DRAFT INITIAL STUDY / NEGATIVE DECLARATION

for the Proposed Changes to the

Nonresidential Lighting Alteration Requirements

in the Building Energy Efficiency Standards

ABSTRACT

Public Resources Code Sections 25402 was enacted in 1974 as part of the enabling legislation establishing the California Energy Commission and its basic mandates. The statute requires the Energy Commission to adopt, implement, and periodically update energy efficiency standards for both residential and nonresidential buildings to ensure that building construction, system design, and installation achieve energy efficiency and preserve outdoor and indoor environmental quality. The Energy Commission first adopted building standards in 1975. The most recent version was adopted in 2012 and became effective in 2014.

The Building Energy Efficiency Standards are aimed at the building components that affect energy use in newly constructed residential and nonresidential buildings, and additions and alterations to existing buildings, including lighting, water heating, and space conditioning systems, process energy occurring in the building, and the building envelope. The standards are fundamentally performance standards requiring buildings to meet specified energy budgets while providing flexibility in selecting the features to meet those energy budgets. The standards also include prescriptive alternatives to the performance standards, as well as mandatory requirements. Compliance with the standards must be demonstrated to the local enforcement agency, a city or county building department, or a state agency that has responsibility for assuring compliance with building codes before a Certificate of Occupancy is issued.

The building standards cover both brand-new construction as well as major modifications. They must be cost-effective, based on the life cycle of the building, must include performance and prescriptive compliance approaches, and must be periodically updated to account for technological improvements in efficiency technology. The bulk of the standards (codified in portions of Part 1, Chapter 10, and as Part 6, of Title 24 of the California Code of Regulations) establish a minimum level of building energy efficiency for various types of buildings (e.g., one- or two-story houses, large hotels, commercial office buildings, etc.). The standards vary depending on where in one of 16 "climate zones" within the state a building is to be constructed. (A building may be designed to a higher efficiency level than required by these standards, resulting in additional energy savings.)

The 2016 Standards focus on three key areas in Parts 1 (in Chapter 10) and 6 of Title 24: updating requirements for low-rise residential buildings to move those buildings closer to California's goal that all new residential buildings will be "zero net energy" starting in 2020, updating nonresidential and high-rise residential requirements to better align those requirements with the national standards adopted by the American Society of Heating, Air Conditioning, and Refrigerating Engineers (ASHRAE 90.1), and updating the entirety of the existing Standards to improve clarity and consistency, correct errors, streamline requirements, or make adjustments to provisions in the regulations to accommodate impacts that were unanticipated when those provisions were adopted.

Included in the proposed clarifying revisions were revisions to the requirements for nonresidential lighting alterations. These revisions restructure the current requirements for alterations to existing nonresidential lighting, providing a compliance path based on total power reduction rather than calculation of lighting power densities along with simplifying and more

uniformly applying the existing allowance for reduced multi-level and daylighting controls when sufficient power reductions are achieved. In addition, an exception was added to allow for completion of small projects (projects involving less than 20 luminaires) without separate acceptance testing of the controls.

During the public comment period for the proposed 2016 Standards, the Energy Commission received comments expressing concern that the lighting alteration changes may have impacts beyond the impacts described in the Initial Study prepared for the proposed 2016 Standards as a whole. Accordingly, staff has prepared this separate Initial Study examining the impacts of the proposed change to the requirements for lighting alterations.

The Energy Commission has found in preparing this Initial Study / Negative Declaration that there is no substantial evidence that the proposed revisions may have a significant adverse effect on the environment.

Keywords: California Energy Commission, California Building Energy Efficiency Standards, Title 24, Part 6, 2016 Building Energy Efficiency Standards, negative declaration, nonresidential, newly constructed, additions and alterations to existing buildings, mandatory, building commissioning, acceptance testing, gigawatt hours, lighting, lighting controls, mega-watt, therms per year, nitrous oxides, sulfur oxides, carbon monoxide, carbon dioxide equivalent, NOx, SOx, CO, $PM_{2.5}$, CO2e, mercury, lead, copper, steel, plastic, silicon, gold, aluminum, fiber glass, glass, wood, time dependent valuation, TDV

Peter Strait., 2015. *Initial Study/Proposed Negative Declaration for the 2016 Building Energy Efficiency Standards for Residential and Nonresidential Buildings*. California Energy Commission, Buildings Standards Office. CEC-400-2015-012

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EXECUTIVE SUMMARY

California Public Resources Code Section 25402 was enacted in 1974 as part of the enabling legislation establishing the California Energy Commission and its basic mandates. It requires the Energy Commission to adopt, implement, and periodically update energy efficiency standards for both residential and nonresidential buildings.

The Building Energy Efficiency Standards (Standards) were first adopted in 1976 and have been updated periodically since then as directed by statute. In 1975, the Department of Housing and Community Development adopted initial insulation standards, under its State Housing Law authority, that were a precursor to the first generation of the Standards. The Warren-Alquist Act was passed that year with explicit direction to the Energy Commission to adopt and implement the Standards. The Energy Commission's statute granted consolidated energy authority and provided specific direction to the Energy Commission regarding what the Standards are to address, what criteria are to be met in developing Standards, and what implementation tools, aids, and technical assistance are to be provided. The Standards contain energy efficiency and indoor air quality requirements for newly constructed buildings, additions to existing buildings, alterations to existing buildings, and, in the case of nonresidential buildings, repairs to existing buildings. The Standards have contained requirements for alterations to existing buildings for both nonresidential buildings and residential buildings since 1977.

The enabling statute stressed the importance of building design and construction flexibility by requiring the Energy Commission to establish performance standards, in the form of an "energy budget" of the energy consumption per square foot of floor space, and to support the performance standards with compliance software to do the necessary energy calculations. The Energy Commission establishes specific requirements for input, output, and calculation uniformity, enabling private firms to develop compliance software to be approved by the Energy Commission, as long as the software programs meet the specific requirements in the Alternative Calculation Method (ACM) Approval Manuals adopted by regulation in support of the Standards. The Energy Commission also provides reference appendices that contain data and other information that serve as reference information for compliance with the Standards.

The Standards are aimed at the building components that affect energy use in newly constructed residential and nonresidential buildings, and additions and alterations to existing buildings, including lighting, water heating, and space conditioning systems, process energy occurring in the building, and the building envelope. The Standards are fundamentally performance standards requiring buildings to meet specified energy budgets while providing flexibility in selecting the features to meet those energy budgets. The Standards also include prescriptive alternatives to the performance standards, as well as mandatory requirements. Compliance with the Standards must be demonstrated to the local enforcement agency, a city or county building department, or a state agency that has responsibility for assuring compliance with building codes, before a Certificate of Occupancy is issued.

The Standards include a basic set of mandatory requirements that apply in all cases. In addition to the mandatory requirements, the performance standards establish energy budgets that depend on climate zone and building type, providing high levels of flexibility for compliance.

As an alternative to the performance standards, there are prescriptive requirements that are basically a "checklist" compliance approach that offers simplicity but less flexibility.

Included in these Standards are regulations that apply to additions and alterations to existing nonresidential buildings, organized by building component. Within these regulations are a set of provisions that apply to alterations of existing lighting. This Initial Study evaluates the impacts of the revisions to these requirements proposed for 2016.

The Energy Commission finds that, in light of the whole record, the proposed revision would not have a significant adverse impact on the environment and has thus prepared this Initial Study/Negative Declaration.

Summary of Proposed Changes

The changes to the requirements for lighting alterations proposed for the 2016 Standards establish a parallel compliance path specifying a percent reduction in existing lighting power instead of a Lighting Power Allowance. This path includes a requested relaxation of a bi-level lighting requirement that would otherwise apply to projects at 85 percent or less of their Lighting Power Allowance. In addition, the numeric threshold for triggering requirements in a luminaire modification project was raised from 40 luminaires to 70 luminaires, and a numeric threshold of five (5) luminaires was added to the requirements for outdoor lighting projects. Lastly, an exception to acceptance testing requirements was added for projects that add controls for 20 luminaires or fewer.

Environmental Impacts

Materials Use

This Initial Study concludes that the 2016 Standards will not have a significant negative effect on materials use, and provides the basis for that conclusion. No mitigation measures are proposed.

Indoor Air Quality

This Initial Study concludes that the 2016 Standards will not have a significant negative effect on indoor air quality, and provides the basis for that conclusion. No mitigation measures are proposed.

Energy and Emissions

This Initial Study concludes that the 2016 Standards will not result in an increase in energy use or emissions, and provides the basis for that conclusion. No mitigation measures are proposed.

Conclusions

The Energy Commission has analyzed the environmental impacts of the proposed lighting alteration provisions of the 2016 Building Standards for residential and nonresidential buildings. Together, this Initial Study/Negative Declaration and the 2016 Standards constitute the

environmental record for the proposed changes to the lighting alterations. This initial study of potential impacts finds that the potential adverse environmental impacts associated with the implementation of the proposed lighting alteration provisions of the 2016 Standards are less than significant. A detailed description of all potential impacts is included in this report. Therefore, a negative declaration for the 2016 Standards should be adopted.

CHAPTER 1:
Project History, Description, and Environmental Setting

History and Summary of Basic Statutory Authority for the Energy Commission's Building Standards

In 1974, the Legislature enacted statutes creating the California Energy Commission and required it to adopt Building Energy Efficiency Standards (Standards). (Statutes 1974, Chapter 276.) The Standards must be cost-effective based on the lifecycle of the building, must include performance and prescriptive compliance approaches, and must be periodically updated to account for technological improvements in efficiency technology. (Pub. Res. Code § 25402.) Accordingly, the Energy Commission has adopted and periodically updated the Standards (codified in Title 24, portions of Part 1 and in Part 6, of the California Code of Regulations) to ensure that building construction, system design, and installation achieve energy efficiency and preserve outdoor and indoor environmental quality. The Standards establish a minimum level of building energy efficiency. A building may be designed to a higher efficiency level, resulting in additional energy savings.

The Standards are aimed at the building components that affect energy use in newly constructed residential and nonresidential buildings, and additions and alterations to existing buildings, including lighting, water heating, and space conditioning systems, process energy occurring in the building, and the building envelope. The Standards are fundamentally performance standards requiring buildings to meet specified energy budgets while providing flexibility in selecting the features used to meet those energy budgets. The Standards also include prescriptive alternatives to the performance standards, as well as mandatory requirements. Compliance with the standards must be demonstrated to local enforcement agencies, city or county building departments, or a state agency that has responsibility for assuring compliance with building codes, before a Certificate of Occupancy is issued.

The Energy Commission must amend the Standards periodically to incorporate improvements in energy efficiency technologies, accounting for changes in the cost of fuels and energy-conserving strategies, improved building science research, and better understanding of California building energy performance. As is the case for the original standards, the amendments must be cost-effective. The Energy Commission makes amendments in alignment with statutory direction that building codes be updated on a three-year cycle.

Additional Laws and Policies Affecting the Standards

Enacted in 1974, Public Resources Code Section 25910 directed the Energy Commission to adopt standards for the minimum amount of additional insulation installed (as an alteration) in existing buildings. Senate Bill (SB) 639 (Rosenthal, Chapter 1067, Statutes of 1993) added Section 25402.5, which expressly directed the Energy Commission to consider both new and replacement (as an alteration to an existing building), as well as interior and exterior lighting devices as

subject to Energy Commission authority. SB 639 also clarified that the Energy Commission's authority relating to exterior lighting and to alterations to existing buildings was included in the Legislature's original intent in enacting Section 25402. Senate Bill 5X (Sher, Chapter 7, Statutes of 2001, 1st Extra Session) added Subsection (c) to Section 25402.5 to clarify and expand the Energy Commission's authority to adopt standards for outdoor lighting (defined as all electrical lighting not subject to the Energy Commission's existing and prior standards).

The Global Warming Solutions Act (Assembly Bill 32, Núñez, Chapter 488, Statutes of 2006) has been the foundation of California's efforts over the past nine years to reduce greenhouse gas emissions to the state's 1990 level by 2020. Improving the energy efficiency of existing residential and commercial buildings is the single most important activity to reduce greenhouse gas emissions that result from the production and use of electricity and natural gas. Expanding and strengthening existing energy efficiency programs as well as building and appliance standards are a key recommendation of the California Air Resources Board's (CARB) *AB 32 Scoping Plan*. Climate change is the most important environmental and economic challenge of this century; greenhouse gas emissions are the largest contributors to global warming; and California's ability to slow the rate of greenhouse gas emissions will depend first on energy efficiency.

Senate Bill 1 (SB1) (Murray, Chapter 132, Statutes of 2006) enacted Governor Schwarzenegger's Million Solar Roofs Initiative. The statute added sections to the Public Resources Code that require building projects applying for ratepayer-funded incentives for photovoltaic (PV) systems to meet minimum energy efficiency levels and PV system components and installations meet rating standards and specific performance requirements. SB 1 required the Energy Commission to determine how and to what extent PV systems should be required in the Standards. The Energy Commission has responded by including PV installation as an intermediate trade-off for certain limited efficiency measures.

The Energy Commission's *Energy Action Plan* (updated February 2008; available at http://www.energy.ca.gov/energy_action_plan/) guides California's Energy Policy and establishes California's "Loading Order" policy, the latter of which calls for load growth to be met first by cost-effective energy efficiency improvements and demand response, followed by renewable resources

The California Long-Term Energy Efficiency Strategic Plan (2008), developed by the California Public Utilities Commission (CPUC) in collaboration with the Energy Commission, establishes the importance of the Standards in reaching the State's policy goal of zero net energy homes by 2020 and zero net energy buildings by 2030. The strategic plan also explains the Energy Commission's development of voluntary "reach standards"—now codified in Part 11 of Title 24 – as a critical component of the Standards. In each update cycle the reach standards establish a "market pull strategy" to encourage the industry to anticipate that additional standards improvements will be coming in the following cycle, and for a substantial portion of newly constructed buildings to build to meet higher levels of efficiency than just what the mandatory standards require. Building to meet the reach standards is further encouraged by the minimum installation requirements to qualify for PV incentives under the New Solar Homes Partnership (California Energy Commission *New Solar Homes Partnership Guidebook, Eighth Edition* Publication No. CEC-300-2014-001-ED8-CMF), as well as incentives provided by utility programs and other

governmental agencies, such as the Tax Credit Allocation Committee incorporating efficiency into their Low-Income Housing Tax Credit Programs (http://www.treasurer.ca.gov/ctcac/).

Assembly Bill 758 (Skinner, Chapter 470, Statutes of 2009) requires the Energy Commission to develop and implement a comprehensive program to achieve greater energy savings in California's existing residential and nonresidential building stock. The program consists of a complimentary portfolio of techniques, applications, and practices to achieve greater energy efficiency in existing residential and nonresidential structures, especially those structures that fall significantly below the efficiency required by the current Standards. One important means for achieving energy efficiency in existing buildings is ongoing improvement of the standards' requirements for alterations to existing buildings.

The California's Clean Energy Futures Initiative (2010) is a collaborative effort of the Energy Commission, the CPUC, CARB, California Environmental Protection Agency, and the California Independent System Operator (ISO) to advance carbon-cutting innovation and green job creation. It points the way toward new investments in energy efficiency, transmission, smart grid applications, and increased use of renewable resources. The Clean Energy Futures Initiative calls for achievement of California's zero net energy goals through updates of the Standards.

Governor Brown's *Clean Energy Jobs Plan* (2010) combines existing state energy policy with economic recovery and growth goals by focusing on developing renewable energy and energy efficiency technologies and creating more than half a million green jobs. The Governor's *Clean Energy Jobs Plan* calls for:

1. Creating new efficiency standards for new buildings;
2. Increasing public education and enforcement efforts so that the gains promised by California's efficiency standards are realized; and
3. Actively pursuing the achievement of "zero-net-energy" buildings.

Proposed Project

The proposed project is comprised of proposed regulatory changes to the nonresidential lighting alteration provisions within the Title 24 Building Energy Efficiency Standards, setting forth requirements for alterations to existing lighting in nonresidential buildings. These regulatory changes are being made as part of a regular triennial update to the Standards.

Environmental Setting

The Building Energy Efficiency Standards are a set of regulations that require energy efficient designs, features, equipment, and practices in new construction occurring within the state of California. As these regulations are statewide, the environmental setting of updates to the Standards is the entire state of California.

California currently consumes roughly 300,000 gigawatt-hours (GWh) of electricity on an annual basis[1], and the primary sources of electricity generation remain the burning of natural gas and coal. In addition, natural gas is consumed on-site in buildings for space heating, water heating, and for other uses such as cooking. Approximately one-third of the energy consumed in California is consumed by buildings, either via consumption of electricity or burning of natural gas.

As California's population grows, every year hundreds of thousands of new buildings are constructed, added on to, or remodeled, adding onto this energy use. The Energy Commission's Forecasting unit estimates 108,000 new residential homes will be built in 2017 along with 189 million square feet of new nonresidential buildings.

The Standards make buildings more efficient, resulting in reduced consumption of both natural gas and electricity. These reductions in turn result in lower emissions from natural gas combustion at the building site, and lower emissions from the generation of electricity that powers buildings.

Methodology

Staff analyzed the proposed measures by identifying the compliance paths allowed by the proposed measures, assigning a market share percentage to each path (representing what percent of the market would be likely to use that path for compliance), and evaluating the energy savings that would result from each path. The total savings is compared against estimated savings calculated for the current regulations. Staff verified the results of this analysis by performing an alternate assessment based on lighting vintage and total package savings of each edition of the regulations (including the proposed).

The analysis is supported by an Excel spreadsheet tool that has been developed by the Codes and Standards Enhancement (CASE) team (titled "Lighting Alteration Savings Analysis")[2], and by a lighting vintage table[3] developed by staff to compare the energy savings of 2016 Standards lighting power densities (LPDs) against vintage LPDs of 1998/2001, 2005, 2008, and 2013 Standards. The Savings Analysis relies on a straightforward set of assumptions to assess the energy impact of the proposed 2016 Standards, as described below:

1. Separate scenarios are developed for each compliance path under Entire Luminaire Alterations (Alterations), Luminaire Component Modifications (Modifications), and Lighting Wiring Alterations (Wiring Alterations) proposals. The available pathways under Alterations and Modifications scenarios include complying by meeting prescribed

[1] http://energyalmanac.ca.gov/electricity/electricity_generation.html.
[2] *Lighting Alteration Savings Analysis*, prepared by Y. Zhang and M. Shirakh, July 2015. Available at www.energy.ca.gov/title24/2016standards/rulemaking/documents/
[3] *Vintage Lighting Savings*, prepared by M. Shirakh, July 2015. Available at www.energy.ca.gov/title24/2016standards/rulemaking/documents/

lighting power densities (LPDs) and complying via the 35 percent power reduction option.

2. Market share is assigned to each scenario to represent the assumed percentage of alteration projects that would pursue each compliance pathway.
3. The impact of each control requirement (e.g., area controls, multi-level controls, shutoff controls, daylighting controls, and demand response controls) is separately assessed for each scenario/pathway.
4. The impacts are weighted by market share, and then summed.
5. The summed impacts are compared to the estimated impact of the 2013 Standards.

In contrast, the vintage table analysis estimates the energy use of existing, installed lighting, using the year of the most recent update to the lighting system. The analysis presumes that updating the lighting brings the lighting up to the minimum requirements of the code in effect at that time. This establishes an alternate basis for comparing the 35 percent power reduction option to the current Lighting Power Allowance option. This analysis first establishes an expected, weighted average LPD for each edition of the Standards, then calculates what a 30 and 35 percent reduction in that lighting power would achieve and compares it to 100 percent and 85 percent of the weighted average 2016 LPD.

It should be noted that there is an antagonistic relationship between lighting efficiency and control savings. Extremely efficient lighting consumes less power when on, and therefore less consumption is avoided by turning that lighting down or off. For this reason, some paths that show increased savings from lighting power reduction will show decreased savings from installation of lighting controls.

CHAPTER 2:
List of Agencies That Will Use or Comment on This Initial Study

The Energy Commission is the lead agency for this rulemaking proceeding. Following adoption by the Energy Commission, the Standards must be reviewed and approved by the California Building Standards Commission, which will have access to this Initial Study and all other documents related to the rulemaking proceeding. The Energy Commission will make the Initial Study, and all other documents in the proceeding, available to all potentially interested federal, state, and local agencies, and those agencies will be invited to comment.

CHAPTER 3:
List of Permits and Other Approvals Required to Implement The Project

No permits are applicable for this project. The Energy Commission and the California Building Standards Commission are the only agencies that must approve changes to the Standards.

CHAPTER 4:
Descriptions of 2016 Proposed Changes to Building Energy Efficiency Standards – Lighting Alterations

Overview

Existing regulations in Title 24, Part 6, Section 141.0(b)2 set requirements for alterations to existing lighting in nonresidential buildings. These requirements establish a limit on the total lighting power that may be installed in a given space, and specify updates to the lighting controls that must be performed as a part of such alterations. Other sections of the Regulations further specify that newly installed lighting controls are subject to acceptance testing.

The existing regulations allow for a tradeoff between the complexity of the controls and the efficiency of the installed lighting. If the total lighting power is at least 15 percent below the limit for that space, then the updates to the controls are not required to include daylighting and may include bi-level controls in place of more extensive multi-level controls that would otherwise be required.

The proposed regulations restructure the requirements of this Section primarily to enhance its clarity and consistency. As the rulemaking process is an open, public process that solicits public participation, the proposed regulations were also responsive to concerns regarding the existing regulations that were brought to the Energy Commission. For the regulations applicable to indoor lighting, the following concerns were addressed:

1. Members of the public had voiced concerns that calculation of Lighting Power Allowances for existing buildings can be complex and prone to uncertainty, particularly in buildings with complex (i.e., non-rectangular) spaces. To address this concern, the proposed regulations include a parallel compliance path based on achieving a 35 percent reduction in the amount of installed lighting power in the space: staff analysis had shown that for the majority of existing buildings this percentage would result in greater savings than being 15 percent below the Lighting Power Allowance.
2. Members of the public had voiced concerns that installing bi-level or multi-level lighting often requires extensive rewiring, if the existing lighting is not already bi-level or multi-level, raising questions of cost and cost effectiveness relative to the anticipated savings from having multiple lighting levels. To address this concern, the bi-level control requirement (that would otherwise apply to a project 15 percent below its Lighting Power Allowance) was relaxed for projects using the percent reduction compliance path, based on the additional savings estimated to be achieved by that path.
3. Members of the public had voiced concerns that acceptance testing was inappropriate for small projects that include installation of small numbers of off-the-shelf, non-networked controls. To address this concern, an exception to the acceptance testing requirement was added for projects where new controls were installed for no more than 20 luminaires.

4. Members of the public had voiced concerns that the threshold of 40 luminaires for requiring updated controls, as it applies to projects that modify existing luminaires, was overly restrictive and not indicative of a typical small project (given that the intent of the threshold was to exclude small projects from the associated requirements). To address this concern, the threshold was raised to 70 luminaires.

For outdoor lighting, the following concerns were addressed:

1. Members of the public had voiced concerns similar to those for indoor lighting that calculation of Lighting Power Allowances for existing outdoor lighting can be complex and prone to uncertainty, particularly in areas with complex geometry. To address this concern, the proposed regulations include an exception to determining Lighting Power Allowances based on achieving a percent reduction in the amount of installed lighting power in the space that would achieve an equivalent savings.
2. Members of the public were concerned that, without a numeric threshold, the 10 percent and 50 percent thresholds could be crossed by altering a single luminaire, which was not the intent of the regulations given that it defeats the purpose of having a threshold. To address this concern, the proposed regulations include a numeric threshold of five (5) luminares and specify that the greater of five luminaires or the specified percentage would trigger the need to meet associated requirements.
3. Members of the public had voiced concerns similar to those for indoor lighting that acceptance testing was inappropriate for small projects that include installation of small numbers of off-the-shelf, non-networked controls. To address this concern, an exception to the acceptance testing requirement was added for projects where new controls were installed for no more than 20 luminaires.

After publishing 15-Day Language that included these proposed revisions, the Energy Commission received public comments expressing concern that the changes to the regulations for indoor lighting alterations would result in an overall loss of energy efficiency and increase in energy use, and therefore a significant adverse environmental impact. In response to these comments, the Energy Commission made minor changes to the proposed language

To address this comment and ensure that the regulations were equivalent to the current regulations, staff re-evaluated the proposed regulatory language and prepared this Initial Study to examine the impacts of these revisions and determine whether the proposed changes to these Sections are likely to result in an adverse impact on the environment.

CHAPTER 5:
Estimated Environmental Impacts

The Energy Commission has evaluated the proposed changes to the lighting alterations sections of the Standards for their potential for environmental impacts, as described in the Methodology section of Chapter 1.

While the Standards generally, and the proposed amendments to the nonresidential lighting alteration provisions specifically, relate to new construction, they do not cause new construction to occur within the state. The Standards do not regulate where or when construction occurs, but rather apply to how new buildings and other types of new construction are designed and built, including how alterations to existing buildings are undertaken. The Standards also do not prescribe or otherwise regulate the aesthetic appearance of buildings.

Consequently, the environmental impacts of the proposed changes are limited to any anticipated changes in energy consumption, and any increase in material use necessary to comply with the updated Standards. Furthermore, as noted below, the proposed changes to the lighting alterations requirements do not increase the number of controls required to be installed; therefore, there is no increase in material use and no associated impacts.

Estimated Change in Energy Consumption

The evaluation of the proposed amendments to the Lighting Alterations described in the Methodology section of Chapter 1 shows that the proposed changes to the Lighting Alterations requirement save at least as much energy as the current requirements. Specifically, the Lighting Alteration Savings Analysis finds that:

1. Compared to the Lighting Power Allowance compliance path, the 35% power reduction path saves 116 GWHs of electricity each year.
2. Compared to the 2013 control requirements, the proposed 2016 control requirements result in a separate loss of savings of 60 GWHs per year, primarily from reduced installation of daylighting controls (49 GWH/year) and with a smaller contribution from the increased luminaire modification threshold (11 GWH/year).
3. Including the above and the more marginal impacts of the changes to the lighting alteration requirements, the overall result is a net energy savings of 74 GWHs per year under the proposed 2016 Standards.

To explain, staff determined that the 2016 Standards 35 percent power reduction option under the Alterations and Modifications scenarios saves more energy than complying with current Lighting Power Allowances, which is the only option for the 2013 Standards. The resulting savings are enough to compensate for the energy loss of some daylighting controls and still achieve a net electricity savings of 74 GWHs per year compared to the 2013 Standards.

The Vintage Table corroborates this result by demonstrating how the 35 percent power reduction saves more energy than meeting current Lighting Power Densities, using each past cycle of the Standards dating back to the 1998/2001 Standards as an independent baseline.

This analysis shows that for installed lighting that minimally complies with each edition of the Standards, a 35 percent reduction achieves more energy savings than meeting the 2016 LPD in all cases. In addition, a 35 percent reduction achieves more energy savings that meeting 85 percent of the 2016 LPD[4] for lighting meeting the 2005 or any later LPD, and comes extremely close to achieving the same reduction for the 1998/2001 vintage. The following table compares the calculated savings for each vintage:

	1998 / 2001	2005	2008	2013	2016	85% of 2016
Weighted Average LPD for each Vintage	1.39	1.21	1.14	1.04	1.01	0.86
Average 2016 LPD Savings Over Vintage LPDs (at 100% of LPD)	27%	17%	11%	3%	0%	
Average 2016 LPD Savings Over Vintage LPDs (at 85% of LPD)	38%	29%	25%	17%	15%	
65% of Vintage LPD (35% reduction)	0.90	0.79	0.74	0.68		

The first row shows the weighted average LPD, in watts per square foot, that would result from meeting the required LPDs for that edition of the Standards. The second row shows the percent savings that would result from reducing the lighting power to the 2016 LPD, and the third row shows the percent savings that would result from reducing the lighting power to 85 percent of the 2016 LPD. The fourth row shows the LPD that would result from reducing that vintage's LPD by 35 percent.

The percent values in the second and third columns can be compared directly to the 35 percent reduction option. This shows that achieving a 35 percent decrease in lighting power always results in more savings than meeting the 2016 LPD, which at most achieves a 27 percent decrease in lighting power. Installing lighting to 85 percent of the 2016 LPD results in comparable savings for 1998 / 2001 vintage lighting (38 versus 35 percent, or 0.90 watts per square foot versus 0.86), and less savings for every later vintage.

Thus, given a typical lifespan of a lighting installation of 10-15 years, the proposed 35 percent reduction pathway would result in similar or better improvements in lighting efficiency starting in its proposed effective date of January 1, 2017, and would result in greater improvements in lighting efficiency over time as systems of later vintages age and become in need of replacement. This supports the results of the Lighting Alteration Savings Analysis that the proposed Standards would result in a net savings of electricity.

[4] Under the current Standards, daylighting and multi-level control requirements are relaxed when the installed lighting power is no more than 85 percent of the prescribed LPD. This option is comparable to the proposed 35 percent reduction pathway, which also provides relaxed daylighting and multi-level control requirements.

Estimated Change in Materials Use

The proposed changes to the lighting alterations requirements do not increase the number of controls required to be installed, therefore there is no increase in material use.

Air Quality / Indoor Air Quality

The proposed changes to the requirements for lighting alterations do not result in an increase in energy use, meaning that they do not cause any increase in emissions associated with electric power production and therefore do not have a significant adverse impact on either air quality generally or on indoor air quality.

Greenhouse Gas Impacts

The proposed changes to the requirements for lighting alterations do not result in an increase in energy use, meaning that they do not cause any increase in emissions associated with electric power production and therefore do not have a significant adverse impact on the emissions of greenhouse gasses.

CHAPTER 6:
Energy and Environmental Benefits

The Energy Commission evaluated the proposed change to the lighting alterations requirements in the building energy efficiency standards for its energy and environmental benefits. The proposed changes result in a modest amount of energy savings, estimated at 74 gigawatt-hours per year. This savings reduces the need to operate power plants that generate electricity, thereby avoiding the emissions that would ordinarily result from power generation. The estimated annual emissions savings[5] are as follows:

NOx	SOx	CO	$PM_{2.5}$
3774 lbs	518 lbs	5328 lbs	1628 lbs

[5] *Criteria Air Emissions and Water Use Factors for Gas and Electricity Efficiency Savings for the 2013 California Building Energy Efficiency Standards*, California Energy Commission (2012)

CHAPTER 7:
Cumulative Effects

Because the proposed changes to the lighting alteration provisions in Title 24, Part 6, Section 141.0(b)2 will not result in any adverse environmental impact, they will not contribute to any significant adverse impact that is cumulatively considerable. For additional information about the cumulative effects of the other changes proposed for Title 24, Part 6, as a part of the current triennial update to the Standards, please see the Initial Study and Proposed Negative Declaration prepared for the project as a whole[6].

[6] *Initial Study / Proposed Negative Declaration for the 2016 Building Energy Efficiency Standards for Residential and Nonresidential Buildings*, California Energy Commission (2015)

CHAPTER 8:
Energy Commission Recommendations

The analysis provided for the proposed changes to the Building Energy Efficiency Standards requirements for nonresidential lighting alterations concludes that there will be no significant impact on the environment. A Negative Declaration is proposed to be adopted for this change to the Building Energy Efficiency Standards.

CHAPTER 9:
Initial Study Preparers

This Initial Study was prepared by Peter Strait of the Efficiency Division's Building Standards Office, with contributions from Pippin Brehler and Galen Lemei of the Office of the Chief Counsel.

REFERENCES

2013 Building Energy Efficiency Standards for Residential and Nonresidential Buildings, California Energy Commission (2013 Standards), Publication Number CEC-400-2012-004-CMF-REV2, Sacramento, California, May 2012. http://www.energy.ca.gov/title24/2013standards/index.html

California Energy Commission (CEC 2012), Alvarado, A., Loyer, J., March 2012, Criteria Air Emissions and Water Use Factors for Gas and Electricity Efficiency Savings for the 2013 California Building Energy Efficiency Standards. http://www.energy.ca.gov/title24/2013standards/prerulemaking/documents/current/Reports/General/2013_Initial_Study_Air_and_Water_Emission_Factors.pdf

Air Emission Factors	Units	NOx	SOx	CO	$PM_{2.5}$
Electricity	lbs/MWh	0.051	0.007	0.072	0.022

Initial Study / Proposed Negative Declaration for the 2016 Building Energy Efficiency Standards for Residential and Nonresidential Buildings, Publication Number CEC-400-2015-012, Sacramento, California, February 2015. http://www.energy.ca.gov/2015publications/CEC-400-2015-012/CEC-400-2015-012.pdf

Lighting Alteration Savings Analysis, Y. Zhang and M. Shirakh, Sacramento, California, July 2015. http://www.energy.ca.gov/title24/2016standards/rulemaking/documents/

Proposed 2016 Building Energy Efficiency Standards for Residential and Nonresidential Buildings, California Energy Commission (2016 Standards), Sacramento, California, February 2015. http://www.energy.ca.gov/title24/2016standards/rulemaking/index.html

Vintage Lighting Savings, M. Shirakh, Sacramento, California, July 2015. http://www.energy.ca.gov/title24/2016standards/rulemaking/documents/

GLOSSARY

Building Energy Efficiency Standards (Standards)	The California Building Energy Efficiency Standards as set forth in the California Code of Regulations, Title 24, Part 6.
Gigawatt-hour (GWh)	One thousand megawatt-hours, one million kilowatt-hours, or one billion watt-hours of electrical energy.
Glazing	Transparent or translucent material (typically glass or plastic) used for admitting light.
Heating, Ventilating, and Air Conditioning (HVAC)	The mechanical heating, ventilating and air-conditioning system of the building is also known as the HVAC system. The Standards use measures of equipment efficiency defined according to the type of HVAC equipment installed.
Kilowatt (kW)	One thousand watts of power. A kilowatt is a measure of demand, or how many thousand watts are being drawn at any instant.
Kilowatt-hour (kWh)	One thousand watt-hours (watts of energy provided or expended for the duration of one hour) of energy.
Lighting Power Density (LPD)	A measure of the amount of light in a room. For the purpose of this document, LPD represents the amount of watts used to produce light per square foot that can be installed for a specific task.
Megawatt (MW)	One million watts of power. A megawatt is a measure of demand or how many million watts are being drawn at any instant (see also kilowatt).
MBtu	One million Btus of energy.
Time Dependent Valuation (TDV)	A method of valuing electricity and other building energy sources differently according to the time of day and season of electricity demand; for example, the cost of electricity in California rises at peak demand times in hot weather due to a much larger need to power air conditioning. TDV energy includes energy used at the building site as well as that consumed in producing and delivering energy to the site, including but not

	limited to generation, transmission, and distribution losses.
Watt (W)	A unit of measure of electric power at a point in time, as capacity or demand.

APPENDIX A: California Environmental Quality Act Checklist

Project title:	2013 Energy Efficiency Standards for Residential and Nonresidential Buildings
Lead agency name and address	California Energy Commission 1516 Ninth Street Sacramento, California 95814
Contact person and phone number:	Peter Strait, Efficiency Division (916) 654-2817
Project Description	The Energy Commission is proposing changes to the energy efficiency standards for residential and nonresidential buildings as mandated by the Warren-Alquist Act. A summarized list of the proposed changes is included in the Executive Summary of this Initial Study.
Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement.)	The California Building Standards Commission must approve the changes.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

	I. Aesthetics		II. Agriculture Resources		III. Air Quality
	IV. Biological Resources		V. Cultural Resources		VI. Geology /Soils
	VII. Energy		VIII. Hazards & Hazardous Materials		IX. Hydrology / Water Quality
	X. Land Use/ Planning		XI. Mineral Resources		XII. Natural Resources
	XIII. Noise		XIV. Population/ Housing		XV. Public Services
	XVI. Recreation		XVII. Transportation/ Traffic		XVIII. Utilities/ Service Systems
	XIX. Mandatory Findings of Significance				

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Signifi-cant Impact	No Impact
I. **AESTHETICS --** Would the project:				
a) Have a substantial adverse effect on a scenic vista?				X
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				X
c) Substantially degrade the existing visual character or quality of the site and its surroundings?				X
d) Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?				X
Per Chapter 5, Energy Commission staff has determined that the proposed changes to the Lighting Alterations requirements within the Standards have no possible impact on aesthetics.				
II. **AGRICULTURE RESOURCES** -- In determining whether impacts to agricultural resources are significant environmental benefits, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. 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?				X
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				X
c) Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?				X

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Signifi-cant Impact	No Impact
Per Chapter 5, Energy Commission staff has determined that the proposed changes to the Lighting Alterations requirements within the Standards have no possible impact on agricultural resources.				
III. AIR QUALITY -- Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?				X
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?				X
c) 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 (including releasing emissions that exceed quantitative thresholds for ozone precursors)?				X
d) Expose sensitive receptors to substantial pollutant concentrations?				X
e) Create objectionable odors affecting a substantial number of people?				X
Per Chapter 5, Commission staff has determined that the proposed changes to the Lighting Alterations requirements within the Standards will have no adverse impacts on air quality.				
IV. **BIOLOGICAL RESOURCES** -- Would the project**:**				
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 Game or U.S. Fish and Wildlife Service?				X
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or				X

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Signifi-cant Impact	No Impact
regional plans, policies, and regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?				
c) 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.) through direct removal, filling, hydrological interruption, or other means?				X
d) 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 native wildlife nursery sites?				X
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				X
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?				X
Per Chapter 5, Commission staff has determined that the proposed changes to the Lighting Alterations requirements within the Standards have no possible impact on biological resources.				
V. **CULTURAL RESOURCES** -- Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?				X
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?				X
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?				X

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Signifi-cant Impact	No Impact
d) Disturb any human remains, including those interred outside of formal cemeteries?				X
Per Chapter 5, Commission staff has determined that the proposed changes to the Lighting Alterations requirements within the Standards have no possible impact on cultural resources.				
VI. **GEOLOGY AND SOILS** -- Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				X
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.				X
ii) Strong seismic ground shaking?				X
iii) Seismic-related ground failure, including liquefaction?				X
iv) Landslides?				X
b) Result in substantial soil erosion or the loss of topsoil?				X
c) Be located on a geologic unit 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?				X
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?				X
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the				X

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Signifi-cant Impact	No Impact
disposal of wastewater?				
Per Chapter 5, Commission staff has determined that the proposed changes to the Lighting Alterations requirements within the Standards have no possible impacts on geology and soils.				
VII. **ENERGY --** Would the project:				
a) Use exceptional amounts of fuel or energy?				X
b) Increase demand upon existing sources of energy, or require the development of new sources of energy?				X
Per Chapter 5, Commission staff has determined that the proposed changes to the Lighting Alterations requirements within the Standards will have no adverse impacts on energy.				
VIII. **HAZARDS AND HAZARDOUS MATERIALS** -- Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?				X
b) 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?				X
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				X
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?				X
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				X

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Signifi-cant Impact	No Impact
hazard for people residing or working in the project area?				
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				X
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				X
h) Expose people or structures to a significant risk of loss, injury or death involving wild land fires, including where wild lands are adjacent to urbanized areas or where residences are intermixed with wild lands?				X
Per Chapter 5, Commission staff has determined that the proposed changes to the Lighting Alterations requirements within the Standards have no possible impact on hazards and hazardous materials.				
IX. **HYDROLOGY AND WATER QUALITY** -- Would the project:				
a) Violate any water quality standards or waste discharge requirements?				X
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?				X
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner, which would result in substantial erosion or siltation on- or off-site?				X

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Signifi-cant Impact	No Impact
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site?				X
e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?				X
f) Otherwise substantially degrade water quality?				X
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				X
h) Place within a 100-year flood hazard area structures that would impede or redirect flood flows?				X
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?				X
j) Inundation by seiche, tsunami, or mudflow?				X
Per Chapter 5, Commission staff has determined that the proposed changes to the Lighting Alterations requirements within the Standards will have no adverse impacts on hydrology and water quality.				
X. **LAND USE AND PLANNING** -- Would the project:				
a) Physically divide an established community?				X
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project				X

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Signifi-cant Impact	No Impact
(including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?				
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?				X
Per Chapter 5, Commission staff has determined that the proposed changes to the Lighting Alterations requirements within the Standards have no possible impact on land use and planning.				
XI. **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?				X
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?				X
Per Chapter 5, Commission staff has determined that the proposed changes to the Lighting Alterations requirements within the Standards have no possible impact on mineral resources.				
XII. **NATURAL RESOURCES** -- Would the project result in:				
a) Significant increase in the rate of use of any natural resources?				X
b) Significant depletion of any non-renewable natural resource?				X
Per Chapter 5, Commission staff has determined that the proposed changes to the Lighting Alterations requirements within the Standards have no possible impact on natural resources.				
XIII. **NOISE** -- Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?				X
b) Exposure of persons to or generation of excessive ground borne vibration or				X

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Signifi-cant Impact	No Impact
ground borne noise levels?				
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?				X
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?				X
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 expose people residing or working in the project area to excessive noise levels?				X
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?				X
Per Chapter 5, Commission staff has determined that the proposed changes to the Lighting Alterations requirements within the Standards have no possible impact on noise.				
XIV. **POPULATION AND HOUSING** -- Would the project:				
a) Induce substantial 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)?				X
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				X
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				X

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Signifi-cant Impact	No Impact
Per Chapter 5, Commission staff has determined that the proposed changes to the Lighting Alterations requirements within the Standards have no possible impact on population and housing.				
XV. **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:				X
Fire protection?				X
Police protection?				X
Schools?				X
Parks?				X
Other public facilities?				X
Per Chapter 5, Commission staff has determined that the proposed changes to the Lighting Alterations requirements within the Standards have no possible impact on public services.				
XVI. **RECREATION** -- Would the project:				
a) 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?				X
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?				X
Per Chapter 5, Commission staff has determined that the proposed changes to the Lighting Alterations requirements within the Standards have no possible impact on recreation.				
XVII. **TRANSPORTATION AND TRAFFIC** -- Would the project:				
a) Cause an increase in traffic that is				

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Signifi-cant Impact	No Impact
substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?				X
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?				X
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?				X
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				X
e) Result in inadequate emergency access?				X
f) Result in inadequate parking capacity?				X
g) Conflict with adopted policies plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?				X
Per Chapter 5, Commission staff has determined that the proposed changes to the Lighting Alterations requirements within the Standards have no possible impact on transportation and traffic.				
XVIII. **UTILITIES AND SERVICE SYSTEMS** -- Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?				X
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental				X

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Signifi-cant Impact	No Impact
benefits?				
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental benefits?				X
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?				X
e) Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the projects projected demand in addition to the providers' existing commitments?				X
f) Be served by a landfill with sufficient permitted capacity to accommodate the projects solid waste disposal needs?				X
g) Comply with federal, state, and local statutes and regulations related to solid waste?				X
Per Chapter 5, Commission staff has determined that the proposed changes to the Lighting Alterations requirements within the Standards have no possible impact on utilities and service systems.				
XIX. **MANDATORY FINDINGS OF SIGNIFICANCE**				
a) Does the project have the potential to 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, 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?				X

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Signifi-cant Impact	No Impact
c) Does the project have environmental benefits that will cause substantial adverse effects on human beings, either directly or indirectly?				X
Commission staff has determined that the proposed changes to the Lighting Alterations requirements within the Standards will have no impacts that would result in a mandatory finding of significance.				

DETERMINATION:
On the basis of this evaluation:

X	I find that the proposed project WILL NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
	I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
	I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
	I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
	I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Robert P. Oglesby Date
Executive Director
California Energy Commission

APPENDIX B: Proposed Text of Negative Declaration

Pursuant to the California Environmental Quality Act (CEQA), the Energy Commission approves the Initial Study analyzing the environmental impacts of the proposed changes to the Lighting Alterations requirements within the Building Energy Efficiency Standards.

Based on the Initial Study, the Energy Commission finds that:

1. There is no substantial evidence, in light of the whole record, that adopting the proposed changes to the Building Energy Efficiency Standards, in Part 6, Sections 141.0(b)2I, J, K, and L of Title 24 of the California Code of Regulations, will have a significant effect on the environment; and
2. The Initial Study reflects the Energy Commission's independent judgment and analysis.

The Energy Commission therefore also adopts a Negative Declaration for the proposed 2016 Standards based on the approved Initial Study.