DOCKETED

Docket Number:	17-BSTD-02
Project Title:	2019 Title 24, Part 6, Building Energy Efficiency Standards Rulemaking
TN #:	222254
Document Title:	2019 Standards Nine Point Criteria Analysis
Description:	This document is the Health and Safety Code section 18930(a) required analysis for the California Energy Commissionâ€™s proposed updates to its energy and water efficiency standards in Part 1, Chapter 10, and Part 6 of Title 24.
Filer:	Adrian Ownby
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	1/19/2018 9:55:49 AM
Docketed Date:	1/19/2018

CALIFORNIA ENERGY COMMISSION
1516 NINTH STREET
SACRAMENTO, CA 95814-5512
www.energy.ca.gov

NINE-POINT-CRITERIA ANALYSIS

ADOPTED BUILDING STANDARDS OF THE CALIFORNIA ENERGY COMMISSION:

CALIFORNIA CODE OF REGULATIONS, TITLE 24, PARTS 1 and 6 (2019 CALIFORNIA ENERGY CODE)

CALIFORNIA ENERGY COMMISSION DOCKET NUMBER 17-BSTD-02: January 19, 2018

Health and Safety Code section 18930, subdivision (a), requires that building standards submitted to the California Building Standards Commission (CBSC) for approval be accompanied by an analysis which will, to the satisfaction of the CBSC, justify their approval. This document is the required analysis for the California Energy Commission's proposed updates to its energy and water efficiency standards in Part 1, Chapter 10, and Part 6 of Title 24. The 9-Point Criteria Analysis for the Energy Commission's amendments to the voluntary standards in Part 11 (the Green Building Code) is being submitted as part of a separate rulemaking package.

Summary of the Adopted Standards

The California Energy Commission adopts deletions, additions, and amendments to its energy and water efficiency standards for buildings on a triennial cycle consistent with the updates to the other Parts of Title 24. 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 Energy Commission adopted these standards under the authority established by the Warren-Alquist State Energy Resources Conservation and Development Act, in the following sections of the Public Resources Code: 25218, subdivision (e), 25402, 25402.1, 25402.4, 25402.5, 25402.8, 25910, and 25943. The standards were also adopted under the authority in the Building Standards Law, in Health and Safety Code sections 18930.5 and 18941.5.

The standards implement, interpret and make specific the Warren-Alquist Act, in the following sections of the Public Resources Code: 25402, subdivisions (a)-(c), 25402.1, 25402.4, 25402.5, 25402.5.4, 25402.8, 25910, and 25943. The standards also implement and interpret the Building Standards Law, in Health and Safety Code sections 18930.5 and 18941.5.

Prior to the start of the formal rulemaking, the Energy Commission filed with the CBSC on December 18, 2017, the following:

- A Notice of Proposed Action (NOPA), which described the proceeding, summarized the proposed Standards, and explained how interested persons could participate;
- An 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.

The CBSC subsequently submitted the necessary materials to the Office of Administrative Law on January 9, 2018. On that same date, the Energy Commission published the above referenced documents on the Energy Commission website. OAL published the NOPA in the California Regulatory Notice Register on January 19, 2018, beginning the formal rulemaking phase, and at that time the Commission began to receive comments on the proposed Standards.

In response to public comments, the Energy Commission may publish revisions to the 45-Day Language. Those revisions, called 15-Day Language, are also made available for public comment.

Adoption of the proposed 2019 Building Energy Efficiency Standards occurs at a publicly noticed public hearing. Once adopted, the 2019 Standards become effective on January 1, 2020, if they are approved by the California 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, subd. (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.[1] 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.[2] 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.[3]

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

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 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).[4]

- 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, Ch. 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.[5] 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.[6]

- The Energy Commission's 2011 Integrated Energy Policy Report (IEPR) includes many greenhouse gas emission reduction and energy-efficiency strategy recommendations.[7] Energy efficiency is identified as the first strategy for accomplishing significant greenhouse gas reduction targets because it is a fast and inexpensive solution. The 2011 IEPR reiterated the statewide goal that new

[4] http://www.energy.ca.gov/energy_action_plan/2003-05-08_ACTION_PLAN.PDF.
[5] http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf.
[6] See Health and Safety Code § 38566
[7] http://www.energy.ca.gov/2011publications/CEC-100-2011-001/CEC-100-2011-001-CMF.pdf.

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.[8] 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.

- 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.[9]

- The Air Resource Board, Energy Commission, CPUC, the California Environmental Protection Agency (CalEPA) and the Independent System Operator collaborated in 2008 to develop California's Clean Energy Future Vision, accompanied by an implementation plan and roadmap. California's Clean Energy Future underscored the need to continue investing in energy efficiency and clean technologies to maintain California's leadership as the most energy efficient and forward-thinking state in the nation. The document integrates energy efficiency with the monumental effort required to attain California's renewable energy and other environmental objectives. California's Clean Energy Future re-confirmed energy efficiency as California's top priority electric generation resource, and identified renewable energy as the electric generation supply-side resource of choice. The document identified the major two goals for energy efficiency as: 1) achieving zero net energy in newly constructed residential and commercial buildings, and 2) decreasing energy consumption by 30 to 70 percent in existing residential and commercial buildings. The Building Energy Efficiency Standards play a major role in achieving these goals.

[8] http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=5303..
[9] http://gov.ca.gov/docs/Clean_Energy_Plan.pdf.

- Executive Order B-18-12, April 25, 2012[10] and its accompanying Green Building Action Plan[11] which set more stringent energy efficiency, renewable on-site generation, and greenhouse gas 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 greenhouse gas emissions by at least 10% by 2015 and 20% 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% of new facilities beginning design after 2020 to be Zero Net Energy.

    - State agencies shall take measures toward achieving Zero Net Energy for 50% 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% by 2018, as compared to a 2003 baseline, and reduce other non-building, grid-based retail energy purchases by 20% 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 photovoltaic, 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.

    - State agencies must reduce overall water use at the facilities they operate by 10% by 2015 and by 20% 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

[10] http://gov.ca.gov/news.php?id=17508.
[11] http://gov.ca.gov/docs/Green_Building_Action_Plan_B.18.12.pdf.

retail customers per year from eligible renewable energy resources be increased to 50% by December 31, 2030.[12]

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 Building Energy Efficiency 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 Integrated Energy Policy Report, 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 Building Energy Efficiency 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 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

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

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 buildings by around [INSERT]% percent compared to buildings constructed under the current standards. 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 [INSERT] gallons (roughly [INSERT] acre-feet) per year;
- Reduce statewide annual electricity consumption by about [INSERT] gigawatt-hours per year (GWh/yr), and natural gas consumption by [INSERT] million therms per year;
- Result in a net reduction in the emission of nitric oxides (NOx) by roughly [INSERT] tons per year, sulfur oxides (SOx) by [INSERT] tons/year, carbon monoxide (CO) by [INSERT] tons/year and particulate matter less than [INSERT] microns in diameter (PM2.5) by [INSERT] tons per year; and
- Reduce statewide carbon dioxide equivalent (CO2e) emissions by [INSERT] thousand metric tons per year.

To further illustrate the anticipated savings, in the residential context, the [INSERT] percent natural gas and [INSERT]% electricity efficiency improvements in the 2019 Standards will provide a [INSERT]:1 return on a typical homeowner's investment. If factored into a 30-year mortgage, the standards will add approximately $[INSERT] per month to the cost of the average home (assuming call costs are first costs and the full costs are financed at 5% for 30 years), but will save approximately $[INSERT] 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 $[INSERT] but will return more than $[INSERT] in energy savings over 30 years.

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.[13] 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.

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

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).

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 will obtain the written approval of the State Fire Marshal and determination that the proposed 2019 Building Energy Efficiency Standards do not promote fire or panic safety.