Regs., tit. 22, Division 4.5.

86 Health & Saf. Code § 25270.5(c).

87 Health & Saf. Code, Division 20, Chapter 6.7; See also Cal. Code of Regs., tit. 23, Chapters 16 and 17.

88 Health and Saf. Code. Division 20, Chapter 6.95, Article 1; See also Cal. Code of Regs., tit. 19, §§ 2620-2734.

89 Health and Saf. Code, Division 20, Chapter 6.95, Article 2; See also Cal. Code of Regs., tit., 19, §§ 2735.1-2785.1.

90 Cal. Code of Regs., tit. 24, Part 9, §§ 2701.5.1 and 2701.5.2.

- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;
- Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, would it create a significant hazard to the public or the environment;
- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, result in a safety hazard or excessive noise for people residing or working in the project area;
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or
- Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.

The 2022 amendments' potential for significant direct or foreseeable indirect environmental impacts related to each of these questions is discussed in order below. Due to the increased transportation, use, and disposal of lithium ion batteries that would result from the 2022 amendments, the analysis below assesses the potential for any hazards and hazardous materials impacts related to battery energy storage systems. Hazards and hazardous materials associated with the other amendments to the Energy Code were also considered and determined to not present any foreseeable direct or indirect potential to increase the risk of environmental harm, personal injury, loss of life, or damage to property from the project.

Amendments to the Energy Code do not approve specific construction projects or regulate the pace or location of future construction. As such, any effects of the amendments would be indirect, occurring only as a result of buildings being constructed in compliance with the proposed Energy Code amendments after they have taken effect. As noted above, the main foreseeable indirect potential impacts derived from these amendments relate to the increase in battery storage systems installed at a specific subset newly built buildings including certain nonresidential, high-rise residential, hotels, motel buildings, and other listed buildings.[91] In preparing this analysis, the CEC considered the other amendments to the Energy Code and determined them to either be beneficial to the environment (e.g., by reducing existing hazards and hazardous materials affiliated with new buildings being built in California) or to have no direct or foreseeable indirect environmental impacts related to hazards and hazardous materials. Accordingly, the other amendments are not discussed in detail, and the focus of this section is on the proposed addition of prescriptive battery

91 CEC Staff. 2021. Express Terms 2022 Energy Code, Title 24 Parts 1 and 6. California Energy Commission. Section 140.10, Table 140.10-B. TN#237717. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237717.

storage requirements in the Energy Code and any foreseeable environmental consequences of these requirements.

The 2022 Energy Code's new battery storage requirement is expected to result in a total of 300 MW of battery storage installed from 2023-2025 (~~CEC 2021~~Athalye et al. 2021).[92] The marginal increase in lithium ion batteries for energy storage systems required by the amendments to the Energy Code could result in an incremental, but ultimately insignificant, increase in potential exposure to lithium, which is considered a hazardous material. The analysis below discusses the potential hazard from increased use of lithium ion batteries from a statewide perspective and concludes that compliance with the comprehensive regulatory framework at the federal, state, and local level would ensure foreseeable potential indirect impacts from the 2022 amendments would be less than significant. The local governing agency would be responsible—through building inspections to ensure building code compliance.

a. **Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?**

Transport and Handling of Lithium Ion Batteries

Hazardous materials that are classified as universal wastes, such as lithium ion batteries, can be handled according to streamlined regulations. The regulations allow generators to handle and transport universal waste under a simple set of rules that are appropriate for the risks posed by the wastes. Large volume generators may be subject to more stringent requirements for transport, storage, and handling of waste. The appropriate methods for storage and handling would be identified in accordance with plans and requirements specified by the CUPA consistent with hazardous waste control law. A licensed professional with the necessary experience and knowledge would develop procedures for the proper identification, characterization, handling and disposal or recycling of hazardous materials generated as a result of a project. Methods for appropriate storage, labeling, and containment would be implemented during delivery, project construction, and operation. When not in use, any hazardous material such as lithium ion batteries would be stored in designated construction staging areas in compliance with local, state, and federal requirements. As wastes are generated, they would be placed, based on CUPA approved plans, in designated areas that offer secure, secondary containment, and/or protection from storm water runoff. Other forms of

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92 CARB. April 14, 2021. California electric vehicle rebate demand exceeds Clean Vehicle Rebate Project funding. News release. Available at https://ww2.arb.ca.gov/news/california-electric-vehicle-rebate-demand-exceeds-clean-vehicle-rebate-project-funding. (Over 145,000 electric vehicles were sold in California 2020. If each of those were a Chevy Bolt (200 HP/150 KW), the total peak MW equivalent of these 145,000 vehicles would be approximately 21,750 MW, or approximately 72.5 times greater than the 300 MW of stationary storage capacity expected to be installed from 2023 to 2025 under the 2022 Energy Code amendments.)

containment may include placing waste in steel bins or other suitable containers pending profiling and disposal or recycling. Regular inspections would be required to observe whether there are any spills or leaks that must be remedied. Compliance with the local agency's CUPA approved plans would ensure that any potential impact from handling and storage of lithium ion batteries resulting from the Energy Code updates is less than significant.

Since there is a long history of hazardous materials such as lithium ion batteries, being routinely transported, it is appropriate to consider the extensive regulatory framework that applies to the shipment of hazardous materials on California highways and roads to ensure safe handling in general transportation (see Federal Hazardous Materials Transportation Law, 49 U.S.C. § 5101 et seq., DOT regulations 49 CFR subpart H, §§ 172–700, and Department of California Highway Patrol enforcement regulations for hazardous cargo). Further, transportation of lithium ion batteries is subject to 49 Code of Federal Regulations section 173.185. These regulations include requirements for prevention of a dangerous evolution of heat; prevention of short circuits; prevention of damage to the terminals; and the requirement that no battery come in contact with other batteries or conductive materials. Adherence to the requirements such as training, safe interim storage, and segregation from other potential waste streams would minimize any public hazard related to transport, use, or disposal. Absent substantial evidence to the contrary, CEQA allows an agency to assume that existing transportation safety laws are sufficient to prevent significant impacts. Thus, the transportation of lithium batteries that would result from the amendments to the Energy Code would pose a less than significant risk to the public and environment.

Use of Lithium Ion Batteries

For the use of lithium battery storage systems, safety and reliability systems would be built in. Safety and reliability systems include voltage and current protection via software controls, physical protection via component isolation, and fire alarm and suppression systems. Depending on the lithium ion battery storage system design, there are cell, module, rack, and enclosure and control system level standards that also ensure safe operation.

The battery cell must pass abuse tests according to UL Standard 1642 for Lithium Batteries. This standard includes protocols for several tests designed to reduce the risk of fire or explosion, including electrical tests, mechanical tests, environmental tests, and fire exposure tests. At the module level, each battery storage system would be designed to prevent events such as over currents, over voltage, under voltage and over temperature. The module must also comply with UL Standard 1973 - Batteries for Use in Light Electric Rail and Stationary Applications. Battery protection at the rack level includes battery management system communication, pre-charge relay and resisters for inrush current prevention, circuit breakers to protect overcurrent, sensors for measuring voltage and current, and emergency stops. The enclosures may also have several safety systems including an HVAC system that is sized to maintain the advised temperature range and account for the heat dissipation from the batteries when being charged or discharged. System-level protections designed to maintain battery health and safety may also include an automatic stop to battery operations at certain temperatures and dangerously high and low states of charge (i.e., near 0 percent and 100 percent). The battery storage control system could detect and categorize all device or internal communication faults as Warning, Normal Error or Critical Error faults. Fault occurrences could generate alerts that are sent to monitoring systems and over web service to the battery storage system supplier's portal, and email notifications to the project operator. If any critical error occurs, the system could stop charge/discharge operations within milliseconds and the DC contactor is opened to cut off any current flow. These codes and standards significantly increase the safe operation of battery storage systems. As such, the additional use of lithium battery storage systems resulting from the amendments to the Energy Code would have a less than significant impact on the public and environment.

The battery storage system supplier also would be required to develop Safety Data Sheets (SDS) for hazardous material such as lithium ion batteries in accordance with Cal OSHA requirements. The SDS includes information identifying the properties of each hazardous material; the physical, health, and environmental health hazards; protective measures; and safety precautions for handling, storing, and transporting a hazardous material. As part of the project commissioning process, the battery storage system supplier could also provide classroom and field training (operations, maintenance, and safety) to the owners including instructions and procedures on power conversion system and battery/module safety during maintenance and replacement.

Depending on the size of the battery storage system, a project owner could be required to develop and implement contingency plans such as a Fire Protection Plan, Emergency Response Plan, and Hazardous Materials Business Plan in accordance with CUPA requirements and would include the SDS discussed above. These plans would address potentially hazardous materials used at a project, including lithium ion and other batteries. The plans would address discharge and fires, where fire suppression material is stored on the site, how the fire department could access the material, what the material is, and where copies of the plan are stored. All plan approvals would occur in coordination with the CUPA and other affected agencies such as the fire department or other local agency where a project would rely on emergency response services. Contingency plans must be updated on a regular basis and following any emergency or unanticipated situation during which contingency plan procedures are required to be implemented, in order to ensure that contingency plans remain relevant and applicable to the project site and surroundings. This comprehensive set of required plans would ensure that any incremental increase in risk to the public and environment from the use of lithium ion and other batteries resulting from the Energy Code updates would be less than significant.

Recycling and Disposal of Lithium Ion Batteries

Although there is no regulatory framework in place to require 100 percent recycling of lithium ion batteries, it is California policy to reduce, reuse, and recycle wherever possible. It is anticipated lithium ion batteries will be repurposed for a second life. The potential value in batteries is significant and data from Markets and Markets (2020) research shows there are already national and international partnerships being formed to recycle and reuse batteries from electric vehicles. The need for a stable supply chain for battery construction appears to be driving these partnerships. This is occurring independent of a state mandate to recycle batteries.

In addition, due to an increased demand for limited cobalt supply, rates and volume of lithium-ion battery recycling has increased (USGS, 2017a). At present, recycling activities for lithium-ion batteries primarily serve to conserve cobalt, which by comparison, is a rarer material (U.S. EPA, 2013). While not all lithium-ion batteries use cobalt, the additional volume of batteries using other metal combinations combined with consumer products and stationary batteries may provide economies of scale and thus further incentive for recycling. Recycling would also help address social-justice issues associated with the cobalt industry.

To meet forecasted increases in demand for reuse and recycling of batteries, new facilities or modifications to existing facilities have already been planned for construction to accommodate recycling activities. Current research and product data show grid connected batteries could have a life of 7 to 10 years depending on how well the battery is maintained (Smith et al, 2017). The Tesla Powerwall specifications show they are warranted for 10 years (available at https://www.tesla.com/powerwall). Assuming a project is built shortly after the adoption of the Energy Code updates the need for battery recycling or disposal would occur in 2030 and beyond. Construction of a new recycling facility in Fernley, Nevada by American Battery Technology Corporation is near completion and is slated to process up to 20,000 tons per year. This will add significant recycling capacity equivalent to about 20 percent of the lithium battery waste disposed in 2020.

By the time batteries required by the Energy Code updates have reached their end of life, it is reasonable to anticipate shifts in the battery recycling industry as California, other states, and the federal government will have developed recommendations and implemented plans, policies, or regulations to address the forecasted increases in batteries that will be generated by the electric car industry. The evidence on increased efforts at recycling supports a conclusion that there will be sufficient opportunities for recycling by the time the batteries deployed as a result of the 2022 amendments are replaced.

As discussed above the demand for lithium batteries for electrification of the transportation sector (Steward et al. 2019) is much greater than the demand for batteries that would be used for building construction. Infrastructure development which is already underway to meet the transportation sector demand could also be used to accommodate any new demand created by the Energy Code updates. The updates would also be implemented over time as new or remodel construction is approved by the local agencies and buildings subject to the Energy Code's prescriptive requirements for battery storage systems are constructed in 2023 and beyond. This would thus spread the need for recycling and disposal of lithium batteries over the period of the building life and provide for adequate time to plan and develop battery recycling facilities needed to meet demand.

In the unlikely event that plans, policies, or a regulatory framework is not developed or industry and regulatory bodies are slow to independently develop reuse and recycling programs, then lithium ion batteries may be disposed at hazardous waste landfills. Disposal of lithium ion batteries within the state must comply with California law, including but not limited to the Hazardous Waste Control law and implementing regulations which includes the Universal Waste Rule. This rule requires used batteries to be managed as hazardous waste and prohibits the disposal of used batteries to solid waste landfills. There are two hazardous waste landfills in California that have some limited remaining capacity for disposal. They are Chemical Waste Management - Kettleman Hills and Clean Harbors Buttonwillow facilities. There are also other out of state facilities that are currently in use, primarily in Nevada, Arizona, and Utah, for other hazardous waste disposal that could accommodate the disposal of the relatively small proportion of lithium ion batteries that would be needed to accommodate the forecasted increase in waste attributable to the Energy Code updates. These landfills are designed and operate in accordance with governing state and federal laws for hazardous waste disposal. Thus, disposal of the lithium ion batteries installed due to 2022 Energy Code amendments at the end of their useful life would not create a significant hazard to the public or the environment.

In summary, the marginal increase in routine transport, use, and disposal of batteries needed to install building battery storage systems in accordance with the Energy Code updates would not pose a significant hazard to the public or the environment. The project's potential impact would be less than significant.

Required Mitigation Measures: None

b. Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Potential upset conditions for a lithium ion battery storage system would include system malfunction, intentional or unintentional damage, theft, or vandalism resulting in damage to the battery storage system or exposure of the battery system components to the environment. Under such conditions, the equipment could be shut down and rendered inoperable, with no potential for offsite impacts. Because such conditions are highly dependent on physical and operational context, it is anticipated that upset and accident conditions will primarily be addressed on a project-by-project basis at the design stage. To prevent these types of upset conditions, the battery storage system could be located inside a secure gated or walled area. Surveillance cameras could be installed and continuously monitored. Fire Protection Plans, Emergency Response Plans, and Hazardous Materials Business Plans would also be required by the CUPA for project permitting. These plans would ensure there are procedures in place to respond to fire, explosion, leakage, and contamination of soil, water, and working surfaces and that cleanup is managed in accordance with RCRA and the California Hazardous Waste Control Law.

During normal operation there would be no emissions from a lithium battery project. However, in the event of an external fire or battery storage system malfunction, such as a runaway reaction or overcharge event, the project could emit pollutants to the surrounding air. Project emissions to the air would consist of combustion and vent products from the burning and/or venting of the battery cells due to a system malfunction or an external fire event. Compounds that could be emitted during a battery storage system malfunction or external fire event include hydrogen, carbon monoxide, carbon dioxide, methane, acetylene, ethylene, ethane, propene, propane, hydrogen fluoride, sulfur dioxide, nitrogen oxides, and fire suppressant (City of Goleta 2017). The primary pollutants released due to malfunction would be CO2 and CO along with lesser amounts of other compounds, including any chemicals released by a fire suppression system. Inhalation is the main pathway by which air pollutants from battery cell combustion due to a system malfunction or external fire event could potentially cause public health impacts. The local agency and local fire authorities are responsible for accounting for specific projects and project sites to determine whether a proposed project has incorporated adequate fire and safety protection measures to ensure impacts to any nearby sensitive receptors are less than significant.

If a fire were to occur, the battery system would be protected by alerts, alarms, fire suppressions systems inside the enclosure, and external to the enclosure in accordance with fire safety plans approved by the CUPA and the fire suppression and safety systems required under the applicable provisions of the California Fire Code. As discussed above, battery storage systems are required to be designed and installed in accordance with various electrical and safety codes and regulations and include numerous safety features. Required safety features include voltage and current protection via software controls; physical protection via component isolation; and fire alarm and suppression systems. If smoke is detected or if the system is manually triggered, alarms would sound, strobes would flash, and agents appropriate for extinguishing lithium ion battery fires could be discharged. These systems would allow for timely response to upset, and protect the public, first responders, and the environment from reasonably foreseeable upset and accident conditions.

Electric and magnetic fields (EMF) are invisible lines of force that are part of the natural and manmade environment. A natural source of EMF is the earth's magnetic field. Manmade sources include household or building wiring, electrical appliances and electric power transmission and distribution facilities. EMF strength decreases rapidly with distance from the source. Electric fields are created around appliances and wires wherever a voltage exists, similar to the water pressure in a hose. Electric field strength is measured in units of volts per meter (V/m). Health-related research around EMF focuses primarily on magnetic field exposures. Magnetic fields are created whenever electrical current flows, similar to the way water flows when the nozzle of a hose is opened. Magnetic field strength is measured in units of gauss (G) or more commonly in milligauss (mG). Potential EMF sources from the battery storage system are the battery system electronic components and the offsite electrical grid. EMF is not normally associated with the batteries themselves, as these are a pure DC source. Battery storage systems will not generally add incremental EMF to the existing offsite electrical grid. The battery storage system provides a new point of interconnection with the grid, and the grid will experience the same load as it would without the battery storage system. Given the low levels of EMF from a battery storage system's electronic components and the absence of new incremental EMF to the existing offsite electrical grid, no impacts from EMF would occur.

Given the existing framework of codes and standards that will ensure safe operation of the battery energy storage systems resulting from the Energy Code updates, there would not be a significant hazard to the public or the environment from reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. Impacts would be less than significant.

Required Mitigation Measures: None

c. **Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?**

The 2022 amendments are not expected to result in direct impacts to schools, and the amendments do not incentivize or increase the likelihood that projects will be built within one-quarter mile of an existing or proposed school. Compliance with the Energy Code updates could result in indirect impacts due to development of projects using lithium ion batteries to satisfy code requirements throughout the state. Although there is risk that lithium ion batteries could emit or create hazardous materials conditions as discussed in **item a** and **b**, above, the industry standards and fire code compliance that would be required to install and operate the system would ensure that the risk is managed and that there is an insignificant likelihood of harm to the environment and to public safety.

The extent to which future development projects may create project-specific hazards or hazardous materials impacts within one-quarter mile of an existing or proposed school will be evaluated locally by lead agencies with discretional approval authority over future development. However, the specific nature and characteristics of such projects are not reasonably foreseeable to the CEC. Battery storage systems do no routinely subject those nearby to hazardous materials exposure under normal operations. This is especially so given the required design and installation measures to ensure safe operations discussed above. Therefore, the potential impact from implementation of the Energy Code updates would be less than significant.

Required Mitigation Measures: None

d. **Would the project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?**

The amendments to the Energy Code will not create a significant hazard to the public or the environment due to location of a specific construction project on a hazardous materials site identified on a list compiled pursuant to Government Code section 65962.5. This project focuses on updating regulatory standards related to energy efficiency and does not affect decisions by building developers and local agencies regarding the location of specific future projects. A local or lead agency would be responsible for reviewing and mitigating any potential hazards and hazardous materials impacts related to the location of a project on a site where hazardous materials are known to exist. Therefore, there would be no impact from the Energy Code updates related to the location of a project on a hazardous waste site that would create a significant hazard to the public or the environment.

Required Mitigation Measures: None

e. **For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?**

The amendments to the Energy Code will not create a safety hazard or excessive noise within two miles of a public airport or within airport land use plan areas. This project focuses on updating regulatory standards related to energy efficiency and does not affect decisions by building developers and local agencies regarding the location of specific future projects. A local or lead agency would be responsible for reviewing and mitigating any potential hazards and hazardous materials impacts related to the location of future projects within airport land use plans or within two miles of a public airport or public use airport. Therefore, there would be no impact from the Energy Code updates related to the location of a project within two miles of an airport that would result in a safety hazard or excessive noise.

Required Mitigation Measures: None

f. **Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?**

Amendments to the Energy Code are not expected to have direct impacts to emergency response or evacuation plans. However, compliance with the Energy Code updates could result in indirect impacts to these plans due to development of a project using lithium ion batteries to satisfy code requirements. Implementation of contingency plans such as a fire plan, hazardous materials business plan, and emergency response plan required by the CUPA would ensure the proper emergency response is in place, and that first responders are aware of which buildings within their jurisdiction have battery energy storage systems and prepared to respond to emergencies involving such systems, and that there are no conflicts with other response plans under their jurisdiction. In addition, site-specific impacts of future proposed development projects will be evaluated locally by lead agencies with discretional approval authority over future developments to ensure such projects would not impair the implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan. The Energy Code updates would not impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan. The potential impact from implementation of the Energy Code updates would be less than significant.

Required Mitigation Measures: None

g. **Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?**

The Energy Code updates would not expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires. Compliance with the updates could result in a project using lithium ion batteries to satisfy code requirements. Although there is risk that a lithium ion battery could ignite a fire, such as in instances of battery failure or misuse, the industry standards and fire code compliance that would be required to install and operate the systems required by the Energy Code updates would ensure that this risk is minimized and that there is an insignificant resulting likelihood of harm to the environment and to public safety. As identified in **Section 4.18 Utilities and Service Systems**, amendments to the Energy Code also have a less than significant impact on expansion of electric infrastructure, which could be a source for starting wildfires, such as transmission lines. Furthermore, Energy Code amendments do not incentivize or increase the likelihood that buildings will be built within areas of the state that are sensitive to wildland fires. Any potential for site-specific impacts of future proposed development projects will be evaluated locally by lead agencies with discretional approval authority over future developments to ensure such projects would not expose people or structures to significant risk from wildland fires. The potential impact from implementation of the Energy Code updates would be less than significant.

Required Mitigation Measures: None

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4.7 Utilities and Service Systems

This section describes the project's environmental and regulatory setting and discusses impacts associated with the 2022 amendments to the Energy Code specific to utilities and service systems. The 2022 amendments would not approve specific construction projects or otherwise regulate the rate of building construction. The 2022 amendments would have no impacts on water, wastewater treatment, storm water drainage, or telecommunication facilities, and will have less than significant impacts on electric power and natural gas facilities.

4.7.1 Environmental Setting

The environmental setting includes the existing statewide utility infrastructure that provides electrical power, natural gas, water, and telecommunications services to residential and non-residential buildings. The setting includes the utility infrastructure expected to be available in 2023, the initial year the 2022 amendments would take effect and be incorporated into the design of buildings in California. To focus on any foreseeable infrastructure changes that would be attributable to the project, this section considers the current conditions within the state as well as the potential for increases in statewide utilities and service system impacts from the proposed 2022 amendments compared to the existing utilities and service system impacts associated with buildings in California under the current building design and construction requirements of the 2019 Energy Code. For electricity, the infrastructure includes power generation facilities, substations, poles and wires, and other components of the grid. For natural gas, the infrastructure includes storage facilities, pipes, and pump stations. For water resources the infrastructure includes reservoirs, dams, pipes, pump stations, treatment plants, evaporations ponds and storage tanks. For telecommunications, infrastructure includes poles, wires, cable, data centers, internet and other related equipment.

Specific to energy utilities in 2018, California has approximately 80,000 MW of electric generation capacity installed across the state amongst more than 1,500 power plants utilizing a broad array of technologies.[93] Total installed renewable generation capacity by 2019 is over 34,000 MW with 13,000 MW from solar and 6,000 MW from wind.[94] Large hydroelectric power plants, considered a zero-carbon resource, provide an additional 12,000 MW of capacity while natural gas-fired power plants make up 41,000 MW or about half of the state's total generating capacity in 2018.[95]

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93 CEC. [2018 Total System Electric Generation webpage] at https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/2019-total-system-electric-generation/2018.

94 CEC. [California Energy Commission Renewable Energy Tracking Progress] at https://www.energy.ca.gov/sites/default/files/2019-12/renewable_ada.pdf. p.6.

95 Ibid.

4.7.2 Regulatory Background

State

Warren-Alquist Act. Public Resources Code section 25402(a)-(b), requires the CEC to adopt regulations "to reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy, including energy associated with the use of water, in new residential and new nonresidential buildings, and to manage energy loads to help maintain electrical grid reliability." The CEC accomplishes this in large part through the adoption to building standards and appliance efficiency standards. The building standards are adopted every three years as part of the California Building Standards Commission's triennial update cycle, whereas appliance efficiency standards are adopted on an ad hoc basis. Both sets of standards are required to be technically feasible and cost-effective.

2019 Building Energy Efficiency Standards (2019 Energy Code). The 2019 Building Energy Efficiency Standards, in California Code of Regulations, Title 24, Part 6, establish a range of mandatory and prescriptive energy efficiency measures for newly constructed residential and nonresidential buildings, as well as additions and alterations to existing buildings, to reduce wasteful, uneconomical, and unnecessary uses of energy, thereby reducing the rate of growth of energy consumption and related supporting utilities, prudently conserving energy resources, and assuring that statewide environmental, public safety, and land use goals are met.

SB 350. Clean Energy and Pollution Reduction Act (SB 350, de León, Chapter 547, Statutes of 2015) establishes a target to achieve a cumulative doubling of energy efficiency savings in electricity and natural gas final end uses of retail customers by 2030 through energy efficiency and conservation by 2030. It does not impose any specific regulatory requirement.

SB 1078. California Renewable Portfolio Standards Program (SB 1078, Chapter 516, Statutes of 2002) established the RPS for electricity supply. The RPS required that retail sellers of electricity, including publicly owned utilities and community choice aggregators, provide 20 percent of their supply from renewable sources by 2017. As of 2020, utilities in California are required to demonstrate procurement of renewable energy resources sufficient to meet 33 percent of each utility's retail sales. By 2030, this requirement increases to 60 percent of each utility's retail sales. The RPS affects the impacts of the Energy Code by increasing the percentage of renewable generation consumed in the state, which has a different operational and environmental profile than non-renewable sources.

SB 100.The 100 Percent Clean Energy Act of 2018 increases the target procurement of electricity from renewable sources to 60 percent by 2030 from the previous target of 50 percent identified in SB 350, the Clean Energy and Pollution Reduction Act of 2015. Additionally, SB 100 targets 100 percent of electricity sold in California come from eligible renewable energy resources and zero-carbon resources by 2045.

The adoption of SB 100 will impact the implementation of electric power facilities through 2045. The SB 100 Joint Agency Report: Charting a path to a 100 percent Clean Energy Future, estimates an increased utility-scale capacity of 145 GW by 2045, which includes in state and out of state renewable sources and energy storage.[96]

AB 758. The California Energy Efficiency Action Plan (AB 758, Skinner, Chapter 470, Statutes of 2009) requires the CEC to develop and periodically update an action plan to increase energy efficiency savings in existing buildings. On December 11, 2019, the CEC adopted the California 2019 Energy Efficiency Action Plan (2019 Action Plan) to serve as the state's most recent policy map for increasing energy efficiency. The 2019 Action Plan includes strategies for achieve a statewide doubling of energy efficiency savings from electricity and natural gas end uses by 2030. It also addresses financing mechanisms, resiliency, multifamily building energy efficiency, building decarbonization, industrial and agricultural energy efficiency, use of energy data to better design and target efficiency, demand response measures, and barriers and opportunities to expand low-income and rural residents' access to energy efficiency and renewable energy. AB 758 does not impose specific regulatory requirements

Executive Order N-79-20. On September 23, 2020, Governor Gavin Newsom signed Executive Order N-79-20 requiring sales of all new passenger vehicles to be zero-emission by 2035, all medium-and heavy-duty vehicles by 2045 for all operations where feasible, and drayage trucks by 2035. The executive order also pushes for acceleration in the deployment of affordable fueling and charging options for ZEVs.

Integrated Energy Policy Report. SB 1389 (Chapter 568, Statutes of 2002) requires the CEC to conduct assessments and forecasts of all aspects of energy industry supply, production, transportation, delivery and distribution, demand, and prices. The CEC uses these assessments and forecasts to develop and evaluate energy policies and programs that conserve resources, protect the environment, ensure energy reliability, enhance the state's economy, and protect public health and safety.[97] The CEC includes these energy policy recommendations in its biennial IEPR that is issued in odd-numbered years with update reports in even-numbered years.

The 2018 IEPR Update provides an assessment of energy issues facing California which will require action for the state to meet climate, energy, air quality, and other environmental goals. The assessment identifies building GHG emissions as one potential issue and indicates that building decarbonization through building codes and standards should be considered.

96 CEC, CPUC, CARB. 2021. California Energy Commission SB 100 Joint Agency Report Achieving 100 Percent Clean Electricity in California: An Initial Assessment. Report. p. 75. TN#237167. Available at https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=19-SB-100.

97 Pub. Resources Code, § 25301(a).

The 2019 IEPR, adopted on February 20, 2020, summarizes priority energy issues currently facing the state, outlining strategies and recommendations to further the state's goal of ensuring reliable, affordable, and environmentally responsible energy sources. Energy topics covered in the 2019 IEPR include, but are not limited to, electricity sector trends and building decarbonization and energy efficiency.

The 2020 IEPR provides policy recommendations in to ensure a clean, affordable, and reliable energy system. In the area of zero emission vehicles (ZEV), the IEPR has identified an increase use in the use of ZEVs, including plug-in electric vehicles, and a subsequent need for increased vehicle charging stations and associated infrastructure. Recommendations for incentives and policies to manage charging patterns to benefit the grid are included in the 2020 IEPR. These recommendations may also have an effect on the California electric grid due to the increased electric demand from charging facilities and possible vehicle grid integration.

Executive Order B-55-18. This executive order signed by former Governor Edmund Brown provides a goal of statewide carbon neutrality by 2045 and net negative emissions thereafter.

4.7.3 Environmental Impacts and Mitigation Measures

Appendix G of the CEQA Guidelines establishes that a project would result in a potentially significant impact on the environment related to utility services if it would:

- Result in the relocation or construction of new or expanded utilities;
- Result in insufficient water supplies to the project and other reasonably foreseeable projects;
- Result in insufficient wastewater treatment capacity;
- Generate solid waste in excess of state and local standards or in excess of capacities at receiving infrastructures; or
- Not comply with federal, state, and local management and reduction statutes and regulations related to solid waste.

a. **Would the project require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?**

The 2022 amendments have no impact on the state's water supplies, the generation of wastewater, or generation of storm water drainage because the project does not approve any building construction, regulate the rate of construction, or otherwise cause any consumption or generation of water, wastewater, or storm water drainage in a manner that could result in the construction or relocation of facilities causing significant environmental effects. The project also does not change the ability for local jurisdictions to limit construction based on regional water supply constraints or to require waste reduction protocols and best management practices at future site-specific development proposals. For the same reasons, the project has no impacts on telecommunication infrastructure, as there are no direct impacts or reasonably foreseeable indirect impacts on telecommunications infrastructure that could result from the 2022 amendments. Therefore, the project would have no impacts on the relocation or construction of these facilities, and no further analysis is necessary.[98]

Implementation of the 2022 amendments may result in increased electrification of certain types of new buildings while reducing the use of natural gas within the state by providing a mix of requirements and incentives for builders to install electric appliances. Therefore, the project does have a potential to indirectly impact the mix of energy supply in the state or impact corresponding energy-related utility infrastructure serving new and altered buildings in California compared to the current 2019 Energy Code. While certain types of buildings may increase electricity use, on a statewide basis, the 2022 amendments will reduce electricity usage compared to the current 2019 Energy Code. (See **Table 4.7-1**.)

Specifically, revisions to the prescriptive compliance path and "standard design" building model to include heat pump technologies, in specific circumstances, may result in an increase in electric power needs and subsequent decrease in or elimination of natural gas needs, and related utility infrastructure, in future newly constructed or altered buildings. However, heat pump technologies are not a requirement of the 2022 amendments in these circumstances. Additionally, integration of energy reduction measures required by the 2022 amendments will counterbalance the potential increase from use of heat pumps. Finally, the installation of heat pump technologies as a result of compliance with the 2022 amendments would be distributed throughout the state. Therefore, any potential increases in demand and electricity usage will also be distributed and highly dependent on location and seasonal conditions. The current capacity of instate electricity generation is expected to meet any near-term potential increase in electrical usage from heat pump technologies with minimal expansion of existing electrical infrastructure.

The energy reduction measures in the 2022 amendments include increases in building envelope performance, equipment efficiencies, and new solar PV and battery requirements for specified nonresidential and high-rise residential buildings, which build on existing residential solar PV requirements in the current 2019 Energy Code.

98 Pub. Resources Code, § 21100(c) (EIRs shall "contain a statement briefly indicating the reasons for determining that various effects on the environment of a project are not significant and consequently have not been discussed in detail in the environmental impact report."); Cal. Code Regs., tit. 14, § 15128 ("An EIR shall contain a statement briefly indicating the reasons that various possible significant effects of a project were determined not to be significant and were therefore not discussed in detail in the EIR.").

Increased efficiency and standards pertaining to lighting, space conditioning equipment, and various process load equipment will also reduce energy usage and the need to rely on infrastructure to provide electricity and natural gas to the buildings.[99] Improvements to solar PV efficiency standards in residential buildings and new requirements for solar PV systems in specified nonresidential and high-rise residential building types will reduce reliance on utility-scale electricity generation through the generation of electricity at the building. Updates to battery requirements and operational efficiencies will also reduce the effect of building electricity use on electric generation infrastructure by allowing energy to be generated and stored for later use at building sites.[100]

Overall, 2022 amendments are expected to indirectly reduce electricity and natural gas usage, and corresponding reliance on utility infrastructure, when compared to continued implementation of the current 2019 Energy Code requirements. Increased energy and electricity demand usage from specific heat pump measures will be distributed and offset by other measures. Therefore, the project will result in little to no relocation or construction of new electric power infrastructure to accommodate the increase in electricity for some buildings and the overall statewide reduction in electricity. (See **Table 4.7-1**.) Likewise, the project will not result in the relocation or construction of natural gas infrastructure. In fact, because the overall natural gas demand of new and altered buildings in the state is projected to be reduced due to the 2022 amendments, it is more likely that fewer buildings in California will require gas service lines, meters, and other utility infrastructure under the 2022 amendments than under the current 2019 Energy Code. The 2020 California Gas Report is already projecting an annual decline in natural gas demand due to energy efficiency programs, including building efficiency, and GHG emission reduction goals.[101]

In the long term, the strategies being pursued by the state of California to attain SB 100 objectives will ensure any near-term increases in utilization of current electricity infrastructure capacity will be offset by renewable energy and other zero carbon energy sources.

The tables below include updates from the Draft EIR for newly constructed single-family residences in response to comments received from ConSol Company. Specifically, annual new single-family residential construction starts were reduced from 119,045 units per year to 58,052 units per year to better incorporate historical new construction starts for single-family residences. **Table 4.7-1** also includes minor changes due to switching the prescriptive requirements for climate zone 10 from heat pump space heating to heat pump water heating. See Final EIR, Section 1.5, Project Updates, discussing Section 150.1 for explanation of this change.

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99 See Lerner 2020, p. 22; Worth 2020 p. 18; and Johnson 2020 p. 14.

100 Athalye, 2021 p. xi.

101 California Gas and Electric Utilities p. 4.

Table 4.7-1

2022 Energy Code Heat Pump Measure Savings Compared to All Other Measures

Building Types and Measures	Therms	kWh	TDV, kBTU
Single Family Heat Pump Measures	~~12,685,939~~6,186,178	~~-125,227,444~~-61,067,031	~~531,549~~259,199
Multifamily Heat Pump Measures	696,820	-6,715,355	38,181,271
Nonresidential Heat Pump Measures	2,003,424	-15,451,367	90,885,902
All Other 2022 Measures	17,917,545	1,496,063,691	44,948,539,596
Grand Totals – All Measures, All Buildings	~~33,303,728~~26,803,967	~~1,348,669,525~~1,412,829,938	~~45,078,138,318~~45,077,865,96

Positive numbers represent energy savings relative to compliance with 2019 Energy Code requirements, negative numbers represent additional energy use.

Source: Appendix B

As described more fully in **Chapter 3 Project Description**, this EIR utilizes a modeled baseline for four technical areas that incorporates the impacts of the 2019 Energy Code in 2023, when the requirements of the proposed 2022 amendments would take effect. This modeled baseline forecasts the number of anticipated building construction starts for year 2023 and the anticipated consumption of energy from those new buildings, which would be subject to the 2019 Energy Code if the project is not approved. The results of the forecast are then compared to the anticipated consumption of energy resources from the new buildings constructed in 2023 under the 2022 Energy Code to provide information about the overall statewide reduction in electricity, and the reductions in natural gas consumption, if the project is approved. These findings, which are detailed further in **Appendix B** to this document, provide evidence in support of the lack of significant environmental impacts from the project related to utilities and service systems.

Independent of the proposed project, utility infrastructure is already undergoing a transformation to accommodate the shift to renewable energy and greater use of electricity in transportation and other sectors, as identified in the requirements and policies noted in the regulatory setting above. These include increasing the amount of renewable and zero carbon energy sources through SB 100, and the RPS requirements as well as electrification of transportation. SB 100 and transportation policies are expected to be the main driver of continued and accelerated transformations of the grid and expansion of renewable electric power facilities. This includes increases to facilities for generation, transmission, and energy storage.

The RPS requires LSEs in the state to achieve escalating procurement targets. LSEs were required to procure increasing amounts of renewable electricity each year ramping up to achieve at least 33 percent of retail sales by December 31, 2020 increasing to 60 percent by 2030. After 2030, the 60 percent RPS requirement continues along with the added SB 100 goal to supply renewable and zero-carbon resources for the remaining 40 percent of California delivered electricity by 2045.[102] As sources of electric power generation become more reliant on renewable and zero-carbon sources, stability and reliability of the electric grid must also be considered. The use of emerging technologies such as offshore wind, hydrogen, and load flexibility strategies have been identified as electricity sources for complementing solar generation.[103]

The utility system will also need to provide energy for an increased number of ZEVs adopted as part of state goals. This includes approximately 566,000 existing ZEVs currently in use in California and a targeted 5 million ZEVs in use in California by 2030 as a result of various executive orders.[104]

Transmission expansion plays a vital role in enabling the interconnection and deliverability of renewable energy to meet demand and support load-serving entities in meeting the state's RPS requirements. The California ISO conducts its transmission planning process annually to identify system upgrades needed to meet grid reliability requirements, projects that could bring economic benefits to consumers, and projects needed for policy reasons, such as to meet California's renewable and clean energy goals. Transmission constraints inhibit the ability of California to export excess

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102 CEC. California Energy Commission Renewable Energy Tracking Progress at https://www.energy.ca.gov/sites/default/files/2019-12/renewable_ada.pdf. p. 3

103 CEC, CPUC, CARB. 2021. California Energy Commission SB 100 Joint Agency Report Achieving 100 Percent Clean Electricity in California: An Initial Assessment. Report. p. 10. TN#237167. Available at https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=19-SB-100.

104 Ibid at p. 32.

generation, like midday solar, or import generation, such as afternoon wind from out of state. Both actions help balance regional resources during steep afternoon ramp periods when demand grows and solar generation declines.

Battery energy storage is another tool that can maximize the benefits of renewable energy resources and help ensure the reliability of the electric grid. Energy storage technologies capture potential energy, electricity, or heat for later use, which can be particularly helpful to balance times when there is too much or not enough electricity to meet demand. The state is seeing significant growth in the installation of battery energy storage systems at large generation facilities, commercial sites, and even homes. The variety of battery energy storage technologies in commercial use or in the research and development phase is also growing. Grid-connected battery storage is also growing for many of the same reasons. In July 2019, Los Angeles Department of Water and Power announced the intent to approve a 400 MW solar and 300 MW battery storage project[105]. Future planned storage facilities have even higher energy storage nameplate capacities (from the single digits of MWs to the 1000s of MW—including one rated/estimated up to 1,800 MW).[106] As sources of electric power generation become more reliant on renewable and zero-carbon sources, utility infrastructure will continue evolve accommodate the statewide transition. Increasing distributed and utility-scale battery energy storage can help bridge the gap between variable renewable generation and grid energy demands.

For the reasons discussed above, the 2022 amendments would result in less than significant impacts to the environment from the relocation or construction of electric utility infrastructure. As noted, the grid is already transforming to accommodate existing policies that encourage electrification and renewable energy. Implementation of the 2022 amendments would benefit California's current electric utility infrastructure by reducing overall energy usage and supporting the grid transition described above by facilitating the deployment of greater quantities of distributed battery energy storage and solar PVs.[107]

The 2022 amendments would also result in less than significant impacts to the environment from the relocation or construction of new natural gas infrastructure. Implementation of the 2022 amendments would result in an overall reduction in the use of natural gas and could lead to fewer buildings being built in California that will require gas service lines, meters, and other utility infrastructure than under the current 2019

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105 John, Jeff St. July 1, 2019. "L.A. Looks to Break Price Records With Massive Solar-Battery Project." News article. Green Tech Media. Available at https://www.greentechmedia.com/articles/read/ladwp-plans-to-break-new-low-price-records-with-massive-solar-battery-proje.

106 Ibid. at p. 13

107 CEC. California Energy Commission Renewable Energy Tracking Progress at https://www.energy.ca.gov/sites/default/files/2019-12/renewable_ada.pdf. p. 13.

Energy Code. In the case of buildings that would have been built with natural gas infrastructure under the current 2019 Energy Code but choose to shift to full electrification of their building under the 2022 amendments, natural gas infrastructure would no longer be needed to serve the building. For buildings that continue to use natural gas for various end uses, the reduction in natural gas usage due to implementation of the 2022 amendments would have minimal effects on the infrastructure needed to deliver natural gas to existing buildings and would not result in the relocation or construction of new infrastructure.

Required Mitigation Measures: None

b. **Would the project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?**

This project focuses on updating regulatory standards related to energy efficiency and is not approving any type of specific construction project, water allocation, or otherwise impacting the rate of water use in the state or limiting the ability of local jurisdictions to curtail development in response to regional water supply. Revisions to the prescriptive compliance path and "standard design" building model to include heat pump technologies in specific circumstances may result indirectly in reduced water usage due to reliance on refrigerant in place of hydronic systems. Improved energy efficiency standards for commercial and industrial process loads, specifically towards steam traps, are expected to also result in indirect reduction of water usage due to reduction in steam loss. Therefore, the project would have less than significant impacts on water supplies in the state, and all foreseeable impacts would be beneficial, so no further analysis is necessary.

Required Mitigation Measures: None

c. **Would the project result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments?**

The 2022 amendments are regulatory changes to energy efficiency standards and do not approve any specific construction project, regulate the pace of construction, or result in the occupancy of buildings or the generation of wastewater. The 2022 amendments have no impact on the ability of the local jurisdictions to limit construction based on wastewater treatment capacity. Additionally, some of the measures in the Energy Code update, such as revisions to the prescriptive compliance path and "standard design" building model to include heat pump technologies in specific circumstances and the steam trap requirements, may result in reductions in water usage and consequently the amount of wastewater generated by affected buildings. Therefore, the project would have less than significant impacts on wastewater treatment in the state, and all foreseeable impacts would be beneficial, so no further analysis is necessary.

Required Mitigation Measures: None

d. **Would the project generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?**

The 2022 amendments are regulatory changes to energy efficiency standards and do not approve any specific construction project or directly result in the generation of solid waste. While the project itself does not generate any solid waste, there may be slight changes in indirect waste generation from affected buildings. Foreseeable decreases in solid waste generation would be a result of decreases in materials and equipment used to comply with the 2022 amendments, however the broad discretion that builders have to specify equipment and materials both at design and during construction combined with the nature of Energy Code requirements as a set of minimum performance requirements means that the actual types and quantities of materials used by specific buildings to meet or exceed energy efficiency standards are too speculative for CEC staff to analyze.

Foreseeable long-term increases in solid and hazardous waste indirectly generated by the 2022 amendments pertaining to battery energy storage are discussed in **Chapter 4, Section 4.6 Hazards and Hazardous Materials** and would not be generated in exceedance of state or local capacity or standards.

Overall, the project would have less than significant indirect impacts on the generation of solid waste and would not impair the attainment of state or local solid waste reduction goals or exceed the capacity of local infrastructure to handle accommodate solid waste associated with buildings built or altered in compliance with the 2022 amendments.

Required Mitigation Measures: None

e. **Would the project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?**

The California Integrated Waste Management Act of 1989 (AB 939) requires local jurisdictions in California to reduce, by 50 percent, the amount of solid waste disposed of in landfills by the year 2000 and beyond. The 2022 amendments are regulatory changes to energy efficiency standards and do not approve any specific construction project or result in the direct generation of any solid waste and are not subject to any federal, state, and local management and reduction laws related to solid waste. As discussed above under question d., the 2022 amendments may result indirectly in the reduction of some solid wastes and the generation of other solid wastes at new and altered buildings, compared to the continuation of the current 2019 Energy Code, however the specific types and quantities of materials ultimately selected by builders for inclusion in buildings to meet or exceed energy efficiency standards are too speculative for CEC staff to analyze. These indirect changes in waste would not affect the ability of building owners and occupants to comply with all federal, state, and local management and reduction statutes and regulations related to solid waste, including the California Integrated Waste Management Act of 1989. The project will have less than significant impacts on compliance with waste management reduction laws.

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4.8 Wildfire

This section describes the environmental and regulatory setting, and discusses impacts associated with the project specific to wildfire.

4.8.1 Environmental Setting

State Responsibility Areas (s) are locations where the state of California is responsible for wildfire protection[108] and Local Responsibility Areas are locations where the responding agency is the county or city. The Department of Forestry and Fire Protection (Cal Fire) identifies and maps areas of significant fire hazard based on fuels, terrain, and other relevant factors.[109] Wildfire risks in State Responsibility Areas (SRAs) are called Fire Hazard Severity Zones (FHSZ) and are grouped into unzoned, moderate, high, and very high zones.[110] Wildfire risks designated by a local agency that is not an SRA are called Local Agency Very High Fire Hazard Severity Zones.[111]

The CPUC categorizes fire threat areas as Tier 1, Tier 2, or Tier 3.[112] A Tier 1 area (or CAL FIRE Zone 1) encompasses High Hazard Zones (HHZ) on the United States Forest Service (USFS-CAL FIRE) joint map of Tree Mortality HHZ. This tier represents areas where tree mortality directly coincides with critical infrastructure such as communities, roads, and utility lines, and are a direct threat to public safety. Tier 2 consists of areas where there is an elevated risk (including likelihood and potential impacts on people and property) from wildfires associated with overhead utility power lines or overhead utility power-line facilities also supporting communication facilities. Tier 3 consists of areas where there is an extreme risk (including likelihood and potential impacts on people and property) from wildfires associated with overhead utility power lines or overhead utility power-line facilities also supporting communication facilities.

The 2022 amendments are a set of regulations that would apply statewide and require energy efficient designs, features, equipment, and practices in new construction and certain additions and alterations to buildings within California. Though the 2022 amendments do not have a specific location, the requirements could apply to newly constructed and certain renovated buildings located in or near an SRA or a very high FHSZ, or land classified as having a fire threat by the CPUC or other entity, including potentially at wildland-urban interfaces,[113] the area where homes and wildlands

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108 See Cal. Code Regs, tit. 24, § 702A (definition of "State Responsibility Area").

109 Office of the State Fire Marshall. Fire Hazard Severity Zones Maps webpage at https://osfm.fire.ca.gov/divisions/wildfire-planning-engineering/wildland-hazards-building-codes/fire-hazard-severity-zones-maps/. Last visited May 13, 2021.

110 See Cal. Code Regs, tit. 24, § 702A (definition of "fire hazard severity zones.").

111 See Cal. Code Regs, tit. 24, § 702A (definition of "local agency very high fire hazard severity zone").

112 CPUC. CPUC FireMap website. Last visited May 14, 2021. Available at https://ia.cpuc.ca.gov/firemap/.

113 See Cal. Code Regs, tit. 24, § 701A (definition of "wildland-urban interface fire area").

intermix where there is significant risk from wildfires. Therefore, to focus on changes that would be attributable to the project, this section evaluates the potential for increases in statewide wildfire impacts from the 2022 amendments compared to the existing state of wildfire impacts associated with buildings in California under the current building design and construction requirements of the 2019 Energy Code.

4.8.2 Regulatory Setting

Federal

Federal Register Communities at Risk List. High risk communities identified within the wildland-urban interface, the area where homes and wildlands intermix, were published in the Federal Register in 2001. At the request of Congress, the Federal Register notice only listed those communities neighboring federal lands. With California's extensive urban Wildland-Urban Interface situation, the list of communities extends beyond just those adjacent to federal lands. Beginning on August 17, 2001, no more updates were being made to the Federal Register with states assuming responsibility for continued updates to their own lists. The Cal Fire Director has taken the responsibility for managing the list.

State

Fire Hazard Severity Zones.[114] The purpose of this code section is to provide for the classification of lands within SRAs in accordance with the severity of fire hazard present and identify measures to be taken to retard the rate of spreading and to reduce the potential intensity of uncontrolled fires that threaten to destroy resources, life, or property.

CPUC General Order 166: Standards for Operation, Reliability, and Safety during Emergencies and Disasters. CPUC GO 166 covers the standards which require all electric utilities to be prepared for emergencies and disasters in order to minimize damage and inconvenience to the public which may occur as a result of electric system failures, major outages, or hazards posed by damage to electric distribution facilities.

4.8.3 Environmental Impacts and Mitigation Measures

Appendix G of the CEQA Guidelines provides that a project would result in a significant impact related to hazards and hazardous materials if the project is located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would:

- Substantially impair an adopted emergency response plan or emergency evacuation plan;

114 Pub. Resources Code, §§ 4201-4204; Cal. Code Regs, tit. 14, § 1280.01.

- Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire;
- Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment; or
- Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.

The 2022 amendments' potential for significant direct or foreseeable indirect environmental impacts related to each of these questions is discussed in order below.

The 2022 amendments do not approve specific construction projects or regulate the pace or location of future construction. The 2022 amendments would improve existing residential and non-residential energy efficiency standards for building construction and design. As such, any effects of the 2022 amendments would be indirect, occurring only as a result of buildings being constructed in compliance with the 2022 amendments after they have taken effect.

The 2022 amendments would add prescriptive solar PV and battery requirements for high-rise multifamily, hotel-motel, tenant-space, office, medical office or clinic, restaurant, grocery store, retail store, school, and theater / auditorium / convention center buildings. The battery storage systems expected to result from the 2022 amendments would be located inside of or adjacent to buildings and would not easily contribute to wildfires. Chapter 4, Section 4.6 Hazards and Hazardous Materials contains additional discussion of less than significant impacts related to fire risk from battery energy storage systems that would be associated with the project because battery storage systems are subject to a variety of electrical and fire safety requirements imposed on the manufacturer of the batteries, as well as during installation (See **Table 4.6-1**).

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:

a. Substantially impair an adopted emergency response plan or emergency evacuation plan?

As with the existing Energy Code, the 2022 amendments would apply to buildings that are constructed or located in or near an SRA or a very high FHSZ, or land classified as having a fire threat by the CPUC. However, the amendments do not directly or indirectly increase the likelihood that future projects would be built in these zones or in such a way to cause impacts.

As such, the project is not expected to bring a large number of people to any particular areas in California and therefore is not expected to increase emergency response demand during a potential small or large-scale evacuation effort. Thus, the project would not substantially impair an adopted emergency response plan or emergency evacuation plan.

There would be no impact to an adopted emergency response plan or emergency evacuation plan from the 2022 amendments.

Required Mitigation Measures: None

b. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

The 2022 amendments would apply to projects that are constructed or located in or near an SRA or a very high FHSZ, or land classified as having a fire threat by the CPUC. The 2022 amendments would apply to future construction in a variety of areas with various slope types and wind zones. However, the 2022 amendments do not make it more likely that projects would be built in these areas or in such a way as to exacerbate wildfire risks or expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire.

As such, there would be no impact to exacerbate wildfire risk due to slope, prevailing winds, and other factors from the 2022 amendments.

Required Mitigation Measures: None

c. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

The 2022 amendments apply to projects that are constructed or located in or near an SRA or a very high FHSZ, or land classified as having a fire threat by the CPUC. However, the 2022 amendments do not make it more likely that projects would be built or occupied in these zones or in such a way as to exacerbate fire risk or that may result in temporary or ongoing impacts to the environment.

The 2022 amendments include battery storage requirements for certain nonresidential buildings, which may partially supplant more volatile equipment in the absence of battery energy storage, such as portable fossil fuel backup generators. So, the wildfire ignition risks associated with the exclusion of battery storage from new and existing buildings could be greater under existing conditions for buildings in SRAs and very high FHSZs (Generator Safety, Honda Power Equipment; Moench, 2019).

There would be a less than significant impact to exacerbated fire risk due to installation or maintenance of associated infrastructure from the 2022 amendments.

Required Mitigation Measures: None.

d. Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

The 2022 amendments apply to projects that are constructed or located in or near an SRA or a very high FHSZ, or land classified as having a fire threat by the CPUC. The 2022 amendments would apply to projects built in a variety of slope types and drainage areas. However, the 2022 amendments do not make it more likely that projects would be built in these zones or areas or in such a way as to expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.

Therefore, the 2022 amendments would have no impact to exposure of people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.

Required Mitigation Measures: None

4.8.4 References

Office of the State Fire Marshall. Fire Hazard Severity Zones Maps webpage at https://osfm.fire.ca.gov/divisions/wildfire-planning-engineering/wildland-hazards-building-codes/fire-hazard-severity-zones-maps/. Last visited May 13, 2021.

Honda. Generator Safety, Honda Power Equipment webpage at https://powerequipment.honda.com/generators/generator-safety. (discussing fire, electrocution, and carbon monoxide poisoning risks associated with the misuse or misplacement of portable fossil fuel generators). Last accessed May 7, 2021.

Moench, Mallory. 2019. "During PG&E outages, generators caused fires, carbon monoxide poisoning." News article. San Francisco Chronicle. Available at https://www.sfchronicle.com/california-wildfires/article/During-PG-E-outages-generators-caused-fires-14833601.php.

4.9 Technical Areas Not Affected

As discussed in **Chapter 3 Project Description**, the overall purpose of the proposed amendments to the Energy Code is to employ technically feasible and economic methods "to reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy, including the energy associated with the use of water, and to manage energy loads to help maintain electrical grid reliability" consistent with the express statutory direction in the Warren-Alquist Act. The 2022 amendments were prepared with these considerations and the project objectives in mind and are intended to introduce new and emerging measures and technologies that reduce existing environmental impacts associated with buildings. To achieve this, the 2022 amendments include several measures that are designed to reduce existing environmental impacts that occur statewide and would continue unless these measures are implemented. Although this EIR discusses these benefits in some areas in order to differentiate the project's potential impacts from existing conditions that the project will improve upon, the full range environmental benefits associated with this project are not required to be analyzed under CEQA, which only requires disclosure, analysis, and mitigation of significant adverse environmental impacts in this EIR.[115]

Based on a review of the 2022 amendments, CEC staff has determined that there is no substantial evidence that the amendments would cause any environmental impacts associated with the technical areas discussed below. For each of these technical areas, this EIR provides a brief statement of the reasons for concluding the 2022 amendments would not result in environmental impacts, using questions derived from Appendix G of the CEQA Guidelines.[116]

115 Pub. Resources Code, § 21068 ("Significant effect on the environment" means a substantial, or potentially substantial, adverse change in the environment.).

116 Pub. Resources Code, § 21100(c) (EIRs shall "contain a statement briefly indicating the reasons for determining that various effects on the environment of a project are not significant and consequently have not been discussed in detail in the environmental impact report."); Cal. Code Regs., tit. 14, § 15128 ("An EIR shall contain a statement briefly indicating the reasons that various possible significant effects of a project were determined not to be significant and were therefore not discussed in detail in the EIR.").

4.9.1 Agriculture and Forestry Resources

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and forest carbon measurement methodology provided in Forest Protocols adopted by the CARB.

Would the project:

a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?

c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?

d. Result in the loss of forest land or conversion of forest land to non-forest use?

e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?

Would the project:

a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

The 2022 amendments would not incentivize or induce new construction to occur in such a way that would convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) as shown on the Farmland Mapping and Monitoring Program Map to non-agricultural use.

No impact would occur; therefore, this issue is not evaluated further in this EIR.

b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?

California Planning and Zoning Law codified in California Government Code, section 65000 et seq. provides that "…each county and city shall adopt a comprehensive, long term general plan for the physical development of the county or city, and of any land outside its boundaries…."[117] Counties and cities may adopt ordinances that regulate: use of buildings, structures, and land; location, height, bulk, number of stories, and size of buildings and structures; the percentage of a lot which may be occupied by a building or structure; the size and use of lots, yards, courts, and other open spaces; the intensity of land use; signs and billboards.[118]

California Land Conservation Act of 1965, as amended, enables local governments to enter contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. Landowners receive substantially reduced property tax assessments in return for enrollment under a contract.

The 2022 amendments would not induce or incentivize regulated building projects to be sited, designed, or constructed in such a way that they would conflict with existing zoning for agricultural use or Williamson Act contracts, as the project does not direct or incentivize where new buildings would be constructed.

No impact would occur; therefore, this issue is not evaluated further in this EIR.

c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?

Section 12220(g) of the Public Resources Code defines forest land as land that can support 10 percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits.

"Timberland" is land owned by the federal government and designated by the State Board of Forestry and Fire Protection as experimental forest land, which is available for, and capable of, growing a crop of trees of a commercial species used to produce lumber and other forest products, including Christmas trees.

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117 Gov. Code, § 65300.

118 Gov. Code, § 62850.

Government Code section 51104(g) defines "Timberland Production Zone" (TPZ) as land used for growing and harvesting timber and compatible uses.

The 2022 amendments do not include any provisions or exceptions specific to forest land, timberland, or TPZ land. The amendments do not incentivize or otherwise increase the likelihood that future building projects would be sited, designed, or constructed in such a way that would conflict with existing zoning for, or cause rezoning of, forest land, timberland, or TPZ land as the amendments would not direct where new buildings would be constructed.

No impact would occur; therefore, this issue is not evaluated further in this EIR.

d. Result in the loss of forest land or conversion of forest land to non-forest use?

Cal Fire's Forest Practice Geographical Information System (GIS) captures current and historic timber harvesting activities for over 4 million acres of California timberland. The Forest Practice Watershed Mapper is a web-based mapping application allowing users to identify the status of a specific planning watershed regarding anadromous salmonids, 303.d waterbodies, Forest Districts, and average rainfall, all in the context of past and present timber harvesting activities.

The 2022 amendments do not include any provisions or exceptions specific to forest land that incentivizes or otherwise increases the likelihood that future building projects would be sited, designed, or constructed in such a way as to result in the loss of forest land or conversion of forest land to non-forest use compared to building projects under the current or prior Energy Codes as the amendments would not direct where new buildings would be constructed.

No impact would occur; therefore, this issue is not evaluated further in this EIR.

e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?

The provisions of the Energy Code apply either to internal features of the building (inclusive of installed components such as HVAC, lighting, and water heating equipment) or to specific outdoor improvements such as outdoor parking areas, outdoor lighting, and PVs.

The 2022 amendments do not induce or incentivize regulated building projects to be sited in such a way that they result in conversion of Farmland as defined to non-agricultural use or conversion of forest land as defined to non-forest use as they would not direct where new buildings would be constructed.

No impact would occur; therefore, this issue is not evaluated further in this EIR.

4.9.2 Cultural and Tribal Cultural Resources

CULTURAL RESOURCES

Would the project:

a. Cause a substantial adverse change in the significance of a historical resource pursuant to section15064.5?

b. Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to section 15064.5?

c. Disturb any human remains, including those interred outside of dedicated cemeteries?

TRIBAL CULTURAL RESOURCES

Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

a. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or

b. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

CEQA requires lead agencies to assess potential impacts on various cultural resources: historical resources, unique archaeological resources, and tribal cultural resources. These resources are physical aspects of California's heritage and history and generally are at least 45 years old.[119]

A *historical resource* is:

119 Office of Historic Preservation, *Instructions for Recording Historical Resources*. Sacramento, CA: Office of Historic Preservation, March 1995, p. 2.

- A resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources (California Register),
- A resource listed in a local register of historical resources or identified as significant in a historical resource survey meeting specific requirements,[120] or any object, building, structure, site, area, place, record, or manuscript that a lead agency determines historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the agency's determination is supported by substantial evidence in light of the whole record.[121]

A *Unique archaeological resources* is an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
- Has a special and particular quality such as being the oldest of its type or the best available example of its type.
- Is directly associated with a scientifically recognized important prehistoric or historic event or person.[122]

Tribal cultural resources are either of the following:

Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:

- Included or determined to be eligible for inclusion in the California Register
- Included in a local register of historical resources as defined in the Public Resources Code section 5020.1(k).

A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in the Public Resources Code section 5024.1(c). In applying these criteria, the lead agency shall consider the significance of the resource to a California Native American tribe.[123]

In addition:

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120 Pub. Resources Code § 5024.1(g).

121 Cal. Code Regs., tit. 14, 15064.5(a).

122 Pub. Resources Code, § 21083.2(g).

123 Pub. Resources Code, § 21074(a).

A cultural landscape that meets the criteria of Public Resources Code, section 21074(a), is a tribal cultural resource to the extent that the landscape is geographically defined in terms of its size and scope.[124]

A Historical resource, unique archaeological resource, or a non-unique archaeological resources, as defined at Pub. Resources Code, §§ 21084.1, 21083.2(g), and 21083.2(h), respectively may also be a tribal cultural resource if it conforms to the criteria of Public Resources Code section 21074(a).[125]

For the purposes of this section, a substantial adverse change is any physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of a historical resource or tribal cultural resource would be materially impaired.[126]

CULTURAL RESOURCES

Would the project:

a. **Cause a substantial adverse change in the significance of a historical resource pursuant to section15064.5?**

The 2022 amendments do not include any provisions that would cause proposed building projects to be more likely to be sited or designed in such a way as to adversely change the significance of a historical resource. In addition, the Scope of the Energy Code provides an express exception to "[q]ualified historic buildings, as regulated by the California Historic Building Code (Title 24, Part 8)."

No impact would occur; therefore, this issue is not evaluated further in this EIR.

b. **Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to section15064.5?**

The 2022 amendments do not include any provisions that would cause proposed building projects to be more likely to be sited or designed in such a way as to adversely change the significance of a unique archaeological resource.

No impact would occur; therefore, this issue is not evaluated further in this EIR.

c. **Disturb any human remains, including those interred outside of dedicated cemeteries?**

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124 Pub. Resources Code, § 21074(b).

125 Pub. Resources Code, § 21074(c).

126 Pub. Resources Code, § 21084.2; Cal. Code Regs., tit. 14, § 15064.5(b).

The 2022 amendments do not include any provisions that would cause proposed building projects to be more likely to be sited or designed in such a way as to disturb human remains.

No impact would occur; therefore, this issue is not evaluated further in this EIR.

TRIBAL CULTURAL RESOURCES

Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

a. **Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or**

The 2022 amendments do not include any provisions that would cause proposed building projects to be more likely to be sited or designed in such a way as to adversely change the significance of a listed tribal cultural resource.

No impact would occur; therefore, this issue is not evaluated further in this EIR.

b. **A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.**

CEQA requires lead agencies to consult with all California Native American tribes that have traditional and cultural affiliation with the geographic area of a project, and that have previously requested consultation. To invoke an agency's requirement to consult under CEQA, a tribe must first send the lead agency a written request for formal notification of any projects within the geographic area with which they are traditionally and culturally affiliated.[127] Because this rulemaking is state-wide in scope, all tribes (18 tribes) that have sent formal notifications to the CEC were invited to consult on this rulemaking.

In addition, and consistent with the CEC's tribal consultation policy,[128] CEC staff contacted the Native American Heritage Commission (NAHC) to request a search of the Sacred Lands File and a list of California Native American tribes that might be interested

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127 Pub. Resources Code, § 21080.3.1(b).

128 California Energy Commission, *Tribal Consultation Policy*. CEC-700-2017-002-D. Sacramento, CA, revised December 2017.

in the proposed project. The NAHC responded on June 25, 2020 and provided a state-wide contact list of all California Native American tribes. CEC staff mailed initial consultation letters to all listed California Native American tribes on March 15, 2021. Those letters provided a brief project description, invited consultation, provided a link to the project docket, and provided contact information for lead staff.

CEQA affords tribes 30 days to respond to agency invitations to consult. The CEC determined that the 30-day response period expired on April 18, 2021. Within that 30-day period two tribes responded. One tribe, the Elk Valley Rancheria requested formal consultation, the second tribe, the Nor-Rel-Muk Wintu Tribe response indicated they were not interested in formal consultation but were interested in following the rulemaking process. A project scoping meeting was held on April 9, 2021, and all tribes, including the two mentioned above, were sent a notice encouraging those interested to attend the scoping meeting, and to subscribe to the project list serve that provides routine updates to the docket.

CEC staff contacted the Elk Valley Rancheria and conducted a virtual meeting on April 14, 2021. CEC staff provided a brief overview of the objectives for achieving greater energy efficiencies through the rulemaking process. A discussion was held concerning the use of heat pumps in relation to tribal development that might be subject to the state building code standards. Staff informed the Elk Valley Rancheria that staff's preliminary analysis concluded that the rulemaking would not impact tribal cultural resources. The Tribe did not identify any impacts to tribal cultural resources at the meeting, and stated that they would consider responding at a later time and upon conducting their own review of the docket, including the draft EIR, if they identify any potential impacts at a later time.

Consultation with California Native American tribes has not resulted in the identification of impacts to tribal cultural resources. The amendments do not include any provisions that would cause proposed building projects to be more likely to be sited or designed in such a way as to adversely change the significance of a tribal cultural resource.

No impact would occur; therefore, this issue is not evaluated further in this EIR.

4.9.3 Geology and Soils

GEOLOGY AND SOILS

Would the project:
a. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.
ii. Strong seismic ground shaking?
iii. Seismic-related ground failure, including liquefaction?
iv. Landslides?
b. Result in substantial soil erosion or the loss of topsoil?
c. Be located on geologic units or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?
d. Be located on expansive soil, as defined in Section 1803.5.3 of the California Building Code (2010), creating substantial direct or indirect risks to life or property?[129]
e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?
f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Would the project:

a. **Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:**

   i. **Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence**

129 Geology and Soils question (d) reflects the current 2013 California Building Code (CBC), effective January 1, 2014, which is based on the International Building Code (2009).

of a known fault? Refer to Division of Mines and Geology Special Publication 42.

The 2022 amendments do not include any provisions that would directly or indirectly cause proposed building projects to be more likely to be sited on or near earthquake faults.

ii. Strong seismic ground shaking?

The 2022 amendments do not include any provisions that would directly or indirectly cause proposed building projects to be more likely to be sited on or near earthquake faults and subject to ground shaking.

iv. Seismic-related ground failure, including liquefaction?

The 2022 amendments do not include any provisions that would increase the likelihood for buildings constructed in California of having an increased vulnerability to seismic-related ground failure.

v. Landslides?

The 2022 amendments do not include provisions that would increase the likelihood of buildings constructed in California to cause landslides or have an increased vulnerability to landslides.

No impacts would occur; therefore, these issues are not evaluated further in this EIR.

b. Result in substantial soil erosion or the loss of topsoil?

The 2022 amendments do not include any provisions that would cause proposed building projects to be more likely to be sited or designed in such a way as to cause increased erosion or topsoil loss relative to buildings constructed under the 2019 Energy Code or earlier Energy Codes.

No impact would occur; therefore, this issue is not evaluated further in this EIR.

c. Be located on geologic units or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?

The 2022 amendments do not induce or incentivize building projects to be sited on unstable soil or designed in such a way as to cause stable soil to become unstable relative to buildings constructed under the 2019 Energy Code or earlier Energy Codes.

No impact would occur; therefore, this issue is not evaluated further in this EIR.

d. Be located on expansive soil, as defined in Section 1803.5.3 of the California Building Code (2010), creating substantial direct or indirect risks to life or property?

The 2022 amendments do not induce or incentivize building projects to be sited on expansive soil.

No impact would occur; therefore, this issue is not evaluated further in this EIR.

e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

The 2022 amendments do not induce or incentivize building projects to be sited where sewers are not available and soils do not support use of septic tanks or alternative disposal systems.

No impact would occur; therefore, this issue is not evaluated further in this EIR.

f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

The 2022 amendments do not include any provisions that would cause building projects to be sited or designed in such a way as to destroy paleontological resources or sites, or unique geologic features relative to buildings constructed under the 2019 Energy Code or earlier Energy Codes.

No impact would occur; therefore, this issue is not evaluated further in this EIR.

4.9.4 Hydrology and Water Quality

HYDROLOGY AND WATER QUALITY
Would the project:
a. Violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?
b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or through the addition of impervious surfaces in a manner which would:
i. result in substantial erosion or siltation, on- or offsite;
ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;
iii. create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or
iv. impede or redirect flood flows?
d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?
e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

<u>Would the project:</u>

a. Violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

The 2022 amendments do not include any provisions that would cause building projects to be more likely to be sited or designed in such a way as to cause water quality or waste discharge requirements to be violated or to otherwise substantially degrade surface or ground water quality.

No impact would occur; therefore, this issue is not evaluated further in this EIR.

b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

The 2022 amendments do not induce or incentivize regulated building projects to deplete groundwater supplies or interfere more greatly with groundwater recharge. Future projects constructed consistent with the proposed 2022 Energy Code would remain subject to all laws governing sustainable groundwater management.

No impact would occur; therefore, this issue is not evaluated further in this EIR.

c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or through the addition of impervious surfaces in a manner which would:

i. result in substantial erosion or siltation, on- or offsite;

The 2022 amendments do not include any provisions that would cause building projects to be more likely to be sited or designed in such a way as to cause erosion or siltation.

ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;

The 2022 amendments do not include any provisions that would cause building projects to be more likely to be sited or designed in such a way as to alter existing drainage patterns or increase surface runoff.

iii. create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or

The 2022 amendments do not include any provisions that would cause building projects to be more likely to be sited or designed in such a way as to cause drainage system capacities to be exceeded or result in substantial additional sources of runoff.

iv. impede or redirect flood flows?

The 2022 amendments do not include any provisions that would cause building projects to be more likely to be sited or designed in such a way as to impede or redirect flood flows.

No impacts would occur; therefore, these issues are not evaluated further in this EIR.

d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

The 2022 amendments do not include any provisions that would cause building projects to be more likely to be sited in flood hazard, tsunami, or seiche zones, or designed in such a way as to risk release of pollutants within these areas.

No impact would occur; therefore, this issue is not evaluated further in this EIR.

e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

The 2022 amendments do not include any provisions that would cause building projects to be designed in conflict with or obstruct a water control plan or sustainable groundwater management plan.

No impact would occur; therefore, this issue is not evaluated further in this EIR.

4.9.5 Land Use and Planning

LAND USE AND PLANNING

Would the project:

a. Physically divide an established community?
b. Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

Would the project:

a. Physically divide an established community?

The 2022 amendments do not induce or incentivize building projects to be sited such that they divide communities as the amendments would not direct where new buildings would be constructed.

No impact would occur; therefore, this issue is not evaluated further in this EIR.

b. Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

California Planning and Zoning Law codified in California Government Code, section 65000 et seq. provides that "…each county and city shall adopt a comprehensive, long term general plan for the physical development of the county or city, and of any land outside its boundaries…."[130] Pursuant to this section, counties and cities may adopt ordinances that regulate: use of buildings, structures, and land; location, height, bulk, number of stories, and size of buildings and structures; the percentage of a lot which may be occupied by a building or structure; the size and use of lots, yards, courts, and other open spaces; the intensity of land use; signs and billboards.[131]

The proposed amendments to the Energy Code do not induce or incentivize regulated building projects to be sited in such a way that they would conflict with land use plans, policies, or regulations adopted for the purpose of avoiding or mitigating environmental effects as they would not direct where new buildings would be constructed. Local agencies are also empowered to make changes to their own building codes to deviate from the California Building Code and impose more restrictive building standards, including but not limited to green building standards, when reasonably necessary for

130 Gov. Code, § 65300.

131 Gov. Code, § 65850.

local climatic, geological, or topographical conditions, provided they make those findings required by state building standards law.[132]

No impact would occur; therefore, this issue is not evaluated further in this EIR.

4.9.6 Mineral Resources

MINERAL RESOURCES
Would the project:
a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?
b. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?

Would the project:

a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

The 2022 amendments do not include any provisions that would cause building projects to be more likely to be sited or designed in such a way as to result in loss of availability of a known mineral resource. Also, the amendments would not direct where new buildings would be constructed.

No impact would occur; therefore, this issue is not evaluated further in this EIR.

b. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

The 2022 amendments do not include any provisions that would cause building projects to be more likely to be sited or designed in such a way as to result in loss of availability of a locally important mineral resource recovery site. Also, the amendments would not direct where new buildings would be constructed.

No impact would occur; therefore, this issue is not evaluated further in this EIR.

4.9.7 Noise

132 See Health & Saf. Code, §§ 18941.5, 17958.5, and 17958.7 and Cal. Code of Regs., tit. 24, Part 1, §§ 1.1.8 and 1.8.6.

NOISE

Would the project result in:

a.	Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?
b.	Generation of excessive ground borne vibration or ground borne noise levels?
c.	For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

Would the project result in:

a. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

The 2022 amendments would not increase the level of noise expected to occur during construction or occupancy of regulated buildings.

No impact would occur; therefore, this issue is not evaluated further in this EIR.

b. Generation of excessive ground borne vibration or ground borne noise levels?

The 2022 amendments would not increase the level of groundberries noise or vibration expected to occur during construction or occupancy of regulated buildings.

No impact would occur; therefore, this issue is not evaluated further in this EIR.

c. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

The 2022 amendments do not include any provisions that would cause proposed building projects to be more likely to be sited near airports or within airport land use plans. In cases where proposed projects are sited near airports or within plan areas, the proposed amendments to the Energy Code would not cause those projects to expose people residing or working in the project area to excessive noise levels.

No impact would occur; therefore, this issue is not evaluated further in this EIR

4.9.8 Population and Housing

POPULATION AND HOUSING

Would the project:

a. Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?
b. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

Would the project:

a. Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

The 2022 amendments affect the minimum levels of efficiency of new buildings statewide, but they do not induce or incentivize additional building or infrastructure projects or action that would induce population growth. The amendments apply equally to new development statewide, and they do not propose any new homes or businesses or indirectly induce population growth in the state through the extension of new infrastructure to a specific region of the state.

No impact would occur; therefore, this issue is not evaluated further in this EIR.

b. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

The 2022 amendments do not induce or incentivize regulated building projects to be sited in such a way that they displace existing housing or people or necessitate the construction of replacement housing elsewhere in California. Also, the amendments would not direct where new buildings would be constructed.

In response to the Notice of Preparation, two commenters expressed concerns about the amendments causing possible increases in construction costs and housing occupancy costs, such as energy bills. While these considerations were the subject of extensive discussion during the pre-rulemaking process and are addressed in measure proposals from Vertiv, the Statewide Codes and Standards Enhancement (CASE) initiative, and CEC staff reports, economic considerations such as this are beyond the scope of the CEQA analysis required to be conducted in this EIR. CEQA Guidelines, section 15131(a) states that "[e]conomic or social effects of a project shall not be treated as significant effects on the environment," although section 15131(b) states that "[e]conomic or social effects of a project *may be* used to determine the significance of physical changes caused by the project" (emphasis added). Even assuming commenters are correct that some level of increase in housing construction or occupancy costs may be foreseeable in some future housing development projects under the 2022 Energy Code amendments, such costs are purely economic effects which would be associated with the specific future building design decisions of developers—and the specific use and behavior patterns of those building occupants—which would not be attributable to physical changes in the environment resulting from the amendments. The commenters have not submitted substantial evidence that the project is likely to result in potential economic effects or social changes on so great a scale that they would result in adverse physical changes *to the environment*, such as blight or urban decay.[133] Without a resulting substantial adverse physical effect on the environment, these are appropriately classified purely economic cost-impacts which would be absorbed by developers, occupants, and other market participants. Under CEQA, lead agencies are not required to reach a determination of significance based on such an assertion.

No impact would occur; therefore, this issue is not evaluated further in this EIR.

133 See CEQA Guidelines, § 15384 ("Argument, speculation, unsubstantiated opinion or narrative, evidence which is clearly erroneous or inaccurate, or evidence of social or economic impacts which do not contribute to or are not caused by physical impacts on the environment does not constitute substantial evidence.") See, e.g., *Bakersfield Citizens for Loc. Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, 1213; *Chico Advocs. for a Responsible Econ. v. City of Chico* (2019) 40 Cal.App.5th 839, 847-49 (discussing *City of Bakersfield* and related cases involving social and economic concerns raised by petitioners).

4.9.9 Public Services

PUBLIC SERVICES

Would the project:

a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services: i. Fire protection?
ii. Police Protection?
iii. Schools?
iv. Parks?
v. Other public facilities?

Would the project:

a. **Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:**

i. Fire protection?

The 2022 amendments do not include any provisions that would cause building projects to be more likely to be sited or designed in such a way as to require additional fire protection relative to buildings constructed under the 2019 Energy Code or earlier Energy Codes, nor do they incentivize construction such that provision of services would be affected.

ii. Police Protection?

The 2022 amendments do not include any provisions that would cause building projects to be more likely to be sited or designed in such a way as to require additional police protection under the 2019 Energy Code or earlier Energy Codes, nor do they incentivize construction such that provision of services would be affected.

iii. Schools?

The 2022 amendments do not incentivize siting, design, or construction such that provision of educational services would be affected.

iv. Parks?

The 2022 amendments do not incentivize siting, design, or construction such that availability or utilization of parks would be affected.

v. Other public facilities?

The 2022 amendments do not incentivize siting, design, or construction such that availability or utilization of other public facilities would be affected.

No impacts would occur; therefore, these issues are not evaluated further in this EIR.

4.9.10 Recreation

RECREATION
Would the project:
a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?
b. Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?

Would the project:

a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

The 2022 amendments do not incentivize siting, design, or construction in such a way that availability or utilization of recreational facilities would be affected.

No impact would occur; therefore, this issue is not evaluated further in this EIR.

b. Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?

The 2022 amendments do not incentivize siting, design, or construction in such a way that availability or utilization of recreational facilities would be affected.

The amendments do not require the construction or expansion of recreational facilities or otherwise cause them to be included in building projects.

No impact would occur; therefore, this issue is not evaluated further in this EIR.

4.9.11 Transportation

TRANSPORTATION
Would the project:
a. Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?
b. Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?
c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?
d. Result in inadequate emergency access?

Would the project:

a. Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

The 2022 amendments do not induce or incentivize regulated building projects to be sited or designed in such a way that they would conflict with transit, roadway, bicycle, or pedestrian facilities, nor do they include provisions that would cause proposed building projects to be more likely to be sited or designed in such a way as to decrease performance or safety of such facilities.

No impact would occur; therefore, this issue is not evaluated further in this EIR.

b. Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

Public Resources Code section 15064.3 defines "vehicle miles traveled" as the amount and distance of automobile travel attributed to a project. The 2022 amendments would not induce construction or operation-generated VMT or incentivize future development to exceed applicable transportation thresholds but would rather improve upon the existing 2019 Energy Code for new construction of, and additions and alterations to, residential and nonresidential buildings. Furthermore, the project does not propose construction of new facilities or indirectly increase or decrease the potential VMTs that might be associated with the construction or occupancy of buildings meeting the proposed 2022 Energy Code requirements. Therefore, the project would not conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b).

No impact would occur; therefore, this issue is not evaluated further in this EIR.

c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

The 2022 amendments do not induce or incentivize regulated building projects to be sited or designed in such a way that they increase hazards due to design features or incompatible uses.

No impact would occur; therefore, this issue is not evaluated further in this EIR.

d. Result in inadequate emergency access?

The 2022 amendments do not induce or incentivize regulated building projects to be sited or designed in such a way that they result in inadequate emergency access.

No impact would occur; therefore, this issue is not evaluated further in this EIR.

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Chapter 5

OTHER CEQA DISCUSSIONS

Other CEQA Discussions

5.1 Environmental Justice (EJ)

This section analyzes the project's potential impacts on EJ populations. While EJ is not a technical area needed to be analyzed under CEQA, the CEC is including this analysis as part of its evaluation of potential environmental impacts. All departments, boards, commissions, conservancies and special programs of the California Natural Resources Agency must consider EJ in their decision-making process if their actions have an impact on the environment, environmental laws, or policies, including adopting regulations. The 2022 amendments do not approve any particular construction project or impact local zoning and therefore this analysis can only consider broadly what effects the 2022 amendments could have on a statewide basis and whether there may be a disproportionate environmental impact on certain segments of the population.

5.1.1 Environmental Setting

The Energy Code updates cover the entire state. For purposes of this analysis, all EJ communities within the state are considered.

5.1.2 Regulatory Setting

The Office of Planning and Research is the state's coordinating agency for EJ programs. State law defines "environmental justice" as "the fair treatment of people of all races, cultures and income with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies."[134] The California Natural Resources Agency recognizes that EJ communities are commonly identified as those where residents are predominantly minorities or live below the poverty level; where residents have been excluded from the environmental policy setting or decision-making process; where they are subject to a disproportionate impact from one or more environmental hazards; and where residents experience disparate implementation of environmental regulations, requirements, practices, and activities in their communities.[135] EJ efforts attempt to address the inequities of environmental protection in these communities.

An EJ analysis is composed of the following:

134 Gov. Code, § 65040.12(e)(1); see also Pub. Resources Code, §§ 71110-71118.

135 Office of Planning and Research. 2003. Resources Agency Environmental Policy. Pp 59-61. Available at https://cawaterlibrary.net/wp-content/uploads/2018/01/OPR_EJ_Report_Oct2003.pdf.

- Identification of areas potentially affected by various emissions or impacts from a proposed project;
- Providing notice in appropriate languages (when possible) of the proposed project and opportunities for participation in public meetings to EJ communities;
- A determination of whether there is a comparatively larger population of minority persons, or persons below the poverty level, living in an area potentially affected by the proposed project; and
- A determination of whether there may be a significant adverse impact on a population of minority persons or persons below the poverty level caused by the proposed project alone, or in combination with other existing and/or planned projects in the area.[136]

The Office of Planning and Research is the state's coordinating agency for EJ programs. EJ is defined as "the fair treatment of people of all races, cultures and income with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies."[137] As noted above, all departments, boards, commissions, conservancies and special programs of the California Natural Resources Agency must consider EJ in their decision-making process. Such actions that require EJ consideration may include:

- Adopting regulations;
- Enforcing environmental laws or regulations;
- Making discretionary decisions or taking actions that affect the environment;
- Providing funding for activities affecting the environment; and
- Interacting with the public on environmental issues.[138]

CalEnviroScreen

CalEnviroScreen is a science-based mapping tool used by CalEPA to identify disadvantaged communities pursuant to SB 535.[139] CalEnviroScreen data is based on Census tracts. CalEPA has defined disadvantaged communities as the top 25 percent scoring census tracts, plus census tracts that score in the highest 5 percent of CalEnviroScreen's Pollution Burden. (CalEPA 2017).

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136 Office of Planning and Research. 2003. Resources Agency Environmental Policy. Pp 59-61. Available at https://cawaterlibrary.net/wp-content/uploads/2018/01/OPR_EJ_Report_Oct2003.pdf.

137 Gov. Code, § 65040.12; Pub. Resources Code, §§ 71110-71118.

138 Office of Planning and Research. 2003. Resources Agency Environmental Policy. Pp 59-61. Available at https://cawaterlibrary.net/wp-content/uploads/2018/01/OPR_EJ_Report_Oct2003.pdf.

139 Stats. 2012, Ch. 830, § 2.

As required by SB 535, disadvantaged communities are identified based on geographic, socioeconomic, public health, and environmental hazard criteria. CalEnviroScreen identifies communities most burdened by pollution from multiple sources and most vulnerable to its effects, taking into account socioeconomic and health status of people living in those communities (OEHHA 2017, pg. 1).

Using data from federal and state sources, the tool consists of four components in two broad groups. The Exposure and Environmental Effects components comprise a Pollution Burden group, and the Sensitive Populations and Socioeconomic Factors components comprise a Population Characteristic Group. The four components are made up of environmental, health, and socioeconomic data from 20 indictors.

Table 5.1-1 lists the indicators that go into the Pollution Burden score and the Population Characteristics score to form the final CalEnviroScreen score. These indicators are used to measure factors that affect the potential for pollution impacts in communities.

TABLE 5.1-1
COMPONENTS THAT FORM THE CALENVIROSCREEN 3.0 SCORE

Pollution Burden

Pollution Burden Exposure Indicators	Pollution Burden Environmental Effects Indicators
Diesel PM emissions	Cleanup sites
Drinking water contaminants	Groundwater threats
Ozone concentrations	Hazardous waste
PM 2.5 concentrations	Impaired water bodies
Pesticide use	Solid waste sites and facilities
Toxic releases from facilities	
Traffic density	

Population Characteristics

Sensitive Population Indicators	Socioeconomic Factors Indicators
Asthma emergency department	Educational attainment
Cardiovascular disease (emergency department visits for heart attacks)	Housing burdened low income households
Low birth-weight infants	Linguistic isolation
	Poverty

	Unemployment
Exposure Indicators	**Environmental Effects Indicators**
Diesel PM emissions	Cleanup sites
Drinking water contaminants	Groundwater threats
Ozone concentrations	Hazardous waste
PM 2.5 concentrations	Impaired water bodies
Pesticide use	Solid waste sites and facilities
Toxic releases from facilities	
Traffic density	

Population Characteristics

Sensitive Population Indicators	**Socioeconomic Factors Indicators**
Asthma emergency department	Educational attainment
Cardiovascular disease (emergency department	Housing burdened low income households
Low birth-weight infants	Linguistic isolation
	Poverty
	Unemployment

Notes: PM= particulate matter. PM 2.5= fine particulate matter 2.5 microns or less.
Source: OEHHA 2017

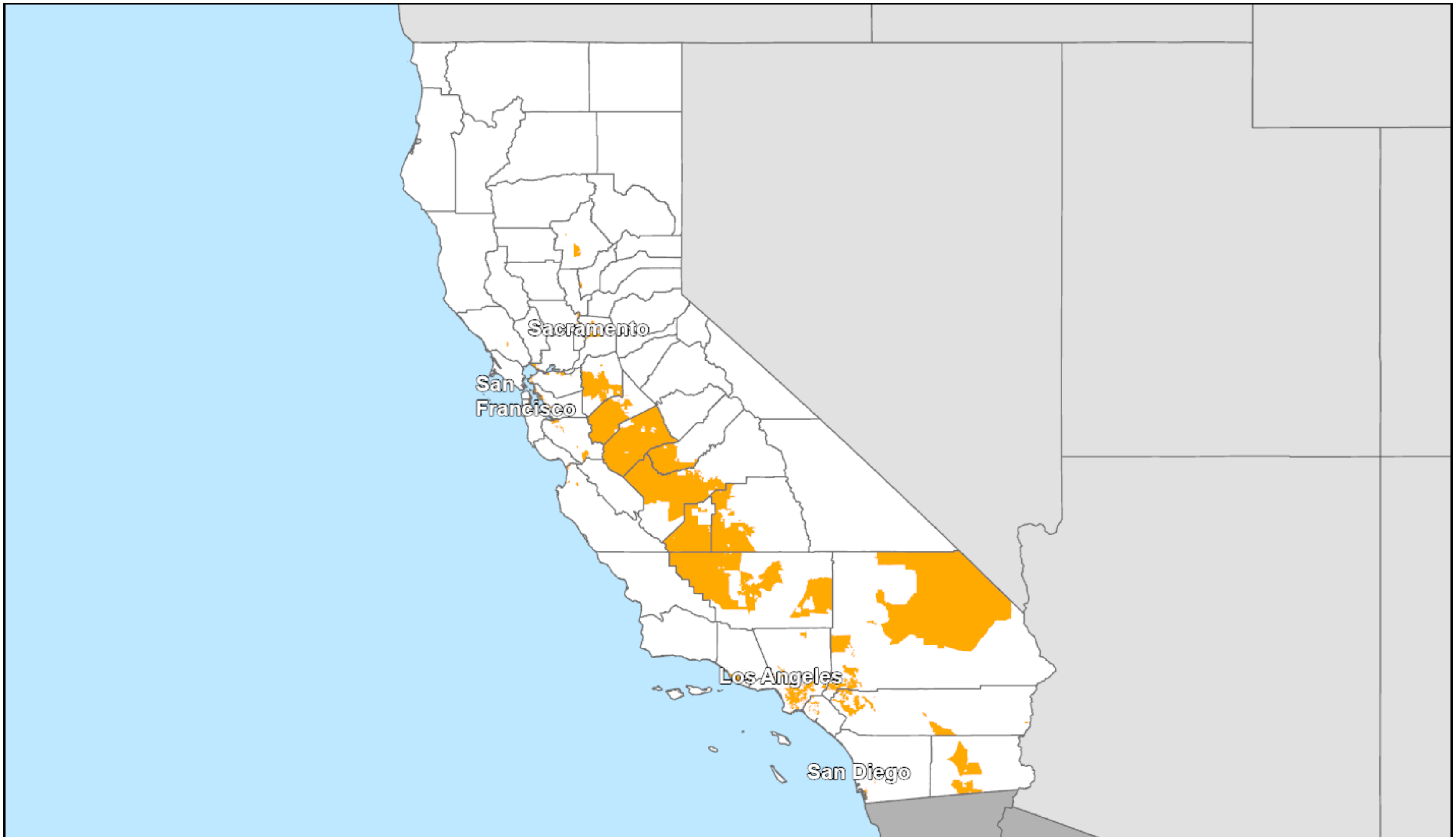
This draft EIR analyzes three technical areas that, combined with CalEnviroScreen indicators, could have potential adverse environmental impacts on EJ populations. These technical areas include: Air Quality, Hazards and Hazardous Materials, and Utilities and Service Systems. The CalEnviroScreen indicators relevant to each of the three technical areas are:

- For air quality, these indicators are: asthma, cardiovascular disease, diesel PM emissions, low birth-weight infants, ozone concentrations, pesticide use, PM2.5 concentrations, toxic releases from facilities, and traffic density.
- For hazards and hazardous materials, the indicator is cleanup sites.
- For utilities and service systems, these indicators are: cleanup sites, hazardous waste, and solid waste sites and facilities.

CalEnviroScreen 3.0 was used to identify disadvantaged communities in the state of California and gather information about the population potentially impacted by the Energy Code updates. The CalEnviroScreen indicators are used to measure factors that affect the potential[140] for pollution impacts in communities (OEHHA 2017).

140 Cal. Code Regs., tit. 14, § 15130(a)(1).

Figure 5.1-2 presents the CalEnviroScreen 3.0 data for the state of California. As the figure shows, the disadvantaged communities are generally in the Central Valley, and eastern San Bernardino County, with a few small clusters around the port of Los Angeles and Long Beach.



75 - 100 Percentile CalEnviroScreen 3.0

Figure 5.2-2
Disadvantaged Communities

0 100 200
Miles

Source: CalEnviroScreen 3.0 CalEPA 2018

5.1.3 Environmental Impacts and Mitigation Measures

This EIR identified potentially significant impacts in the areas of Aesthetics, Air Quality, Biological Resources, Energy, Greenhouse Gas Emissions, Hazards and Hazardous Materials, Utilities and Service Systems, and Wildfire. As noted above, only three of these areas – Air Quality, Hazards and Hazardous Materials, and Utilities and Service Systems, combined with CalEnviroScreen indicators, could have potential adverse environmental impacts on EJ populations. For the other technical areas, the EIR did not identify any significant adverse impacts, and they are not further evaluated for EJ issues. The 2022 amendments do not incentivize or induce new construction to occur in a specific location, however they create a benefit when new buildings are built serving disadvantaged communities and when existing buildings in disadvantaged communities are updated to meet newer code requirements, due to increased efficiency of the buildings, and reduced area sources of air pollution.

Air Quality

No sectors of the population, including the EJ populations, would experience an adverse air quality impact due to the proposed amendments. As shown in **Tables 4.2-2**, **4.2-3** and **4.2-4**, annual criteria pollutant and hazardous air pollutant emissions would decrease. As stated in **Section 4.2 Air Quality**, there is a potential for some seasonal increased emissions from power plants during wintertime as heating sources switch from on-site fossil fuel to electricity, a portion of which is generated from fossil fuels. However, any seasonal increases would be within permit limits for the power plants that have likely been subject to offset requirements as part of the permitting process, and would moreover be reduced as the electricity system transitions to increased production of electricity from non-fossil sources of electricity. Thus, there would also not be any disproportionate impacts to any EJ communities.

Hazards and Hazardous Materials

The project would require the use of battery energy storage systems that could contain hazardous materials such as lithium ion batteries. However, there is a comprehensive system of regulatory requirements under federal, state, and local law that would ensure that any potential impact due to the transportation, installation, and use of these types of storage systems would be less than significant. For this reason, the EIR concludes that any impacts associated with these systems is less than significant. Therefore, the potential impact to EJ populations would be less than significant and would not be disproportionate.

Utilities and System Services

The project would have less than significant impact on the state's water supplies, the generation of wastewater or generation of storm water drainage because the project does not approve any building construction or influence the rate of construction or otherwise cause any consumption of water or materials and corresponding waste.

Similarly, the project would have no impacts on telecommunication infrastructure. Therefore, the project would have no impacts on the relocation or construction of these facilities. Therefore, the project would not have any impacts related to water supply, generation of wastewater or wastewater treatment capacity, generation of storm water, or telecommunication services for the general public or the EJ communities.

With respect to energy systems, the 2022 amendments may cause an increase in demand due to the incentivizing of heat pump technology. However, as discussed in the Utilities and Service Systems analysis above, any such increase can be accommodated with existing resources, and would not cause any impairment of grid reliability. There is no significant impact on utilities and services systems and therefore no impact on EJ populations. In terms of solid waste generation and disposal capacity, the project may result indirectly in reduction of solid waste due to the decreased materials used when meeting Energy Code requirements, and therefore there would be no impact to the general public or the EJ communities and thus no disproportionate impact.

5.1.4 References

CalEPA. 2017. Designation of Disadvantaged Communities Pursuant to Senate Bill 535 (de Leon). Available at https://calepa.ca.gov/wp-content/uploads/sites/6/2017/04/SB-535-Designation-Final.pdf.

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U.S. EPA. 2015. Guidance on Considering Environmental Justice During the Development of Regulatory Actions. Available at https://www.epa.gov/environmentaljustice/guidance-considering-environmental-justice-during-development-action.

U. S. EPA 2019. EJ 2020 Glossary. Available at https://www.epa.gov/environmentaljustice/ej-2020-glossary. Last updated: August 2, 2019.

5.2 Growth Inducing Impacts

Public Resources Code section 21100(b)(5) requires an agency to include in an EIR a detailed statement setting forth the growth-inducing impact of the proposed project. Section 15126.2(e) of the CEQA Guidelines address growth inducing impacts with the following guidance:

> *Discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth (a major expansion of a wastewater treatment plant might, for example, allow for more construction in service areas). Increases in the population may tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects. Also discuss the characteristic of some projects which may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.*

A project can have direct or indirect growth-inducing potential. The most direct growth inducement is construction of new housing, which would bring new population to an area.

Indirect growth inducement can result from a project that involves, for instance, if any of the following:

- Substantial new permanent employment opportunities (e.g., commercial, industrial, or governmental enterprises);
- Substantial short-term employment opportunities (e.g., construction employment) that indirectly stimulates the need for additional housing and services to support the new temporary employment demand; or
- Removal of an obstacle to additional growth and development, such as removing a constraint on a required public utility or service (e.g., construction of a major sewer line with excess capacity through an undeveloped area).

As indicated throughout this EIR, the Energy Code updates are regulatory and not an approval of any specific construction project. The 2022 amendments do not change any local zoning requirements, land use planning goals, urban growth boundaries; increase the rate of new construction; or direct the types of buildings to be built or their location. If approved, the proposed amendments will result in increased energy efficiency for any buildings constructed, but what is built, where it is built, and what infrastructure is necessary to support any development, is a matter for local jurisdictions to decide.

Whatever obstacles to population growth currently exist in each community, whether insufficient wastewater treatment capacity, lack of infrastructure access, lack of economic opportunity, city zoning laws, or other barriers, the 2022 amendments do not change these barriers, or could they. Public Resources Code section 25402(a)-(b) requires the CEC to adopt regulations to reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy in buildings. The CEC has no statutory authorization to control local land use planning or to direct or encourage building construction and population growth in specific areas.

The 2022 amendments do not have an effect that may attract people into the community or remove conditions that lessen the desirability of living in a given place (e.g., traffic congestion, over-crowded schools, poor employment prospects). Therefore, the project would not have any growth inducing impacts.

5.3 Mandatory Findings of Significance

Under the CEQA Guidelines section 15065(a), a lead agency shall find that a project may have a significant effect on the environment and thereby require an EIR to be prepared for the project where there is substantial evidence, in light of the whole record, that any of the following conditions identified below will occur. In this case, since an EIR was prepared, this section is not being used as a screening tool to determine the type of environmental document to prepare, but as a forum for additional analysis on project impacts.

a. **Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?**

Biological Resources

Potential impacts related to habitat of fish or wildlife species were discussed in **Section 4.3 Biological Resources**.

The 2022 amendments to the Energy Code would build on existing building design and construction requirements in the 2019 Energy Code and support the state's clean energy goals, policies, and mandates. The 2022 amendments will increase the deployment of on-site renewable energy generation, reduce carbon emissions from new buildings, reduce growth in energy demand, increase energy demand flexibility, and ensure that California buildings are as energy efficient as is found to be technically feasible and cost-effective.

The project does not entail the approval of any construction project, nor does it streamline or otherwise affect the CEQA review requirements for future discretionary construction projects to be reviewed by local lead agencies or increase the rate of construction. The 2022 amendments would not substantially degrade the quality of the environment, reduce the existing habitat of any fish or wildlife species, cause any fish or wildlife population to drop below self-sustaining levels, threaten to eliminate any plant or animal community, or substantially reduce the number or restrict the range of an endangered, threatened, or rare plant or animal.

These 2022 amendments would not degrade the quality of the environment but result in a benefit as they would reduce overall energy use and the pollution-associated with electricity generation from combustion of fossil fuels, including nitrogen deposition and other environmentally harmful emissions that adversely affect flora and fauna. Therefore, the proposed measures would yield a positive environmental impact.

In addition, the project will have no potential to eliminate important examples of the major periods of California history or prehistory.

b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?

Section 15130(a) of the CEQA Guidelines requires a discussion of the cumulative impacts of a project when the project's incremental effect is cumulatively considerable. Cumulatively considerable, as defined in CEQA Guidelines section 15065(a)(3), means that the "incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects." The CEQA Guidelines section 15355 defines a cumulative impact as two or more individual effects that, when considered together, are considerable or that compound or increase other environmental impacts. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

An EIR should not discuss impacts which do not result in part from the project evaluated in the EIR.[141]

CEQA also states that both the severity of impacts and the likelihood of their occurrence are to be reflected in the discussion, "but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion of cumulative impacts shall be guided by standards of practicality and reasonableness, and shall focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects that do not contribute to the cumulative impact."[142]

Cumulative impacts are generally assessed using a two-step analysis. The first question is whether the combined effects from both the proposed project and other projects would be cumulatively significant. If yes, the second question is whether the proposed project's incremental effects are cumulatively considerable.[143]

CEQA Guidelines section 15130 states that either of the following two elements are necessary to an adequate discussion of cumulative impacts: the use of a list of past, present, and probable future projects; or the use of adopted projections from a general

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141 Cal. Code Regs., tit. 14, § 15130(a)(1).

142 Cal. Code Regs., tit. 14, §15130(b).

143 *Communities for a Better Environment v. California Resources Agency* (3d Dist. 2002) 103 Cal.App.4th 98, 120; see also Cal. Code Regs., tit. 14, § 15064(h)(1).

plan, other regional planning document, or a certified EIR for such a planning document.

Because the project is not a discrete localized ground disturbing project but is a set of regulatory changes to the state's building Energy Code, there are no specific projects to comprise the cumulative environment. Thus, this cumulative analysis examines types of projects that could be incentivized by state policies and laws and that might, in combination with the 2022 amendments, cumulatively impact the environment. A list of relevant policies and laws, along with a qualitative description of expected changes as a result of those policies and law are discussed in each section below.

No impacts were identified for the topics of Agriculture and Forestry, Cultural and Tribal Cultural Resources, Geology and Soils, Hydrology and Water Quality, Land Use and Planning, Mineral Resources, Noise, Population and Housing, Public Services, Recreation, and Transportation, therefore there can be no cumulative contribution and further discussion of these topics is not required.

Less than significant impacts were identified for the topics of Aesthetics, Air Quality, Biological Resources, Energy, GHGs, Hazards and Hazardous Materials, Utilities and Service Systems, and Wildfire. The remainder of this analysis will discuss whether identified incremental impacts, although less than significant, may combined with similar effects from other projects resulting in a cumulatively significant impact, and if so whether the proposed project's incremental effects are cumulatively considerable

Aesthetics

Analysis contained in the section on Aesthetics (4.1) is evidence that the 2022 amendments to the Energy Code would induce an increase in the number of surfaces that could cause glare in the state as the 2022 amendments include the new prescriptive solar PV requirements for newly constructed nonresidential buildings. Most additional PV systems would be installed on the buildings' roof tops.

This cumulative analysis section considers the impacts from the 2022 amendments in combination with other laws and policies that increase the deployment of solar PV and potentially increase glare from the built environment. The existing 2019 standards already include a requirement for PV to be included in the construction of certain buildings, the 2022 amendments to the Energy Code expand this requirement to other newly constructed building types including: high-rise multifamily, hotel-motel, unleased tenant spaces, offices, medical offices or clinics, restaurants, grocery stores, retail stores, schools, and theater/auditorium/convention center buildings. This analysis thus, considers the cumulative impact from the addition of PV to these types of buildings if constructed under the 2022 amendments.

Actions that could affect cumulative impacts associated with glare from PV installation include projects that are incentivized by policies that promote the deployment of PV projects. SB 1078 (Chapter 516, Statutes of 2002) established the RPS for electricity supply. The RPS required that retail sellers of electricity, including publicly owned utilities and community choice aggregators, provide 20 percent of their supply from renewable sources by 2017. As of 2020, utilities in California are required to demonstrate procurement of renewable energy resources sufficient to meet 33 percent of each utility's retail sales. By 2030, this requirement increases to 60 percent of each utility's retail sales.

SB 100, the 100 Percent Clean Energy Act of 2018 increases the target procurement of electricity from renewable sources to 60 percent by 2030 from the previous target of 50 percent identified in SB 350, the Clean Energy and Pollution Reduction Act of 2015. Additionally, SB 100 targets 100 percent of electricity sold in California come from eligible renewable energy resources and zero-carbon resources by 2045.

Both these laws are likely to result in the continuing increase in the deployment of renewable energy generation, including medium to large utility scale PV generation.

As a result of these factors, the combined effects from the 2022 amendments to the Energy Code and projects incentivized by the above listed laws and policies would not result in cumulatively significant impacts due to glare.

The 2022 amendments do not direct the construction of non-residential commercial buildings in any place resulting in significant glare. Glare is a localized impact requiring proximity and a direct line of sight to the source and as noted in Section 4.1, any glare emitted from a source is typically transient as the source, sun or observer moves. There is no substantial evidence that construction of high-rise multifamily, hotel-motel, unleased tenant spaces, offices, medical offices or clinics, restaurants, grocery stores, retail stores, schools, and theater/auditorium/convention center buildings with rooftop PV, as a result of the amended Energy Code, will contribute to any existing or future potential glare impacts which could amplify or combine with glare originating from the medium to larger scale PV facilities driven by existing state laws.

These larger industrial projects tend to be sited in different areas; thus, combined effects are unlikely. For example, large utility scale solar PV projects are ground based and tend to be in remote desert locations away from population centers where commercial buildings are typically constructed. PV systems installed due to the 2022 amendments are typically small-scale roof top systems with varying orientations among a development, some may not even be observable from the ground, depending on building height and design. Based on the analysis set forth in Section 4.1, it is unlikely glare from a PV system installed due to the 2022 amendments to the Energy Code will combined with glare from other PV installations in a manner that would cause a significant impact; thus, there are no cumulative impacts and no further analysis is necessary.

Air Quality

Section 4.2 sets forth the full Air Quality analysis. Air quality impacts are inherently cumulative, as current emission levels and attainment status are a result of past and present activities. Typically, for an air quality cumulative assessment, the reference air basin is where the project would be constructed and emissions from the project are considered in combination with the existing level of pollution in the basin and whether the basin is in attainment or non-attainment for a criteria pollutant. Because the 2022 amendments to the Energy Code do not result in the construction of any buildings or change the rate of construction in any particular place, there is no specific air basin to consider the project's contribution of emissions.

As detailed in Section 4.2, the 2022 amendments are expected to reduce annual electricity and fossil fuel natural gas (and propane) use when compared to continued use of existing Energy Code requirements. The 2022 amendments, on a statewide basis, would annually save approximately 27~~33~~ million therms of fossil fuel natural gas and 1.4~~3~~ billion kWh of electricity, which result in net reductions of NOx and SOx emissions as a result of the 2022 amendments.

There could be a potential for seasonal air pollutant criteria emissions to increase from portions of the electricity generation sector, even if the 2022 amendments result in an annual net decrease in electricity consumption for the new and altered buildings. The increased electricity used due to the replacement of on-site fossil fuel with electric heat pumps for space heating in the cooler months of the year may result in new peaks of electricity demand and generation in those months. In the near term, existing in-state under-utilized electric sector capacity, which may include fossil generation, is projected to be available to meet an increase in winter demand when zero carbon emitting capacity is unavailable.[144] The additional operations of these facilities would be within permitted emissions limits, and therefore accounted for in each air district's attainment plan.

At the same time any increases in electricity demand this project creates also increases the eligible retail sales for which California utilities will need to procure renewable generation in order to comply with the RPS targets. Considering the long-term impacts of this project, SB 100 objectives will ensure any seasonal near-term increases in utilization of current carbon emitting capacity will be offset by renewable energy and other zero carbon energy sources.

As a result of these factors, the combined effects from the 2022 amendments to the Energy Code will not result in cumulatively significant impacts to air quality. The 2022 amendments create an overall reduction in emissions, which would be a positive impact

144 CEC Staff. 2020. Thermal Efficiency of Natural Gas-Fired Generation in California: 2019 Update. Staff report. TN#233380. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=233380&DocumentContentId=65895.

and would not contribute to pollution levels in the state's air basins or otherwise result in a cumulative considerable net increase of any criteria pollutant. The potential seasonal increases in criteria pollutant emissions are speculative and likely to be very small, if they occur at all. Moreover, any increases that do occur will be impossible to estimate as their location, their source, and their duration cannot be reasonably ascertained. As discussed in **Chapters 4, Sections 4.2 Air Quality**, the 2022 amendments to the Energy Code would also improve indoor air quality associated with cooking within enclosed spaces such as kitchens and there would be no cumulatively considerable impacts. Because there is no adverse cumulative impact, no further analysis is necessary.

Biological Resources

Analysis contained in the Biological Resources Section (4.3) and Air Quality Section (4.2) evidences that the 2022 amendments to the Energy Code would reduce pollutants such as NOx which would benefit biological resources. The 2022 amendments may also induce an increase in the number of surfaces that could, depending on their location, impact birds, bats and other species in the state as the 2022 amendments include new prescriptive PV requirements for newly constructed nonresidential buildings. The majority of these additional PV systems would be installed on the buildings' roof tops. For this analysis, the cumulative setting is the state of California.

While utility-scale projects are well documented to have various adverse impacts on biota (Kosciuch et al. 2020), outside of opinion pieces (e.g., Audubon 2017) and "gray literature" (anecdotal or non-peer-reviewed literature), little scientific data is available on impacts of distributed PV, such as rooftop solar. Siting of utility-scale projects frequently aims to avoid locating projects in ecologically rich areas, and rooftop solar has been proposed as a means of minimizing adverse avian impacts (Hathcock 2018). While the 2022 amendments will likely increase the deployment of small PV systems on roofs, they do not include provisions that would make it more likely for new buildings to be sited, designed, or constructed in such a way as to introduce new or additional adverse effects on candidate, sensitive, or special-status species. This cumulative analysis section considers the impacts from the 2022 amendments in combination with projects that may be incentivized by other laws and policies that increase the deployment of solar PV in the environment.

SB 1078 (Chapter 516, Statutes of 2002) established the RPS for electricity supply. The RPS required that retail sellers of electricity, including publicly owned utilities and community choice aggregators, provide 20 percent of their supply from renewable sources by 2017. As of 2020, utilities in California are required to demonstrate procurement of renewable energy resources sufficient to meet 33 percent of each utility's retail sales. By 2030, this requirement increases to 60 percent of each utility's retail sales.

SB 100, the 100 Percent Clean Energy Act of 2018 increases the target procurement of electricity from renewable sources to 60 percent by 2030 from the previous target of 50 percent identified in SB 350, the Clean Energy and Pollution Reduction Act of 2015. Additionally, SB 100 targets 100 percent of electricity sold in California come from eligible renewable energy resources and zero-carbon resources by 2045.

Both these laws are likely to result in the continuing increase in the deployment of renewable energy generation, including medium to large utility scale PV generation.

As a result of these factors, the combined effects from the 2022 amendments to the Energy Code and the above listed laws and policies will not result in cumulatively significant impacts to biological resources. Installation of rooftop PV systems due to the 2022 amendments would not be expected near the types of utility scale PV facilities developed under RPS and renewable energy laws. Construction of new buildings in 2023 with rooftop PV will not contribute to any existing or future potential biological impacts originating from the medium to larger scale PV facilities because these large industrial projects tend to be sited in different areas, thus combined effects are unlikely. The available literature on small distributed systems is scant and does not indicate that marginal additional small systems would be expected to create a significant adverse impact (cumulative or otherwise). As noted in the cumulative aesthetics section above, large utility scale solar PV projects are ground based and tend to be in remote desert locations away from population centers where residential and commercial buildings are typically constructed. PV systems installed due to the 2022 amendments are typically small-scale roof top systems with varying orientations among a development. Because there will be no combination with other expected medium to large scale PV projects, there are no cumulative impacts, and no further analysis is necessary.

Energy

As detailed in Section 4.4 covering Energy, the 2022 amendments do not result in inefficient, wasteful, and unnecessary consumption of energy. The 2022 amendments would result in energy savings when compared to the continued use of the 2019 standards. Specifically, there is an energy savings of 46 billion-time dependent valuation (kTDV) in 2023. TDV is the "common currency" adopted first by the CEC in 2003 as a result of the 2000 electricity crisis; it is updated every Energy Code cycle to reflect changes to energy systems resulting from adopted state energy policy. This enables time dependent valuation of all fuel types (natural gas, propane, and electricity) for the building standards, combining hourly increases and decreases in each of these fuel types into one overall energy metric. TDV creates the means to determine the value for all measures addressed by the standards, including efficiency, generation, storage, and demand response measures.

While PV and battery storage systems, envelope efficiency measures, and covered process load improvements reduce the use of natural gas, electricity, and TDV energy across all building types, the new prescriptive and performance standards for heat pump technology for water and space heating will result in a modest increase in the total electricity consumed in affected buildings. However, as analyzed in section 4.4, the increase in electricity resulting from heat pumps would be more than offset by the natural gas savings in the same buildings as shown by the TDV savings.

Because the 2022 amendments result in significant energy savings, there is no contribution to any existing inefficient, wasteful, and unnecessary consumption of energy within the state, and no further discussion is required.

Greenhouse Gas Emissions

Chapter 4, Section 4.5 sets forth the full GHG analysis. As with air quality, GHG impacts are inherently cumulative, as current emission levels are a result of past and present projects. For this cumulative analysis, statewide emissions are considered.

The 2022 amendments are expected to cause a change in the source of power for water and space heating in new construction. Currently, natural gas and propane are often used for these purposes. Under the 2022 amendments, electric heat pumps for space heating in some building applications and climate zones in California and for water heating in building applications and other climate zones are expected to be the primary method used to comply with the amended building standards. This change in fuel source would decrease natural gas and propane consumption in new construction while correspondingly increasing electricity consumption across all resource technologies and fuels. As discussed in section 4.5 the evidence indicates that the 2022 amendments will result in a statewide reduction in GHG emissions from 2025 through 2050 as compared to the existing standards.

As a result of these factors, the combined effects from the 2022 amendments and the existing levels of GHG would not result in cumulatively significant impacts.

With an overall reduction in emissions, the impacts from the 2022 amendments would be positive and would not contribute to GHG levels or otherwise result in a cumulative considerable net increase of GHG emissions. Because there is no adverse cumulative combination, no further analysis is necessary.

Hazards and Hazardous Materials

Section 4.6 sets forth the full analysis of Hazards and Hazardous Materials. This cumulative analysis section considers the impacts from the 2022 amendments in combination with other laws and policies that will expand the use of battery systems to electrify transportation and provide stationary energy storage, potentially resulting in a significant increase in hazards and hazardous materials associated with batteries utilizing current chemistries.

SB 100, the 100 Percent Clean Energy Act of 2018 increases the target procurement of electricity from renewable sources to 60 percent by 2030 from the previous target of 50 percent identified in SB 350, the Clean Energy and Pollution Reduction Act of 2015. Additionally, SB 100 targets 100 percent of electricity sold in California come from eligible renewable energy resources and zero-carbon resources by 2045. It is expected that the adoption of California SB 100 will result in greater deployment of battery storage options to achieve the identified goals.

Executive Order N-79-20 by Governor Gavin Newsom sets ZEV sales goals for California, obligating dramatic expansion of all-electric vehicles. This EO calls for 100 percent of in-state sales of new passenger cars and trucks to be all-electric by 2035, medium- and heavy-duty vehicles by 2045. The executive order also pushes for acceleration in the deployment of affordable fueling and charging options for ZEVs. The transition to electric vehicles will result in increased battery deployment during the time period relevant to the proposed amended regulations.

These laws result in the continuing encouragement of storage systems, which use lithium-ion batteries and have the potential to create impacts due their use of hazardous materials.

As discussed in Section 4.6, the proposed Energy Code changes would incorporate battery storage systems into specific high-rise multifamily, hotel-motel, tenant-space, office, medical office or clinic, restaurant, grocery store, retail store, school, and theater/auditorium/convention center buildings. (See Table 140.10-B, section 140.10). Battery storage equipment relies most commonly on use of lithium ion batteries for their operation.[145] Currently, the Energy Code does not require battery storage for these kinds of buildings, although some buildings in California are being built with lithium ion battery storage in absence of any requirements to incorporate this technology.

The 2022 amendments' requirement to include these systems in specified buildings can be reasonably anticipated to result in marginal increases in production of lithium ion batteries and routine transport of lithium ion batteries to such construction projects, and recycling or disposal of batteries after their useful life. This would also likely result in a slight increase in generation of hazardous waste, statewide, which could potentially increase the incidence of exposure to battery-related hazardous wastes.

The 2022 amendments do not approve specific construction projects or regulate the pace or location of future construction. As such, any effects of the 2022 amendments would be indirect, occurring only as a result of buildings being constructed in compliance with the 2022 amendments after they have taken effect. As noted above, the main foreseeable indirect potential impacts derived from the 2022 amendments relate to the increase in battery storage systems installed at a specific subset of newly constructed buildings including certain nonresidential, high-rise residential, hotels, motels, and other listed buildings (See Table 140.10-B, Section 140.10).

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145 Bowen et al. 2019. Grid Scale Battery Storage, Frequently Asked Questions National Renewable Energy Laboratory. Available at https://www.nrel.gov/docs/fy19osti/74426.pdf.

The forecasted demand for batteries for electric vehicles in California is significantly greater than those needed for stationary structure applications and required by the project.[146] The 2022 amendment's new battery storage requirement is expected to result in a total of 300 MW of battery storage installed from 2023-2025~~ (CEC 2021)~~.[147] The marginal increase in lithium ion batteries for energy storage systems required by the 2022 amendments could result in an incremental, but ultimately insignificant, increase in potential exposure to lithium, which is considered a hazardous material.

As a result of these factors, the combined effects from the 2022 amendments and the existing laws and policies increasing battery usage would not result in cumulatively significant impacts related to hazards or hazardous materials.

As discussed in Section 4.6, compliance with the existing comprehensive regulatory framework at the federal, state, and local level would ensure foreseeable potential combined effects related to operational hazards from the 2022 amendments and other projects stemming from laws and policies encouraging the use of battery storage would be less than significant. The lead or local governing agency would be responsible—through CEQA, building inspections, and other means—for ensuring any health and safety hazards from specific future project sites are mitigated if necessary, and for ensuring that buildings with Li-ion batteries are operated in a manner that is safe for that location and does not put the public at risk from battery related hazards.

Regarding increases in hazardous materials, it is California policy to reduce, reuse, and recycle wherever possible. It is anticipated lithium ion batteries will be repurposed for a second life, and stationary battery storage systems are a potential second life destination for electric vehicle batteries.[148] In addition, due to an increased demand for limited cobalt supply, rates and volume of lithium-ion battery recycling has increased (USGS, 2017a). At present, recycling activities for lithium-ion batteries primarily serve to conserve cobalt, which by comparison, is a rarer material (U.S. EPA, 2013). While not all lithium-ion batteries use cobalt, the additional volume of batteries using other metal

146 Steward et al.2019. Economics and Challenges of Li-Ion Battery Recycling from End-of-Life Vehicles. National Renewable Energy Laboratory. Available at www.sciencedirect.com.

147 Athalye, Rahul, John Arent, Roger Hedrick, Nikhil Kapur, Axaule Sultanova, Ben Lalor, Silas Taylor, et al. 2021. Building Energy Efficiency Measure Proposal to the California Energy Commission for the 2022 Update to the California Energy Code, Title 24, Part 6 Building Energy Efficiency Standards Nonresidential PV and Battery Storage. Report. Prepared by NORESCO and E3. TN#237776. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237776&DocumentContentId=71014.

148 From plug-in cars to plug-in homes – EV batteries get a second life | Automotive World. February 14, 2018; accessed May 10, 2021. Available at https://www.automotiveworld.com/articles/plug-cars-plug-homes-ev-batteries-get-second-life/.

combinations combined with consumer products and stationary batteries may provide economies of scale and thus further incentive for recycling. Recycling would also help address social-justice issues associated with the cobalt industry.

As discussed in Section 4.6, the demand for lithium batteries for electrification of the transportation sector (Steward et al. 2019) is much greater than the demand for batteries that would be used for building construction. Infrastructure development which is already underway to meet the transportation sector demand could also be used to accommodate any new demand created by the Energy Code updates. The 2022 amendments would also be implemented over time as new or remodel construction is approved by the local agencies and buildings subject to the Energy Code's prescriptive requirements for battery storage systems are constructed in 2023 and beyond. This would delay the need for recycling and disposal of lithium batteries for the period of the equipment's life and provide time to plan and develop battery recycling facilities needed to meet demand. In addition, growth in the lithium-ion recycling market is expected[149].

In the unlikely event batteries cannot be recycled, they can be disposed in landfills. Disposal of lithium ion batteries within the state must comply with California law, including but not limited to the Hazardous Waste Control law and implementing regulations which includes the Universal Waste Rule. This rule requires used batteries to be managed as hazardous waste and prohibits the disposal of used batteries to solid waste landfills. There are two hazardous waste landfills in California that have some limited remaining capacity for disposal. They are Chemical Waste Management - Kettleman Hills and Clean Harbors Buttonwillow facilities. As discussed in **Chapters 4, Sections 4.6 Hazards and Hazardous Materials**, there are also other out of state facilities that are currently in use, primarily in Nevada, Arizona, and Utah, for other hazardous waste disposal that could accommodate the disposal of the relatively small proportion of lithium ion batteries that would be needed to accommodate the forecasted increase in waste attributable to the Energy Code updates. These landfills are designed and operate in accordance with governing state and federal laws for hazardous waste disposal.

The current and expected ability to either recycle or dispose of lithium ion batteries and the existing compliance framework for handling hazardous material would ensure the batteries installed due to the 2022 amendments would not result in significant cumulative impacts. The project's contribution reflects only a minimal shift from existing conditions, and recycling infrastructure developed to address EV recycling will be

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149 Markets and Markets. 2020. "Lithium-ion Battery Recycling Market by Battery Chemistry (Lithium-nickel Manganese Cobalt, Lithium-iron Phospate, Lithium-Manganese Oxide, LTO, NCA,LCO), Industry (Automotive, Marine, Industrial, and Power), and Region – Global Forecast to 2030." Report. Available at https://www.marketsandmarkets.com/Market-Reports/lithium-ion-battery-recycling-market-153488928.html#:~:text=Key%20Market%20Players,lithium%2Dion%20battery%20recycling%20market. Last Accessed April 17, 2020.

available to accommodate the small incremental increase for storage devices at the end of their life.

Utilities and Service Systems

Analysis contained in the section on Utilities and Service Systems (4.7) evidences that the 2022 amendments may increase electrification of certain types of new buildings while reducing the use of natural gas within the state by providing requirements and incentives for builders to install electric appliances especially heat pumps. Overall, on a statewide basis, electricity use will be reduced compared to the existing Energy Code. But the project does have a potential to indirectly impact the mix of energy supply and related utility infrastructure.

This cumulative analysis section considers the impacts from the 2022 amendments in combination with projects incentivized by other laws and policies that are part of a broader effort to meet state goals relating to the reduction of GHGs and to increase the deployment of renewable energy. One way to achieve these goals is to expand energy efficient electrification in not just buildings but in other areas such as transportation and increase the capacity of renewable generation to meet increased electrification.

SB 350: Clean Energy and Pollution Reduction Act

The Clean Energy and Pollution Reduction Act of 2015, (SB 350, de León, Chapter 547, Statutes of 2015) establishes a target to achieve a cumulative doubling of energy efficiency savings in electricity and natural gas final end uses of retail customers by 2030 through energy efficiency and conservation by 2030.

SB 1078 (Chapter 516, Statutes of 2002) established the RPS for electricity supply. The RPS required that retail sellers of electricity, including publicly owned utilities and community choice aggregators, provide 20 percent of their supply from renewable sources by 2017. As of 2020, utilities in California are required to demonstrate procurement of renewable energy resources sufficient to meet 33 percent of each utility's retail sales. By 2030, this requirement increases to 60 percent of each utility's retail sales.

SB 100, the 100 Percent Clean Energy Act of 2018 increases the target procurement of electricity from renewable sources to 60 percent by 2030 from the previous target of 50 percent identified in SB 350, the Clean Energy and Pollution Reduction Act of 2015. Additionally, SB 100 targets 100 percent of electricity sold in California come from eligible renewable energy resources and zero-carbon resources by 2045.[150]

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150 CEC, CPUC, CARB. 2021. California Energy Commission SB 100 Joint Agency Report Achieving 100 Percent Clean Electricity in California: An Initial Assessment. Report. p. 75. TN#237167. Available at https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=19-SB-100.

AB 758 (Skinner, Chapter 470, Statutes of 2009) requires the CEC to develop and periodically update an action plan to increase energy efficiency savings in existing buildings. On December 11, 2019, the CEC adopted the California 2019 Energy Efficiency Action Plan (2019 Action Plan) to serve as the state's most recent policy map for increasing energy efficiency. The 2019 Action Plan includes strategies to achieve a statewide doubling of energy efficiency savings from electricity and natural gas end uses by 2030. It also addresses financing mechanisms, resiliency, multifamily building energy efficiency, building decarbonization, industrial and agricultural energy efficiency, use of energy data to better design and target efficiency, demand response measures, and barriers and opportunities to expand low-income and rural residents' access to energy efficiency and renewable energy. AB 758 does not impose specific regulatory requirements

Executive order N-79-20 by Governor Gavin Newsom sets ZEV sales goals for California, obligating dramatic expansion of all-electric vehicles. This EO calls for 100 percent of in-state sales of new passenger cars and trucks to be all-electric by 2035, medium- and heavy-duty vehicles by 2045. The executive order also pushes for acceleration in the deployment of affordable fueling and charging options for ZEVs.

SB 1389 (Chapter 568, Statutes of 2002) requires the CEC to conduct assessments and forecasts of all aspects of energy industry supply, production, transportation, delivery and distribution, demand, and prices. The CEC uses these assessments and forecasts to develop and evaluate energy policies and programs that conserve resources, protect the environment, ensure energy reliability, enhance the state's economy, and protect public health and safety. (Pub. Resources Code, § 25301(a).) The CEC includes these energy policy recommendations in its biennial IEPR that is issued in odd-numbered years with update reports in even-numbered years.

The 2018 IEPR Update provides an assessment of energy issues facing California which will require action for the state to meet climate, energy, air quality, and other environmental goals. The assessment identifies building GHG emissions as one potential issue and indicates that building decarbonization through building codes and standards should be considered.

The 2019 IEPR, adopted on February 20, 2020, summarizes priority energy issues currently facing the state, outlining strategies and recommendations to further the state's goal of ensuring reliable, affordable, and environmentally responsible energy sources. Energy topics covered in the 2019 IEPR include, but are not limited to, electricity sector trends and building decarbonization and energy efficiency.

The 2020 IEPR provides policy recommendations in to ensure a clean, affordable, and reliable energy system. In the area of ZEV, the IEPR has identified an increase use in the use of ZEVs, including plug in electric vehicles, and a subsequent need for increased vehicle charging stations and associated infrastructure. Recommendations for incentives and policies to manage charging patterns to benefit the grid are included in the 2020

IEPR. These recommendations may also have an effect on the California electric grid due to the increased electric demand from charging facilities and possible vehicle grid integration. Amendments to the Energy Code are not expected to conflict with recommendations from the 2020 IEPR. Increases to building efficiency, renewable generation and energy storage are expected to reduce the need for energy generation for buildings.

Executive Order B-55-18. This executive order signed by former Governor Edmund Brown provides a goal of statewide carbon neutrality by 2045 and net negative emissions thereafter. Amendment to the Energy Code are not expected to conflict with this executive order. Rather, amendments promoting the shift of natural gas usage to electric usage will promote decarbonization at the building site.

Together, these laws and policies could have a significant effect on both the electrical transmission and distribution systems, which may be further affected by the increased use of electricity, demand response, and on-site renewable generation that the 2022 amendments are likely to contribute to. Independent of the proposed project, California's utility infrastructure is already undergoing a transformation to accommodate the shift from fossil fuels to renewable energy and the greater use of electricity to address climate change and ensuing wildfire risks. This shift is, in part, driven by the increasing amount of renewable and zero-carbon energy sources required through SB 100, and the state's RPS requirements as well as electrification of transportation. Utility infrastructure, including the electricity grid, is a dynamic system constantly being updated and changed in response to many factors as demand changes over time, technology changes and the location of loads shift. Utility infrastructure is also subject to reliability requirements, determined by actual projected aggregated demand from all sources, not just the buildings subject to the 2022 amendments.

The multiple laws and policies listed, as well as the 2022 amendments to the Energy Code, are purposely increasing electrification as a primary tool to increase energy efficiency and reduce the state's GHG emissions over the next 24 years. Given the strategy and phased time period, substantial evidence supports the conclusion that the state's utility infrastructure will continue to transition.[151]

Because the grid is already transforming to accommodate projects meeting policies that encourage efficient electrification with renewable energy, implementation of the 2022 amendments would benefit the utility electric infrastructure by reducing overall energy usage, encouraging efficient and cost-effective heat pumps, and contributing to energy storage options due to battery storage requirements. Also, as stated in **Chapter 4,**

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151 See letter from PG&E TN#237100 at https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=19-BSTD-03; See also SB 100 report p. 105-111, https://www.energy.ca.gov/sb100#anchor_report.

Section 4.4 Energy, existing powerplant capacity is sufficient to accommodate the shifted peaks without the need for additional development.

As a result of these factors, the combined effects from the 2022 amendments and projects incentivized by the above listed laws and policies would not result in cumulatively significant impacts to utility infrastructure. It is likely the listed laws and policies, without considering the 2022 amendments, over the next 24 years will result in the relocation or construction of transmission and distribution equipment, renewable electric power and storage facilities, the construction or relocation of which could cause cumulatively significant environmental effects. However, this project's incremental effect is not cumulatively considerable.

As detailed in Section 4.7, the proposed project is expected to indirectly reduce electricity and natural gas usage on a statewide basis when compared to continued use of existing Energy Code requirements. In addition, the current capacity of in-state electricity generation is sufficient to meet the near term expected potential increase in electrical usage from heat pump technologies in certain buildings, as a result of the project.

As discussed in Section 4.7, the grid is transforming due to other laws and policies independent of the 2022 amendments. Steps that predate the implementation of the 2022 amendments, to ensure adequate utility resources, have already been taken through the CPUC's reliability proceedings. These proceedings include a 10-year-ahead look at system needs (reliability needs of the overall electric system); local needs (reliability needs specific to areas with transmission limitations); and flexibility needs (such as the resources needed to integrate renewables).[152] Given that these planning processes have already considered and accommodated the states' near-term infrastructure and electrification directives, the project is not expected to have any direct or indirect effect on utility infrastructure and therefore will not be cumulatively considerable.

Wildfire

Section 4.8 sets forth the full analysis relating to wildfire risks to very high FHSZ and SRA. Also, in relation to fires, Section 4.6 sets forth the full analysis of Hazards and Hazardous Materials, with specific discussion of wildland fires in section (g). The 2022 amendments would add prescriptive solar PV and battery requirements for certain buildings, including high-rise multifamily, hotel-motel, tenant-space, office, medical office or clinic, restaurant, grocery store, retail store, school, and theater/auditorium/convention center buildings.

The main foreseeable impact related to wildfires derived from the 2022 amendments relates to the increase in battery storage systems installed in certain newly constructed

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152 Pub. Util. Code §§ 454.51 and 454.52, available at https://www.cpuc.ca.gov/irp/.

buildings including certain nonresidential, high-rise residential, hotels, motel buildings. This cumulative analysis section considers the impacts from these battery storage systems in combination with other wildfire threats potentially resulting in a significant increase in wildfire risk. However, the battery storage systems expected to result from the 2022 amendments would be located inside of or adjacent to buildings and would not easily contribute to wildfires even for those buildings near land classified for high wildfire risk. Moreover, the 2022 amendments do not make it more likely that projects would be built in these zones in such a way to cause impacts.

As a result of these factors, the combined effects from the proposed 2022 amendments to the Energy Code and existing threats for causing wildfire, such as transmission lines, would not result in cumulatively significant impacts related to wildfire. The 2022 amendments do not result in the approval of any particular project with features that result in significant impacts in regard to wildfire. The project does not require or otherwise encourage development in areas prone to wildfires. While batteries are electrical and can potentially spark a fire, there is no evidence any battery system installed under the 2022 amendments presents wildfire risk that can be combined with other existing wildfire risks, such as transmission lines or other electrical infrastructure that may spark a wildfire.

As noted in Section 4.8, the battery systems installed under the 2022 amendments would be located inside the building or inside a structure near the building. This will limit the potential for there to be any combined effects between the battery system and some other risk in inducing a wildfire. Besides a physical barrier, there are a number of standards to ensure proper operations of a battery system.

Table 4.6-1 identifies standards and codes related to the safety and performance of lithium ion batteries. Battery safety and reliability systems include voltage and current protection via software controls, physical protection via component isolation, and fire alarm and suppression systems. Depending on the battery design, there are cell, module, rack, and enclosure and control system level standards that also ensure safe operation.

Battery cells must pass abuse tests according to UL Standard 1642 for lithium batteries. This standard includes protocols for several tests designed to reduce the risk of fire or explosion, including electrical tests, mechanical tests, environmental tests, and fire exposure tests.

Given these safety measures and that the 2022 amendments would not result in additional electrical infrastructure construction, there is no substantial evidence that the operation of an enclosed lithium battery system presents a risk of inducing a wildfire that can combine with other risks, to create a cumulative impact. Therefore, further analysis is not necessary.

c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

As detailed in the analysis set forth in Chapter 4, as well as summarized in Table 1.1, the project will not have any substantial adverse effects on human beings. The 2022 amendments directly increase the energy efficiency of buildings that will be constructed under the code. This efficiency will provide positive impacts for humans by reducing criteria air pollutants due to a reduction in power generation. The 2022 amendments will also improve kitchen air quality by setting standards for kitchen ventilation which also benefits humans. Finally, the 2022 amendments will incentivize the reduction in use of natural gas for water and space heating, which will also improve air quality and lower GHG emissions.[153]

Commenters also raised concerns regarding the effects of flicker in light sources and the potential limit of application of existing flicker standards to not apply to types of color-changeable lighting that were not considered when the standard was adopted. CEC staff is modifying the project to eliminate this potential impact, specifically by maintaining the existing scope of application of minimum flicker standards.

5.3.1 References

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153 For a detailed analysis of the air quality and GHG benefits from the project see sections 4.2 Air Quality and 4.5 GHGs.

Chapter 6

Alternatives

Alternatives

6.1 Introduction and Summary Conclusions

This section evaluates a reasonable range of alternatives to the 2022 amendments. Alternatives selected for analysis are limited to those that could feasibly meet most of the project's basic objectives while reducing or avoiding any of the project's significant effects. In this Draft EIR, because no significant adverse effects on the environment would result from the project, alternatives were selected that could reduce the reasonably foreseeable but less than significant impacts that could result from the project. Alternatives considered but not evaluated in detail are discussed below, including the reasons for their dismissal from detailed consideration.

Review of information in this Draft EIR led staff to select four project alternatives for analysis and comparison to the proposed project in addition to the No Project Alternative:

- No Prescriptive Solar Alternative
- No Prescriptive Battery Storage Alternative
- No Removal of Prescriptive Compliance Path Options Alternative
- Heat Pump-Based Space Heating and Water Heating Alternative

6.2 CEQA Requirements

The CEQA Guidelines require that an EIR consider and discuss alternatives to the proposed project. Section 15126.6 of the CEQA Guidelines provides that the alternatives analysis must:

- describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project;
- evaluate the comparative merits of the alternatives;
- focus on alternatives that would avoid or substantially lessen any significant effects of the project, even if these alternatives would impede to some degree attainment of the project objectives, or would be more costly; and
- describe the rationale for selecting alternatives to be discussed and identify alternatives that were initially considered but then rejected from further evaluation.

CEQA requires that an EIR "consider a reasonable range of potentially feasible alternatives that will foster informed decision-making and public participation."[154] Alternatives may be eliminated from detailed consideration by the lead agency if they

154 CEQA Guidelines, § 15126.6(a).

fail to meet most of the basic project objectives, are infeasible, or could not avoid any significant environmental effects.[155] The range of potentially feasible alternatives selected for analysis is governed by a "rule of reason," requiring evaluation of only those alternatives "necessary to permit a reasoned choice."[156]

An EIR is not required to consider alternatives that are infeasible.[157] In addressing feasibility of alternatives, factors that may be taken into account are site suitability; economic viability; availability of infrastructure; general plan consistency; other plans or regulatory limitations; jurisdictional boundaries; and whether the proponent can reasonably acquire, control, or otherwise have access to the alternative site.[158] An EIR "need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative."[159]

The lead agency is also required to evaluate the "no project" alternative along with its impacts. Analyzing a "no project" alternative allows decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project.[160] "The 'no project' analysis shall discuss the existing conditions at the time the notice of preparation is published…as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services. If the environmentally superior alternative is the 'no project' alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives."[161]

6.3 Project Objectives and Alternatives Screening

The overall purpose of the 2022 amendments is to employ technically feasible and cost-effective technologies and measures "to reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy, including the energy associated with the use of water, and to manage energy loads to help maintain electrical grid reliability" consistent with the statutory direction in the Warren-Alquist Act (e.g., Public Resources Code section 25402).

In furtherance of the project's overall purpose, the CEC has identified the following four specific project objectives as guiding these 2022 amendments:

155 Ibid.

156 CEQA Guidelines, § 15126.6(f)).

157 CEQA Guidelines, § 15126.6(a).

158 CEQA Guidelines, §§ 15126.6(f)(1), 15364.

159 CEQA Guidelines, § 15126.6(f)(3).

160 CEQA Guidelines, § 15126.6(e)(1).

161 CEQA Guidelines, § 15126.6(e)(2).

Objective 1: Reducing the wasteful, uneconomic, inefficient, or unnecessary consumption of energy via the deployment of technically feasible and cost-effective technologies and measures;

Objective 2: Reducing wasteful, uneconomic, inefficient, or unnecessary consumption of energy and maintaining grid reliability by increasing deployment and utilization of distributed, on-site renewable energy equipment and increasing the percentage of energy consumption from new residential and nonresidential buildings which is able to be served by renewable energy equipment;

Objective 3: Reducing the wasteful, uneconomic, inefficient, or unnecessary consumption of energy by ensuring that newly constructed buildings designed for use of natural gas equipment include wiring and other design features necessary to allow future use of electric equipment when it becomes cost-effective and technically feasible to do so; and

Objective 4: Reducing wasteful, uneconomic, inefficient, or unnecessary consumption of energy and maintaining grid reliability by improving the ability of buildings to engage in and benefit from energy storage and load management.

6.4 Alternatives Selected for Analysis

The following alternatives are evaluated in this EIR:

- 6.4.1 – No Project Alternative
- 6.4.2 – No Prescriptive Nonresidential Solar Alternative
- 6.4.3 – No Prescriptive Battery Storage Alternative
- 6.4.4 – No Removal of Prescriptive Compliance Path Options Alternative
- 6.4.5 – Heat Pump-Based Space Heating and Water Heating Alternative

Other than the No Project Alternative, because no significant adverse effects on the environment would result from the project, project alternatives were developed that could feasibly avoid or lessen the proposed project's potentially less than significant impacts. A comparative impact analysis is followed by an assessment of the extent to which each alternative could meet the basic project objectives and a discussion of potential feasibility issues. The alternatives selected for analysis in this Draft EIR represent options that would incrementally increase or decrease requirements relative to the 2022 amendments. The comparative analysis that follows is based on the analysis of the technical areas evaluated in **Chapter 4, sections 4.1 through 4.8** of this document.

6.4.1 No Project Alternative

Description

The purpose of a no project alternative is to provide decision makers with comparative information regarding the effect of approving the project versus not approving the project.[162] A no project alternative considers existing environmental conditions, as well as what would reasonably be expected to occur in the foreseeable future if a project were not approved, based on current plans and other available information about expected future conditions.[163] When a project is the revision of an existing regulatory plan, then the no project alternative will be the continuation of the existing plan into the future.[164]

Here, the no project alternative is that the CEC does not adopt the 2022 amendments; under this alternative, the existing 2019 Energy Code would remain in effect with its existing building design and construction requirements.

The 2022 amendments would encourage builders to install efficient and cost-effective electric heat pumps for space heating or water heating in particular newly constructed building types in particular climate zones in California. Implementation of these amendments would shift some fraction of building end uses away from using fossil fuel—natural gas or propane—for water and space heating. As discussed in **Chapters 4, Sections 4.2 Air Quality, 4.4 Energy, and 4.5 Greenhouse Gas Emissions**, this would shift fossil fuel consumption patterns compared to the continuation of the 2019 Energy Code. Overall, on an annual basis the project is expected to reduce electricity and fossil fuel use compared to the existing 2019 Energy Code. Thus, under the no project alternative, the shifts from fossil fuel to efficient electricity usage anticipated under the proposed project, and the overall reductions in annual electrical and fossil fuel use anticipated under the proposed project, would not be expected to occur.

The measures included within the 2022 amendments are by their nature modular: they apply to separate building types and systems and, with some exceptions, their feasibility and cost-effectiveness generally are not dependent on one another. As a consequence, the project could be modified to take no action in a specific area while pursuing 2022 amendments in other areas. To account for this, consideration of the no project alternative (taking no action at all) is followed by an analysis of several narrower alternatives, which are derivatives of the no project alternative that would preserve some elements of the 2022 amendments and remove other elements.

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162 CEQA Guidelines, § 15126.6(e)(1).

163 CEQA Guidelines, § 15126.6(e)(2).

164 CEQA Guidelines, § 15126.6(e)(3)(A).

Aesthetics

As identified in **Chapter 4, Section 4.1 Aesthetics**, the project would require increased deployment of solar panels that would have less than significant aesthetic impacts related principally to daytime glare from the panels. The no project alternative would not lead to the increased deployment of solar panels expected under the project and would instead maintain the existing level of PV deployment due to the 2019 Energy Code, thus avoiding the potential for any new effects from increased glare from the proposed project. However, as noted in **Section 4.1 Aesthetics**, "[m]odern PV panels reflect as little as 2 percent of incoming sunlight, about the same as water," and "[a]ny perceived glare would be temporary (a few minutes) as the reflected beam of the sun moves." It should also be noted that a fraction of nonresidential buildings already install solar PV systems at or after construction (i.e., without being required to do so by the Energy Code) and that low-rise residential buildings are currently subject to solar PV requirements, making the aesthetic appearance of solar panels increasingly commonplace. The impact is therefore less than significant. Based on this, the no project alternative would not avoid a significant adverse impact of the project related to aesthetics.

Air Quality

As identified in **Chapter 4, Section 4.2 Air Quality**, the project would cause a less than significant impact on air quality by increasing the number of new buildings that will be equipped with electric heat pumps instead of fossil fuel appliances for space or water heating, and by reducing electricity and fossil fuel use overall through the introduction of new efficiency measures and new onsite renewables and energy storage requirements.

The anticipated shift to electric heat pumps resulting from the project would reduce air pollutant emissions from fossil fuel heating appliances onsite at new and certain altered buildings. But because California's generation resources mix currently includes a proportion of fossil fuel generation, the increased electricity use by heat pumps would consequently increase air pollutant emissions from portions of the electricity generation sector for heating. Specifically, the buildings' use of heat pumps for space heating could result in small increases of electricity peak demand and generation during cooler months. However, as discussed in **Chapter 4, Section 4.2 Air Quality**, the increase in electricity demand will have no significant adverse impacts because the project will decrease annual energy use compared to the existing 2019 Energy Code and thus decrease net criteria pollutant and toxic air contaminant emissions statewide.

The no project alternative could avoid small seasonal increases in air pollutant emissions from portions of the electricity generation sector, but it would prevent the overall statewide net decrease in air pollutant emissions anticipated to result from the project. Based on this and the fact that the proposed project will not create any significant adverse impacts, the no project alternative would not avoid a significant adverse impact of the project related to air quality.

Biological Resources

As identified in **Chapter 4, Section 4.3 Biological Resources**, the project could have less than significant impacts on biological resources. The project would cause increased deployment of solar PV panels that could conceivably result in indirect future impacts to biological resources, such as avian injury and mortality, depending on the location, size, and design of the facility. However, the project would cause overall reductions in air pollutants statewide that would benefit biological resources, primarily by reducing nitrogen deposition and other toxic air contaminants relative to minimum compliance with the 2019 Energy Code and therefore to the no project alternative. Under the no project alternative, the potential for foreseeable but less than significant indirect impacts related to the expanded PV deployment would be avoided (as would the benefits to biological resources from an overall reduction in air pollutants).Therefore, the no project alternative would not avoid a significant adverse impact of the project related to biological resources.

Energy and Energy Resources

As identified in **Chapter 4, Section 4.4 Energy**, the project would cause less than significant energy impacts by encouraging builders to construct buildings that use electric heat pumps instead of fossil fuel (natural gas and propane) appliances for space and/or water heating depending on the climate zone. The buildings' use of efficient heat pumps would decrease fossil fuel consumption in newly constructed buildings and consequently increase electricity consumption for heating. However, the project would result in an overall reduction in the use of both electricity and natural gas, as the electricity savings from measures for both newly constructed buildings and alterations to existing buildings would strongly outweigh the relatively small increase in electricity used by heat pumps. The buildings' use of heat pumps for space heating could shift peaks in electricity consumption in newly constructed buildings during certain cooler seasons, relative to what would have been built under the existing building standards. Existing in-state under-utilized generation capacity is projected to be available to meet an increase in demand.

The "no project" alternative could avoid small seasonal increases in peak electricity demand, which may be more pronounced in some areas of the state than others, but it would prevent the overall reduction in the use of both electricity and natural gas causing it to fail to satisfy Objective 1. Because the project does not create a significant effect on energy and energy resources, the "no project" alternative" would not avoid a significant impact.

Greenhouse Gas Emissions

As identified in **Chapter 4, Section 4.5 Greenhouse Gas Emissions**, the project would reduce GHG emissions at the building site while increasing them on an increasingly clean grid by encouraging builders to construct buildings that use electric heat pumps instead of fossil fuel appliances for space or water heating, and would reduce electricity and fossil fuel use overall. The shift to electric heat pumps would reduce GHG emissions from fossil fuel heating appliances onsite at newly constructed buildings. But because California's generation resources mix currently includes a proportion of fossil fuel generation, then the increased electricity use by heat pumps would consequently increase GHG emissions from portions of the electricity generation sector for heating. However, the net effect of the project is a statewide reduction in GHG emissions, and the adverse effects of GHG emissions are not dependent on geographical location of the source of the emissions. Because GHG emission impacts are global rather than local, local or seasonal increases do not create an impact when overall GHG emissions are reduced. Therefore, the project will not create an adverse impact related to GHG emissions and the "no project" alternative would not avoid a significant impact related to GHG emissions (and would instead prevent the beneficial statewide reduction in GHG emissions that would result from the project).

Hazards and Hazardous Materials

As identified in **Chapter 4, Section 4.6 Hazards and Hazardous Materials**, the project would cause less than significant hazardous materials impacts by requiring inclusion of battery storage systems in certain newly constructed nonresidential buildings, the vast majority of which are reasonably anticipated to use lithium ion batteries for this purpose. The project would cause a marginal increase in production, transportation, use, and disposal of lithium ion batteries compared to what would already be expected to meet the demands of the transportation and utility sectors. Comprehensive federal, state, and local laws relating to the transport, use, and disposal of lithium ion batteries would ensure that any incremental increase in risk to the public and environment from the use of lithium ion batteries resulting from the Energy Code updates would be less than significant.

The project's use of these batteries would ensure greater self-utilization of energy generated by installed solar PV systems and, in so doing, minimize or eliminate the building's impacts on daily peak energy demands while also improving building resiliency and self-reliance by reducing its dependence on grid-delivered energy. Increased self-utilization also reduces the total amount of power provided from the grid. Lastly, battery storage systems can in most cases provide power during grid outages, enhancing building resiliency and reducing the effects of outages on building occupants.[165]

Because the project will not cause a significant hazards impact, the "no project" alternative would not avoid a significant hazards and hazardous materials impact associated with the increased use of lithium ion batteries. The no project alternative would, however, increase adverse impacts relative to the project in emissions and use of energy resources.

Utilities and Service Systems

As identified in **Chapter 4, Section 4.7**, the project would cause less than significant impacts to utilities and service systems by increasing electrification of certain types of newly constructed buildings while reducing the use of natural gas. Overall, increased energy and demand usage from specific heat pump measures are offset by other measures so the 2022 amendments are expected to indirectly reduce electricity and natural gas usage when compared to continued use of 2019 Energy Code requirements. Implementation of the 2022 amendments would benefit the utility electric infrastructure by reducing overall energy usage and lessen the need for infrastructure expansion by contributing to energy storage options due to battery storage requirements. Seasonal increases in demand for electricity for building heating can be met with current in-state electricity generation capacity. Because the project will not cause a significant impact on utilities and service systems, the "no project" alternative would not lessen or avoid a significant impact on the state's utility infrastructure. The no project alternative would, however, prevent the state from achieving greater energy efficiency in buildings, and therefore forgo the overall reduction of energy usage in the state.

Wildfire

As identified in **Chapter 4, Section 4.8**, the project could cause less than significant wildfire impacts by requiring inclusion of battery storage systems in certain newly constructed nonresidential buildings in SRA or very high FHSZ. The industry standards and compliance with laws such as the fire code that would be required to install and operate a battery system would ensure that the risks of battery fault or failure are managed and that there is an insignificant likelihood of harm to the environment and to public safety.

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165 Athalye, Rahul, John Arent, Roger Hedrick, Nikhil Kapur, Axaule Sultanova, Ben Lalor, Silas Taylor, et al. 2021. Building Energy Efficiency Measure Proposal to the California Energy Commission for the 2022 Update to the California Energy Code, Title 24, Part 6 Building Energy Efficiency Standards Nonresidential PV and Battery Storage. Report. Prepared by NORESCO and E3. TN#237776. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237776&DocumentContentId=71014.

The no project alternative avoids the possibility of impacts associated with requiring installation of lithium ion batteries in future specified nonresidential buildings in SRAs and very high FHSZs, though it is worth noting that battery storage systems will remain available to be incorporated into the design of newly constructed buildings in California, at the discretion of the building owner, and will receive credit for their effects on overall building energy efficiency under the existing 2019 Energy Code's performance compliance approach. That is, while the number of such systems installed is likely to be substantially smaller under the 2019 Energy Code than under the proposed project, and installation of these systems will not be compelled by the Energy Code but would instead be an elective compliance choice of a given builder, the number of systems installed in California will not be zero[166] and the Energy Code will continue to incentivize installation of these systems by appropriately modeling their energy benefits. Furthermore, in the absence of a battery energy storage system installed at construction under the project alternative, building owners and occupants may turn to more volatile sources of backup generation such as portable fossil fuel backup generators, and in such cases, the potential wildfire, electrocution, and carbon monoxide poisoning risks associated with certain new nonresidential buildings in SRAs and very high FHSZs could increase.[167]

Because the project will not cause a significant wildfire impact, the "no project" alternative would not avoid a significant wildfire impact associated with the increased use of lithium ion batteries. The continuation of the 2019 Energy Code that would occur under the no project alternative would result in a greater total demand for energy. While the likelihood of either the existing 2019 Energy Code or 2022 amendments being a direct or indirect causal or exacerbating factor in a wildfire is extremely remote in both the project and no project alternatives, available evidence does not indicate that potential wildfire impacts are likely to be lower for the no project alternative.

Feasibility and Attainment of the Project Objectives

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166 As noted in Chapter 4, Section 4.6 Hazards and Hazardous Materials, California is on track to meet its AB 2514 target of procuring 1,325 MW of energy storage capacity, including distributed energy storage resources, by 2024 even under a no project alternative scenario.

167 Honda. Generator Safety, Honda Power Equipment webpage at https://powerequipment.honda.com/generators/generator-safety. (discussing fire, electrocution, and carbon monoxide poisoning risks associated with the misuse or misplacement of portable fossil fuel generators). Last accessed May 7, 2021; See also Moench, Mallory. 2019. "During PG&E outages, generators caused fires, carbon monoxide poisoning." News article. San Francisco Chronicle. Available at https://www.sfchronicle.com/california-wildfires/article/During-PG-E-outages-generators-caused-fires-14833601.php.

Although the project does not approve any construction projects or regulate the rate and quantity of new building construction, the reasonably foreseeable implementation and compliance actions taken in response to the 2022 amendments would meet all of the project objectives. These amendments include requirements and measures, such as ensuring that California buildings are as energy efficient as is found to be technically feasible and cost-effective, increasing the deployment of onsite renewable energy generation, reducing growth in energy demand, and increasing energy demand flexibility and grid reliability. The project would also have environmental benefits such as reducing carbon emissions from new buildings. These benefits are analyzed in the measure proposals submitted through the statewide CASE initiative, Vertiv, and CEC staff reports listed in **Appendix D**.

The no project alternative would not attain any of the project objectives identified above in **Section 6.3**. As the existing 2019 Energy Code would not be altered, the no project alternative would not further reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy, would not deploy additional feasible and cost-effective technologies and measures, would not increase deployment and utilization of distributed, on-site renewable energy equipment, would not increase the percentage of energy consumption from new buildings that can be served by renewable energy equipment, would not ensure that newly constructed buildings designed for use of natural gas equipment include design features to allow future use of electric equipment, and would not improve the ability of buildings to engage in and benefit from energy storage and load management.

6.4.2 No Prescriptive Nonresidential Solar Alternative (Section 140.10(a))

An alternative to the project as proposed would be to forego adopting a minimum level of solar PV equipment as a requirement for newly constructed nonresidential buildings of the specified types; this alternative would mean not adding Section 140.10(a) or its subsections[168] while pursuing the remaining amendments. Doing so avoids the possibility of impacts associated with glare (aesthetics), and avian harm and mortality (biological impacts) that could be associated with the installation of solar PV panels, as discussed above in the discussion of the No Project alternative. The absence of nonresidential solar PV systems means that the quantity of electricity expected to be sourced from the on-site panels would instead be sourced from the grid.

In the near term, this marginal additional grid-sourced electricity would be produced using the current and future mix of generation resources, which includes natural gas power plants as well as renewables in varying quantities depending on where the electricity is consumed in California, what time of the day and year it is, and other

168 Cal. Code of Regs., tit. 24, Part 6, § 140.10(a).

factors. Relative to the project, this alternative impairs achievement of the project objectives, which include increasing grid reliability through increased deployment of renewable energy and reducing emissions from power plants. It also would greatly reduce GHG emissions benefits of the project.

Because the project will not cause significant environmental impacts, the No Prescriptive Nonresidential Solar Alternative not to require solar PVs on certain nonresidential buildings would not lessen or avoid significant environmental impacts. In addition, this alternative would fail to meet Objective 2, as it would not "increase deployment and utilization of distributed, on-site renewable energy equipment." The alternative does not avoid any significant adverse impacts. For this reason, CEC staff did not find this alternative to be superior to the project.

6.4.3 No Prescriptive Nonresidential Battery Storage Alternative (Section 140.10(b))

An alternative to the project as proposed would be to forego adopting requirements for a minimum capacity battery storage system as a requirement for newly constructed nonresidential buildings for which minimal solar PV systems are required. Specifically, this alternative would remove the project's addition of Section 140.10(b)[169] to the Energy Code while pursuing all remaining amendments. Doing so would avoid the less than significant impacts associated with hazardous materials.

The absence of a system for capturing generation from the solar PV array in excess of the moment-to-moment needs of the building has two primary consequences. First, the fraction of the energy generated by on-site solar PV equipment that could not immediately be used on-site would be exported to the grid. Consequently, the renewably generated electricity produced by the panels that could potentially be captured by an on-site storage system for later use is exported to the grid at times when the grid may be flush with renewable resources.

Second, the building will require grid-sourced electricity during those hours where the on-site solar PV system is not providing electricity and where a battery storage system would have been able to be discharged to serve building loads, including during daily ramp up and peak periods where marginal demand comes at the highest cost both in emissions and dollars.

The documents relied upon for the proposed requirement show that pairing battery storage with solar PV systems is feasible, cost-effective, extends the benefits of on-site generation by allowing the building to meet more of its own loads, and helps lessen grid impacts of newly constructed buildings both with regards to hourly exports and peak demands. As a result, pursuing this alternative would fail to achieve Objectives 2 and 4, as it would not "improve the ability of buildings to engage in and benefit from energy

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169 Cal. Code of Regs., tit. 24, Part 6, § 140.10(b).

storage and load management" nor would it "increase[] the percentage of energy consumption from new residential and nonresidential buildings which is able to be served by renewable energy equipment" by capturing excess generation during the middle of the day and using it to meet demands during non-generating periods, including peak demand periods. It also would greatly reduce GHG emissions benefits of the project. The alternative does not avoid any significant adverse impacts. For these reasons, staff did not find this alternative to be superior to the no project alternative.

6.4.4 No Change to Prescriptive Compliance Path for Natural Gas Alternative

An alternative to the project as proposed would be to forego the removal of inefficient fossil fuel-reliant prescriptive compliance options, thereby allowing a "business as usual" approach to the builder's ability to select between electric and mixed-fuel building designs when seeking project approval. Doing so avoids less than significant impacts associated with increased electricity demand (See **Chapter 4, Section 4.4 Energy Resources**) and potential increased refrigerant use (See **Chapter 4, Sections 4.2 Air Quality and 4.5 Greenhouse Gas Emissions**) potentially attributable to the incentivizing provisions in the project. It also would allow buildings to be able to avoid beneficial impacts associated with reductions in fossil fuel combustion resulting from the use of efficient heat pumps for setting the performance target for buildings.

However, the potential adverse environmental impacts associated with the more stringent performance baseline and the incentivization of electric design via the removal of mixed fuel prescriptive options are found to be less than significant. Moreover, this alternative fails to achieve Objectives 1, 2, and 4, as it does not "reduce the wasteful, uneconomic, inefficient or unnecessary consumption of energy via the deployment of technically feasible and cost-effective technologies," specifically heat pump technologies, nor does it "increase the percentage of energy consumption from new residential and nonresidential buildings which is able to be served by renewable energy equipment", including onsite and grid-level solar PV equipment and other sources of renewable electricity. It also would greatly reduce GHG emissions benefits of the project. The alternative does not avoid any significant adverse impacts. It is therefore not superior to the no project alternative.

6.4.5 Heat Pump-Based Space Heating and Water Heating Alternative

An alternative to the proposed project would be to use heat pump equipment for both the prescriptive and performance-based compliance approaches for all space and water heating end uses in all newly constructed buildings, in addition to pursuing all other proposed amendments. This change would be expected to substantially increase the number of newly constructed buildings that would install heat pumps for both of these heating end uses during the 2023, 2024 and 2025 time period due to the Energy Code. As discussed below, this alternative would cause the change to heat pump technology for space and water heating end uses to occur precipitously without the opportunity for a transition for market and industry adoption.

This alternative would also result in increased demand for electricity by newly constructed buildings compared to the project and a corresponding decrease in on-site fossil fuel use by newly constructed buildings, representing a shift in associated combustion emissions from occurring on-site to occurring at utility generation facilities. As explained in **Chapter 4, Sections 4.2 Air Quality, 4.4 Energy Resources, and 4.5 Greenhouse Gas Emissions**, the project will not adversely impact the environment because it will cause a net decrease in annual energy demand and associated emissions. Because the project will not cause significant environmental impacts, the heat pump space and water heating alternative would not avoid significant environmental impacts.

It should be noted that although this alternative results in a reduction of on-site combustion gases, exposure to on-site combustion is not an impact of the project; rather, it is a characteristic of the existing regulatory setting for newly constructed buildings which would continue if the project were not approved. Therefore, it is inaccurate to characterize the beneficial effects not realized under this alternative as an adverse impact caused by the project, because a decision to not adopt this alternative is equivalent to "the continuation of the existing plan, policy or operation into the future," meaning the existing 2019 Energy Code and its existing level of allowance of mixed fuel construction.[170]

Separate from environmental impacts, the absence of a transition period where mixed-fuel buildings remain allowed under the performance approach to compliance could be expected to cause sizeable economic and market impacts, which contribute to the infeasibility of this alternative at this time. The current market penetration of heat pump space and water heating equipment is low: data from the CHEERS registry[171] shows that for residential buildings permitted under the 2013 and 2016 Building Standards Code (meaning building permits requested between January 1, 2014 and January 1, 2020), the statewide rate of adoption of electric water heating of all types (not solely

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170 CEQA Guidelines, § 15126.6(e)(3)(A). See also *Lake Norconian Club Found. v. Dep't of Corr. & Rehab.* (2019) 39 Cal.App.5th 1044, 1051 ("[T]he failure to act is not itself an activity, even if, as may commonly be true, there are consequences, possibly including environmental consequences, resulting from the inactivity.")

171 CHEERS. CHEERS website at https://www.cheers.org/. ("CHEERS is an online verification platform where building industry professionals register projects for California energy code compliance." CHEERS is an approved Home Energy Rating Service (HERS) Provider under California Code of Regulations, title 20, sections 1670-75.)

heat pump) was less than two percent, and that the prevalence of all-electric construction tracked very closely with use of electric water heating. Electric space heating fared better in isolation, particularly for low rise multifamily: nearly half of low-rise multifamily units were served by electric space heating equipment of some kind, though this level falls to eight percent of proposed designs and four percent of final installs for single-family construction, as seen in **Appendix C**.

An immediate shift to requiring that 100 percent of the market be served by heat pump equipment for these end uses could potentially result in equipment and labor shortages.[172] Prices could rise significantly, and construction projects could be delayed in cases where equipment and/or skilled installers cannot be acquired. Also, stakeholders have stated that a rapid transition away from natural gas can leave insufficient time for retraining of natural gas plumbing installation professionals, potentially resulting in increased unemployment.[173]

Part of the rationale for selection of the project over a combined heat pump space and water heating alternative is the avoidance of these economic impacts. Although this rationale is distinct from environmental impacts, "economic viability" and the "availability of infrastructure" are "[a]mong the factors that may be taken into account when addressing the feasibility of alternatives."[174] Taken as a whole, these impacts raise concerns that an immediate transition to the sole use of electric heat pump equipment for the prescriptive and performance standards may not be economically feasible.

There are also technical limitations on the ability to replace central boiler systems in newly constructed, multi-family and nonresidential buildings with currently, primarily experimental central heat pump systems.[175] The market penetration for this use as of now is effectively zero percent, with a total of no more than one hundred installations

172 CEC staff. 2021. Approaches to Zero Net Energy Cost-Effectiveness in New Homes. California Energy Commission. Publication Number: CEC-500-2021-025. Available at https://ww2.energy.ca.gov/2021publications/CEC-500-2021-025/CEC-500-2021-025.pdf.

173 2022 Energy Code Update Pre-Rulemaking, 19-BSTD-03, TN#237095. https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=19-BSTD-03.

174 CEQA Guidelines, § 15126.6(f)(1).

175 Hoeschele, M. and E. Weitzel. 2017. Multifamily Heat Pump Water Heater Evaluation. Report. Alliance for Residential Building Innovation. Available at https://www1.eere.energy.gov/buildings/publications/pdfs/building_america/66430.pdf.

statewide of which CEC staff are aware.[176] This means a dearth of laboratory and field performance data by which a reliable performance model for estimating energy and emissions could be established, hampering the ability to evaluate energy costs and cost-effectiveness or even to create performance-based compliance approaches for these buildings. Use of ganged small water heaters to provide a function equivalent to a large boiler is still novel and exploratory, and very few products are designed to support this configuration.[177] Similarly, there are open questions regarding the efficacy of using equipment designed to provide domestic hot water to also provide space heating. Lastly, there is a relative absence of design standardization regarding use of centralized heat pump equipment compared to central boiler products and system designs. The lack of real world projects with documented equipment and installation costs also inhibits cost-effectiveness analysis, and likely would lead to premium costs that would be prohibitive to mainstream applications.

The combined effect of these limitations is to inject an amount of uncertainty into project designs and expectable outcomes, impairing staff's ability to state with certainty that central system heat pump designs are technically feasible, will result in energy savings and will be cost-effective to install. Neither the CBECC nor EnergyPlus building energy modeling software possess a software model for heat pump driven central systems, meaning that CEC staff are not able to make determinations that energy consumption and associated costs would be lower than for central natural gas equipment or that these reductions would be enough to offset any construction cost increases and support the finding of cost-effectiveness required by the CEC's statutory authority. Although the situation is expected to change as the market for these types of systems evolves, the current lack of performance and technical feasibility data means this alternative cannot be determined to be energy efficient or cost-effective.

There also are similar issues related to the use of heat pump space heating in climates with winter temperatures below 40º F. At these temperatures heat pumps lose capacity to extract heat from the outside air.[178] Conventional heat pumps switch from heat

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176 Pande, Abhijeet, Jingjuan (Dove) Feng, Julianna Yun Wei, Mia Nakajima. All-Electric Multifamily Compliance Pathway. Report. Prepared by TRC. TN#237692. Available at https://title24stakeholders.com/wp-content/uploads/2021/04/2022-T24-Final-CASE-Report_MF-All-Electric_updated_V2.pdf.

177 Pande, Abhijeet, Jingjuan (Dove) Feng, Julianna Yun Wei, Mia Nakajima. All-Electric Multifamily Compliance Pathway. Report. Prepared by TRC. TN#237692. Available at https://title24stakeholders.com/wp-content/uploads/2021/04/2022-T24-Final-CASE-Report_MF-All-Electric_updated_V2.pdf.

178 Shen, Bo. 2016. High Efficiency Cold Climate Heat Pump: 2016 Building Technologies Office Peer Review. Report. U.S. Department of Energy, Energy Efficiency and Renewable Energy. Available at https://www.energy.gov/sites/prod/files/2016/04/f30/32212_Shen_040616-1135.pdf.

pump mode to electric resistance at or about this temperature. As electric resistance becomes more dominant, the heat pump efficiency advantage is lost, along with the resulting emissions and energy cost reduction advantages. For this reason, the proposed 2022 amendments do not use heat pumps as the basis of the prescriptive and performance standards for some building types and some climate zones. There are national efforts to develop cold-climate heat pumps that will maintain the heat pump advantages at lower temperatures.[179]

With evolution of heat pumps as replacements for central boiler-driven systems and technology advancements for improved cold-climate performance that may occur with further market exploration, information could become available necessary to show that this alternative could achieve the project objectives at a future Energy Code update cycle. However, the lack of existing data supports a conclusion that its implementation at this time cannot be deemed to be either cost-effective or technically feasible. Although not directly incorporated into the environmental analysis, additional risks and delays in construction of buildings, and new housing in particular, could impact California's goals relating to the availability of housing generally and affordable housing in particular,[180] separate from the project objectives applicable to this project. Because this alternative does not avoid any significant adverse impacts, cannot be determined to meet project objectives, and is not economically or technically feasible, this alternative is not environmentally superior to the project alternative.

6.5 Alternatives Considered and Not Evaluated Further

Some of the alternatives initially considered by CEC staff for this analysis were eliminated from detailed consideration because they could not feasibly be accomplished, would not avoid any significant impacts, or would fail to meet most of the basic project objectives.[181] The following discussions provide staff's reasons for eliminating these alternatives from further analysis and comparison to the project.

6.5.1 Alternative Not Evaluated Further: Natural Gas Equipment

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179 Nelson, Carl, Jon Blaufuss, Christopher Plum, Josh Quinnell, Nick Brambilla, Elena Foshay, Jennifer Edwards, et al. 2018. Minnesota Energy Efficiency Potential Study: 2020-2029. Report. Prepared by Center for Energy and Environment, Optimal Energy and Seventhwave for the Minnesota Department of Commerce, Division of Energy Resources. Available at https://www.mncee.org/MNCEE/media/PDFs/MN-Potential-Study_Final-Report_Publication-Date_2018-12-04.pdf.

180 Office of Governor Gavin Newsom. 2020. Governor Newsom Signs Legislation Boosting Housing Production in California to Fight Affordability Crisis. News release. Available at https://www.gov.ca.gov/2020/09/28/governor-newsom-signs-legislation-boosting-housing-production-in-california-to-fight-affordability-crisis/.

181 CEQA Guidelines, § 15126.6(c).

Prohibition Alternative

An alternative requested by a portion of the stakeholders for the project is to fully prohibit the use of natural gas equipment in newly constructed buildings. Under this alternative, the option to install natural gas equipment by using performance-based compliance would be removed, and buildings would be required to use heat pumps or other electric technologies, whether efficient or not, to meet building demands for space heating, water heating, residential cooking, clothes drying and other end uses.

Space and water heating represent upwards of 66 percent of natural gas loads in commercial buildings and 80 percent in residential buildings. Those end uses represent the major opportunity to save energy through efficiency and simultaneously achieve building decarbonization.[182] Once the market is able to transition to the effective integration of heat pumps in most applications, and there is progress on the challenging endeavor to develop acceptable and reliable alternatives to replace at least some central boiler-driven systems in multi-family and nonresidential buildings, most of that major opportunity for feasible and cost-effective energy savings will have been realized. The remainder offer only limited energy savings (e.g., residential cooking) or extremely low market acceptance (e.g., heat pump clothes dryers). It is not clear how other end uses could be addressed through feasible and cost-effective energy savings.

Moreover, this alternative was found not to be feasible as it risks exceeding the CEC's statutory authority and direction relating to establishing building energy efficiency standards. Whereas the proposed project establishes a performance baseline using prescriptive measures shown to result in an overall more efficient building, this alternative would ban the use of natural gas without regards to the efficiency of the proposed end uses and based on grounds outside of "reduc[ing] the wasteful, uneconomic, inefficient, or unnecessary consumption of energy, including the energy associated with the use of water, and [managing] energy loads to help maintain electrical grid reliability[.]" Without the ability to demonstrate that a measure saves energy and is cost-effective, there is no clear statutory authority that the CEC can rely on to bar efficient use of natural gas within buildings as part of a proceeding to adopt new and updated building energy efficiency standards.

6.5.2 Alternative Not Evaluated Further: Additional building efficiency measures

As a part of developing the list of building energy efficiency measures to include as amendments to the Energy Code, staff evaluated conceptual proposals submitted by

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182 German, Alea, Bill Dakin, Joshua Pereira, Ben White, Vrushali Mendon, Elizabeth McCollum. 2020. Residential Energy Savings and Process Improvements for Additions and Alterations. Report. Prepared by Frontier Energy, Resource Refocus, TRC. Available at https://title24stakeholders.com/wp-content/uploads/2020/08/SF-Additions-and-Alterations_Final_-CASE-Report_Statewide-CASE-Team.pdf.

stakeholders for roughly 500 possible measures for their technical feasibility and cost-effectiveness. Of those, a list of 80 measures was selected for further development based on consideration of their anticipated level of benefit, their relative cost-effectiveness, and their likelihood of successful implementation if adopted as minimum standards. Development and refinement of these measure proposals occurred over a year-and-a-half long process, with close interactions between CEC staff, proposal drafters and other stakeholders. Staff also hosted topic-focused workshops and released a pre-rulemaking draft of proposed amendments to solicit additional input from stakeholders and the general public, and further refined the 2022 amendments based on this input.

The pursuit of additional possible energy efficiency measures is not further analyzed in this EIR. The selection of included measures represents those staff found to best meet project objectives, and for which there are complete and robust supporting analysis demonstrating technical feasibility. Additional measures would not avoid significant impacts, as no significant impacts have been identified for the project. Additional efficiency measures would be reasonably expected to have marginal incremental impacts (both beneficial and adverse). Because the Energy Code is updated triennially, many of the additional efficiency measures not selected at this time will be considered for future amendments to the Energy Code and included in the future amendments if available evidence indicates that they meet the project objectives for future amendments.

6.6 Environmentally Superior Alternative

CEQA requires that if "the environmentally superior alternative is the 'no project' alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives."[183]

Because the substantial evidence reviewed in the preparation of this EIR indicates that the project would not result in any significant environmental impacts, there is no clear environmentally superior alternative to the project. The proposed project best obtains the project objectives without creating significant adverse impacts. The project's foreseeable impacts avoided by the alternatives are less than significant, and the alternatives' infeasibility, failure to meet all or most of the project objectives, or both supports adoption of the proposed project.

6.7 References

Office of Governor Gavin Newsom. 2020. Governor Newsom Signs Legislation Boosting Housing Production in California to Fight Affordability Crisis. News release. Available

183 CEQA Guidelines, § 15126.6(e)(2).

at https://www.gov.ca.gov/2020/09/28/governor-newsom-signs-legislation-boosting-housing-production-in-california-to-fight-affordability-crisis/.

CEC staff. 2021. Approaches to Zero Net Energy Cost-Effectiveness in New Homes. California Energy Commission. Publication Number: CEC-500-2021-025. Available at https://ww2.energy.ca.gov/2021publications/CEC-500-2021-025/CEC-500-2021-025.pdf.

Chapter 7

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Appendices

Appendices Table of Contents

Appendix A

Notice of Preparation and Public Comments

Notice of Preparation

TN#237212. Available at

https://efiling.energy.ca.gov/GetDocument.aspx?tn=237212&DocumentContentId=70393

CALIFORNIA ENERGY COMMISSION
1516 Ninth Street
Sacramento, California 95814
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CEC-057 (Revised 1/21)

NOTICE OF PREPARATION

NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT
FOR THE 2022 AMENDMENTS TO THE ENERGY CODE

The California Energy Commission (CEC) is the lead agency under the California Environmental Quality Act (CEQA) and will prepare an environmental impact report (EIR) for the proposed 2022 amendments to the Building Energy Efficiency Standards contained in the California Code of Regulations, Title 24, Part 6 (Energy Code).

In accordance with California Code of Regulations, Title 14, section 15082, the CEC has prepared this notice of preparation (NOP) to inform agencies and interested parties that an EIR will be prepared for the above-referenced project. The purpose of an NOP is to provide sufficient information about the project and its potential environmental impacts to allow agencies and interested parties the opportunity to provide a meaningful response related to the scope and content of the EIR, including mitigation measures that should be considered and alternatives that should be addressed (Cal. Code Regs., tit. 14, § 15082[b]).

The CEC has the exclusive authority to adopt energy efficiency standards for buildings, which are located in the Energy Code. Public Resources Code section 25402, subdivisions (a) and (b) establish that the CEC shall periodically prescribe, by regulation, statewide building energy efficiency standards to reduce wasteful, uneconomic, inefficient, or unnecessary consumption of energy. The Energy Code includes the energy efficiency requirements applicable to newly constructed buildings and additions and alterations to existing buildings.

Submitting Comments

Pursuant to California Code of Regulations, Title 14, section 15082(b), your response must be sent no later than 30 days after receipt of this notice, although you are encouraged to submit them sooner. You may submit comments electronically through the CEC's electronic commenting feature on the CEC's webpage at https://efiling.energy.ca.gov/EComment/EComment.aspx?docketnumber=19-BSTD-03.

A full name, email address, comment title, and either a comment or an attached document (.doc, .docx, or .pdf format) is mandatory. After a challenge response test used by the system to ensure that responses are generated by a human user and not a computer, click on the "Agree & Submit Your Comment" button to submit the comment to the CEC's Docket Unit.

You are encouraged to use the electronic filing system described above to submit comments. If you are unable or do not wish to submit electronically, a paper copy of your comments, including the docket number 21-BSTD-02 and indicating "2022 Energy Code Update CEQA Documentation" may be sent to:

Docket Unit
California Energy Commission
Docket No. 21-BSTD-02
1516 9th Street, MS-4
Sacramento, CA 95814

Or, email them to docket@energy.ca.gov

Please note that your e-comments, emails, written letters, any attachments, and associated contact information (for example, address, phone number, and email address) become part of the viewable public record. Additionally, this information may become available via internet search engines.

If you have any questions or need additional information on how to participate in CEC's review of the proposed project, please contact Peter Strait at peter.strait@energy.ca.gov.

The project location, description, and potential environmental effects are summarized below.

Project Description

The Warren-Alquist Act establishes the CEC as California's primary energy policy and planning agency. Public Resources Code sections 25213, 25402, 25402.1, 25402.4, 25402.5, 25402.8, and 25910 mandate and/or authorize that the CEC adopt rules and regulations, as necessary, to reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy and water in new residential and new nonresidential buildings.

One of the ways the CEC satisfies this requirement is through the Energy Code. The Energy Code includes the energy efficiency requirements applicable to newly constructed buildings and permitted additions and alterations to existing buildings. The CEC updates the Energy Code on a three-year cycle as part of the California Building Standards Code.

The current project is the latest triennial update to the Energy Code. The proposed amendments, if adopted, would be incorporated into the 2022 edition of the Energy Code and become effective on January 1, 2023. The CEC is proposing the following amendments to the Energy Code:

- Revise the prescriptive compliance path available for building projects to include only heat pump technology in specific circumstances;
- Revise the "standard design" used for the modeling-based performance compliance path available for building projects to establish the performance baseline based on heat pump technologies in specific circumstances;
- Improve existing residential energy efficiency standards for solar photovoltaic systems, including battery storage, and associated compliance options;
- Add new prescriptive solar photovoltaic and battery requirements for the following newly constructed nonresidential building types: high-rise multifamily, hotel-motel, tenant-space, office, medical office or clinic, restaurant, grocery store, retail store, school, and theater/auditorium/convention center buildings;
- Add new requirements that mixed fuel buildings be electric ready, meaning that electrical connections and other features needed to allow use of non-combustion equipment options are installed at the time of initial construction;
- Establish new energy efficiency standards for lighting, envelope, and space conditioning systems serving controlled environment horticulture spaces;
- Improve energy efficiency standards for commercial and industrial process loads, including, computer room air conditioning, refrigerated areas, fan systems, compressed air systems, and steam traps;
- Improve nonresidential and multifamily efficiency standards for building envelopes (e.g., exterior walls, windows, roofs, and floors), fan and duct systems, HVAC controls, boilers and service water heating systems, indoor and outdoor lighting systems, and grid integration equipment such as demand responsive controls;
- Improve minimum standards for residential kitchen ventilation;
- Update and enhance requirements relating to duct sealing and ventilation; and
- Make numerous minor revisions to existing provisions to improve the clarity of the regulations.

Project Location

The project is a change to building design and construction requirements that are applicable statewide.

Potential Environmental Impacts

While the Energy Code relates to new construction, it does not cause new construction to occur within the state. The Energy Code also does not regulate where such construction occurs nor does it change the application of zoning laws, land use restrictions, or any other laws that affect the siting of specific building projects.

Rather, the Energy Code is a set of design and construction requirements that apply once a decision to begin a construction project has been made and a building permit requested (i.e., the Energy Code provides conditions attached to the permit to construct a given improvement). The Energy Code sets design and construction standards for specific building components to ensure the building achieves a minimum level of overall energy efficiency. For example, the Energy Code may require that installed HVAC equipment meet minimum federal standards for equipment efficiency and that associated ducting be appropriately sealed and insulated. As such, adopting amendments to Energy Code requirements does not directly cause any changes to the environment. Its effects are indirect, as builders and manufacturers respond to new requirements.

Rather, improvements in energy efficiency act to lower a building's wasteful use of energy, thus avoiding potentially negative impacts that would otherwise have occurred. The majority of efficiency improvements considered in the proposed amendments to the Energy Code do not increase the amount of ground disturbance needed for a given building nor change the type or character of equipment or materials installed into the building as a part of its construction. Nevertheless, CEC has identified three areas where a potentially significant environmental impact may exist:

- An increase in greenhouse gas emissions is theoretically possible but not expected. The proposed Energy Code encourages heat pump technology, which reduces on-site gas combustion for space and water heating equipment. Heat pump equipment relies on use of refrigerants for its operation, as do air conditioners. Many of the most common refrigerants have a high global warming potential (see https://ww2.arb.ca.gov/resources/documents/high-gwp-refrigerants), meaning that refrigerant leakage, should it occur during transport, installation, operation, or disposal, could result in increased greenhouse gas emissions. While mixed-fuel buildings will still be constructed using the performance compliance approach, the removal of gas alternatives in the prescriptive pathway and the need to achieve modified performance targets can be reasonably anticipated to incentivize additional use of heat pump technologies that would not otherwise occur, with an expected commensurate increase in the use of necessary refrigerants.

  The use of refrigerants substitutes for continuous on-site combustion of gas during operation of space and water heating equipment, thus reducing combustion-related emissions and potentially increasing those from refrigerants. This substitution is not expected to lead to a significant increase in net greenhouse gas emissions attributable to building space heating and water heating needs, though staff acknowledges that there is a possibility than an environmental impact may nonetheless exist and intends to investigate this area in the EIR.

- Replacement of combustion of natural gas at the building site with heat pump technologies has a significantly lower emissions tradeoff than has historically been the case, making it reasonable to expect a net reduction in emissions. While use of utility-provided electricity means that overall fuel efficiency, inclusive of transmission losses, can be lower than the fuel efficiency of on-site equipment, this is counterbalanced by the fact that heat pump equipment is more efficient than combustion equipment (having coefficients of performance of two and above, meaning that they provide twice or more energy as heating than they consume as electricity). Further, California has made (and is mandated to continue making) significant strides to decarbonize its electricity system by converting to renewable sources, such that it is reasonable to expect that the relative advantages of heat pump technologies will increase over time.

Staff is not aware of any substantial evidence that fuel substitution would have a direct or a cumulatively considerable environmental impact on criteria pollutant emissions or greenhouse gas emissions, though staff acknowledges that there is a possibility that an environmental impact may nonetheless exist and intends to investigate this area in the EIR.

Lastly, staff has also identified a possibility of a cumulative impact occurring as this project encourages transition to electric equipment serving new space and water heating needs at the same time that other projects encourage transition to electric equipment serving transportation needs. Staff intends to investigate whether this context creates any potentially significant impacts.

- A significant increase in hazards and hazardous materials is possible but not expected, because the proposed Energy Code would incorporate battery storage systems into nonresidential system requirements. Battery storage equipment relies most commonly on use of lithium ion batteries for their operation. The requirement to include these systems in specified buildings can be reasonably anticipated to require routine transport of lithium ion batteries to such construction projects. Lithium ion batteries are regulated as a hazardous material under the U.S. Department of Transportation's Hazardous Materials Regulations (HMR; 49 C.F.R., Parts 171-180). (See https://www.phmsa.dot.gov/lithiumbatteries.)

  Lithium ion batteries are ubiquitous throughout consumer and commercial products, and compliance with existing federal laws allows them to be safely transported, used, and recycled. The marginal increase in routine transport, use, and disposal of such batteries needed to install building battery storage systems is not expected to lead to a significant increase in risk or to pose a significant hazard to the public or the environment, though staff acknowledges that there is a possibility that an environmental impact may nonetheless exist and intends to investigate this area in the EIR.

Staff has identified that this project will have either no or less-than-significant impacts in the following environmental topic areas: aesthetics, agriculture and forestry resources, biological resources, cultural resources, energy, geology and soils, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation and traffic, utilities and other service systems, tribal cultural resources, and wildfire.

Responsible and Trustee Agencies

Any adoption of building standards by any state agency is subject to approval by the California Building Standards Commission, making them a responsible agency for this project.

Staff is not aware of any significant environmental impacts for which another California agency would be a trustee agency.

Alternatives

The EIR will consider a reasonable range of potentially feasible alternatives to the project. In addition to a no project alternative. The EIR will likely consider project alternatives that do not change provisions relating to use of heat pump equipment or add requirements for battery storage systems.

Public Comment Summary

- NOP Public Comment Letter 1: Earthjustice and Sierra Club
  TN#237462. Available at
  https://efiling.energy.ca.gov/GetDocument.aspx?tn=237462&DocumentContentId=70662
- NOP Public Comment Letter 2: Holland & Knight
  TN#237496. Available at
  https://efiling.energy.ca.gov/GetDocument.aspx?tn=237496&DocumentContentId=70697
- NOP Public Comment Letter 3: Jon McHugh, PE
  TN#237497. Available at
  https://efiling.energy.ca.gov/GetDocument.aspx?tn=237497&DocumentContentId=70695
- NOP Public Comment Letter 4: Jim Stewart, PhD
  TN#237519. Available at
  https://efiling.energy.ca.gov/GetDocument.aspx?tn=237519&DocumentContentId=70719
- NOP Public Comment Letter 5: Sierra Club CA
  TN#237523. Available at
  https://efiling.energy.ca.gov/GetDocument.aspx?tn=237523&DocumentContentId=70727
- NOP Public Comment Letter 6: Southern California Gas Company
  TN#237493. Available at
  https://efiling.energy.ca.gov/GetDocument.aspx?tn=237493&DocumentContentId=70691
- NOP Public Comment Letter 7: Native American Heritage Commission
  TN#237537. Available at
  https://efiling.energy.ca.gov/GetDocument.aspx?tn=237537&DocumentContentId=70747

Appendix B

Project Energy and Emissions Greenhouse Gas Impacts

TN#239152. Available at - https://efiling.energy.ca.gov/GetDocument.aspx?tn=239152&DocumentContentId=72605.

~~TN #237848. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237848&DocumentContentId=71090.~~

This appendix provides an overview of the workbook of spreadsheets used to compute the values reported in Tables 4.2-2, 4.2-3 and 4.2-4 in Chapter 4.2 and Tables 4.5-1 and 4.5-2 in Chapter 4.5. These spreadsheets consolidate data found in the documents identified in **Appendix D**. Building construction starts were determined following a methodology described in a memo to the CEC (see **Chapter 3**).A summary of each of the 1~~2~~3 tabs in the workbook follows:

1. **Tab ResCountDataEntry**

   This is a new tab. It is used to switch between single-family new housing start numbers. Specifically, the Draft EIR used an estimate of 119,045 new single-family house starts per year based upon the CEC 2023 forecast value (taken from the data to make forecasts used by the Energy Commission. Future forecasts will consider updating this value to better align with historical data). A commenter recommended using historical house starts per year. After review, CEC staff revised the number to 58,052 new single-family house starts per year. Then the number of new housing starts shows up in the SF-HPSD tab (see below) in cells I1, O22 and O23, O46 and O46, and O68 and O69.

2. ~~1~~**. Tab SF-HPSD**

   Single Family Heat Pump Standard Design (SF-HPSD). This spreadsheet is used to compute, depending on the climate zone, a heat pump water heating or heat pump space heating Standard Design energy budget in each of the 16 California climate zones for a newly constructed 2,100 square foot single-family residence, a newly constructed 2,700 square foot single-family residence and a weighted average of these two. This sheet computes values for the existing 2019 Energy Code, the proposed 2022 Energy Code, and the savings that accrue due to the proposed 2022 Energy Code. The analysis shows the amount of fossil fuel saved and the increased electricity consumption for this sector in each climate zone due to using heat pump water heaters and heat pump space heaters. Also included is an estimate of net carbon dioxide-equivalent emissions saved. The Standard Design is based on heat pump water heaters in climate zones 1, 2, 5-9, 11, 12, 15, and 16; the Standard Design is based on heat pump space heaters in climate zones 2, 3, 10, 13, and 14. In the final EIR, climate zone 10 was moved from heat pump space heaters to heat pump water heaters, as described below.

Appendix B includes updates from the Draft EIR for newly constructed single-family residences in response to comments received from ConSol Company. Specifically, annual new single-family residential construction starts was reduced from 119,045 units per year to 58,052 units per year to better reflect historical new construction starts for single-family residences. An option was incorporated into the spreadsheet workbook by using a new tab titled "ResCountDataEntry." On cell C3 of the new tab, in the pull-down menu choose "CIRB 2019" to select the new number of single-family housing starts of 58,052; select "CEC 2023 Forecast" to select the previous 119,045 number.

Appendix B includes updates from the Draft EIR due to the change to remove climate zone 10 from Exception 1 to Section 150.1(c)8 in order to switch the prescriptive baseline water heating system for single-family buildings from a natural gas water heating system to a heat pump water heating system. This change coincided with the switching of the prescriptive baseline space heating system for these buildings from a heat pump system to a natural gas system.

3. 2. Tab MF-HPSD

Multifamily Heat Pump Standard design (MF-HPSD). This spreadsheet is used to compute a heat pump space heating Standard Design energy budget in each of the 16 California climate zones for a newly constructed 2-story multifamily residence (low rise), a newly constructed 3-story multifamily residence (low rise), a newly constructed 5-story multifamily residence (midrise), and a newly constructed 10-story multifamily residence (high rise) and a newly constructed “combined” building. This sheet computes values for the existing 2019 Energy Code, the proposed 2022 Energy Code, and the savings that accrue due to the proposed 2022 Energy Code. The analysis shows the amount of fossil fuel saved and the increased electricity consumption for this sector in each climate zone due to converting to heat pump water heaters and heat pump space heaters. Also included is an estimate of net carbon dioxide-equivalent emissions saved.

4. 3. Tab NR-HPSD

Nonresidential Heat Pump Standard Design (NR-HPSD). This spreadsheet is used to compute an energy budget in each of the 16 California climate zones for newly constructed “nonresidential” buildings. The analysis assumes that natural gas fueled space heaters are no longer used in selected nonresidential building types and climate zones; heat pump space heaters are used instead. Some Small school buildings use heat pumps both for space heating and domestic hot water (DHW) heating, as noted below. The affected building types include small offices (5,303 square feet); large retail spaces (240,023 square feet); medium retail spaces (24,566 square feet); small retail spaces (9,376 square feet); small schools (24,415 square feet), some with DHW; and warehouse space heating (2,550 square feet of office and 52,046 square feet of total space). This sheet computes values for the existing 2019 Energy Code, the proposed 2022 Energy Code, and the savings that accrue due to the proposed 2022 Energy Code. The analysis shows the amount of fossil fuel saved and the increased electricity consumption in this sector in each climate zone due to converting to heat pump water heaters and heat pump space heaters. Also included is an estimate of net carbon dioxide-equivalent emissions saved.

5. ~~4.~~ Tab MF&NR-PV&BATT

Multifamily and Nonresidential PV and Battery Storage (MF&NR-PV&BATT). This spreadsheet is used to compute electricity and CO2e emission savings for newly constructed multifamily and nonresidential buildings that install PV and battery storage systems. These include small office, medium office, large office, small retail, medium retail, large retail, small school, large school, warehouse, midrise multifamily, and high-rise multifamily buildings. This sheet computes values for the existing 2019 Energy Code, the proposed 2022 Energy Code, and the savings that accrue due to the proposed 2022 Energy Code. The analysis shows the amount of electricity saved in this sector in each climate zone due to converting to installation of PV and battery storage. Also included is an estimate of net carbon dioxide-equivalent emissions saved.

6. ~~5.~~ Tab MF-EE

Multifamily Energy Efficiency. This spreadsheet is used to compute the effect of energy efficiency measures for the same building types in Tab 2 MF-BL.

7. ~~6.~~ Tab EE-Alts

Energy Efficiency Alterations. This spreadsheet is used to compute the effect of making improvements to existing buildings. Approximately 7 percent of single-family residences and 3.6 percent of multifamily residences are assumed to be altered each year. Efficiency measures and sub-measures are included as follows:

Measure	Sub-Measure
Air Distribution	Duct Leakage Testing
	Fan Energy Index
	Fan Power Budget
Daylighting	Automatic Daylight Dimming to 10%
	Prescriptive to Mandatory Automatic Daylighting Controls in the Secondary Sidelit Daylit Zone
Nonresidential Grid Integration	Communication Protocol Clean up
	Demand Responsive Lighting Systems
Nonresidential High Performance Envelope	Cool Roofs: Steep-Sloped
	Hotel/Motel Simplification
	Roof Recovers
	Roof Replacements
Nonresidential HVAC Controls	Dedicated Outdoor Air Systems (DOAS)
	Exhaust Air Heat Recovery
	Expand Economizer Requirements
	VAV Dead-band Airflow
Nonresidential Indoor Lighting	Lighting Power Densities
	Multi-zone Occupancy Sensing in Large Offices
Outdoor Lighting	Nonresidential Lighting Power Allowances for General Hardscapes
	Nonresidential Lighting Zone Reclassification
Reduce Infiltration	Air barrier verification all climate zones
	Require air barrier where not currently required (CZ1-9 all buildings; hotel/motel all CZs)

8. ~~7.~~ Tab Impact GWP by Building Type

Global Warming Potential. This spreadsheet is used to compute refrigerant leakage rates for single-family, multifamily and nonresidential water heating and space heating heat pumps used in all 16 climate zones for newly constructed buildings. The space heating and water heating heat pumps would replace conventional natural gas-fueled equipment. The analysis computes the CO2e emissions of these high global-warming potential gases.

a. Heat Pump Global Warming Potential Analysis

Heat pumps commonly use HFC refrigerants for heat transfer, which have a much higher GWP than CO_2. As a result, while heat pumps can reduce CO_2 emissions from heating and cooling due to their efficiency and source energy (increasingly clean electricity), they can also contribute to climate change when they leak or at the end of their useful life by emitting high-GWP refrigerants into the atmosphere. To understand the impact of heat pump refrigerants on Title 24 CO_2e savings, we estimated the GWP of installed heat pump equipment across the single-family, multifamily, and nonresidential sectors. The following sections explain the methodology of the analysis. Table 1 provides a summary of key assumptions, and Table 2 provides the analytical inputs.

b. Explanation of Key Variables

i. Heat Pump Type and Size

The analysis varies across building sectors and climate zones, as the proposed Title 24 code prescriptive option calls for either heat pump space heaters (HPSH) or heat pump water heaters (HPWH), depending on building type. The analysis assumes that single-family homes are equipped with HPWHs in most climate zones, and HPSHs in other climate zones. For multifamily, HPSHs were applied in each individual dwelling unit. In the nonresidential sector, the analysis assumes that HPSHs are applied in all sub-sectors covered by the proposed code (small office, small, medium and large retail, small schools, and warehouses). In the small school scenario, one HPWH is added to each school, where water heating is used in the school's kitchen.

The analysis uses 3-ton units in 2100 ft^2 single-family homes and 4-ton units in 2700 ft^2 single-family homes. In studio and 1-bedroom apartments, 1.5-ton units were assumed; 2-ton units were assumed in 2-bedroom apartments, and 3-ton units were assumed in 3-bedroom apartments. In the non-residential sectors, specific charge sizes were modeled for each sub-sector and climate zone, consistent with the capacity requirements for each building category. In small schools an 80-gallon water heater is assumed to serve kitchen hot water demand.

In all sectors, the amount of refrigerant in the system is calculated using 2.73 pounds of refrigerant per ton of capacity for heat pumps and 2.5 pounds of refrigerant per ton of capacity for unitary air conditioners.

ii. Heat Pump Lifetime

Heat pump effective useful life (EUL) is approximately 15 years, and the building lifetime assumed in the analysis is 30 years. As a result, the heat pumps are replaced once in the lifecycle analysis. Because refrigerant regulations are becoming more stringent in California and in the U.S. at large, it was assumed that when the refrigerants are replaced at 15-years, they would be replaced with substances that have a lower GWP. More information about the application of specific refrigerants is provided in the next section.

iii. Refrigerants and Leakage

The analysis for air conditioning and space heating considers the effective date of January 1, 2025, for the CARB Refrigerant

Regulations.[184] Prior to the effective date of those regulations, the analysis uses the refrigerant R-410a across all sectors.[185] For 2025 for original installations and after 15-years for replacements, the refrigerant R-32 is used, which has a lesser GWP in compliance with regulations adopted by the CARB. For water heating, the analysis uses R-134a for original equipment, which is also replaced by R-32 after 13 years, reflecting demanding GWP reductions by the California Legislature and the U.S. Congress.[186] The analysis uses 20-year GWP values, which are far greater than 100-year GWP, to reflect the California Legislature's priority on Short Lived Climate Pollutants.[187]

Refrigerants leak from heat pumps gradually over the course of the equipment lifetime and at the end of life, effectively resulting in most of the refrigerant being lost. The end-of-life leakage accounts for the majority of the refrigerant loss, so we annualize the end-of-life loss over the entire lifetime of the equipment to arrive at a generalized annual leak rate that takes into account both the gradual loss and the end-of-life loss (Table 2).

iv. Methodology

The average annual GWP of the applicable heat pump was calculated on a per-building (or dwelling unit) basis by the following steps:

1. The effective percentage of refrigerant lost, based on the annual leakage plus the leakage of remaining refrigerant at the end of the equipment's EUL is calculated as:

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184 CARB. 2020. Proposed Amendments to Prohibitions on Use of Certain Hydroflourocarbons in Stationary Refrigeration, Chillers, Aerosols, Propellants, and Foam End-Use Regulation. Resolution 20-37. Available at https://ww3.arb.ca.gov/board/res/2020/res20-37.pdf.

185 CARB. 2016. California's High Global Warming Potential Gases Emission Inventory: Emission Inventory and Technical. Support Document. Available at https://ww3.arb.ca.gov/cc/inventory/slcp/doc/hfc_inventory_tsd_20160411.pdf.

186 House Resolution 133. Consolidated Appropriations Act, 2021. (Cuellar, 116th Congress); See also U.S. Environmental Protection Agency. 2021. EPA Moves Forward with Phase Down of Climate-Damaging Hydrofluorocarbons. News release. Available at https://www.epa.gov/newsreleases/epa-moves-forward-phase-down-climate-damaging-hydrofluorocarbons.

187 Senate Bill 605 (Laura, Chapter 523, Statutes of 2014); See also Senate Bill 1383 (Laura, Chapter 395, Statutes of 2016).

*Cumulative annual leakage (%) = (1 – annual leakage rate %) * equipment EUL (years)*

*End-of-life loss (%) = (1 – Cumulative annual leakage %) * end-of-life leak rate*

taking into account that the end-of-life leak rate applies *only* to the amount of refrigerant remaining in the system at the end of life.

2. The total annualized leak rate is calculated as:

Average annualized leak rate = (Cumulative annual leakage + End-of-life loss) / equipment EUL

3. The refrigerants used in the heat pumps depend on the year of installation, as discussed in the sections above. An average 20-year GWP factor is calculated to represent a) the mix of refrigerants used over the 30-year lifetime of the building (for example, replacement refrigerants will have a lower GWP), and b) the CARB refrigerant regulations that take effect on January 1, 2025 for HPSH, thus affecting newly constructed buildings in the last year of this code cycle. The average GWP is calculated as:

Original share = Share of GWP of original equipment = EUL of original equipment / 30-year building life

Replacement share = Share of GWP of replacement equipment = 1 – Original Share

*Average GWP = Original share * Original GWP (R-410a, R-134a, or R-32) + Replacement share * Replacement GWP (R-32)*

As explained above:

- For HPSH, the Original GWP is based on R-410a in 2023 and 2024 install years and Original GWP is based on R-32 in 2025. Replacement GWP is based on -R32.
- For HPWH, since CARB's regulations do not apply to HPWHs, the Original GWP is based on R-134a in 2023, 2024, and 2025 install years. Replacement GWP is based on R-32.
- Equipment EUL of HPWH is 13 years
- Equipment EUL of HPSH is 15 years.

- GWP represents the average 20-year GWP potential of 1 lb. of refrigerant.

4. The average annual GWP of the applicable heat pump is calculated per-building:

*Average annual GWP = Average annualized leak rate * Average GWP * lbs of refrigerant for device*

Using the same method, the annual GWP of a baseline unitary air conditioner unit is also calculated. The increase in GWP due to the 2022 Energy Code is then taken as the difference between the GWP from refrigerants from the baseline air conditioner and the projected GWP assuming the building would use a heat pump rather than an air conditioner as follows:

The GWP is scaled to the statewide level by multiplying by the number of projected construction starts for each building category in each climate zone. In the non-residential sector, the change from conventional heating to heat pumps would occur only for specific building types, so the statewide scaling applies only to the applicable percentage of building starts (Table 1).

Table 1. California Title 24 Global Warming Potential Analysis Assumptions

Single Family	Assumptions
Equipment Type	*Either* a HPSH or HPWH depending on climate zone.
Equipment Size	2100 sqft: 3-ton HPSH 2700 sqft: 4-ton HPSH HPWH: 50-gallon water heater
Refrigerant Assumptions	Air Conditioner and Space heater: prior to 2025, R-410a, 20-year GWP 4340; 2025, R-32, 20-year GWP 2330; replacement after 15 years, R-32; charge scalar based on CARB data Water heating: R-134a; 20-year GWP 3830; replacement after 13 years, R-32; refrigerant charge scalar based on CARB data
Leakage Assumptions	Annualized leakage rate
Scaling Statewide	100% of single-family new construction assumed to have either HPSH or HPWH
Multifamily	
Equipment Type	2019 Design is for individual HPSH s for each apartment unit, with the size of the unit varying by apartment size.
Equipment Size	Studio, 1-br: 1.5-ton HPSH 2-br: 2-ton HPSH 3-br: 3-ton HPSH
Refrigerant Assumptions	Air Conditioner and Space heater: prior to 2025, R-410a, 20-year GWP 4340; 2025, R-32, 20-year GWP 2330; replacement after 15 years, R-32
Scaling Statewide	100% of multifamily new construction assumed to have a HPSH in each unit

Non-Residential	
Equipment Type	HPSH for small office, small, med and large retail, and warehouse office; all electric school included one 50-gallon HPWH.
Equipment Size	Unit sizes from CBECC simulations provided for small office, small, med and large retail, all electric school, and warehouse office.
Refrigerant Assumptions	Air Conditioner and Space heater: prior to 2025, R-410a, 20-year GWP 4340; 2025, R-32, 20-year GWP 2330; replacement after 15 years, R-32; charge scalar based on CARB data. Water heating (in school only): R134a; 20-year GWP 3830; replacement after 13 years, R-32; refrigerant charge scalar based on CARB data.
Scaling Statewide	GWP applied only to the portion of the market expected to take up heat pumps as a result of proposed code, as follows: 100% of retail 100% small office 60% of schools 4.9% of non-refrigerated warehouse

Table 2. California Title 24 Global Warming Potential Analysis Inputs

Technology:	Unitary AC [(a)]	HPSH	HPWH	15-year Replacement	Source
Refrigerant charge (lbs):	7.5	8.2	1.76	NA	*CARB [1,2]*
Annual leak rate (fraction):	0.05	0.053	0.02	NA	*CARB [1,2]*
End-of-life leak rate (fraction):	0.8	0.8	0.985	NA	*CARB [1,2]*
Replacement Lifetime (years):	15	15	13	NA	*CARB [1,2,4]*
Generalized annual leak rate (fraction):	0.06	0.06	0.08	NA	*Calculation*
Refrigerant type:	R-410A	R-410A	R-134a	R-32	*CARB [1,2]*
100-year GWP of refrigerant:	2088	2088	1430	675	*CARB [1,2]*
20-year GWP of refrigerant:	4340	4340	3130	2330	*IPCC [3]*
Lbs/Ton of Unit Capacity Scalar	2.5	2.73	NA	NA	*CARB [3]*

Notes:
[(a)] A "unitary AC" is a self-contained (not built-up) air conditioner. Most or all of the basic components are assembled in a factory.
[1]California Air Resources Board. Staff Report: Initial Statement of Reasons, Public Hearing to Consider the Proposed Amendments to the Prohibition of Certain Hydroflourocarbons in Stationary refrigeration, Chillers, Aerosols-Propellants, and Foam End-uses Regulation, 2020.
[2] California Air Resources Board. California's High Global Warming Potential Gases Emissions Inventory: Emission inventory and Technical Support Document (2016. Retrieved From: https://ww3.arb.ca.gov/cc/inventory/slcp/doc/hfc/_inventory_tsd_20160411.pdf
[3]IPCC, 2007: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 996 pp.
[4]NREL, 2013. National Renewable Energy Laboratory, "Comparison of Advanced Residential Water Heating Technologies in the United States", Jeff Maguire, Xia Fang, and Eric Wilson for NREL. Technical Report NREL/TP-5500-55475; May 2013. Available at: https://www.nrel.gov/docs/fy13osti/55475.pdf

9. ~~8.~~ Tab Combined All Buildings

This spreadsheet uses values computed in the tabs above to determine statewide totals of program savings and statewide annual carbon dioxide-equivalent, NOx and SOx emissions. The lower portion of this spreadsheet provides summary values reported in Tables 4.5-1, 4.2-2 and 4.2-3. While reviewing the spreadsheet to respond to comments, two computational errors were discovered. First, cell D25 was not correctly summing the therms saved from new construction. Second, cell D26 was not correctly summing the therms saved from new construction plus alterations. These equations are now corrected. These minor corrections do not alter any of the conclusions contained in the Draft EIR.

10. ~~9.~~ Tab Combined All Buildings—Compact

This spreadsheet provides a summary of program savings in a compact single page format.

11. ~~10.~~ Tab CO2 Emissions

This spreadsheet is used to compute year-by-year CO2e savings attributed to the 2022 Energy Code relative to "business-as-usual" as determined from the 2019 Energy Code. First, a "typical years' worth" of fossil fuel and electricity consumption savings is computed, then this typical year is assumed to apply to compute program savings of CO2e for 2023 through 2052, assuming no further building standards are implemented after 2022. The bottom portion of the spreadsheet summarizes these CO2e savings and is used to develop the CO2e values reported in Table 4.5-2.

12. ~~11.~~ Tab CO2 Dollar Benefit

Time Dependent Valuation. This spreadsheet is used to compute total TDV benefits (from cap-and-trade benefits and economywide emissions reduction benefits) through the year 2052.

13. ~~12.~~ Tab Criteria Pollutants

This spreadsheet is used to compute annual NOx and SOx criteria pollutant emission reductions attributable to the 2022 Energy Code. First, a "typical years' worth" of fossil fuel and electricity consumption savings is computed, then this typical year is assumed to apply to compute program savings of NOx and SOx for 2023 through 2052, assuming no further building standards are implemented after 2022. The bottom portion of the spreadsheet summarizes these criteria pollutant emission savings and is used to develop the values reported in Table 4.2-4.

While reviewing the spreadsheet to respond to comments, some computational errors were discovered. First, cell d40 was not correctly computing NOx emissions reductions fuel saved for multifamily facilities and cell c42 was not correctly computing NOx reductions from electricity savings. Second, cell d41 was not correctly computing SOx emissions reductions for fuel saved for multifamily facilities and cell c43 was not correctly computing SOx emissions reductions from electricity savings. These errors have been corrected in the final version of the spreadsheet. These minor corrections do not alter any of the conclusions contained in the Draft EIR.

Appendix C

HERS Registrations, 2013 and 2016 Energy Code Cycles

California Residential New Construction HERS Registrations (2016 & 2013 Code Cycles)

Electric Water Heating	%	Statewide Sample Size (Units)
Single Family (CF-1Rs)	3.43%	266,242
Single Family (CF-2Rs)	0.75%	191,731
Low-Rise Multifamily (CF-1Rs)	7.96%	63,641
Low-Rise Multifamily (CF-2Rs)	4.49%	46,447
All Low-Rise RNC (CF-2Rs)	**1.48%**	**238,178**

Electric Space Heating		
Single Family (CF-1Rs)	8.47%	266,242
Single Family (CF-2Rs)	4.30%	191,731
Low-Rise Multifamily (CF-1Rs)	49.39%	63,641
Low-Rise Multifamily (CF-2Rs)	46.93%	46,447
All Low-Rise RNC (CF-2Rs)	**12.61%**	**238,178**

All-Electric New Construction	%	Sample Size (Units)
Single Family (CF-1Rs)	1.88%	266,242
Single Family (CF-2Rs)	0.48%	191,731
Low-Rise Multifamily (CF-1Rs)	7.76%	63,641
Low-Rise Multifamily (CF-2Rs)	4.43%	46,447
All Low-Rise RNC (CF-2Rs)	**1.25%**	**238,178**

Notes

This data was generated by Southern California Edison by analyzing multiple sources of CA HERS Registry Data and includes registrations from both the 2016 and 2013 Title-24 Code Cycles

CF-1Rs contain energy design intent for new construction projects and needed by building departments to pull permits. CF-2Rs are installation certificates for new construction projects.

Numbers for IOU territories are divided and estimated based on primary electric IOU serving each CA Climate Zone

All-electric construction is conservatively inferred based on registrations that have both electric water heating and space heating

Appendix D

Documents Relied Upon for 2022 Energy Code Rulemaking

The rulemaking for the 2022 update to the Energy Code includes numerous documents relied upon, the majority of which are in the form of code change proposals. These proposals and other documents contain descriptions and analysis of the anticipated effects of the proposed changes to regulation, including some descriptions of environmental effects. These documents are docketed into the record of the rulemaking proceeding at https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=21-BSTD-01.

The information in these documents was used by CEC staff in evaluating and describing the environmental impacts of the project, as shown in **Appendix B**.

Report Title	**Docket Number and Link**
Code Change Proposals	
Integrated Pumped Refrigerant Economizer for Computer Rooms	TN#237790. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237790&DocumentContentId=71031
Demand Management – Controlled Receptacles	TN#237775. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237775&DocumentContentId=71016
All-Electric Multifamily Compliance Pathway	TN#237692. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237692&DocumentContentId=70915
Multifamily Domestic Hot Water Distribution	TN#237696. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237696&DocumentContentId=70922
Multifamily Indoor Air Quality	TN#237702. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237702&DocumentContentId=70926
Market Analysis in Support of Single-family and Updated Multifamily	TN#237788. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237788&DocumentContentId=71030

Multifamily Restructuring	TN#237697. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237697&DocumentContentId=70921
Residential Energy Savings and Process Improvements for Additions and Alterations	TN#237713. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237713&DocumentContentId=70934
Enhanced Air-to-Water Heat Pump Compliance Options	TN#237710. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237710&DocumentContentId=70937
Single Family Grid Integration	TN#237712. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237712&DocumentContentId=70935
Variable Capacity HVAC Compliance Software Revisions	TN#237711. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237711&DocumentContentId=70936
High Efficiency Boilers and Service Water Heating	TN#237777. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237777&DocumentContentId=71013
Controlled Environment Horticulture	TN#237699. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237699&DocumentContentId=70919
Pipe Sizing, Monitoring, and Leak Testing for Compressed Air Systems	TN#237701. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237701&DocumentContentId=70927
Nonresidential Computer Room Efficiency	TN#237707. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237707&DocumentContentId=70929
Nonresidential Daylighting	TN#237706. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237706&DocumentContentId=70930
Nonresidential Drain Water Heat Recovery	TN#237828. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237828&DocumentContentId=71070
Nonresidential Grid Integration	TN#237705. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237705&DocumentContentId=70931

Air Distribution: High Performance Ducts and Fan Systems	TN#237695. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237695&DocumentContentId=70923
Nonresidential Indoor Lighting	TN#237704. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237704&DocumentContentId=70924
Nonresidential High-Performance Envelope	TN#237698. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237698&DocumentContentId=70920
Nonresidential HVAC Controls	TN#237693. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237693&DocumentContentId=70914
Reduced Infiltration	TN#237691. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237691&DocumentContentId=70916
Nonresidential Outdoor Lighting Sources	TN#237709. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237709&DocumentContentId=70932
Refrigeration System Opportunities	TN#237708. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237708&DocumentContentId=70933
Steam Trap Monitoring	TN#237700. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237700&DocumentContentId=70928
Nonresidential PV and Battery Storage Systems	TN#237776. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237776&DocumentContentId=71014
Heat Pump Baseline for Non-Residential and High-Rise Residential Buildings	TN#237849. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237849&DocumentContentId=71091
Residential Electric Baseline	TN#237850. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237850&DocumentContentId=71093
Additional Documents Relied Upon	

Brett Singer comment in response to UCLA paper on Gas combustion in buildings	TN#237687. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237687&DocumentContentId=70908
Technical Memo on Updated Analysis from NO2 and PM25 Cooking Simulation	TN#237684. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237684&DocumentContentId=70911
Simulations of short-term exposure to NO2 and PM2.5 to inform capture efficiency standards	TN#237685. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237685&DocumentContentId=70910
Effective Kitchen Ventilation for Healthy Zero Net Energy Homes with Natural Gas	TN#237686. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237686&DocumentContentId=70909
Development of a standard capture efficiency test method for residential kitchen ventilation	TN#237690. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237690&DocumentContentId=70917
Product Performance Certification Procedure (updated as of February 28, 2020)	TN#237694. Available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=237694&DocumentContentId=70918