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STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

2019 Title 24 Building Energy Efficiency Standards Rulemaking Proceeding California Code of Regulations, Title 24, Parts 1 and 6	**Docket No. 17-BSTD-2**

RESOLUTION ADOPTING NEGATIVE DECLARATION AND PROPOSED REGULATIONS

I. INTRODUCTION

The California Energy Commission has, as directed by Section 25402 of the California Public Resources Code, developed and undertaken a proceeding to adopt revisions to its Building Energy Efficiency Standards.

These standards apply to residential, nonresidential, high-rise residential, and hotel and motel buildings. The standards are in Part 6 (also known as the California Energy Code) and associated administrative regulations in Part 1, Chapter 10, of Title 24 of the California Code of Regulations. The standards are called the *2019 Building Energy Efficiency Standards* (2019 Standards), as proposed on May 26, 2015, for a 15-day review, and as further revised by the errata set forth in Appendix A of this Resolution. The 2019 Standards will go into effect on January 1, 2020, following approval by the California Building Standards Commission.

As adoption of the revised regulations is a "discretionary project" under the California Environmental Quality Act (CEQA)[1], the Energy Commission has determined that CEQA applies to this project and, pursuant to CEQA, has prepared an Initial Study of its environmental effects and proposed Negative Declaration.

Therefore, the Energy Commission based on the Initial Study analyzing the environmental impacts of the proposed revisions to the Building Energy Efficiency Standards together with comments received during the public participation process, finds that:

(1) there is no substantial evidence, in light of the whole record, that adopting the

[1] Pub. Resources Code, § 21000 et seq.

revisions to the Building Energy Efficiency Standards, in Parts 1 and 6 of Title 24 of the California Code of Regulations, will have a significant effect on the environment; and

(2) the Negative Declaration reflects the Energy Commission's independent judgment and analysis.

Accordingly, the Energy Commission adopts the Negative Declaration.

The Energy Commission additionally and subsequently adopts the proposed additions and amendments to its energy and water efficiency standards for buildings.

The Energy Commission takes this action under the authority given by Public Resources Code Sections 25218, Subdivision (e), 25402, 25402.1, 25402.4, 25402.5, 25402.5.4, 25402.8 and 25910, to implement, interpret and make specific Sections 25402, Subdivisions (a)-(c), 25402.1, 25402.4, 25402.5, 25402.5.4, 25402.8 and 25910.

II. HISTORY OF THE PROCEEDING

To develop the 2019 Standards, the Energy Commission conducted an open, transparent, and extensive public process. Between March 2017 and today, the Commission has held 14 workshops and 2 hearings, in addition to 10 webinars and 9 in-person meetings hosted by Codes and Standards Enhancement (CASE) program organizers. Development began with a presentation of the overall plan and schedule for this rulemaking, and the fundamental building blocks that would be used in the Standards. Subsequent workshops addressed various aspects of the 2019 Standards in detail. During this process, stakeholder groups assessed, analyzed, discussed, and helped to improve numerous versions of the proposed Standards, and the Commission staff considered more than 400 formal public comments submitted to Commission dockets (split between the pre-rulemaking and formal rulemaking proceedings).

On November 22, 2017, the formal rulemaking phase was initiated when the Commission (1) filed with the California Building Standards Commission (CBSC) and the Office of Administrative Law (OAL), and (2) published, the following:

- A Notice of Proposed Action (NOPA), which described the proceeding, summarized the proposed Standards, and explained how interested persons could participate;
- Economic and Fiscal Analysis (Form 399);
- An Initial Statement of Reasons (ISOR), which presented the rationales for the Standards;
- Proposed Express Terms (45-day language) of the 2019 Standards, and;
- The Initial Study and Proposed Negative Declaration for the 2019 Standards.

OAL published the NOPA in the California Regulatory Notice Register on January 19, 2018.[2]

[2] California Regulatory Notice Register, Jan. 19, 2018, vol. no. 3-Z, p. 83.

The Commission also provided the NOPA to:

- every contact on the Energy Commission's mailing lists for: *The Blueprint* (an Energy Code newsletter), appliance efficiency standards, nonresidential and residential building energy efficiency standards, city and county building officials, and county clerks,
- the Commission's *Efficiency* and *Building Standards* electronic mail list-servers, and
- every person who had requested notice of such matters.

The NOPA, the ISOR, the Initial Study, and the 45-day and 15-day language (discussed below) were also timely posted on the Energy Commission's website.[3]

On February 5 and 6, 2018, the lead commissioner for energy efficiency of the Energy Commission held a public hearing, pursuant to Government Code Section 11346.8 and Public Resources Code Section 25402, to accept both oral and written comments on the 2019 Standards and the Initial Study. On February 23, 2018, the Commission published notice that Energy Commission staff were developing revisions to the proposed 2019 Standards to address comments received, would publish proposed changes to the proposed Standards, and would not consider adopting the proposed Standards as initially thought.

As stated in the NOPA, page 3, the Commission welcomed comments on any of the proposed provisions and, as we have noted above, many were received. Accordingly, the Commission on April 20, 2018, published proposed changes to the 45-day language (and identified additional documents beyond those identified in the NOPA upon which it is relying in adopting the 2019 Standards). These changes are called "15-day language" because they are sufficiently related to the 45-day language and thus only subject to an abbreviated 15-day notice requirement. The Commission also identified additional documents upon which it was relying for adopting the proposed Standards. The 15-day language and additional documents were made available for public comment for 15 days, through May 5, 2018.[4] The public notice of the 15-day language also stated that the Commission would consider adopting the proposed regulations and negative declaration at a public hearing during its business meeting on May 9, 2018.[5]

III. FINDINGS AND CONCLUSIONS

Several different statutory schemes govern the Commission's adoption of building standards: the Warren-Alquist State Energy Resources Conservation and Development Act,[6] the administrative rulemaking provisions of the Administrative Procedure Act,[7] and the Building Standards Law.[8] Pursuant to these statutes, the Commission has reviewed the entire record of this proceeding, including public comments, reports and other documents, transcripts of public events, and all other materials that have been filed in

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[3] See http://www.energy.ca.gov/title24/2019standards/rulemaking/documents/.
[4] Gov. Code § 11346.8; Cal. Code Regs., Title 1, § 42.
[5] See https://efiling.energy.ca.gov/getdocument.aspx?tn=222224
[6] Pub. Resources Code, § 25000 et seq.
[7] Gov. Code, § 11340 et seq.
[8] Health & Safety Code, § 18901 et seq.

this proceeding (Docket No. 17-BSTD-2). Based on that record, the Commission makes the following findings and conclusions.

A. The California Environmental Quality Act, Public Resources Code Section 21000 et seq.

CEQA requires that state agencies consider the environmental impact of their discretionary decisions, including the adoption of regulations. The Energy Commission began its compliance with CEQA's mandate by preparing an "Initial Study." (See California Code Regulations, Title 14, §§ 15060 - 15065.) The Initial Study addressed matters such as air emissions, water use, indoor air pollution, and the use of materials such as wood, glass, aluminum, copper, fiberglass, mercury, lead, steel, plastic silicon, gold, and titanium.

As CEQA requires, the Commission then published a Notice of Intent to adopt a Negative Declaration.[9] The Notice, Initial Study and the Proposed Negative Declaration were made available through the Statewide Clearinghouse at the Office of Planning and Research to identified responsible agencies.[10]

The Notice of Intent was also sent physically to all 58 county clerks in California and electronically to over 10,000 people and entities that had previously requested such notice.[11] Finally, a legal notice was published on February 23, 2018, in the Los Angeles Times.[12]

The Energy Commission provided a comment period on the Initial Study and Proposed Negative Declaration beginning on February 23, 2018, and ending March 16, 2018 (a total of 21 days).[13]

Accordingly, based on the Initial Study together with comments received during the public participation process, the Energy Commission finds[14] that:

(1) In light of the whole record, there is no substantial evidence that the 2019 Standards in Parts 1 and 6 of Title 24 of the California Code of Regulations, will have a significant effect on the environment and

(2) The Proposed Negative Declaration reflects the Energy Commission's independent judgment and analysis.

Therefore, the Energy Commission adopts the Negative Declaration.

B. The Warren-Alquist Act

1. Public Resources Code Sections 25402, subdivisions (a)-(b)

The Standards we adopt today satisfy the requirements of Public Resources Code

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[9] See Pub. Resources Code, §§ 21091, 21092 and 21092.3, and Cal. Code Regs., Title 14, § 15072(g).
[10] Cal. Code Regs., Title 14, § 15073(d).
[11] Cal. Code Regs., Title 14, § 15072(a).
[12] Cal. Code Regs., Title 14, § 15072(b)(1).
[13] Cal. Code Regs., Title 14, § 15073(a).
[14] Pub. Resources Code, § 21082.1.

Section 25402, Subdivisions (a) and (b). Those provisions require the Commission to adopt building design and construction standards that increase the efficiency in the use of energy and water for new residential and new nonresidential buildings, and energy and water conservation design standards. By law, these standards must be "cost effective when taken in their entirety, and when amortized over the economic life of the structure when compared with historic practice."

The 2019 Standards fulfill these directives. They increase the efficiency of and conserve the use of energy and water. Moreover, they are cost-effective.

Buildings constructed pursuant to the 2019 Standards are projected to:

- save $2.17 billion in energy over a 30-year life;
- save 246 million gallons of water per year, and;
- reduce growth in statewide greenhouse gas emissions by 230 thousand metric tons carbon dioxide equivalent (CO2e) per year.

To further illustrate the anticipated savings, in the residential context, the improvement in energy efficiency and reduction in demand for grid electricity due to on-site photovoltaics (PV) will provide a 2:1 return on a typical homeowner's investment. If factored into a 30-year mortgage, the standards will add approximately $40 per month to the cost of the average home (assuming call costs are first costs and the full costs are financed at 5 percent for 30 years), but will save approximately $80 on monthly heating, cooling, and lighting bills (net present savings, nominal savings will be higher). On average, the 2019 Standards will increase the cost of constructing a new residential building by $9,500 but will return more than $19,000 in energy savings over 30 years.

Therefore, we find and conclude that the 2019 Standards are cost-effective.

2. Public Resources Code Section 25402.8.

Section 25402.8 of the Warren-Alquist Act directs the Commission, when adopting new building energy conservation standards to "include in its deliberations the impact that those standards would have on indoor air pollution problems."

The Commission must take into account both the indoor air quality concerns embodied in Section 25402.8 and the mandate to achieve cost-effective energy conservation in Sections 25402 Subdivisions (a) and (b). This alone requires a delicate balancing of issues and concerns because, among other reasons, by improving indoor air quality through increased ventilation, energy use will increase, which means that the adverse health impacts of outdoor air pollution may also increase.

Staff considered the impact that the proposed changes to the regulations would have on indoor air quality and found that neither the residential nor the nonresidential provisions would negatively impact indoor air quality. The 2019 Standards propose updates to ventilation and air filtration requirements that are expected to improve air quality, and that were developed in coordination with the California Air Resources Board. Staff therefore finds that both the current and the

proposed regulations:

- ensure adequate outdoor air ventilation;
- preserve and improve indoor air quality;
- require that the minimum outdoor air quantities be provided during regular and pre-occupancy periods; and
- require documentation showing that ventilation systems provide the minimum-required outdoor air quantities.

We find and conclude that such provisions are reasonably necessary to carry out the mandate of Section 25402.8, and that they strike an appropriate balance between the requirements of this section and the energy-savings and cost-effectiveness mandates of Sections 25402, subdivisions (a) and (b).

C. **The Administrative Procedure Act**

The California Administrative Procedure Act (APA) requires all state agencies to take certain steps and assess several matters when adopting regulations. Many of these matters, analyses and findings are required to be addressed in the ISOR prepared as part of the NOPA or in the Final Statement of Reasons (FSOR) that is required to be prepared after the regulations are adopted. In support of those documents, the Commission makes the following findings and determinations here in adopting the 2019 Standards.

1. Reports Required of Businesses, Government Code Section 11346.3, subdivision (d)

In addition to the economic analysis required by Section 11346.3 of the APA, discussed further below, subdivision (d) of this statute mandates that agencies that require the preparation of reports by businesses find that such reports are necessary to protect the health, safety or welfare of the people of California.

The 2019 Standards require completion of certain reports, called compliance documentation, regarding the efficiency measures incorporated into buildings. The reports collect the information necessary for local building officials, building owners and occupants, and contractors to ensure that the measures are properly installed and operating correctly, so that the anticipated energy, environmental and cost benefits will actually be achieved. Accordingly, we find and conclude that it is necessary that these reporting requirements apply to businesses, in order to protect the health, safety and welfare of the people of California, as required by Government Code Section 11346.3, Subdivision (d).

2. Public Participation, Government Code Section 11346.45

State agencies must "involve parties who would be subject to the proposed regulations in public discussions regarding those proposed regulations, when the proposed regulations involve complex proposals or a large number of proposals that cannot easily be reviewed during the comment period." As described above, the Energy Commission conducted extensive outreach with industry and other stakeholders, over the course of the past 18 months on the structure and contents of

the regulations. We therefore find and conclude that the Energy Commission has complied with Government Code Section 11346.45.

3. Economic Impact Assessment, Government Code Sections 11346.3, 11346.5 and 11346.9

Sections 11346.3, 11346.5, and 11346.9 of the APA require state agencies to assess various potential economic and fiscal impacts of proposed regulations and potential alternatives. Briefly stated, the Commission finds that the 2019 Standards:

a) Will not result in a significant statewide adverse impact directly affecting business (including small businesses), including the ability of California businesses to compete with businesses in other states, and job creation;
b) Will not have significant impacts on housing costs;
c) Do not have alternatives that would be more effective in implementing the policies and provisions of the Warren-Alquist Act without increasing burdens, or that would be as effective and less burdensome to affected private persons in implementing the policies and provisions; and
d) Will not impose any direct costs or direct or indirect requirements on state agencies, local agencies, or school districts, including but not limited to costs that are required to be reimbursed under Part 7 (commencing with Section 17500) of the Government Code.

These matters are discussed below.

a) No Significant Economic Impact on Businesses and Job Creation

The Energy Commission has determined that adopting the 2019 Standards will not have a significant statewide adverse economic impact on businesses, including the ability of California businesses to compete with business in other states.

The Standards will require energy efficiency measures for all new nonresidential and residential construction, and for certain additions and alterations to existing buildings as well. However, those measures are cost-effective, so businesses will experience a positive economic impact. In addition, the Standards will indirectly require changes in practice, and the retraining of employees, in businesses that are involved in the design and construction of buildings, in compliance analysis and documentation, and in field verification. Any costs attributable to such changes and retraining would be short-term in nature, since the incremental cost increases for new technologies will not persist once these technologies become mainstream, and building practice changes requiring retraining will not result in ongoing cost increases. In any case, these incremental construction cost increases would ultimately be borne by the beneficiaries of the Standards: the people and businesses benefitting from reduced energy bills.

In addition, new jobs may be created as a result of the new compliance procedures, or to provide compliance-related services and energy-efficiency products. Also, because the Standards will save hundreds of millions of dollars in energy costs, there will be more money in the economy that can be used for job creation.

For the same reasons, the Commission finds that the 2019 Standards will not have

any significant adverse impact on small or other businesses or other affected persons. By making compliance with the standards easier, the proposed regulations will help building designers, architects, contractors, and similar professionals. Most importantly, by causing overall reductions in the costs of owning and operating residences and buildings, the 2019 Standards will reduce costs for all businesses and persons throughout the state.

b) Impact on Housing Costs

The 2019 Standards will affect housing costs. By requiring the installation of energy efficiency measures that would otherwise not be included in buildings, the 2019 Standards will result in small increases in the initial cost of housing. The Energy Commission estimates that an average of approximately $10,500 in additional construction costs for single family residential buildings will result from the 2019 Standards, and an incremental construction cost increase of $10,300 for a 15,000 square foot building (such as a multi-family residential building), less than 3 percent of typical construction costs for this building size. As described above, these increases will be recouped by the reduced energy costs to operate the buildings. Further, this estimate is likely more than what will be realized, since it does not account for volume pricing or reductions in technology costs once these technologies are provided to a mass market. Therefore, we find and conclude that there will be no significant increase in housing costs.

c) Consideration of Alternative Proposals: Necessity

The 2019 Standards are the result of a process that lasted fourteen months, involved almost a dozen publicly-noticed hearings and workshops, relied upon input from numerous representatives of all aspects of the building industry and from building officials, and produced detailed and sophisticated technical analyses. Moreover, the resultant 2019 Standards carefully harmonize the statutory requirements of energy conservation, cost-effectiveness, and other aspects of the public health and welfare.
Many alternatives suggested to the Commission have been included in the Standards; those that are not incorporated into the Standards either (1) were more expensive than the proposed Standards, (2) were infeasible, or (3) would save less energy than the proposed Standards. Discussions of the alternatives considered are in the public comments and reports in the record of this rulemaking proceeding, and will be discussed in more detail in the FSOR prepared after adoption.

Therefore, the Energy Commission has determined that (1) no reasonable alternative considered by it or that has otherwise been identified and brought to its attention (a) would be more effective in implementing the policies and provisions of the Warren-Alquist Act, (b) would be as effective and less burdensome to affected private persons than the adopted regulations, or (c) would be more cost-effective to affected private persons and equally effective in implementing the Warren-Alquist Act; and (2) the 2019 Standards are necessary to carry out the purposes for which they are proposed, cost-effective energy savings and environmental improvements, because without the Standards, those purposes will not be achieved.

d) Mandates and Costs on State or Local Agencies and School Districts

By requiring new or improved energy efficiency measures to be installed, the 2019 Standards will result in small increases in the cost of new construction. However, those construction costs will be more than offset by reductions in energy costs, so that over the life of a building, total costs will be reduced. Therefore, although the 2019 Standards will result in direct costs (for construction) and savings (in energy bills) for local and state agencies and school districts (to the extent that those agencies and districts construct buildings or pay energy bills), the Commission finds that they will not impose a mandate on local agencies or school districts or impose increased or new costs that are reimbursable by the state under Part 7 (beginning with Section 17500) of Division 4 of the Government Code. In addition, because streamlining changes in the 2019 Standards will make enforcement easier, local and state agencies responsible for enforcing the building 2019 Standards are likely to enjoy savings.

As required by Government Code Section 11346.9, Subdivision (a)(2), the Commission finds and concludes that there will be no costs or savings to local or state agencies or school districts. Finally, we find and conclude that there will be no costs or savings to federal agencies, and no costs or savings in federal funding to the State.

D. The State Building Standards Law, Health & Safety Code Section 18930

The 2019 Standards must be submitted to the California Building Standards Commission (CBSC) for approval, and are required, by Health and Safety Code Section 18930, subdivision (a), to be accompanied by an analysis which will, to the satisfaction of the CBSC, justify their approval. For the reasons described below, we find, determine, and conclude that the 2019 Standards comply with each one of the applicable criteria. Further explanation of the Nine Point Criteria and additional supporting analysis will accompany the 2019 Standards when they are submitted for approval to the Building Standards Commission.

1) The proposed building standards do not conflict with, overlap, or duplicate other building standards.

There is no overlap or duplication with other regulations because the Energy Commission is the only state agency authorized to set efficiency standards for buildings, and for the same reason there should be no conflict with other building standards (i.e., no situation in which it is impossible to comply with both an Energy Commission standard and another building standard). For example, considering the lighting energy efficiency standards and the electrical code:

- There are no conflicts between the Energy Code and the Electrical Code on lighting requirements. The Electrical Code requires illumination to be provided for all working spaces, whereas the Energy Code has requirements on the allowable maximum amount of lighting power to be used for the building space and also how the lighting system shall be controlled and switched.

- There are no conflicts between the Energy Code and Building Code on egress lighting requirements. Other parts of the Building Code contain means of egress

requirements and the Energy Code contains express allowance for means of egress for lighting area controls and shut-off controls.

Additionally, Article 1, Section 10-101(b), of the Standards explicitly states that nothing in them lessens any necessary qualifications or responsibilities of licensed or registered building professionals or other designers or builders, or the duties of enforcement agencies that exist under state or local law.

2) The proposed building standards are within the parameters established by enabling legislation and are not expressly within the exclusive jurisdiction of another agency.

The California Energy Commission has statutory authority under Public Resources Code Sections 25213, 25402, 25402.1, 25402.4, 25402.5, 25402.8, and 25910 to promulgate and update energy and water efficiency standards for residential and nonresidential buildings, including both newly constructed buildings and additions and alterations to existing buildings. The Energy Commission is the only state agency with the authority to set efficiency standards for buildings.

3) The public interest requires the adoption of the building standards.

The Building Standards Law states that the "public interest includes, but is not limited to, health and safety, resource efficiency, fire safety, seismic safety, building and building system performance, and consistency with environmental, public health, and accessibility statutes and regulations." (Health & Safety Code, § 18930, Subdivision. (a)(3).) The 2019 Standards are in the public interest, increase resource efficiency, building and building system performance, and are consistent with environmental, public health, and accessibility statutes and regulations.

When the legislature created the Energy Commission over forty years ago, it stated that the California economy, and indeed the well-being of all California citizens, depends on an adequate, reasonably priced, and environmentally-sound supply of energy.[15] The legislature also stated that growth in electricity demand has strained the reliability of California's electricity system, created potential environmental stresses, and contributed to a substantial rise in electricity prices.[16] Finally, the legislature recognized that improvements in energy efficiency are among the most cost-effective and environmentally-friendly methods to help bring demand and supply into balance.[17]

These facts remain as true today as they were then, and they make clear that adoption of the 2019 Energy Standards is required for the public interest.

The 2019 Standards will continue to improve upon the existing Standards and continue to address policy directives that influenced the past Standards updates. These policy directives include:

- The 2003 Energy Action Plan (EAP) which established a "loading order" of

[15] Pub. Resources Code, § 25001; see also § 25300, subd. (a).
[16] See Public Resources Code, § 25002.
[17] See Public Resources Code, §§ 25001, subds. (a) & (b), 25007.

energy resources and strategies to address the State's growing energy demands (through conservation and energy efficiency to minimize energy demand first, followed by electricity generation from renewable energy resources and distributed generation).[18]

- The Climate Action Initiative (Executive Order S-3-05, June 2005) which sets greenhouse gas (GHG) emission reduction targets for California, as follows: by 2020, reduce GHG emissions to 1990 levels, and by 2050, reduce GHG emissions to 80 percent below 1990 levels.

- The Global Warming Solutions Act of 2006, (Assembly Bill 32, Núñez, Stats. 2006, Chapter 488) codified the 2020 GHG emission reduction target into law. AB 32 requires the Air Resources Board (ARB) to report and verify statewide greenhouse gas emissions. The Act further requires that the ARB, in coordination with other state agencies, achieve the maximum technologically feasible and cost–effective GHG emission reductions, setting the stage for the State's transition to a sustainable, clean-energy future. Improving the energy efficiency of buildings is the single most important activity to reduce greenhouse gas emissions in the electricity and natural gas sectors. Thus expanding and strengthening building standards is a key recommendation of the Climate Change Proposed Scoping Plan.[19] Proposed strategies include zero net energy buildings, more stringent building codes and appliance-efficiency standards, broader standards for new types of appliances and for water efficiency, improved compliance and enforcement of existing standards, and voluntary efficiency and green building targets beyond mandatory codes. In 2016, Senate Bill 32, Chapter 249, codified the goal to reduce the State's greenhouse gas emissions to 40 percent below 1990 levels by 2030.[20]

- The Energy Commission's *Integrated Energy Policy Report (IEPR)* includes many GHG emission reduction and energy-efficiency strategy recommendations.[21] Energy efficiency is identified as the first strategy for accomplishing significant GHG reduction targets because it is a fast and inexpensive solution. The 2011 IEPR reiterated the statewide goal that new building standards achieve zero net energy levels by 2020 for residences and by 2030 for commercial buildings.

- The California Public Utility Commission's (CPUC) California Long Term Energy Efficiency Strategic Plan, endorses the Energy Commission's zero net energy goals for all newly-constructed homes by 2020, and 2030 for all newly-constructed commercial buildings.[22] The Investor Owned Utilities (IOUs) authored the plan under the direction of the CPUC, and these utilities are now developing public goods incentive programs that support the implementation of this strategic plan.

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[18] http://www.energy.ca.gov/energy_action_plan/2003-05-08_ACTION_PLAN.PDF.

[19] https://www.arb.ca.gov/cc/scopingplan/scopingplan.htm

[20] See Health and Safety Code § 38566

[21] http://www.energy.ca.gov/energypolicy/

[22] http://www.cpuc.ca.gov/General.aspx?id=4125

- Governor Brown's Clean Energy Jobs Plan establishes the priorities of his administration to aggressively pursue clean energy jobs in California through renewable energy and energy efficiency, extending the success of programs established in his first administration and the ensuing 30 years, which have triggered innovation and creativity in the market. The Clean Energy Jobs Plan calls for the development of 12,000 megawatts of localized, renewable electric generation by 2020, new energy efficiency standards for buildings to achieve dramatic energy savings, creating a path for making newly constructed residential and commercial buildings "zero net energy" through high levels of energy efficiency combined with onsite renewable electric generation, stronger appliance standards for lighting, consumer electronics and other products, in conjunction with increased public education and enforcement efforts so the gains promised by the efficiency standards are in fact realized.[23]

- Executive Order B-18-12, April 25, 2012[24] and its accompanying Green Building Action Plan[25] which set more stringent energy efficiency, renewable on-site generation, and GHG emission and water consumption reduction requirements for state agencies and state buildings as follows:

    - State agencies, departments, and other entities under direct executive authority must take actions to reduce entity-wide GHG emissions by at least 10 percent by 2015 and 20 percent by 2020, as measured against a 2010 baseline.

    - New state buildings and major renovations beginning design after 2025 must be constructed as Zero Net Energy facilities with an interim target for 50 percent of new facilities beginning design after 2020 to be Zero Net Energy.

    - State agencies shall take measures toward achieving Zero Net Energy for 50 percent of the square footage of existing state-owned building area by 2025.

    - State agencies must continue taking measures to reduce grid-based energy purchases for State-owned buildings by at least 20 percent by 2018, as compared to a 2003 baseline, and reduce other non-building, grid-based retail energy purchases by 20 percent by 2018, as compared to a 2003 baseline.

    - Proposed new or major renovation of state buildings larger than 10,000 square feet must use clean, on-site power generation, such as solar PV, solar thermal and wind power generation, and clean back-up power supplies, if economically feasible.

    - New and existing state buildings must incorporate building commissioning to facilitate improved and efficient building operation.

    - State agencies must identify and pursue opportunities to provide electric vehicle charging stations, and accommodate future charging infrastructure demand, at employee parking facilities in new and existing buildings.

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[23] https://www.gov.ca.gov/wp-content/uploads/2017/09/Clean_Energy_Plan.pdf.
[24] https://www.gov.ca.gov/2012/04/25/news17508/.
[25] https://www.gov.ca.gov/wp-content/uploads/2017/09/Green_Building_Action_Plan_B.18.12.pdf.

- State agencies must reduce overall water use at the facilities they operate by 10 percent by 2015 and by 20 percent by 2020, as measured against a 2010 baseline.

- The Clean Energy and Pollution Reduction Act of 2016 (Senate Bill 350, Chapter 547, October 7, 2015) directed the Energy Commission to establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings in electricity and natural gas final end uses of retail customers by January 1, 2030. The bill also required that the amount of electricity generated and sold to retail customers per year from eligible renewable energy resources be increased to 50 percent by December 31, 2030.[26]

All of these enactments and policy statements demonstrate that the energy efficiency advances that will be produced by the 2019 Standards are crucial to the state's energy reliability and economic and environmental health.

The public interest in the adoption and approval of the 2019 Standards is also demonstrated by their cost-effectiveness, which is discussed in detail in section 5 below.

4) The proposed building standards are not unreasonable, arbitrary, unfair, or capricious, in whole or in part.

The 2019 Standards are not unreasonable, arbitrary, unfair, or capricious, in whole or in part. As discussed in section 3 of this Analysis, the Building Energy Efficiency Standards respond to the mandates of the Warren-Alquist Act, the Global Warming Solutions Act of 2006, California's Energy Action Plan 2008 Update, the California Energy Efficiency Long-Term Strategic Plan, the 2011 IEPR, the California's Clean Energy Futures Initiative, Governor Brown's Clean Energy Jobs Plan and the Clean Energy and Pollution Reduction Act of 2016.

The express terms of the 2019 Standards and the record of the rulemaking proceeding through which the language is adopted shows that this criterion is met.

5) The cost to the public is reasonable, based on the overall benefit to be derived from the building standards.

The 2019 Standards are cost-effective, as must be found by the Energy Commission when it adopts standards pursuant to Public Resources Code Section 25402 and consistent with Health and Safety Code Section 18930. The added construction costs that the Standards will impose are reasonable based on the economic, environmental, and the benefits that will be derived from the Standards substantially outweigh the costs. In other words, although building owners and operators will see increases in the costs of purchasing buildings, the savings in natural gas and electricity costs will drastically outweigh such initial costs.

In addition, any updates to the Standards will require changes in some construction practices, including in the post-construction testing of building components. This in

[26] See Public Resources Code § 25310 and § 25943.

turn may require the retraining of employees, but any costs attributable to such changes and retraining will be short-term in nature (i.e., they will be one-time costs and not ongoing costs) and are part of the expected costs associated with continual improvements to building codes generally, as new protocols and technologies become mainstream. The Energy Commission provides ongoing training in the Standards in conjunction with Investor Owned Utilities and professional organizations, such as the California Association of Building Energy Consultants, to encourage reductions in these costs. Moreover, the changes will increase employment and profit opportunities for segments of the construction industry involved with the production of advanced energy efficiency technologies implemented by the Standards, and those responsible for conducting post-construction testing.

The 2019 Standards, as proposed, will reduce the energy use of typical new residential buildings by around 7 percent percent and nonresidential buildings by around 31 percent compared to buildings constructed under the current standards, and for residential buildings the inclusion of PV systems will reduce each building's demand for grid electricity by about 53 percent. In 2020, buildings constructed and retrofitted pursuant to the 2019 Standards are projected to:

- Have a statewide cost of an additional $2.170 billion to build or retrofit;
- Have a state savings of over $3.871 billion in initial, maintenance and energy costs over 30 years;
- Have decreased water consumption of approximately 246 million gallons (roughly 755 acre-feet) per year;
- Reduce statewide annual electricity consumption by about 650 gigawatt-hours per year (GWh/yr), and natural gas consumption by 9.8 million therms per year;
- Result in a net reduction in the emission of nitric oxides (NOx) by roughly 100 metric tons per year, sulfur oxides (SOx) by 0.27 metric tons/year, carbon monoxide (CO) by 28 metric tons/year and particulate matter less than 2.5 micrometers in diameter (PM2.5) by 3.36 metric tons per year; and
- Reduce growth in statewide carbon dioxide equivalent (CO2e) emissions by 230 thousand metric tons per year.

To further illustrate the anticipated savings, in the residential context, the natural gas and electricity efficiency improvements in the 2019 Standards will provide a 2:1 return on a typical homeowner's investment. If factored into a 30-year mortgage, the standards will add approximately $40 per month to the cost of the average home (assuming call costs are first costs and the full costs are financed at 5 percent for 30 years), but will save approximately $80 on monthly heating, cooling, and lighting bills (net present savings, nominal savings will be higher).

The Energy Commission estimates average increases in construction costs of about $10,500 for new single-family residential buildings and about $10,300 for a 15,000 square foot commercial building. These are less than three percent of typical

construction costs for typical buildings and these increases will be more than recouped by the energy cost savings.[27] Furthermore, the construction cost increases are likely higher than will be realized because they do not fully account for volume pricing or anticipated reductions in costs once new energy-efficiency technologies are provided to a mass market.

Staff anticipates a fair amount of discussion about the cost-effectiveness of various provisions of the Standards during the Energy Commission's rulemaking proceeding. The Energy Commission's assessments of applicable comments are discussed in the Comments & Responses section of the Final Statement of Reasons prepared following the formal public comment period(s).

6) **The proposed building standards are not unnecessarily ambiguous or vague, in whole or in part.**

The Energy Commission has proposed many changes in the Draft Express Terms that ensure clarity and prevent ambiguity, and anticipates making further changes throughout the rulemaking proceeding to continually improve the proposed language. Proposals or comments suggesting further clarity improvements are incorporated into the Standards where staff determines that they provide a benefit to clarity without otherwise changing the application or effect of the regulatory language. The Energy Commission's assessments of applicable comments are discussed in the Comments & Responses section of the Final Statement of Reasons prepared following the formal public comment period(s).

7) **The applicable national specifications, published standards, and model codes have been incorporated into the proposed Building Standards as required by the State Building Standards Law, where appropriate.**

There are no federal laws applicable to nonfederal buildings in their entirety, so nothing in this realm could have been incorporated into the 2019 Standards. However, the adopted Standards do incorporate (as previous editions of the Standards have for decades incorporated) federal energy standards for particular appliances that may be installed in buildings.

In addition, the Energy Commission included model and national codes and specifications in the 2019 Standards wherever appropriate. For example, the Standards require heating and cooling systems to meet minimum efficiency requirements for space conditioning equipment that are as or more stringent than the minimum efficiency requirements in ASHRAE 90.1-2016.

Staff anticipates receiving comments during the rulemaking proceeding that address the incorporation of various specifications, standards, and codes into the proposed Standards. The Energy Commission's assessments of applicable comments are discussed in the Comments & Responses section of the Final Statement of Reasons prepared following the formal public comment period(s).

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[27] Assuming construction costs for new residential and nonresidential buildings are $150 per square foot.

8) **The format of the proposed building standards is consistent with that adopted by the Building Standards Commission.**

The 2019 Standards continue to use the format of the other building standards in the state building code.

9) **The proposed building standards, if they promote fire and panic safety, as determined by the state fire marshal, have the written approval of the state fire marshal.**

The Energy Commission has obtained the written approval of the state fire marshal and their determination that the proposed 2019 Standards do not promote fire or panic safety.

IV. ADOPTION OF NEGATIVE DECLARATION AND AMENDMENTS TO REGULATIONS; DELEGATION TO EXECUTIVE DIRECTOR

The California Energy Commission adopts a Negative Declaration based on the content of the Initial Study dated February 23, 2018, and consideration of the full record of this proceeding.

The California Energy Commission adopts the amendments in the 15-day language dated February 23, 2018, in Title 24, Parts 1 and 6, of the California Code of Regulations, as further revised by the errata set forth in Appendix A of this Resolution.

The California Energy Commission directs the executive director to take, on behalf of the Commission, all actions reasonably necessary to have the adopted regulations approved by the California Building Standards Commission and go into effect, including but not limited to preparing and filing all appropriate documents, such as the Final Statement of Reasons and the Notice of Determination of a Negative Declaration, and correcting grammatical, typographical, and other nonsubstantial errors.

CERTIFICATION

The undersigned Secretariat to the Commission does hereby certify that the foregoing is a full, true, and correct copy of a Resolution duly and regularly adopted at a meeting of the California Energy Commission held on May 9, 2018.

AYE: Weisenmiller, Douglas, McAllister, Hochschild, Scott
NAY: None
ABSENT: None
ABSTAIN: None

Cody Goldthrite
Secretariat

Appendix A

Errata to the 2019 Standards 15-Day Language

Page 51, Section 100.1: Remove letter "k" in the list of Addendums in the definition of ASHRAE 62.2. Title 24, Part 6 neither includes nor considers tradeoffs against ventilation rates, and therefore this Addendum is not usable.

Page 105, Table 110.2-J: Remove the rows under "Warm-Air Furnace, Gas-Fired" And "Warm-Air Furnace, Oil-Fired" specified as applying to furnaces below 225,000 BTU/h. These values are incorrect and are preempted by current federal appliance standards. As existing federal standards apply regardless of the text of this Table, removal of the incorrect entries is nonsubstantive and is the best way to correct the error.

Page 113, Table 110.6-A: Add the word "Glazed" before each occurrence of "Door" in this Table to clarify its application. This is a nonsubstantive clarifying change: fenestration is defined to only include glazed (not opaque) doors, and both the title of the Table and the Sections referencing the Table are specific in applying the Table only to fenestration. (Default values for doors that are not glazed doors are specified in JA4.5; this addresses a concern that the values in Table 110.6-A would otherwise appear to erroneously apply to opaque doors.)

Page 137, Section 120.1(c)4: Correct Table reference from 120.1-D to 120.1-B. This is a typographical error: minimum exhaust rates are stated in Table 120.1-B (per its title), and there are no subsequent tables in Section 120.1.

Page 212, Section 140.3(d)2D: Correct Equation reference from 140.3-E to 140.3-D. This is a typographical error: distance factor calculation is included in Equation 140.3-D, and there are no subsequent Equations in Section 140.3.

Page 212, Section 140.3(d)2J: Correct punctuation by adding closing quotes (”). This is a typographical error.

Page 212, Section 140.3(d)3B: Correct grammar by inserting the verb "shall be" in the second sentence ("The head height of the light shelves shall be no more than one foot below the finished ceiling."), and correct the spelling of "Clerstory" to "Clerestory" in the last sentence. This is a typographical error: the sentences occur in a list of requirements, and are clearly stated to be required irrespective of the error.

Page 212, Section 140.3(d)3E: Correct Equation reference from 140.3-F to 140.3-D. This is a typographical error: distance factor calculation is included in Equation 140.3-D, and there are no subsequent Equations in Section 140.3.

Page 250, Table 140.7-A: Correct punctuation of footnote 3 by replacing the dash with a comma. This is a typographical error.

Page 255, Section 140.9(a)1A: Correct "devices" to "system" to correct grammar (plural to singular) and for consistency with referenced Section 120.2(i) which uses the word "system" and does not use the word "device". This is a typographical error.

Page 282, Exception to Section 150.0(k)1F: Correct Section reference from F to G. This

is a typographical error: this Exception is and remains related to lighting integral to residential exhaust fans (specifically kitchen range hoods) per its content and its location in code, and the Section number of its parent Section is not changing.

Page 305, Exception 6 to Section 150.1(c)14: Correct "an battery" to "a battery". This is a typographical error.

Page JA11-3, Section JA11.5.1(a): Correct grammar by inserting "of" ("The nominal kW rating of the PV system.") This is a typographical error.

Page NA7-9, Section NA7.4.5.2(f): Correct spelling of "manufactures" to "manufacturer's". This is a typographical error.

Page NA7-11, Section NA7.4.6.2(f): Correct spelling of "manufactures" to "manufacturer's". This is a typographical error.

Page NA7-20, Section NA7.5.12.2(b): Correct spelling from "an dalarms" to "and alarms". This is a typographical error.

Page NA7-20, Section NA7.5.12.2(c): Correct spelling from "stat" to "state". This is a typographical error.

Page NA7-46, Section NA7.10.3.3: Correct "air-cooled" to "adiabatic". This is a typographical error: this is stated correctly in the Section title and in the following Subsections, and its use here is purely descriptive of the Subsections.

Page NA7-47, Section NA7.10.3.3.1: Correct spelling from "respone" to "response". This is a typographical error.

Page NA7-48, Section NA7.10.3.3.2: Correct spelling from "sufficienctly" to "sufficiently" "setpont" to "setpoint", and correct punctuation error. This is a typographical error.

Page NA7-56, Section NA7.16.3: Correct "Containment" to "Contaminant" in Section title. This is a typographical error, as the Section is clear in referring to contaminants.

Page RA2-4, Table RA2-1: Correct spelling from "DHWR" to "DWHR". This is a typographical error: the abbreviation is short for "Drain Water Heat Recovery".

Page RA3-89, Section RA3.6.9: Correct spelling from "DHWR" to "DWHR". This is a typographical error: the abbreviation is short for "Drain Water Heat Recovery".

Page RA4-15, Section RA4.4.21: Correct spelling from "DHWR" to "DWHR". This is a typographical error: the abbreviation is short for "Drain Water Heat Recovery".

Requested not to adopt

Page 132, Section 120.1(b)1Ai: Do not adopt the additional changes (to the 45-day language) specified in the 15-day language. The proposed 15-day changes introduce an alternate and erroneous reading that is not intended by the authors, and problems resulting from this error have been identified by commenters. Rather than draft new or additional language, this error is best corrected by adopting the proposed 45-day

language without the additional 15-day changes.

Page 135, Section 120.1(c)1A: Do not adopt the additional changes (to the 45-day language) specified in the 15-day language that duplicate the language present in referenced Section 120.1(b)1Ai (and replace that reference). The proposed 15-day language copied from 120.1(b)1Ai duplicates an alternate and erroneous reading that is not intended by the authors, and problems resulting from this error have been identified by commenters. Rather than draft new or additional language, this error is best corrected by adopting the proposed 45-day language without the additional 15-day changes. (Note that the general renumbering of Section 120.1(c)1, inclusive of this Subsection, is retained.)

Page 228, Section 140.5(b): Do not adopt the changes to this Section (adding an Exception). Staff received public commentary that the specific number of floors used as the trigger for the Exception was not well justified. The identified need for additional supporting information is best addressed by not adopting any change to this Section.

Page 257, Section 150.0(m)12Ai: Do not adopt the additional changes (to the 45-day language) specified in the 15-day language. The proposed 15-day changes introduce an alternate and erroneous reading that is not intended by the authors, and problems resulting from this error have been identified by commenters. Rather than draft new or additional language, this error is best corrected by adopting the proposed 45-day language without the additional 15-day changes.