1 2	PROPOSED AMANDMENTS TO CALFORNIA ENERGY CODE – MAKING LOCAL ADOPTION ALL- ELECTRIC REACH CODE											
3												
4	Amendments to Definitions											
5	Section 100.1(b) is modified by adding the following definitions:											
6 7 8 9	ALL-ELECTRIC BUILDING or ALL-ELECTRIC DESIGN is a building or building design that uses a permanent supply of electricity as the source of energy for all space heating, water heating (including pools and spas), cooking appliances, and clothes drying appliances, and has no natural gas or propane plumbing installed in the building.											
10 11 12	<u>CERTIFIED ENERGY ANALYST is a person registered as a Certified Energy Analyst with the</u> <u>California Association of Building Energy Consultants as of the date of submission of a</u> <u>Certificate of Compliance as required under Section 10-103.</u>											
13 14 15 16	FREE STANDING ACCESSORY DWELLING UNIT is a detached building that is not intended for sale separate from the primary residence, on a lot that is zoned for single-family or multifamily use, located on the same lot as an existing dwelling, and does not exceed 1,200 square feet of total floor area.											
17												
18	Amendments for Decarbonization – Mandatory Measures											
19	<b>Section 150.0</b> is modified to change the first two paragraphs as follows:											
20	SECTION 150.0 – MANDATORY FEATURES AND DEVICES											
21 22	Low-rise residential buildings shall comply with the applicable requirements of Sections 150(a) through 150.0( <del>r<u>t</u>).</del>											
23 24 25	NOTE: The requirements of Sections 150.0(a) through 150.0( <del>r</del> <u>t</u> ) apply to newly constructed buildings. Sections 150.2(a) and 150.2(b) specify which requirements of Sections 150.0(a) through 150.0( <u>s</u> ) also apply to additions or alterations.											
26	Section 150.0(e) is modified as follows:											
27												
28 29 30	(e) Installation of Fireplaces <del>, Decorative Gas Appliances and Gas Logs</del> . If a masonry or factory-built fireplace is installed, it shall comply with Section 110.5, Section 4.503 of Part 11, and shall have the following:											
31 32	<ol> <li>Closeable metal or glass doors covering the entire opening of the firebox; and</li> </ol>											
33 34 35 36	2. A combustion air intake to draw air from the outside of the building, which is at least 6 square inches in area and is equipped with a readily accessible, operable, and tight-fitting damper or combustion-air control device; and EXCEPTION to Section 150.0(e)1B: An outside combustion-air											

37 38	intake is not required if the fireplace will be installed over concrete slab flooring and the fireplace will not be located on an exterior wall.
39	3. A flue damper with a readily accessible control.
40 41 42 43	EXCEPTION to Section 150.0(e)1C: When a gas log, log lighter, or decorative gas appliance is installed in a fireplace, the flue damper shall be blocked open if required by the CMC or the manufacturer's installation instructions.
44	Section 150.0(h)4 is modified as follows:
45 46 47 48 49 50 51	<ul> <li>4. Central Forced-Air Heating Furnaces. <u>All Electric Building Equipment. Space-Conditioning Equipment shall meet the requirements for an All Electric Building per Section 100.1(b)</u></li> <li>A. Temperature Rise. Central forced-air heating furnace installations shall be configured to operate in conformance with the furnace manufacturer's maximum inlet-to-outlet temperature rise specifications.</li> </ul>
52	Section 150.0(n)1 is modified as follows:
53 54 55	<ol> <li>Systems using gas or propane water heaters to serve individual dwelling units shall include the following components: <u>All Electric Building Equipment</u>. Water Heating System shall meet the requirements for an All Electric Building per Section 100.1(b)</li> </ol>
56 57 58	A. A dedicated 125 volt, 20 amp or greater electrical circuit that is connected to the electric panel within 3 feet from the water heater and accessible to the water heater with no obstructions. In addition, all of the following:
59 60	<ul> <li>Both ends of the unused conductor shall be labeled with the words "spare" and be electrically isolated; and</li> </ul>
61 62 63	<ul> <li>A reserved single pole circuit breaker space in the electrical panel adjacent to the circuit breaker for the branch circuit in A above and labeled with the words "Future 240V Use"; and</li> </ul>
64 65	B. A Category III or IV vent, or a Type B vent with straight pipe between the outside termination and the space where the water heater is installed; and
66 67	C. A condensate drain that is no more than 2 inches higher than the base of the installed water heater, and allows natural draining without pump assistance, and
68	D. A gas supply line with a capacity of at least 200,000 Btu/hr.
69 70 71 72 73	Section 150.0(p) is modified to add a new subsection 5 as follows: 5. All Electric Building Equipment. Pool and Spa Heating Systems shall meet the requirements for an All Electric Building per Section 100.1(b)
74	Section 150.0 is modified to add a new subsection (s) as follows:

75 76	<u>(s) Clothes Drying and Cooking. Clothes Drying and Cooking equipment shall meet the</u> requirements for an All Electric Building per Section 100.1(b).
77	Section 150 0 is modified to add a new subsection (t) as follows:
78	(t) Requirement for All Electric Buildings. The building shall meet the definition of an All
79	Electric Building per Section 100.1(b).
80	Decarbonization – Performance and Prescriptive Measures
81	Section 150.1(c)8A is modified as follows:
82	8. Domestic Water-Heating Systems. Water-heating systems shall meet the
83	requirements of either A B or C. For recirculation distribution systems serving individual
84	dwelling unit, only Demand Recirculation Systems with manual on/off control as
85	specified in the Reference Appendix RA4.4.9 shall be used:
86	A. For systems serving individual dwelling units, the water heating system shall
87	meet the requirement of either i, ii, iii, iv, or v:-storage tank shall be located in
88	the garage or conditioned space. In addition, one of the following:
89	i. A compact hot water distribution system as specified in the Reference
90	Appendix RA4.4.6 and a drain water heat recovery system that is field
91	verified as specified in the Reference Appendix RA3.6.9; or
92	ii. For Climate Zones 2 through 15, a photovoltaic system capacity of 0.3
93	kWdc larger than the requirement specified in Section 150.1(c)14; or
94	iii. For Climate Zones 1 and 16, a photovoltaic system capacity of 1.1
95	kWdc larger than the requirement specified in Section 150.1(c)14.
96	i. One or more gas or propane instantaneous water heater with an input of
97	200,000 Btu per hour or less and no storage tank.
98	ii. A single gas or propane storage type water heater with an input of 75,000 Btu
99	<del>per hour or less, rated volume less than or equal to 55 gallons and that meets</del>
100	the requirements of Sections 110.1 and 110.3. The dwelling unit shall have
101	installed fenestration products with a weighted average U-factor no greater than
102	0.24, and in addition one of the following shall be installed:
103	a. A compact hot water distribution system that is field verified as specified in
104	the Reference Appendix RA4.4.16; or
105	b. A drain water heat recovery system that is field verified as specified in the
106	Reference Appendix RA3.6.9.
107	iii. A single gas or propane storage type water heater with an input of 75,000 Btu per
108	hour or less, rated volume of more than 55 gallons.
109	iv. A single heat pump water heater. The storage tank shall be located in the garage or
110	conditioned space. In addition, one of the following: a. A compact hot water distribution
111	system as specified in the Reference Appendix RA4.4.6 and a drain water heat recovery
112	system that is field verified as specified in the Reference Appendix RA3.6.9; or b. For
113	Climate Zones 2 through 15, a photovoltaic system capacity of 0.3 kWdc larger than the
114	requirement specified in Section 150.1(c)14; or c. For Climate Zones 1 and 16, a
115	photovoltaic system capacity of 1.1 kWdc larger than the requirement specified in
116	Section 150.1(c)14.

## 119 Table 1501.1-A is modified as follows:

						Climate Zone													
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
ຊິຊ	Electric-Resistance Allowed		No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	
Spac Heatir	If gas, AFUE		MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	
	If Heat Pump, HSPF <sup>7</sup>		MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	
gn	SEER		MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	
ace Cooli	Refrigerant Charge Verification or Fault Indicator Display		NR	REQ	NR	NR	NR	NR	NR	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	NR	
Sp:	Whole House Fan <sup>8</sup>		NR	NR	NR	NR	NR	NR	NR	REQ	REQ	REQ	REQ	REQ	REQ	REQ	NR	NR	
Central Fan Integrated Ventilation System Fan Efficacy		REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ		
Ducts <sup>10</sup>	ling s B	Duct Insulation	R-8	R-8	R-6	R-8	R-6	R6	R-6	R-8	R-8	R-8	R-8	R-8	R-8	R-8	R-8	R-8	
	Roof/Cei Options	§150.1(c)9A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	lling C	Duct Insulation	R-6	R-6	R-6	R-6	R-6	R-6	R-6	R-6	R-6	R-6	R-6	R-6	R-6	R-6	R-6	R-6	
	Roof/Cei Option	§150.1(c)9B	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	
All Buildings				System Shall meet Section 150.1(c)8															
	Ducts <sup>10</sup> Central System Space Cooling Space Cooling Heating	Ducts <sup>10</sup> Central System Photon C Ducts <sup>10</sup> Central System Photon C Ducts <sup>10</sup> Space Cooling Photon C Ductions B Control Central Control Central System Photon C Control Central Central Control Central Cen	and a set of the	Best     Electric-Resistance Allowed     No       If gas, AFUE     MHN       If Heat Pump, HSPF <sup>7</sup> MIN       Refrigerant Charge     Win       Verification or Fault     NR       Indicator Display     NR       Whole House Fan <sup>8</sup> NR       Verification System Fan     REQ       Verification System Fan     Efficacy       Verification     R-8       Verification     R-6       Verification     <	Best     Electric-Resistance Allowed     No     No       If gas, AFUE     MIN     MIN       If Heat Pump, HSPF <sup>7</sup> MIN     MIN       If Heat Pump, HSPF <sup>7</sup> MIN     MIN       See R     MIN     MIN       Refrigerant Charge     NR     REQ       Verification or Fault     NR     REQ       Indicator Display     NR     NR       Whole House Fan <sup>8</sup> NR     NR       User See R     User See Requirements     REQ       Image: See R     See Requirements     REQ       Verification System Fan Efficacy     REQ     REQ       See R     See Requirements     N/A     N/A       Ming     See Requirements     See Requirements     Req       See R     See Requirements     See Req     Req       Ming     See Req     See Req     See Req       Ming     See Req     See Req     Req       See R     See Req     See Req     Req       See Req     See Req     See Req     Req       See Req     See Req     See Req     See Req       See Req     See Req     See Req     See Req       See Req     See Req     See Req     See Req       See Req     See Req <th>Best     Electric-Resistance Allowed     No     No     No       If gas, AFUE     MIN     MIN     MIN     MIN       If Heat Pump, HSPF <sup>7</sup>     MIN     MIN     MIN     MIN       Service     Verification or Fault Indicator Display     NR     REQ     NR       Whole House Fan <sup>8</sup>     NR     NR     NR     NR       Usymptotic     Central Fan Integrated Ventilation System Fan Efficacy     REQ     REQ     REQ       Min     Sing given fan Usymptod     Duct Insulation     R-8     R-6       Sold Q     Sils0.1(c)9A     N/A     N/A     N/A       Min     Duct Insulation     R-6     R-6     R-6       Min<u td="">     Sils0.1(c)9B     REQ     REQ     REQ       All Buildings     All Buildings     Sils0.1(c)9B     Sils0.1(c)9B     Sils0.1(c)9B</u></th> <th>Beck     Electric-Resistance Allowed     No     No     No     No       If gas, AFUE     MIN     MIN     MIN     MIN     MIN     MIN       If Heat Pump, HSPF <sup>7</sup>     MIN     MIN     MIN     MIN     MIN     MIN       Separation of Fault Indicator Display     NR     REQ     NR     NR     NR       Whole House Fan<sup>8</sup>     NR     NR     NR     NR     NR       Usystem Fan Efficacy     Central Fan Integrated Ventilation System Fan Efficacy     REQ     REQ     REQ     REQ       No     Sig g USU     Duct Insulation     R-8     R-6     R-8       MUN     Sig g USU     Sig g USU     Duct Insulation     R-6     R-6     R-6       Max     MI     Sig g USU     Duct Insulation     R-6     R-6     R-6       MUN     MI     Sig g USU     Duct Insulation     R-6     R-6     R-6       MIN     MI     Sig g USU     Sig Sig Sig Sig Sig Sig Sig Sig Sig Sig</th> <th>Beck     Electric-Resistance Allowed     No     No     No     No     No     No       If gas, AFUE     MIN     MIN     MIN     MIN     MIN     MIN     MIN       If Heat Pump, HSPF<sup>7</sup>     MIN     MIN     MIN     MIN     MIN     MIN     MIN       SEER     MIN     MIN     MIN     MIN     MIN     MIN     MIN       Refrigerant Charge     NR     REQ     NR     NR     NR     NR       Indicator Display     NR     NR     NR     NR     NR       Whole House Fan<sup>8</sup>     NR     NR     NR     NR     NR       Verification or Fault     NR     REQ     REQ     REQ     REQ       Verification System Fan     Efficacy     REQ     REQ     REQ     REQ       Min     Juct Insulation     R-8     R-8     R-6     R-6       Min     Juct Insulation     R-6     R-6     R-6     R-6       Min     Juct Insulation     R-6     &lt;</th> <th>Bit     Electric-Resistance Allowed     No     No&lt;</th> <th></th> <th><math display="block"> \frac{1}{10} </math></th> <th>Support         Electric-Resistance Allowed         No         No</th> <th>Marcal Participation         Detertic-Resistance Allowed         No         No</th> <th><math display="block"> \frac{10^{\circ}}{10^{\circ}} \frac{10^{\circ}}</math></th> <th>Bioteric-Kesstance Allowed         No         <th< th=""><th>Beckeric-Lessistance Allowed         No         &lt;</th><th>Beckerics-Kesistance Allowed         No         &lt;</th><th>Model         Indecidence         No         No</th></th<></th>	Best     Electric-Resistance Allowed     No     No     No       If gas, AFUE     MIN     MIN     MIN     MIN       If Heat Pump, HSPF <sup>7</sup> MIN     MIN     MIN     MIN       Service     Verification or Fault Indicator Display     NR     REQ     NR       Whole House Fan <sup>8</sup> NR     NR     NR     NR       Usymptotic     Central Fan Integrated Ventilation System Fan Efficacy     REQ     REQ     REQ       Min     Sing given fan Usymptod     Duct Insulation     R-8     R-6       Sold Q     Sils0.1(c)9A     N/A     N/A     N/A       Min     Duct Insulation     R-6     R-6     R-6       Min <u td="">     Sils0.1(c)9B     REQ     REQ     REQ       All Buildings     All Buildings     Sils0.1(c)9B     Sils0.1(c)9B     Sils0.1(c)9B</u>	Beck     Electric-Resistance Allowed     No     No     No     No       If gas, AFUE     MIN     MIN     MIN     MIN     MIN     MIN       If Heat Pump, HSPF <sup>7</sup> MIN     MIN     MIN     MIN     MIN     MIN       Separation of Fault Indicator Display     NR     REQ     NR     NR     NR       Whole House Fan <sup>8</sup> NR     NR     NR     NR     NR       Usystem Fan Efficacy     Central Fan Integrated Ventilation System Fan Efficacy     REQ     REQ     REQ     REQ       No     Sig g USU     Duct Insulation     R-8     R-6     R-8       MUN     Sig g USU     Sig g USU     Duct Insulation     R-6     R-6     R-6       Max     MI     Sig g USU     Duct Insulation     R-6     R-6     R-6       MUN     MI     Sig g USU     Duct Insulation     R-6     R-6     R-6       MIN     MI     Sig g USU     Sig	Beck     Electric-Resistance Allowed     No     No     No     No     No     No       If gas, AFUE     MIN     MIN     MIN     MIN     MIN     MIN     MIN       If Heat Pump, HSPF <sup>7</sup> MIN     MIN     MIN     MIN     MIN     MIN     MIN       SEER     MIN     MIN     MIN     MIN     MIN     MIN     MIN       Refrigerant Charge     NR     REQ     NR     NR     NR     NR       Indicator Display     NR     NR     NR     NR     NR       Whole House Fan <sup>8</sup> NR     NR     NR     NR     NR       Verification or Fault     NR     REQ     REQ     REQ     REQ       Verification System Fan     Efficacy     REQ     REQ     REQ     REQ       Min     Juct Insulation     R-8     R-8     R-6     R-6       Min     Juct Insulation     R-6     R-6     R-6     R-6       Min     Juct Insulation     R-6     <	Bit     Electric-Resistance Allowed     No     No<		$ \frac{1}{10} $	Support         Electric-Resistance Allowed         No         No	Marcal Participation         Detertic-Resistance Allowed         No         No	$ \frac{10^{\circ}}{10^{\circ}} \frac{10^{\circ}}$	Bioteric-Kesstance Allowed         No         No <th< th=""><th>Beckeric-Lessistance Allowed         No         &lt;</th><th>Beckerics-Kesistance Allowed         No         &lt;</th><th>Model         Indecidence         No         No</th></th<>	Beckeric-Lessistance Allowed         No         <	Beckerics-Kesistance Allowed         No         <	Model         Indecidence         No         No	

## [The following prescriptive requirements vary by climate zone. The final draft of the model ordinance will include tables that correspond to each climate zone for ease of use.]

## New Sections 150.1(c)15 and 16 are added as follows:

- 15. Additional Prescriptive Requirements for Single Family buildings.
  - A. [CZ 8 only] Ducts in Conditioned Space. Ductwork shall comply with either of the three options below:
    - i. <u>Ducts shall comply with 2019 Reference Appendices RA3.1.4.1.2, which</u> requires that no more than 12 linear feet of duct, including the air handler and plenum, may be located outside the conditioned space.
    - ii. <u>Ducts shall comply with 2019 Reference Appendices RA3.1.4.1.3, which</u> requires that all ductwork shall be located entirely in conditioned space.
    - iii. Ducts shall comply with 2019 Reference Appendices RA3.1.4.1.3, which requires that all ductwork shall be located entirely in conditioned space and shall be confirmed to have less than or equal to 25 cfm leakage to outside when measured as specified by Section RA3.1.4.3.4.
  - B. [CZ 1-6 and 9-16] 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.
  - C. **[CZ 14 only]** Reduced infiltration. HERS Rater field verification of reduced building envelope air leakage. Verified infiltration rate shall be no greater than three air changes per hour at 50 Pascals (3ACH50), according to the requirements in Section RA 3.8: Field Verification and Diagnostic Testing of Building Air Leakage.
  - D. **[CZs 11, 13, 15 only]** Roof and Ceiling insulation shall be installed in a ventilated attic as follows:
    - i. <u>A minimum of R-30 insulation installed between the roof rafters in</u> <u>contact with the roof deck and an additional layer of R-38 ceiling</u> <u>insulation located between the attic and the conditioned space.</u>
  - E. **[CZs 10-15 only]** <u>Roofing Products. Low-rise residential buildings with steep-</u> sloped roofs shall have a minimum aged solar reflectance of 0.25.
  - F. [CZ16 only] Installed fenestration products, including glazed doors, shall have an area weighted average U-factor no greater than 0.24 and Solar Heat Gain Coefficient (SHGC) no less than 0.50 and shall be determined in accordance with Sections 110.6(a)2 and 110.6(a)3.
  - G. [ALL EXCEPT CZs 6-9 AND 16] <u>Slab insulation</u>. Slab floor perimeter insulation shall be installed with an R-value equal to or greater than R10. The minimum

<u>depth of concrete-slab floor perimeter insulation shall be 16 inches or the</u> <u>depth of the footing of the building, whichever is less.</u>

- H. **[ALL EXCEPT CZ 7]** Compact Hot Water. The hot water distribution system shall be designed and installed to meet minimum requirements for the basic compact hot water distribution credit according to the procedures outlined in the 2019 Reference Appendices RA4.4.6.
- [ALL EXCEPT CZ 7] Ducted Central Forced Air Heating Systems. Central Fan Integrated Ventilation Systems. The duct distribution system shall be designed reduce external static pressure to meet a maximum fan efficacy equal to:

Gas Furnaces: 0.35 Watts per cfm

Heat Pumps: 0.45 Watts per cfm,

according to the procedures outlined in the 2019 Reference Appendices RA 3.3.

- J. **[All CZs]** Energy Storage. A battery energy storage system with a minimum capacity equal to 5 kWh shall be installed. The system shall have automatic controls programmed to charge anytime PV generation is greater than the building load and discharge to the electric grid, beginning during the highest priced time of use hours of the day.
- 16. Additional Prescriptive Requirements for Multifamily buildings.
  - A. [ALL EXCEPT CZs 3,5,7] Ducts in Conditioned Space. All ductwork shall be located entirely in conditioned space with ducts tested to have less than or equal to 25 cfm leakage to outside. Ductwork shall meet the requirements of Verified Low Leakage Ducts in Conditioned Space (VLLDCS) in the 2019 Reference Appendices RA3.1.4.3.8.
  - B. [ALL EXCEPT CZs 1,3,5,16.] Roofing Products. Low-rise residential buildings with steep-sloped roofs shall have a minimum aged solar reflectance of 0.25.
  - C. [CZs 1, 16] Installed fenestration products, including glazed doors, shall have an area weighted average U-factor no greater than 0.24 and Solar Heat Gain Coefficient (SHGC) no less than 0.50 and shall be determined in accordance with Sections 110.6(a)2 and 110.6(a)3.

[CZs 11, 13-15] Installed fenestration products, including glazed doors, shall have an area weighted average U-factor no greater than 0.24 and Solar Heat Gain Coefficient (SHGC) no less than 0.23 and shall be determined in accordance with Sections 110.6(a)2 and 110.6(a)3.

D. **[ALL EXCEPT CZs 6-9]** Slab insulation. Slab floor perimeter insulation shall be installed with an R-value of 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.

E. **[ALL EXCEPT CZ 8]** Compact Hot Water. The hot water distribution system shall be designed and installed to meet minimum requirements for the basic compact hot water distribution credit according to the procedures outlined in the 2019 Reference Appendices RA4.4.6.

**[CZ8**] <u>Compact Hot Water. The hot water distribution system shall be</u> designed and installed to meet minimum requirements for the basic compact hot water distribution credit according to the procedures outlined in the 2019 Reference Appendices RA3.6.5.

- F. [All CZs] <u>Central Fan Integrated Ventilation Systems. Central forced air</u> <u>system fans used to provide outside air, shall have an air-handling unit fan</u> <u>efficacy less than or equal to 0.35 W/CFM. The airflow rate and fan efficacy</u> <u>requirements in this section shall be confirmed through field verification and</u> <u>diagnostic testing in accordance with all applicable procedures specified in</u> <u>Reference Residential Appendix RA3.3. Central Fan Integrated Ventilation</u> <u>Systems shall be certified to the Energy Commission as Intermittent</u> <u>Ventilation Systems as specified in Reference Residential Appendix</u> <u>RA3.7.4.2.</u>
- G. [ALL CZs] Solar photovoltaic. A PV system meeting the minimum qualification requirements as specified in Joint Appendix JA11 sized to offset 100% of the estimated site electricity load shall be installed. The plans shall include calculations for the electricity load and PV production.
- H. [All CZs] Energy Storage. A battery energy storage system with a capacity equivalent to the PV system shall be installed. The system shall have automatic controls programmed to charge anytime PV generation is greater than the building load and discharge to the electric grid, beginning during the highest priced time of use hours of the day.