

**STATE OF CALIFORNIA
ENERGY RESOURCES CONSERVATION
AND DEVELOPMENT COMMISSION**

**Implementation of Renewables)
Portfolio Standard Legislation (Public)
Utilities Code Sections 381, 383.5,)
399.11 through 399.15, and 445;)
(SB 1038), (SB 1078)**

**Docket No. 03-RPS-1078
RPS Proceeding
Re: Notice of Staff Workshop
Renewable Portfolio Standard**

**WRITTEN COMMENTS CONCERNING THE INCLUSION OF
QUALIFIED HEAT RECOVERY POWER
UNDER THE ELIGIBILITY CRITERIA
OF THE RENEWABLES PORTFOLIO STANDARD**

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QUALIFIED HEAT RECOVERY POWER

A HIDDEN EMERGING RENEWABLE TECHNOLOGY

ORMAT NEVADA, INC (ORMAT) with more than 35 years experience in the development, manufacture, and marketing of innovative power systems is pleased to provide written comments for this workshop.

ORMAT is requesting that the CEC by the statutory authority in SB 1078 support the inclusion of electrical power generation from "*Qualified Heat Recovery Power*" as an "eligible renewable energy resource" under Section 399.13 of California Senate Bill SB 1078 and also as an "Emerging Renewable Technology" under California Senate Bill SB 1038.

ORMAT's justification for this request is as follows:

DISCUSSION

1. Should additional technologies be eligible for incentives? And What Criteria Should the Energy Commission Apply for Adding Other Technologies.

ORMAT contends that the Legislature has given the CEC statutory authority to establish criteria for qualifying additional technologies as eligible for RPS certification purposes.

CRITERIA DISCUSSION – SECTION 383.5

ORMAT contends that under SB 1078 the CEC was given the authority to determine the criteria for defining the eligibility of renewable energy resources for RPS eligibility purposes. According to Section 399.13 the "Energy Commission shall certify eligible renewable energy resources that it determines meet the criteria described in subdivision (a) of Section 399.12". Section 399.12 of SB 1078 defines "eligible renewable energy resource" as an electric generating facility that "meets the definition of 'in-state renewable electricity generation technology" in section 383.5.

SB 1038 amended section 383.5 by giving the Energy Commission the authority to establish criteria for other distributed renewable emerging technologies other than photo-voltaic, solar thermal electric, fuel cell technologies that utilize renewable fuels and wind turbines of not more than 50 kilowatts that meet the emerging technology eligibility criteria technology eligibility criteria (Section 383.5 (e) (2)(C).

On February 11, 2002 the Energy Commission exercised that authority by adopting the Emerging Renewables Program Guidebook which includes an Emerging Technology category titled "Other Technologies" that specifically lists eight qualifying criteria the Energy Commission must apply in determining eligibility of technologies not afforded specific statutory eligibility under Section 383.5 (e)(2)(C) (see Appendix 3). ORMAT contends that the Energy Commission, under the same authority, can establish a similar category utilizing all or some of the same criteria to determine the RPS eligibility of technologies not given specific statutory eligibility."

PROPOSED ADDITION TO SECTION 399.12 of SB 1078

*“(5) A **Qualified Heat Recovery Power**” system is one that converts the lost heat from the exhaust stacks of engines, manufacturing or industrial processes into electricity, in a system with a nameplate capacity of less than 15 MW. Definition excludes lost heat from an engine that operates for the purpose of producing electricity”.*

Qualified Heat Recovery Power meets the following renewable criteria:

- (i) The technology does not use air or oxygen in the conversion process.
- (ii) The technology produces no discharges of air contaminants or emissions, including greenhouse gases,
- (iii) The technology produces no discharges to the surface or ground waters of the state,
- (iv) The technology produces no hazardous waste,
- (v) The power produced may be used inside the facility producing it or it may be delivered to the grid for sale.
- (vi) Provides reliable electrical power with proven high system availability.

2. If so which technologies and what requirements should be placed on them?

- (a) *Qualified Heat Recovery Power* is produced by industrial processes and natural gas pipeline compressors. It can be converted to electricity without any additional fossil fuel, using proven Organic Rankine Cycle (“ORC”) commercial technology that has been producing reliable geothermal power for over 20 years. As with biomass, the power is generated from a renewable fuel-free resource resulting from human activity. Since recoverable lost heat process converts electricity without any additional fossil fuel, is designed to offset part or all of a customer’s own electricity demand, it meets the legislative intent of SB 1038. Section 383.5 (d) (2) (C) states *“eligible electricity generating systems are intended primarily to offset part or all of the consumer’s own electricity demand.”*
- (b) In a comparable instance, Landfill gas, which is produced from the decomposition of municipal refuse and is considered as a renewable resource, is a direct by-product of manufacturing processes. Similarly, the recoverable lost heat generated during manufacture is also a direct by-product of the industrial process. Both result directly from continuous human directed industrial activity.
- (c) *The continuous manufacture* of industrial products such as steel, glass, cement, and the transmission of oil and gas, is achieved almost entirely by consuming fossil fuels. Given industry’s reliance on fossil fuels for many processes, recovered lost heat as a renewable source is consistent with the CEC’s program objectives to encourage emerging distributed technologies that generate on-site power, without the use of additional fossil fuel, to offset the consumer’s electricity demand and be connected to the California utility grid.

- (d) By definition, Renewable Energy reduces the consumption of fossil fuels and preserves the natural environment. Recovered lost heat for electrical generation similarly provides a continuous and renewable resource to the energy supply, thus mitigating the need for relying on fossil energy to serve the same load.
- (e) Furthermore the Qualified Heat Recovery process utilizes a similar recycling system similar to a geothermal injection system, which ensures the renewability attributes of geothermal energy.

3. Comparison with other technologies:

(a) *A simplified comparison of recovered lost heat with other renewable technologies is as follows.*

Resource	Reduce Fossil Fuel	Emissions Free	Capacity Factor	Inside The Fence	Capital Cost \$/KW
Solar PV	Yes	Yes	35%	No	4,000*
Wind	Yes	Yes	25-35%	No	1,000**
Geothermal	Yes	Yes	Over 90%	No	2,500
Land Fill	Yes	No	Over 90%	No	2,500
Recovered Lost Heat	Yes	Yes	Over 90% (95% availability)	Yes	1,500-2,500

(b) *In each category, including capital cost, recovered lost heat performs equal to or better than the other renewable resources. (* Capital costs for solar PV are for continuous power while for wind the capital cost is equivalent to \$3,000 /kW on a continuous basis.)*

(c) *Given the vast amounts of recoverable heat from industrial applications, (estimated at 10,000 MW nationwide) it makes sense to encourage its beneficial use as a fuel source to produce electric power, as opposed to letting it escape to the atmosphere as a source of environmentally polluting emissions.*

4. Comparison with Emerging Renewables Program Guidebook of February 2003

In the CEC Guidebook titled “*Emerging Renewables Program*” Appendix 3, which was issued in February 2003, the CEC recommended that Other Technologies could qualify for the extension of the Emerging Technology program if those technologies met the criteria listed therein. Qualified Heat Recovery Power meets these criteria without any exceptions other than that the “financial assistance” Item 1 of the criteria is currently required only for systems with less than 1 MW capacity, as follows:

1. Financial assistance is required only in a limited number of cases.
2. It has been commercially available for over a decade. with at least one vendor, in this case ORMAT. These power systems can be installed on-site in several weeks and require minimal permitting.
3. ORMAT offers a five year full warranty on the system.
4. ORMAT can demonstrate at least one year of reliable, predictable and safe performance by a full scale facility using this technology under field conditions. In fact in addition to 750 MW of geothermal power plants in 16 countries, using this technology there are operating recovered heat plants generating electricity in Canada, Germany, Japan and China, with projects under construction in the USA..
5. ORMAT can show that the generation systems using the technology have a design life of at least 20 years. Similar power units have been in continuous operation in the United States for 18 years.
6. The technology is designed so it can produce grid-connected electricity. The power generated is fully utility grid compatible.
7. The Qualified Heat Recovery Power technology represents a new electricity process not well represented among grid-connected renewable generating facilities. Recoverable waste heat, which is also produced by industrial processes and natural gas pipeline compressors, is converted to electricity without any additional fossil fuel, using proven commercial technology that has been producing geothermal power for over 20 years. Thus it provides a more efficient use for industrial end-users.
8. The Qualified Heat Recovery Power technology is designed exclusively for the purpose of producing electricity for on-site use, and though as a new technology the CEC incentives can help remove the barriers to its application, in many cases it can very cost effective when compared to retail industrial electricity.

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