

DOCKETED

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OVERVIEW OF SUPPORTING COST EFFECTIVENESS STUDIES

REFERENCE STUDIES:

1. Attachment 3B

Title: 2019 Cost-effectiveness Study: Low-Rise Residential New Construction

Prepared For: Kelly Cunningham, Codes and Standards Program, Pacific Gas and Electric Company

Prepared By: Frontier Energy, Inc., Misti Bruceri & Associates, LLC

Last Modified: July 17, 2019

2. Attachment 3C

Title: 2019 Nonresidential New Construction Reach Code Cost Effectiveness Study

Prepared For: Christopher Kuch, Codes and Standards Program, Southern California Edison Company

Prepared By: TRC, EnergySoft

Last Modified: July 25, 2019

PROPOSED REQUIREMENTS

RESIDENTIAL PERFORMANCE AND PRESCRIPTIVE

Performance Path Requirements	Prescriptive Path Requirements	Reference Study
Single and Two-family New Construction		
1. All Electric. Demonstrate that the proposed home will be all electric, OR	Build All Electric and Meet 2019 Title 24 Part 6.	Refer to Reference Study 1: 2019 Cost-effectiveness Study: Low-Rise Residential New Construction
2. Mixed Fuel Building. Proposed Design Building shall be at least 2.5 EDR points less than the Energy Efficiency Design Rating calculated for the Standard Design Building, OR	Mixed Fuel Building a. Duct System Sealing and Leakage Testing. The duct systems shall exceed the minimum mandatory requirements of Section 150.0(m)11 A and B such that the total duct system leakage shall not exceed 2 percent of the nominal system air handler air flow. b. Slab floor perimeter insulation shall be installed with an R-value equal to or greater than R10. The minimum depth of concrete-slab floor perimeter insulation shall be 16 inches or the depth of the footing of the building, whichever is less. c. The hot water distribution system shall be designed and installed to meet minimum requirements for the basic compact hot water	

	<p>distribution credit according to the procedures outlined in the 2019 Reference Appendices RA4.4.6.</p> <p>d. Central Fan Integrated Ventilation Systems. The duct distribution system shall be designed reduce external static pressure to meet a maximum fan efficacy equal to:</p> <p>(i) Gas Furnaces: 0.35 Watts per cfm (ii) Heat Pumps: 0.45 Watts per cfm, according to the procedures outlined in the 2019 Reference Appendices RA 3.3.</p> <p>e. For buildings with either space heating or water heating systems fueled by gas or propane, also include:</p> <p>(i) 5 kWh battery of battery storage, OR (ii) A solar water heating system with a minimum solar savings fraction of 0.20.</p>	
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NONRESIDENTIAL PERFORMANCE AND PRESCRIPTIVE

Performance Path Requirements	Prescriptive Path Requirements		Reference Study
Nonresidential New Construction – Office Occupancies			
<p>All Electric. Demonstrate that the proposed building will be all electric</p>	<p>Build All Electric and Meet 2019 Title 24 Part 6.</p>		
<p>Mixed Fuel Buildings, Office Occupancies. Demonstrate that the energy use of the proposed building is 10% more efficient than the 2019 State Energy Code</p>	<p>Mixed Fuel Buildings, Office Occupancies, as applicable:</p> <p>a. Install fenestration with a solar heat gain coefficient no greater than 0.22. b. Limit the fenestration area on east-facing and west-facing walls to one-half of the average amount of north-facing and south-facing fenestration. c. Design Variable Air Volume (VAV) box minimum airflows to be equal to the zone ventilation minimums. d. Include economizers and staged fan control in air handlers with a mechanical cooling capacity ≥ 33,000 Btu/h e. Reduce the lighting power density (Watts/ft²) by ten percent (10%) from that required from Table 140.6-C. f. Improve lighting:</p>		<p>Refer to Reference Study 2: 2019 Nonresidential New Construction Reach Code Cost Effectiveness Study</p>

	<ul style="list-style-type: none"> 1) Control to daylight dimming plus off per Section 140.6(a)2H 2) Install Occupant Sensing Controls in Large Open Plan Offices per Section 140.6(a)2I 3) Perform Institutional Tuning per Section 140.6(a)2J 	
Nonresidential New Construction		
	<p>Solar photovoltaic systems shall be installed as follows:</p> <ul style="list-style-type: none"> 1. New residential buildings four stories or more shall provide a minimum of a 3-kilowatt photovoltaic system. 2. New non-residential buildings with less than 10,000 square feet of gross floor area shall provide a minimum of a 3- kilowatt photovoltaic system. 3. New non-residential buildings greater than or equal to 10,000 square feet of gross floor area shall provide a minimum of a 5-kilowatt photovoltaic system. <p>Exception to Section A: As an alternative to a solar photovoltaic system, all of the building types listed above may provide a solar hot water system (solar thermal) with a minimum collector area of 40 square feet.</p>	<p>Refer to Reference Study 2: 2019 Nonresidential New Construction Reach Code Cost Effectiveness Study</p>