

DOCKETED

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OVERVIEW OF SUPPORTING COST EFFECTIVENESS STUDIES

REFERENCE STUDIES:

1. 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. 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

SUMMARY

ALL CONSTRUCTION MANDATORY

All new construction, additions, or alterations must comply with the following mandatory requirements:

- Water heating: 240V/30A circuit, condensate drain, location/design that includes air source and footprint
- Clothes Drying: 240V/40A circuit
- Cooking: 240V/50A circuit
- Space air conditioning: Heat pump operation capability and/or 240V/30A circuit if only space-heating provided

For new construction, compliance documentation prepared by a Certified Energy Analyst receives a performance credit.

RESIDENTIAL PERFORMANCE AND PRESCRIPTIVE

Performance Path Requirements	Prescriptive Path Requirements	Reference Study
Single and Two-family New Construction		
<p>1. All Electric. Demonstrate that the proposed home will be all electric, OR</p>	<p>Build All Electric and Meet 2019 Title 24 Part 6.</p>	<p>Refer to Reference Study 1: 2019 Cost-effectiveness Study: Low-Rise Residential New Construction</p>
<p>2. Mixed Fuel Building. Proposed Design Building shall be at least 10 EDR points less than the Total Energy Design Rating calculated for the Standard Design Building, OR</p>	<p>Mixed Fuel Building</p> <ul style="list-style-type: none"> a. Low leakage ducts in conditioned space per 2019 Reference Appendices RA3.1.4.1.3 and RA3.1.4.3.8. b. Install R-10 perimeter slab insulation at a depth of 16-inches. c. Compact hot water distribution per 2019 Reference Appendices RA4.4.6. d. Maximum central fan integrated ventilation system efficacy of 0.35 Watts/cfm and verification by a HERS rater according to 2019 Reference Appendices RA3.3. e. Either 1) 5 kWh battery OR 2) A solar water heating system with a minimum solar savings fraction of 0.20. 	
<p>3. Electrically Heated Mixed-Fuel Building (electric space and water heating, gas cooking and/or clothes drying). Proposed Design Building shall be at least 2 EDR points less than the Energy Efficiency Design Rating calculated for the Standard Design Building, OR</p>	<p>Electrically Heated Mixed-Fuel Building</p> <ul style="list-style-type: none"> a. Low leakage ducts in conditioned space per 2019 Reference Appendices RA3.1.4.1.3 and RA3.1.4.3.8. b. Install R-10 perimeter slab insulation at a depth of 16-inches. c. Compact hot water distribution per 2019 Reference Appendices RA4.4.6. d. Maximum fan efficacy of 0.35 Watts/cfm and verification by a HERS rater according to 2019 Reference Appendices RA3.3. 	
Multifamily New Construction 3 stories or less		

<p>1. All Electric. Demonstrate that the proposed building will be all-electric, OR</p>	<p>Build All Electric and Meet 2019 Title 24 Part 6.</p>	
<p>2. Mixed Fuel Buildings. Proposed Design Building shall be at least 10 EDR points less than the Total Energy Design Rating calculated for the Standard Design Building, OR</p>	<p>Mixed Fuel Building a. Install R-10 perimeter slab insulation at a depth of 16-inches. b. Compact hot water distribution per 2019 Reference Appendices RA4.4.6. c. Maximum central fan integrated ventilation system efficacy of 0.35 Watts/cfm and verification by a HERS rater according to 2019 Reference Appendices RA3.3. d. Either 1) 2.75 kWh battery per dwelling unit OR 2) A solar water heating system with a minimum solar savings fraction of 0.20.</p>	<p>Refer to Reference Study 1: Title: 2019 Cost-effectiveness Study: Low-Rise Residential New Construction</p>
<p>3. Electrically Heated Mixed-Fuel Building (electric space and water heating, gas cooking and/or clothes drying). Proposed Design Building be no greater than the Energy Efficiency Design Rating calculated for the Standard Design Building.</p>	<p>Electrically Heated Mixed-Fuel Building and Meet 2019 Title 24 Part 6.</p>	
<p>Low Rise Residential Additions or Alterations</p>		

NONRESIDENTIAL PERFORMANCE AND PRESCRIPTIVE

Performance Path Requirements	Prescriptive Path Requirements		Reference Study
<p>Nonresidential New Construction – Office or Retail Occupancies</p>			
<p>All Electric. Demonstrate that the proposed</p>	<p>Build All Electric and Meet 2019 Title 24 Part 6.</p>		<p>Refer to Reference Study 2: 2019 Nonresidential New Construction Reach Code Cost Effectiveness Study</p>

<p>building will be all electric</p>		
<p>Mixed Fuel Buildings, All Occupancies Except Office and Mercantile. Demonstrate that the energy use of the proposed building is 10% more efficient than the 2019 State Energy Code.</p>	<p>Mixed Fuel Buildings, All Occupancies Except Office and Mercantile, as applicable:</p> <ul style="list-style-type: none"> a. Install fenestration with a solar heat gain coefficient either i) no less than 0.45 in hotels/motels/high-rise multifamily, or ii) no greater than 0.22 in all other space types. b. Design Variable Air Volume (VAV) box minimum airflows to be equal to the zone ventilation minimums. c. Include economizers and staged fan control in air handlers with a mechanical cooling capacity $\geq 33,000$ Btu/h d. Reduce the lighting power density (Watts/ft²) by ten percent (10%) from that required from Table 140.6-C. e. In common areas, improve lighting: <ul style="list-style-type: none"> 1) Control to daylight dimming plus off per Section 140.6(a)2H 2) Perform Institutional Tuning per Section 140.6(a)2J f. Install one drain water heat recovery device per every three guest rooms that is field verified as specified in the Reference Appendix RA3.6.9. 	
<p>Mixed Fuel Buildings, Office and Mercantile Occupancies. Demonstrate that the energy use of the proposed building is 15% more efficient than the 2019 State Energy Code</p>	<p>Mixed Fuel Buildings, Office and Mercantile Occupancies, as applicable:</p> <ul style="list-style-type: none"> 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 $\geq 33,000$ 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: <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	
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