

# Waste Heat and Carbon Emissions Reduction

This Act is based on California law. Under California law, the State Energy Resources Conservation and Development Commission (Energy Commission) is charged with monitoring trends in the supply and consumption of electricity and other forms of energy in the state and analyzing the social, economic, and environmental consequences of those trends.

Under California law, the Public Utilities Commission (PUC) has regulatory authority over public utilities, including electrical corporations. The PUC is authorized to fix the rates and charges for every public utility, and those rates and charges must be just and reasonable. The PUC must review and adopt a procurement plan for each electrical corporation in accordance with specified elements, incentive mechanisms, and objectives. The PUC, in consultation with the Independent System Operator, must also establish resource adequacy requirements for all load-serving entities in accordance with specified objectives.

This draft Act authorizes the PUC to require an electrical corporation to purchase excess electricity delivered by a combined heat and power system that complies with certain sizing, energy efficiency, and air pollution control requirements. However, it authorizes the PUC to establish a maximum kilowatt hours limitation on the amount of excess electricity that an electrical corporation is required to purchase if the PUC finds that the anticipated excess electricity generated has an adverse effect on long-term resource planning or the reliable operation of the electricity grid.

The legislation requires the PUC to establish, in consultation with an Independent System Operator, tariff provisions that facilitate the provisions of the Act and the reliable operation of the grid. The bill requires every electrical corporation to file a standard tariff with the PUC for the purchase of excess electricity from an eligible customer-generator and requires the electrical corporation to make the tariff available to eligible customer-generators within the service territory of the electrical corporation upon request. The legislation authorizes the electrical corporation to make the terms of the tariff available in the form of a standard contract.

The Act requires that the costs and benefits associated with any tariff or contract be allocated to benefiting customers. The PUC must establish for each electrical corporation, a pay-as-you-save pilot program, meeting certain goals, for eligible customers to finance all of the upfront costs for the purchase and installation of combined heat and power systems.

The legislation directs the PUC, in approving an electrical corporation's procurement plan, to require the plan to assess the reliability of incorporating combined heat and power solutions to the maximum degree that is cost effective compared to other competing forms of wholesale generation, technologically feasible, and environmentally beneficial, particularly as it pertains to reducing emissions of carbon dioxide and other greenhouse gases. The bill authorizes the PUC to modify or adjust the requirements of the Act for any electrical corporation with less than 100,000 service connections, as individual circumstances merit.

This Act requires a local publicly owned electric utility serving retail end-use customers to establish a program that allows retail end-use customers to utilize combined heat and power systems that reduce emissions of greenhouse gases by achieving improved efficiencies utilizing heat that would otherwise be wasted in separate energy applications and that provides a market for the purchase of excess electricity generated by a combined heat and power system, at a just and reasonable rate, to be determined by the governing body of the utility.

This bill requires the Energy Commission, by January 1, 2010 to adopt guidelines that require combined heat and power systems be designed to reduce waste energy, be sized to meet the eligible customer-generator's thermal load, operate continuously in a manner that meets the expected thermal load, optimizes the efficient use of waste heat, are cost effective,

technologically feasible, and environmentally beneficial. The bill authorizes the Energy Commission to adopt temporary guidelines for combined heat and power systems prior to January 1, 2010. The bill requires an eligible customer-generator's combined heat and power system to meet certain efficiency and emissions requirements. It requires an eligible customer-generator to adequately maintain and service the combined heat and power system so that during operation, the system continues to meet or exceed the efficiency and emissions requirements. This bill requires a combined heat and power system comply with greenhouse gases emission performance standard established by the PUC.

This bill calls for reporting to the Governor and the Legislature on the reduction in emissions of greenhouse gases resulting from the increase of new electrical generation that uses excess waste heat through combined heat and power systems and recommend policies that further the goals of the bill.

Submitted as:

California

Chapter 713 of 2007

Status: Enacted into law in 2007.

### **Suggested State Legislation**

(Title, enacting clause, etc.)

1           Section 1. [*Short Title.*] This Act shall be cited as “The Waste Heat and Carbon  
2 Emissions Reduction Act.”

3  
4           Section 2. [*Legislative Findings and Intent.*] The [Legislature] finds and declares all of  
5 the following:

6           (1) Combined heat and power systems produce both electricity and thermal energy from a  
7 single fuel input, thus achieving much greater efficiency than the usual separate systems for  
8 producing these forms of energy, and reducing consumption of fuel.

9           (2) Combined heat and power systems recover heat that would otherwise be wasted in  
10 separate energy applications, and use this heat to avoid consumption of fuel that would otherwise  
11 be required to produce heat.

12           (3) Gigawatthours of potential useful electricity and millions of British thermal units of  
13 thermal energy could be derived from unused waste heat that is currently being vented into the  
14 atmosphere.

15           (4) State policies should dramatically advance the efficiency of the state's use of natural  
16 gas by capturing unused waste heat, and in so doing, help offset the growing crisis in electricity  
17 supply and transmission congestion in the state.

18           (5) State policies should reduce wasteful consumption of energy through improved  
19 residential, commercial, institutional, industrial, and manufacturer utilization of waste heat  
20 whenever it is cost effective, technologically feasible, and environmentally beneficial,  
21 particularly when this reduces emissions of carbon dioxide and other carbon-based greenhouse  
22 gases.

23           (6) The [Legislature] intends to support and facilitate both customer- and utility-owned  
24 combined heat and power systems.

25 (7) This Act does not apply to, and shall not impact, combined heat and power systems in  
26 operation prior to [January 1, 2008], or combined heat and power systems with a generating  
27 capacity greater than [20] megawatts.  
28

29 Section 3. *[Definitions.]* As used in this Act:

30 (1) “Combined heat and power system” means a system that produces both electricity  
31 and thermal energy for heating or cooling from a single fuel input that meets all of the following:

32 (a) Is interconnected to, and operates in parallel with, the electric transmission and  
33 distribution grid.

34 (b) Is sized to meet the eligible customer-generator's onsite thermal demand.

35 (c) Meets the efficiency standards of subdivisions (a) and (d), and the greenhouse  
36 gases emissions performance standard of subdivision (F) of Section 9 of this Act.

37 (2) “Commission” means the state Public Utilities Commission (PUC) as defined under  
38 [insert citation].

39 (3) “Eligible customer-generator” means a customer of an electrical corporation that  
40 meets both of the following requirements:

41 (a) Uses a combined heat and power system with a generating capacity of not  
42 more than [20] megawatts, that first commences operation on or after [insert date].

43 (b) Uses a time-of-use meter capable of registering the flow of electricity in two  
44 directions. If the existing electrical meter of an eligible customer-generator is not capable of  
45 measuring the flow of electricity in two directions, the eligible customer-generator shall be  
46 responsible for all expenses involved in purchasing and installing a meter that is able to measure  
47 electricity flow in two directions. If an additional meter or meters are installed, the electricity  
48 flow calculations shall yield a result identical to that of a time-of-use meter.

49 (4) “Electrical corporation” has the same meaning as defined in [insert citation].

50 (5) “Energy Commission” means the [State Energy Resources Conservation and  
51 Development Commission] as defined in [insert citation].

52 (6) “Excess electricity” means the net electricity exported to the electrical grid, generated  
53 by a combined heat and power system that is in compliance with [insert citation].

54 (7) “Greenhouse gas” or “greenhouse gases” includes all of the following gases: carbon  
55 dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

56 (8) “Independent System Operator” means as defined in [insert citation].  
57

58 Section 4. *[Combined Heat and Power Systems: Tariffs, Standby Rates, and Purchasing*  
59 *Requirements for Electrical Corporations.]*

60 (A) The [commission] may require an electrical corporation to purchase from an eligible  
61 customer-generator, excess electricity that is delivered to the grid that is generated by a  
62 combined heat and power system that is in compliance with Section 9 of this Act. The  
63 [commission] may establish a maximum kilowatthours limitation on the amount of excess  
64 electricity that an electrical corporation is required to purchase if the [commission] finds that the  
65 anticipated excess electricity generated has an adverse effect on long-term resource planning or  
66 reliable operation of the grid. The [commission] shall establish, in consultation with the  
67 [Independent System Operator], tariff provisions that facilitate both the provisions of this Act  
68 and the reliable operation of the grid.

69 (B) (1) Every electrical corporation shall file with the [commission] a standard tariff  
70 for the purchase of excess electricity from an eligible customer-generator.

71 (2) The tariff shall provide for payment for every kilowatthour delivered to the  
72 electrical grid by the combined heat and power system at a price determined by the  
73 [commission].

74 (3) The tariff shall include flexible rates with options for different durations, not  
75 to exceed [10] years, and fixed or variable rates relative to the cost of natural gas.

76 (4) The [commission] shall ensure that ratepayers not utilizing combined heat and  
77 power systems are held indifferent to the existence of this tariff.

78 (C) The [commission], in reviewing the tariff filed by an electrical corporation, shall  
79 establish time-of-delivery rates that encourage demand management and net generation of  
80 electricity during periods of peak system demand.

81 (D) Every electrical corporation shall make the tariff available to eligible customer-  
82 generators that own, or lease, and operate a combined heat and power system within the service  
83 territory of the electrical corporation, upon request. An electrical corporation may make the  
84 terms of the tariff available to an eligible customer in the form of a standard contract.

85 (E) The costs and benefits associated with any tariff or contract entered into by an  
86 electrical corporation pursuant to this section shall be allocated to all benefiting customers. For  
87 purposes of this section “benefiting customers” may, as determined by the [commission], include  
88 bundled service customers of the electrical corporation, customers of the electrical corporation  
89 that receive their electric service through a direct transaction, as defined in [insert citation], and  
90 customers of an electrical corporation that receive their electric service from a community choice  
91 aggregator, as defined in [insert citation].

92 (F) The physical generating capacity of the combined heat and power system shall count  
93 toward the resource adequacy requirements of load-serving entities for purposes of [insert  
94 citation].

95 (G) The [commission] shall adopt or maintain standby rates or charges for combined heat  
96 and power systems that are based only upon assumptions that are supported by factual data, and  
97 shall exclude any assumptions that forced outages or other reductions in electricity generation by  
98 combined heat and power systems will occur simultaneously on multiple systems, or during  
99 periods of peak electrical system demand, or both.

100 (H) The [commission] may modify or adjust the requirements of this Act for any  
101 electrical corporation with less than [100,000] service connections, as individual circumstances  
102 merit.

103  
104 Section 5. *[Local Publicly Owned Electric Utility Serving Retail End-Use Customers to*  
105 *Establish a Program to Utilized Combined Heat and Power Systems That Reduce Greenhouse*  
106 *Gas Emissions by Utilizing Waste Heat.]* A local publicly owned electric utility serving retail  
107 end-use customers shall establish a program that does both of the following:

108 (1) Allows retail end-use customers to utilize combined heat and power systems that  
109 reduce emissions of greenhouse gases by achieving improved efficiencies utilizing heat that  
110 would otherwise be wasted in separate energy applications.

111 (2) Provides a market for the purchase of excess electricity generated by a combined heat  
112 and power system, at a just and reasonable rate, to be determined by the governing body of the  
113 utility.

114  
115 Section 6. *[Electrical Corporation’s Procurement Plans to Incorporate Combined Heat*  
116 *and Power Solutions Shall be Cost Effective Compared to Other Forms of Wholesale Energy*  
117 *Generation.]* The [commission], in approving a procurement plan for an electrical corporation  
118 pursuant to [insert citation], shall require the electrical corporation's procurement plan

119 incorporate combined heat and power solutions to the extent that it is cost effective compared to  
120 other competing forms of wholesale generation, technologically feasible, and environmentally  
121 beneficial, particularly as it pertains to reducing emissions of carbon dioxide and other  
122 greenhouse gases.

123

124 Section 7. [*Electrical Corporation Planning and Reliability Assessments Shall Promote*  
125 *Combined Heat and Power Systems that are Cost Effective.*] The [commission] shall ensure that  
126 an electrical corporation uses long-term planning and a reliability assessment for upgrades to its  
127 transmission and distribution systems and that any upgrades are not inconsistent with promoting  
128 combined heat and power systems that are cost effective, technologically feasible, and  
129 environmentally beneficial, particularly as those combined heat and power systems reduce  
130 emissions of greenhouse gases.

131

132 Section 8. [*Pay-As-You-Save Pilot Program to Finance Purchasing and Installing*  
133 *Combined Heat and Power Systems.*]

134 (A) The [commission] shall, for each electrical corporation, establish a pay-as-you-save  
135 pilot program for eligible customers.

136 (B) For the purposes of this section, an “eligible customer” means a customer of an  
137 electrical corporation that meets the following criteria:

138 (1) The customer uses a combined heat and power system with a generating  
139 capacity of not more than [20] megawatts that is in compliance with Section 9 of this Act.

140 (2) The customer is a nonprofit organization described in Section 501(c) (3) of the  
141 Internal Revenue Code (26 U.S.C. Sec. 501(c) (3)), that is exempt from taxation under Section  
142 501(a) of that code (26 U.S.C. Sec. 501(a)).

143 (C) The pilot program shall enable an eligible customer to finance all of the upfront costs  
144 for the purchase and installation of a combined heat and power system by repaying those costs  
145 over time through on-bill financing at the difference between what an eligible customer would  
146 have paid for electricity and the actual savings derived for a period of up to [10] years.

147 (D) The [commission] shall ensure that the reasonable costs of the electrical corporation  
148 associated with the pilot program are recovered.

149 (E) All costs of the pay-as-you-save program or financing mechanisms shall be borne  
150 solely by the combined heat and power generators that use the program or financing  
151 mechanisms, and the [commission] shall ensure that the costs of the program are not shifted to  
152 the other customers or classes of customers of the electrical corporation.

153 (F) Each electric corporation shall make on-bill financing available to eligible customers  
154 until the statewide cumulative rated generating capacity from pilot program combined heat and  
155 power systems in the service territories of the three largest electrical corporations in the state  
156 reaches [100] megawatts. An electrical corporation shall only be required to participate in the  
157 pilot program until it meets its proportionate share of the [100-megawatt] limitation, based on the  
158 percentage of its peak demand to the total statewide peak demand within the service territories of  
159 all electrical corporations.

160

161 Section 9. [*Guidelines for Combined Heat and Power Systems.*]

162 (A) The [Energy Commission] shall, by [January 1, 2010], adopt guidelines that  
163 combined heat and power systems subject to this Act shall meet, and shall accomplish all of the  
164 following:

165 (1) Reduce waste energy.

166 (2) Be sized to meet the eligible customer-generator's thermal load.

167 (3) Operate continuously in a manner that meets the expected thermal load and  
168 optimizes the efficient use of waste heat.

169 (4) Are cost effective, technologically feasible, and environmentally beneficial.

170 (B) It is the intent of the [Legislature] that the guidelines do not permit customers to  
171 operate as de facto wholesale generators with guaranteed purchasers for their electricity.

172 (C) Notwithstanding any other provisions of law, the guidelines required by this section  
173 shall be exempt from the requirements of [insert citation]. The guidelines shall be adopted at a  
174 publicly noticed meeting offering all interested parties an opportunity to comment. At least [30]  
175 days' public notice shall be given of the meeting required by this section before the [Energy  
176 Commission] initially adopts guidelines. Substantive changes to the guidelines shall not be  
177 adopted without at least [10] days' written notice to the public.

178 (D) Prior to [January 1, 2010], the [Energy Commission] may adopt temporary guidelines  
179 for combined heat and power systems that comply with the parameters set forth in subdivision  
180 (A).

181 (E) (1) An eligible customer-generator's combined heat and power system shall meet  
182 [an oxides of nitrogen (NOx) emissions rate standard of 0.07 pounds per megawatthour and a  
183 minimum efficiency of 60 percent. A minimum efficiency of 60 percent shall be measured as  
184 useful energy output divided by fuel input. The efficiency determination shall be based on 100-  
185 percent load].

186 (2) An eligible customer-generator's combined heat and power system that meets  
187 the [60-percent efficiency standard may take a credit to meet the applicable NOx emissions  
188 standard of 0.07 pounds per megawatthour]. Credit shall be at the rate of [one megawatthour for  
189 each 3.4 million British thermal units of heat recovered].

190 (F) An eligible customer-generator's combined heat and power system shall comply with  
191 the greenhouse gases emission performance standard established by the [commission] pursuant  
192 to [insert citation].

193 (G) An eligible customer-generator shall adequately maintain and service the combined  
194 heat and power system so that during operation, the system continues to meet or exceed the  
195 efficiency and emissions standards established pursuant to subdivisions (A), (D), and (F).

196

197 Section 10. [*Reporting Reductions in Emissions of Greenhouse Gases Resulting From the*  
198 *Use of Combined Heat and Power Systems Pursuit to This Act.*] The [State Air Resources Board]  
199 shall report to the [Governor and the Legislature] by [December 31, 2011], on the reduction in  
200 emissions of greenhouse gases resulting from the increase of new electrical generation that uses  
201 excess waste heat through combined heat and power systems and recommend policies that  
202 further the goals of this Act.

203

204 Section 11. [*Severability.*] [Insert severability clause.]

205

206 Section 12. [*Repealer.*] [Insert repealer clause.]

207

208 Section 13. [*Effective Date.*] [Insert effective date.]