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 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.)

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

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

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

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

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

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

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

(6) The [Legislature] intends to support and facilitate both customer- and utility-owned combined heat and power systems.
(7) This Act does not apply to, and shall not impact, combined heat and power systems in
operation prior to [January 1, 2008], or combined heat and power systems with a generating
capacity greater than [20] megawatts.

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

(1) “Combined heat and power system” means a system that produces both electricity
and thermal energy for heating or cooling from a single fuel input that meets all of the following:
(a) Is interconnected to, and operates in parallel with, the electric transmission and
distribution grid.
(b) Is sized to meet the eligible customer-generator's onsite thermal demand.
(c) Meets the efficiency standards of subdivisions (a) and (d), and the greenhouse
gases emissions performance standard of subdivision (F) of Section 9 of this Act.

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

(3) “Eligible customer-generator” means a customer of an electrical corporation that
meets both of the following requirements:
(a) Uses a combined heat and power system with a generating capacity of not
more than [20] megawatts, that first commences operation on or after [insert date].
(b) Uses a time-of-use meter capable of registering the flow of electricity in two
directions. If the existing electrical meter of an eligible customer-generator is not capable of
measuring the flow of electricity in two directions, the eligible customer-generator shall be
responsible for all expenses involved in purchasing and installing a meter that is able to measure
electricity flow in two directions. If an additional meter or meters are installed, the electricity
flow calculations shall yield a result identical to that of a time-of-use meter.

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

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

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

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

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

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

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

(B) (1) Every electrical corporation shall file with the [commission] a standard tariff
for the purchase of excess electricity from an eligible customer-generator.
(2) The tariff shall provide for payment for every kilowatthour delivered to the electrical grid by the combined heat and power system at a price determined by the [commission].

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

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

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

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

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

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

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

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

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

(1) 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.

(2) 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.

Section 6. [Electrical Corporation’s Procurement Plans to Incorporate Combined Heat and Power Solutions Shall be Cost Effective Compared to Other Forms of Wholesale Energy Generation.] The [commission], in approving a procurement plan for an electrical corporation pursuant to [insert citation], shall require the electrical corporation's procurement plan
incorporate combined heat and power solutions to the extent that it 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.

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

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

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

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

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

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

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

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

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

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


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

(1) Reduce waste energy.

(2) Be sized to meet the eligible customer-generator's thermal load.
(3) Operate continuously in a manner that meets the expected thermal load and optimizes the efficient use of waste heat.

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

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

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

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

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

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

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

(G) An eligible customer-generator shall 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 standards established pursuant to subdivisions (A), (D), and (F).

Section 10. [Reporting Reductions in Emissions of Greenhouse Gases Resulting From the Use of Combined Heat and Power Systems Pursuit to This Act.] The [State Air Resources Board] shall report to the [Governor and the Legislature] by [December 31, 2011], 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 this Act.

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

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

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