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Decision **DRAFT DECISION OF ALJ GOTTSTEIN** **(Mailed 8/6/2002)**

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking on the Commission's Proposed Policies and Programs Governing Energy Efficiency, Low-Income Assistance, Renewable Energy and Research Development and Demonstration.	Rulemaking 98-07-037 (Filed July 23, 1998)

INTERIM OPINION ADDRESSING ELIGIBILITY OF RENEWABLE-FUEL MICRO-TURBINES FOR SELF-GENERATION INCENTIVES AND ADDRESSING CAPSTONE'S PETITION FOR MODIFICATION OF D.01-03-073

1. Introduction and Summary

By Decision (D.) 01-03-073, dated March 27, 2001, the Commission adopted program incentives for demand-responsiveness and self-generation, pursuant to Public Utilities Code Section 399.15(b).[1] Today's decision addresses issues regarding the eligibility of renewable-fuel combustion technologies (e.g. micro-turbines) for self-generation program incentives under this program. We also address Capstone Turbine Corporation's (Capstone) Petition For Modification To D.01-03-073, filed on March 5, 2002.

[1] D.01-03-073 has subsequently been corrected by D.01-04-048 and modified by D.01-07-028, D.02-02-026 and D.02-04-004, in response to petitions for modification. However, none of these modifications have altered the language in D.01-03-073 concerning the issues we address today.

"Self-generation" refers to distributed generation technologies (micro-turbines, small gas turbines, wind turbines, photovoltaics, fuel cells and internal combustion engines) installed on the customer's side of the utility meter that provide electricity for either a portion or all of that customer's electric load. Under the program adopted in D.01-03-073, financial incentives are provided to three different categories (or levels) of distribution technologies:

> Level 1: The lesser of 50% of project costs or $4.50/watt for photovoltaics, wind turbines and fuel cells operating on renewable fuels;
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> Level 2: The lesser of 40% of project costs or $2.50/watt for fuel cells operating on non-renewable fuel and utilizing sufficient waste heat recovery, and
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> Level 3: The lesser of 30% of project costs or $1.00/watt for micro-turbines, internal combustion engines and small gas turbines utilizing sufficient waste heat recovery and meeting reliability criteria.

The Commission authorized combined annual budgets of $125 million for the self-generation programs administered by Pacific Gas and Electric Company (PG&E), Southern California Gas Company (SoCal), Southern California Edison Company (SCE), and San Diego Regional Energy Office (SDREO) over a four-year period.[2] The program was officially launched on June 29, 2001.

As indicated above, the Commission did not include micro-turbines that utilize renewable fuels in the renewable incentive category (Level 1) under the program adopted in D.01-03-073. Instead of utilizing a nonrenewable fuel, such

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[2] PG&E, SoCal and SCE are the program administrators for the self-generation program within their service territories. Per D.01-06-035, San Diego Gas & Electric Company (SDG&E) subcontracts to SDREO to administer the self-generation program within its service territory. We refer to PG&E, SoCal, SCE and SDREO collectively as "the program administrators " throughout this decision and in Attachment 1. We refer to PG&E, SoCal, SCE and SDG&E collectively as "the utilities."

as natural gas, these micro-turbines burn biomass and waste gases derived from landfills and digesters located at wastewater treatment plants, dairy farms, agricultural processing plants and similar facilities.

In considering whether or not to provide a differential incentive for renewable-fuel micro-turbines, the Commission explained:

> "We note Capstone's suggestion that micro-turbines be allowed to qualify for renewable incentive levels if they utilize renewable fuels. While it is logical to consider such facilities as providing renewable power, the incentives, that we are offering here, relate to capital cost. Capstone has not suggested that micro-turbines using renewable fuels would be appreciably more expensive to install a unit using renewable fuel than it would to install one using fossil fuels. However, it would be appropriate to enable such a facility to qualify for a normal micro-turbine incentive payment without meeting a "system reliability" test. We will consider expanding the program to include renewable-fuel micro-turbines once we determine what comprises a renewable fuel and are persuaded that a facility that once qualifies for a "renewable fuel" incentive would not later switch to fossil fuel. We seek the Energy Division's assistance in answering these questions and ask the staff to report back to us."[3]

As discussed in this decision, Energy Division has reported back to us on these issues. In particular, Energy Division recommends that the Commission offer renewable-fuel combustion technologies (Level 3) an incentive level that is greater than the amount currently offered to combustion technologies that utilize nonrenewable fuels. (See Attachment 1.) In its Petition, Capstone also proposes that the Commission offer a higher incentive for renewable-fuel micro-turbines, relative to those offered under the program for micro-turbines utilizing

[3] D.01-03-073, p. 26.

nonrenewable fuels. However, Capstone recommends a higher incentive level and per watt incentive cap than Energy Division. PG&E and SCE oppose any change to incentive levels at this time.

Today, we adopt Energy Division's recommendations concerning the definition of renewable fuels, the incentive level to be offered to Level 3 technologies that utilize renewable fuels and the project costs to include in the calculation of incentives. In doing so, we provide preferential treatment for combustion technologies (e.g., micro-turbines) that use renewable fuels, relative to those using nonrenewable fuels, in several ways.

First, we provide a differential in the percentage of project costs to be subsidized: 40% of the capital costs versus 30%. Second, we set the per-watt incentive cap for renewable-fueled Level 3 technologies higher than for those that utilize nonrenewable fuels: $1.50 per watt versus $1.00 per watt. This incentive cap differential is based on the project cost information provided by Capstone in its Petition and the cost information we have observed in implementing the self-generation program to date.

Third, for the purpose of calculating the incentive amount, we include the cost of equipment to remove moisture and other undesirable constituents from renewable fuels (e.g., waste gases) that would damage the generation equipment. We do not extend this treatment of fuel cleanup costs to projects that utilize nonrenewable waste gases. This further increases the differential between the incentive levels offered Level 3 projects that use renewable fuels, and those that do not.

In addition, we clarify that Level 3 projects that utilize renewable fuels are not subject to the waste heat recovery and efficiency standards adopted in D.01-06-035. We find that those standards were adopted in response to specific concerns about offering incentives to nonrenewable fuels, and are not applicable

to combustion technologies that utilize renewable fuels. For similar reasons, we waive the reliability criteria established in D.01-03-073 for these renewable-fueled technologies.

To address concerns that renewable-fueled projects may later switch to using fossil-fuels, we adopt a three-pronged approach based on Energy Division's recommendations.[4] First, we require that the applicant have a suitable onsite renewable fuel (i.e., adequate flow rate) available for continuous operation of the self-generation unit. In addition, the applicant will need to submit a purchase order for renewable fuel cleanup equipment as a condition of funding. This approach requires the applicant to make an upfront commitment to a renewable fuel supply that renders a later switch to fossil fuel highly unlikely for economic reasons. It also ensures that the self-generation units are adequately sized to operate on a renewable fuel.

Second, we require applicants to submit a written affidavit that they will not switch to fossil-fuel for a period of three years, or the life of the equipment, whichever is shorter. This establishes the same warranty period for fuel use as for the equipment warranty we require for Level 3 technologies. The affidavit will include an enforcement mechanism, such as a payment retraction clause.

Third, we direct the program administrators or their consultants to conduct on-site inspections of projects that utilize renewable fuels in order to monitor compliance with the renewable fuel provisions once the projects are operational. In this way we can determine whether fuel switching has occurred and seek the appropriate recourse from projects that violate the fuel use

[4] The three-pronged approach described in this decision applies to Level 3 technologies utilizing renewable fuels as well as Level 1 (renewable) fuel cells.

provisions. It also provides us information with which to re-evaluate the renewable incentive categories on a prospective basis, as needed.

In our judgment, these requirements provide adequate assurance that renewable-fueled projects will not switch to fossil-fuels. They will apply to all Level 3-R technologies, as well as to Level 1 (renewable) fuel cells.

2. Positions of the Parties

SCE and PG&E filed comments in opposition to Capstone's Petition on April 4, 2002. Capstone filed a response on April 12, 2002.[5] In the following sections, we summarize the parties' positions on the issues in dispute.

2.1 Incentive Level For Renewable-Fuel Microturbines

Capstone urges the Commission to include renewable-fuel micro-turbines in the Level 1 category of incentives, i.e., to offer the lesser of 50% of project costs or $4.50/watt to these technologies. Capstone provides three reasons why it believes that this level of incentive is justified. First, Capstone contends that converting landfill and digester gases into electricity using micro-turbine technology makes the cost of equipment for biomass and waste gas operations approximately two times more expensive than the equipment needed to use conventional fuels. Second, Capstone argues that micro-turbine systems operating on renewable fuel achieve very low emissions comparable with those of a fuel cell. Third, Capstone contends that there are fuel diversification benefits that arise from the use of biomass and waste gases. Offering the Level 1 incentive

[5] Consistent with Rule 47 of the Commission's Rules of Practice and Procedure, Capstone sought permission to file a response to PG&E's and SCE's comments. Judge Gottstein approved Capstone's request on April 8, 2002.

would, in Capstone's view, reduce the barriers to deployment and enable the benefits of this technology to be gained more rapidly.

PG&E and SCE oppose Capstone's request for Level 1 incentive treatment. They argue that Capstone provided no information on the equipment costs associated with renewable-fuel micro-turbines, or any comparison between those costs and the equipment costs associated with Level 1 technologies. SCE further argues that there is no evidence in the record to support a finding that micro-turbines utilizing landfill or digester gas offer "super clean" generation. In addition, PG&E contends that the reduction in fuel costs over the life of the project should offset all or a significant portion of the upfront capital costs to operate a renewable fuel. Moreover, according to PG&E, micro-turbines operating on renewable fuel already obtain advantageous treatment with regard to the efficiency requirement applied to Level 3 technologies. In PG&E's view, the Commission should undertake a comprehensive examination of the incentive structure for all technologies, based on the experience gained over the past then months of the program's operation, before creating a differential incentive category for renewable-fuel microturbines. Similarly, SCE recommends that the Commission defer consideration of this issue, at least until Energy Division has competed the tasks outlined in D.01-03-073.

2.2 Fuel-Switching

In D.01-03-073, the Commission sought assurance that a renewable facility that receives an incentive payment would not subsequently switch to fossil fuel. Capstone argues that the most effective way of dealing with this issue is by way of a fuel-use warranty. In particular, Capstone argues that facilities (both fuel cells and micro-turbines) that receive the renewable fuel incentive be required to provide a written warranty that they will operate using the renewable fuel for

three consecutive years or the economic life of the facility, whichever is the shorter.

PG&E identifies several problems with Capstone's proposal. First, PG&E argues that the duration of Capstones' proposed warranty is inconsistent with the warranty period already required for Level 1 equipment quality and performance under the program, i.e., 5 years. Second, PG&E argues that the Commission needs to resolve between the project developer and project owner who will be making the warranty that the project will burn renewable fuel, and who will be entitled to or expected to enforce this warranty. In addition, PG&E argues that the Commission will need to resolve what the remedy will be if the promise to burn renewable fuel is breached. For similar reasons, SCE argues that a warranty is not adequate assurance that a facility will not switch to a non-renewable fuel.

3. Energy Division Recommendations

Per our request in D.01-03-073, Energy Division has reported back to us on the issues we need to consider before expanding the program to renewable-fuel micro-turbines. To summarize, Energy Division recommends that the Commission:

a. Adopt the following definition of a "renewable fuel":

> A renewable fuel is a non-fossil fuel resource other than those defined as conventional in Section 2805 of the Public Utilities Code, that can be categorized as one of the following: solar, wind, biomass, digester gas, or landfill gas. A facility utilizing a renewable fuel may not use more than 25 percent fossil fuel annually, as determined on a total energy input basis for the calendar year.

b. Offer the lesser of 40 percent of project costs or $1.50/Watt to combustion technologies operating on a renewable fuel, under a new incentive Level 3-R.

c. Clarify the definition of project costs for the purpose of calculating self-generation incentives, as follows:

--technologies using a renewable fuel may include fuel cleanup equipment in calculating project costs.

--equipment required to produce a usable fuel from organic material does not qualify as fuel cleanup equipment and therefore is not an eligible project cost.

--fuel cleanup and processing equipment for waste gases derived from fossil fuel drilling operations are not eligible project costs.

d. Require applicants for Level 3-R systems to submit an affidavit stating that the unit will comply with the program renewable fuel requirements for the duration of the incentive program (i.e., December 31, 2004) at minimum.

e. Require applicants for Level 3-R systems (and Level 1 fuel cells) to demonstrate an adequate flow rate of renewable fuel to produce electricity at the self-generation unit's rated capacity. Direct the program administrators to develop an appropriate methodology and verification process for this purpose.

f. Waive the waste heat recovery requirement for Level 3-R technologies (and fuel cells) operating on a renewable fuel.

g. Waive the reliability requirement for Level 3-R technologies (and fuel cells) operating on a renewable fuel.

h. Clarify that the annual program evaluation should include compliance monitoring for renewable fuel use.

i. Clarify that Level 3-R is a subsection of Level 3 technologies for the purpose of applying the Commission's adopted fund-shifting rules.

Energy Division's complete report and detailed recommendations are attached to this decision. (See Attachment 1.)

4. Discussion

In the following sections, we address the issues raised by the Commission, Energy Division and the parties concerning the incentive treatment for renewable-fueled combustion technologies.

4.1 Definition of Renewable Fuel

In D.01-03-073, we recognized the need to define "renewable fuels" for the purpose of considering differential incentives for technologies that use them. No party takes issue with the definition of renewable fuels presented by Energy Division in the attached report, and described in Section 3 above. We find it to be a reasonable definition for the purpose of our self-generation program, and note that the 25% limit on fossil fuel use is consistent with the California Energy Commission's definition of a renewable facility. Accordingly, any of the Level 3 technologies that operate consistent with this definition should be classified as using a renewable fuel.

4.2 Incentive Structure For Renewable-Fueled Combustion Technologies

There is no agreement among parties, however, on the level of incentive that a Level 3 technology using a renewable fuel under this definition should receive. On the one hand, PG&E and SCE argue that all Level 3 technologies should continue to receive the current incentive level, i.e., the lesser of 30% of project costs or $1.00/watt, irrespective of fuel type. On the other hand, Capstone argues that Level 3 technologies (e.g., micro-turbines) operating on renewable fuels should receive the highest level incentive offered under the program, i.e., the lesser of 50% of project costs or $4.50/watt. We find that Energy Division's proposal to offer Level 3 technologies that operate on

renewable fuels the lesser of 40% of project costs or $1.50/watt to be reasonable for the reasons discussed below.

Our starting point for the consideration of this issue is to recognize, as Energy Division does, that the per watt incentive limits adopted in D.01-03-073 are a function of *project capital costs*.[6] In particular, the incentives were structured to subsidize a certain percentage of total project capital costs (i.e., 50%, 40%, 30% for Level 1, 2 and 3, respectively), subject to per-watt dollar limits on total subsidy costs. These limits were based on the average capital costs of the technologies within each category. For example, the per-watt limit for Level 1 was designed with projects that have average capital costs of $9.00/watt in mind (i.e., $4.50/watt divided by 50%). As Energy Division explains in its report, current program data on Level 1 technologies is consistent with this expectation.[7] Similarly, Level 2 incentives were designed for projects with costs of approximately $6.25/watt (i.e., $2.50 divided by 40%), and Level 3 incentives were designed for projects that cost about $3.33/watt (i.e., $1.00 divided by 30%).

Examining the incentive structure further, one observes that for any project within Level 1 that costs less than $9.00 per watt, the 50% limit will be binding. For example, if a Level 1 project costs $7.00/watt, and produces 100,000 watts, then the incentive offered will be limited to $350,000, i.e., 50% of the project cost, rather than the $450,000 incentive that corresponds to the

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[6] Refer to D.01-03-073, quoted in Section 1 above: "While it is logical to consider such facilities as providing renewable power, the incentives, that we are offering here, relate to *capital cost*." (p. 27; emphasis added.)

[7] To date, the only active Level 1 applications are for photovoltaic systems. Program-wide system costs average approximately $9.15 per installed watt. See Attachment 1, p. 3 and Appendix A.

$4.50/watt limit. Conversely, for any Level 1 project that costs more than $9.00/watt, the incentive is limited by the $4.50 per watt maximum. For example, if a project costs $10.00/watt, and produces 100,000 watts, then the project will receive an incentive of $450,000 ($4.50 x 100,000 watts), rather then $500,000 (50% of $1,000,000 project costs).

The above example illustrates how establishing the appropriate per watt incentive limit in each category involves the balancing of two considerations. The first consideration is to establish a limit that does not encourage costs to become inflated in the industry. If the per-watt limit is set significantly higher than the cost of the technologies within the category, there is no incentive (and in fact, a potential disincentive) for project developers and vendors to keep costs as low as possible. This is because the higher the per-watt limit, the higher the capital costs can become before the 50% limit becomes binding.[8]

The second consideration is to establish a per-watt incentive limit such that the percentage of project costs that the program is designed to subsidize (e.g., 50% for Level 1 technologies) is generally covered by the total incentive amount. Setting the per watt incentive limit too low relative to the costs of the technologies will result in a subsidy level that covers less than this intended percentage.

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[8] For example, if the per-watt cap is increased to $10/watt, and a project that produces 100,000 watts costs $9/watt, the 50% limit becomes binding at a subsidy level of $450,000. However, if capital costs escalate to $9.50/watt under this incentive structure, the 50% limit is no longer binding at $450,000. Rather it becomes binding at a higher subsidy level ($475,000).

For these reasons, the per-watt incentive limits established in D.01-03-073 were set to reflect the average capital costs of the technologies within each category, based on the cost data available at that time.

Turning to Capstone's request, we note that the capital costs for renewable-fuel micro-turbines are less than one-half the costs associated with Level 1 technologies. In response to PG&E's and SCE's protest, Capstone presents two quotes for digester gas projects at $3.27/watt and $4.20/watt, for an average cost of $3.74/watt. Current program data shows renewable-fuel micro-turbine projects costing on average $3.33/watt, with a high of $4.33/watt.[9] As explained above, the per-watt incentive limit we adopted in D.01-03-073 is designed to coincide with the average capital costs of the technologies within each category. Capstone's proposal clearly does not accomplish this objective.

On the other hand, PG&E's and SCE's recommendation to maintain the status quo also fails to recognize that there are increased capital costs associated with micro-turbines operating on renewable fuel, relative to those operating on non-renewable. The record in this proceeding indicates that non-renewable fuel micro-turbine projects cost an average of $2.77/watt.[10] The record also indicates that the cost of equipment for micro-turbines using renewable fuels is more expensive than the equipment needed when using conventional fuels, i.e., an average of $3.33/watt using program data and $3.74 using Capstone's data. Nonetheless, there is no evidence to support Capstone's assertion that the cost of equipment for micro-turbines using renewable fuel is two times more expensive than the equipment needed to use conventional fuels.

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[9] Attachment 1, p. 5.

[10] *Ibid., p. 6.*

Energy Division considers this information in making its recommendation that Level 3 technologies utilizing renewable fuels receive the lesser of $1.50/watt up to 40 percent of system cost. Energy Division derives the per-watt limit by multiplying the average data points on capital costs provided by Capstone in its reply comments ($3.74/watt) by 40%.

We find this incentive level to be reasonable on several grounds. First, consistent with the discussion above, it establishes a per-watt limit that takes into account the project costs of the technologies involved. Second, it recognizes that Level 3 technologies operating on renewable fuels are eligible for a differential incentive by providing a higher subsidy (40% versus 30% of capital costs) relative to Level 3 technologies that utilize non-renewable fuels. Moreover, as discussed further below, we include the differential capital costs associated with renewable fuel clean-up in figuring the subsidy level for these technologies. Third, this differential (ten percent) is commensurate with the incentive differential in place between non-renewable and renewable fuel cells.

Finally, Energy Division's proposal maintains a differential between Level 1 technologies and combustion technologies, consistent with our consideration of relative air emission characteristics in establishing the original incentive categories. As we note in D.01-03-073, the categories for self-generation technologies and associated incentives recognize these differences by providing a higher subsidy level (50% of capital costs) for Level 1 technologies relative to combustion technologies (30% of capital costs).[11] Capstone has presented no data to suggest that micro-turbines operating on renewable fuels compare favorably with Level 1 technologies with respect to emissions, even though

[11] D.01-03-073, p. 24.

Capstone acknowledges that such evidence would be relevant to our consideration of its Petition.[12] We concur with Energy Division that nothing in the record compels us to equate renewable fuel combustion technologies in terms of air emissions with Level 1 technologies in establishing the incentive differentials.[13]

Accordingly, Level 3 projects that operate on a renewable fuel (referred to as "Level 3-R" projects) will be eligible for an incentive of $1.50/watt up to 40 percent of project costs.

4.3 Eligible Project Costs

In addition to increasing the incentive level for these Level 3 technologies, we will adopt Energy Division's recommendation that the costs of cleanup equipment for Level 3-R projects be included in the project cost. This further increases the differential between the incentive levels offered Level 3 projects that use renewable fuels, and those that do not.[14] As explained in Energy Division's report, the gases derived from landfills and digesters located at dairy farms, processing plants and similar facilities require clean up to remove

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[12] Petition, p. 5.

[13] Capstone attempts to quantify the "environmental benefits" of micro-turbines operating on landfill gas by stating NOx emission levels. However, the record still lacks adequate data on the environmental characteristics of renewable fuel micro-turbines, engines and fuel cells (the only Level 1 technology with operational emissions). Therefore, we do not have a reasonable basis for applying the 50% incentive level adopted for Level 1 technologies to Level 3-R technologies.

[14] We specifically include these type of costs to reflect the preference given to renewable or super clean technologies, per Assembly Bill 970, and do not extend this treatment of clean up costs to projects that utilize nonrenewable waste gases.

undesirable constituents that would damage the generation equipment. Such cleanup equipment is typically an integral part of the generation facility package, and includes gas "skids", dryers/moisture removal and siloxane removal towers. Including clean up costs in the definition of project costs for Level 3-R technologies is consistent with our treatment of Level 2 technologies, i.e., the program incentive structure currently allows fuel cells operating on a renewable fuel to include gas cleanup skids in the total project costs.

Energy Division notes that we have limited data on fuel clean up costs for renewable fuel self-generation units at this time. The data suggests that the cost of fuel cleanup equipment ranges between five and 25 percent of the overall project cost. The program administrators should direct their evaluation consultants to collect and examine the data on these costs for both Level 3-R combustion technologies and renewable fuel cells (Level 1) as part of the second year program evaluation report.[15] It may be appropriate at that time to limit the amount of allowable cleanup costs (e.g., as a percentage of total project costs) if those costs appear unreasonably high.

In defining total project costs for 3-R technologies, we distinguish between the type of clean up costs discussed above and the cost of equipment that is used to process organic material into a usable fuel. As Energy Division explains in its report:

> "The organic waste itself cannot be used in any eligible technologies directly, and requires processing beyond gas cleanup in order to be used

[15] Per D.01-03-073, the program administrators are required to perform program evaluations and load impact studies for the self-generation program by outsourcing to independent evaluation consultants. (pp. 35-36.) The schedule for the consultants' evaluation reports is set forth in the Administrative Law Judge's Ruling On Schedule For Evaluation Reports, dated April 24, 2002.

> for electrical generation. Examples of such processing equipment are boilers, external combustion devices and digesters (composting organic waste in an enclosed structure, capturing and piping the gas). This equipment is discrete and separate from the generation facility."[16]

We agree with Energy Division's assessment that these types of processing costs are not an eligible project cost, and will exclude them from the calculation of program incentives.

4.4 Reliability and Waste Heat Recovery Requirements For Renewable Fuel Systems

In establishing the self-generation program, we required Level 2 and Level 3 technologies to utilize waste heat recovery at the customer site and make a demonstrable contribution to the reliability of the transmission or distribution system in order to mitigate concerns about offering incentives to nonrenewable technologies. Those concerns do not apply to Level 3-R technologies, by definition. Moreover, as Energy Division points out in its report, the efficiency component of our adopted standard for waste heat recovery becomes a meaningless test when applied to a project using fossil fuels no more than 25% annually.[17] For these reasons, we will waive the waste heat recovery standards adopted in D.01-06-035.

For similar reasons, we will waive the reliability criteria established in D.01-03-073 for fossil-fired generators. As we stated in D.01-03-073, and reiterated in D.01-06-035, the Legislature intended that any fossil-fueled project make a demonstrable contribution to the reliability of the transmission or distribution system, in order to be eligible for incentives under the program.

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[16] Attachment 1, p. 9.

[17] *Ibid., p. 10.*

This requirement does not extend to renewable or super clean technologies under the statute.[18] Therefore, we remove this requirement for Level 3-R projects.

4.5 Assurances Against Fuel Switching

In D.01-03-073, we requested Energy Division's assistance in addressing the issue of how to ensure that a facility that qualifies for a renewable fuel incentive would not later switch to fossil fuel. We specifically stated that we must be "persuaded" that such fuel-switching would not occur, as a condition of offering such incentives.[19]

We find that Energy Division's three-pronged approach meets this requirement.[20] In addition to a written affidavit from the applicant stating that the unit will comply with the program renewable fuel requirements, Energy Division recommends that the applicant have suitable onsite renewable fuel (i.e., adequate flow rate) available for continuous operation of the self-generation unit. In addition, the applicant would need to submit the purchase order for renewable fuel cleanup equipment as a condition of funding. Units whose annual fuel consumption exceeds the available renewable fuel plus the allowable nonrenewable fuel supplement would not qualify for a differential incentive. This approach requires the applicant to make an upfront commitment to a renewable fuel supply that renders a later switch to fossil fuel highly unlikely for economic reasons. It also ensures that the self-generation units are adequately

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[18] See D.01-03-073, pp. 25-26, D.01-06-035, p.9.

[19] D.01-03-073, p. 26.

[20] See Attachment 1, pp. 10-12.

sized to operate on a renewable fuel. The program administrators are directed to develop an appropriate methodology for determining that a host customer has adequate onsite renewable fuel supply.

The third component of Energy Division's recommendations, i.e., directing the program administrators or their consultants to conduct on-site inspections of projects that utilize renewable fuels, would enable us to monitor and evaluate compliance with the renewable fuel provisions once the projects are operational. In this way we can determine whether fuel switching has occurred and re-evaluate the renewable incentive categories on a prospective basis, as needed.

We adopt Energy Division's recommendations with two modifications. Rather than wait for the annual program evaluation reports to evaluate this compliance issue, we direct the program administrators to submit monitoring information every six months from the effective date of this decision in the form of a report to the Commission, until further order by the Commission or Assigned Commissioner. Energy Division should evaluate the compliance reports and submit recommendations to the Commission for program modifications, if the monitoring results indicate that such changes are needed prior to our consideration of the annual program evaluations.

We also modify Energy Division's recommendation regarding the duration of the commitment by applicants to use renewable fuels. In its report, Energy Division states that unit should comply with the renewable fuel-use requirement "for the duration of the incentive program (i.e., December 31, 2004) at minimum."[21] We agree with PG&E that any fuel-use affidavit or warranty should be at least the same length as the equipment warranty we adopted in

[21] *Ibid.*, p. 15.

D.01-03-073. The equipment warranty requirement for Level 3 is for three years or the economic life of the facility, whichever is shorter. We will adopt this same requirement for the fuel-use affidavit discussed above. In addition, we clarify that the document signed by the applicant should represent a binding legal contract with an enforcement mechanism, such as a payment retraction clause. The Working Group established by D.01-03-073 should develop appropriate affidavit language for this purpose.

In our judgment, these requirements provide adequate assurance that renewable-fueled projects will not switch to fossil-fuels. They will apply to all Level 3-R technologies, as well as to Level 1 (renewable) fuel cells.

4.6 Other Issues

In creating a new incentive category, Level 3-R, we need to clarify the manner in which Level 3-R technologies will be considered with respect to equipment warrantees and fund-shifting issues that were addressed by D.01-03-073.

In D.01-03-073, we adopted warranty requirements related to the project equipment. For technologies in Levels 1 and 2, we adopted a warranty period of 5 years. For Level 3 technologies, we adopted a three-year warranty period and a three-year minimum maintenance contract requirement. We clarify that projects that qualify under the new Level 3-R incentive category continue to be subject to the warranty requirements we established for Level 3 technologies, per Ordering Paragraph 8 of D.01-03-073.

We also adopted fund-shifting rules in D.01-03-073 that gave the utilities full discretion to move funds from “non-renewable self-generation categories” (referring to Levels 2 and 3 in that decision) to “the renewable category” (Level 1

in that decision).[22] However, the utilities are required to file an advice letter prior to shifting funds in the reverse direction.

We clarify today that Level 3-R will fall under the fundshifting rules associated with Level 2 and Level 3 categories. Since the Level 1 technologies are significantly higher in capital costs, this approach allows us to carefully examine proposals to shift funds away from Level 1 to ensure that funding for these renewable projects is not inappropriately depleted.

Findings of Fact

1. Energy Division's proposed definition of renewable fuels is consistent with the California Energy Commission's definition of a renewable facility, and is undisputed in this proceeding.

2. The incentive structure adopted in D.01-03-073 established the per-watt limits to reflect the average capital costs of the technologies within each category.

3. Capstone's request to offer renewable-fuel micro-turbine projects the Level 1 incentive structure is not consistent with available cost data.

4. PG&E's and SCE's recommendation to maintain the status quo, and offer renewable-fuel micro-turbines the same incentive as those using nonrenewable fuel, fails to recognize that there are increased capital costs associated with micro-turbines using renewable fuels.

5. Energy Division's recommended incentive level for Level 3 technologies using renewable fuels is consistent with the record on the capital costs of these technologies.

6. Energy Division's recommended incentive level recognizes that Level 3 technologies operating on renewable fuel are eligible for a differential incentive.

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[22] D.01-03-073, p. 21.

It provides a higher subsidy (40% versus 30% of capital costs) relative to Level 3 technologies utilizing nonrenewable fuels. This differential is commensurate with the incentive differential in place between non-renewable and renewable fuel cells.

7. Energy Division's recommended incentive level maintains a differential between Level 1 technologies and combustion technologies, consistent with the Commission's consideration of relative air emission characteristics in establishing the original incentive categories.

8. There is no evidence in the record that would equate renewable fuel combustion technologies with Level 1 technologies in terms of air emissions.

9. Gases derived from landfills, wastewater treatment plants and digesters located at dairy farms, processing plants and similar facilities require clean up to remove undesirable constituents that would damage the generation equipment. Such cleanup equipment is generally an integral part of the generation facility package.

10. Energy Division's recommendation to treat fuel clean-up costs for renewable fuels as a component of project costs, for the purpose of calculating incentives, further increases the differential treatment between renewable and nonrenewable-fueled Level 3 technologies. It is also consistent with the current treatment of gas cleanup equipment for Level 1 fuel cells using renewable fuels.

11. There is limited data available at this time on the costs of cleanup equipment for renewable fuels.

12. Equipment that is used to process organic material into a usable fuel (e.g., boilers, external combustion devices and digesters) is discrete and separate from the generation facility.

13. The waste heat recovery and efficiency standards adopted in D.01-06-035 in response to concerns about offering incentives to nonrenewable fuels are not

applicable to combustion technologies that utilize renewable fuels. Similarly, the reliability criteria established in D.01-06-035 for projects that utilize fossil fuels are not applicable to these technologies.

14. The three-pronged approach recommended by Energy Division to address fuel-switching issues provide adequate assurance that renewable-fueled projects will not switch to fossil-fuels.

15. Requiring the utility to file an Advice Letter before shifting funds from Level 1 to Levels 2, 3-N or 3-R categories will enable the Commission to consider whether funding for Level 1 renewable technologies, which have significantly higher capital costs, is being inappropriately depleted.

Conclusions of Law

1. Energy Division's recommendations, as modified by this decision, are reasonable and should be adopted.

2. Because this decision does not adopt any of Capstone's recommendations on how to structure the incentive for Level 3 technologies that utilize renewable fuels, its Petition for Modification of D.01-03-073 should be denied.

3. In order to put the changes we adopt today to the self-generation program into practice as soon as possible, this decision should be effective today.

O R D E R

IT IS ORDERED that:

1. Energy Division recommendations on technologies utilizing a renewable fuel in the self-generation program adopted in D.01-03-073, as presented in Attachment 1, are adopted subject to the modifications discussed in this decision.

2. Ordering Paragraph 5 of D.01-03-073 is modified to read:

"Under the self-generation program authorized today, program administrators shall offer the following incentives on a uniform, statewide basis:

Incentive category	Incentive offered	Maximum percentage of project cost *	Min. system size	Max. system size	Eligible Technologies
Level 1	$4.50/W	50%	30 kW	1 MW	▪ Photovoltaics ▪ Fuel cells operating on renewable fuel ▪ Wind turbines
Level 2	$2.50/W	40%	None	1 MW	▪ Fuel cells operating on non-renewable fuel and utilizing sufficient waste heat recovery
Level 3-R	$1.50/W	40%	None	1 MW	▪ Microturbines operating on renewable fuel ▪ Internal combustion engines and small gas turbines operating on renewable fuel
Level 3-N	$1.00/W	30%	None	1 MW	▪ Microturbines operating on non-renewable fuel, utilizing sufficient waste heat recovery and meeting reliability criteria ▪ Internal combustion engines and small gas turbines

					operating on non-renewable fuel, both utilizing sufficient waste heat recovery and meeting reliability criteria

* For Level 1 fuel cells and Level 3-R technologies only, project costs for the purpose of calculating the incentive include the cost of equipment to remove moisture and undesirable constituents from renewable fuel (e.g., gas skids, dryers/moisture removal and siloxane removal towers). Equipment for processing organic waste beyond gas cleanup is not included."

4. The following language is added to Ordering Paragraph 6 of D.01-03-073.

   "For the purpose of the self-generation program adopted today, 'renewable fuel' is defined as follows:

   "A renewable fuel is a non-fossil fuel resource other than those defined as conventional in Section 2805 of the Public Utilities Code, that can be categorized as one of the following: solar, wind, biomass, digester gas, or landfill gas. A facility utilitizing a renewable fuel may not use more than 25 percent fossil fuel annually, as determined on a total energy input basis for the calendar year."

5. The following language is added to Ordering Paragraph 8 of D.01-03-073:

   "In addition, applicants for Level 1 fuel cell projects and Level 3-R projects are required to:

   - Provide a written affidavit stating that the unit will comply with the program renewable fuel requirements. The length of this commitment shall be the same as the equipment warranty requirement discussed above for each category. The document signed by the applicant shall represent a binding legal contract with an enforcement mechanism, such as a payment retraction

clause. The working group described in this decision shall develop the affidavit language, in consultation with Energy Division.

- Within 90 calendar days of the date the program administrator issues a Conditional Reservation Letter, submit an equipment purchase order that indicates the fuel cleanup equipment as a separate invoice item.

- Demonstrate the availability of an adequate average flow rate of renewable fuel to produce electricity at the unit's full rated capacity, or an appropriate de-rated capacity if supplemented with fossil fuel. This information shall be collected on the program application as well as verified during the on-site inspection prior to approval of the incentive. Units whose annual fuel consumption exceeds the available renewable fuel plus the allowable nonrenewable supplement will not qualify for a differential incentive.

6. The second full sentence on page 21 of D.01-03-073 is modified to read:

"Although the utilities may exercise full discretion in moving funds from the Level 2 and 3 incentive categories to Level 1, a utility must seek approval through advice letter prior to shifting additional funds into either the Level 2 or 3 categories."

7. The following language is added to Ordering Paragraph 12 of D.01-03-073:

- Program administrators for the self-generation program shall direct their evaluation consultants to collect and examine the data on fuel cleanup costs for both Level 3-R combustion technologies and renewable fuel cells (Level 1) as part of the second year program evaluation report.

- Program administrators for the self-generation program, or their consultants shall conduct on-site

> inspections of projects that utilize renewable fuels to monitor compliance with the renewable fuel provisions once the projects are operational. They shall file fuel-use monitoring information every six months in the form of a report to the Commission, until further order by the Commission or Assigned
>
> Commissioner. Energy Division shall evaluate the compliance reports and submit recommendations to the Commission for program modifications, if the monitoring results indicate that such changes are needed prior to our consideration of the annual program evaluations.

8. The program administrators, in consultation with Energy Division, shall jointly submit to the Assigned Administrative Law Judge a schedule for the additional program evaluation and monitoring tasks described in this decision. The submittal shall include an estimated budget for all the monitoring and evaluation activities required under the self-generation program per D.01-03-073 and today's decision. This information is due within 60 days from the effective date of this decision.

9. Program administrators shall file the first on-site monitoring report on fuel-use within six months of the effective date of this decision, and every six months thereafter until further notice by the Commission or Assigned Commissioner.

10. The Assigned Commissioner may, for good cause, modify the filing dates required by today's decision.

11. Unless otherwise indicated, all filings shall be filed at the Commission's Docket Office and served electronically on all appearances and the state service list in this proceeding. Service by U.S. mail is optional, except that one hard copy shall be mailed to Judge Meg Gottstein at P.O. Box 210, Volcano,

CA 95689. In addition, if there is no electronic mail address available, the electronic mail is returned to the sender, or the recipient informs the sender of an inability to open the document, the sender shall immediately arrange for alternate service (regular U.S. mail shall be the default, unless another means—such as overnight delivery—is mutually agreed upon). The current service list for this proceeding is available on the Commission's web page, www.cpuc.ca.gov.

This order is effective today.

Dated_____, at San Francisco, California.

ATTACHMENT 1

Technologies Utilizing a Renewable Fuel in the Self-Generation Incentive Program

Energy Division Report
April 2002

Introduction

In D.01-03-073, issued March 27, 2001, the Commission asked the Energy Division to report on four issues related to renewable fuels and the participation of renewable fuelled self-generation in the Commission's incentive program. The Decision considers these issues on page 27 as follows:

> "We will consider expanding the program to include renewable-fuel micro-turbines once we determine what comprises a renewable fuel and are persuaded that a facility that once qualifies for a "renewable fuel" incentive would not later switch to fossil fuel."
>
> "We note Capstone's suggestion that micro-turbines be allowed to qualify for renewable incentive levels if they utilize renewable fuels."
>
> "[I]t would be appropriate to enable such a facility to qualify for a normal micro-turbine incentive payment without meeting a "system reliability" test."

Energy Division summarizes its four tasks as:

1. Determine what comprises a renewable fuel for combustion technologies for purposes of the incentive program.
2. Determine appropriate incentive for microturbines operating on renewable fuel.
3. Provide assurance that such facilities would not later switch to a fossil fuel source.

4. Consider waiving Reliability Criteria for combustion technologies operating on a renewable fuel.

This report presents the Energy Division's findings, followed by a summary of recommendations.

Background

Assembly Bill 970 (AB 970), signed by Governor Davis on September 6, 2000, required the CPUC to initiate certain load control and distributed generation activities, including the following financial incentives:

- Incentives for load control and distributed generation to be paid for enhancing reliability;
- Differential incentives for renewable or super clean distributed generation resources.[1]

The Self-Generation Incentive Program approved by the Commission in D.01-03-073 is the program through which these incentives are being offered.

Energy Division Responses to Issues

1. Determine what comprises a renewable fuel for combustion technologies for purposes of the Self-Generation Incentive Program.

   The California Energy Commission defines a "renewable" facility in its Renewable Resources Account as:

   > "…electricity generation facilities using power sources other than those defined as conventional in Section 2805 of the Public Utilities Code, provided no more than 25 percent fossil fuel is used by the facility annually, as determined on a total energy input basis for the calendar year. Specifically: biomass, digester gas, geothermal, landfill gas, municipal solid waste,

[1] Codified as Public Utilities Code Sec. 399.15(b)(6) and (7).

> small hydropower (30 MW or less), solar photovoltaic, solar thermal, and wind."

We note that small hydropower, geothermal, and solar thermal technologies are not eligible under the CPUC incentive program. We also note that the CPUC has asked for clarification on what comprises a renewable fuel specifically for purposes of addressing Capstone's request for a differential incentive for microturbines. We acknowledge that renewable fuel can also be utilized in other gas turbines and internal combustion engines, so this consideration extends to those technologies as well. Therefore, we propose the following language:

> A renewable fuel is a non-fossil fuel resource other than those defined as conventional in Section 2805 of the Public Utilities Code, that can be categorized as one of the following: solar, wind, biomass, digester gas, or landfill gas. A facility utilizing a renewable fuel may not use more than 25 percent fossil fuel annually, as determined on a total energy input basis for the calendar year.

The fuel must be delivered to the generator in a form that is readily usable and combustible. Cleanup may be required to remove moisture and other components, as described in issue 2 below. Organic material in a form that requires processing beyond this type of cleanup does not constitute a renewable fuel for purposes of this program.

2. Determine appropriate incentive for microturbines operating on renewable fuel.

<u>Consider a Differential Incentive for Renewable Fuel Self-Generation</u>

Capstone Turbine Corporation filed comments on the proposed Decision that adopted the Self-Generation Incentive Program, as well as a Petition for Modification (dated March 5, 2002), requesting that the Commission amend its definition of renewable self-generation to include microturbines that use renewable fuel. This would make those microturbines eligible for a Level 1 incentive payment.

> The incentive categories were designed to give preference to "renewable or super-clean distributed generation resources" as specified in Public Utilities Code § 399.15(b)(7) (codifying AB 970). We do not find that combustion turbines and engines[2] of any type qualify as "super-clean." D.01-03-073 declares that the Commission does not have any information on record that "provide[s] a basis for declaring that any particular fuel-burning technology" fits into the category of "super-clean" generation.[3] Additionally, we believe the Commission intended to reserve the Level 1 incentive for technologies that qualify as both renewable *and* "super-clean." Nothing in the record compels us to equate renewable fuel combustion technologies with Level 1 technologies.[4] Therefore, we do not recommend applying the same incentive levels to Level 3 technologies that use a renewable fuel.

However, Level 3 technologies operating on a renewable fuel, as defined in Item 1 above, do meet the requirements of a renewable self-generation resource and may be considered eligible for a differential incentive, as prescribed in the legislation. Therefore, we find that increasing the project limit to 40 percent is appropriate for Level 3 technologies that operate on a renewable fuel, as determined in Item 1 of this report. This is commensurate with the incentive differential between non-renewable and

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[2] In this report we apply equal treatment to all Level 3 technologies operating on renewable fuel. Capstone's petition addresses only microturbines, but a differential incentive for renewable fuel operation should also apply to engines and small gas turbines.

[3] D.01-03-073, p. 26 fn. 7.

[4] Capstone attempts to quantify the "environmental benefits" of microturbines operating on landfill gas by stating NOx emissions levels. However, the record still lacks adequate data on the environmental characteristics of renewable fuel microturbines, engines, and fuel cells (the only Level 1 technology with operational emissions). Therefore, we do not have a reasonable basis for applying an incentive appropriate to Level 1 technologies to Level 3 technologies.

renewable fuel cells (i.e. ten percent increase). We also recommend that differential costs associated with renewable fuel cleanup be allowed in figuring the total project cost, as described below.

We do not find that an increase in the dollar per Watt level to $4.50/W, appropriate to Level 1 technologies, is warranted for Level 3 technologies that operate on a renewable fuel. D.01-03-073 explains the distinctions made between program incentive levels:

> "While it is logical to consider such facilities as providing renewable power, the incentives, that we are offering here, relate to **capital cost**." (p. 27, emphasis added)

Level 1 technologies have the highest capital cost of all eligible technologies. To date, the only active Level 1 applications are for photovoltaic systems. Program-wide PV system costs average approximately $9.15 per installed Watt. The $4.50/W limit for Level 1 approximately reflects 50 percent of the average cost.

In a telephone conversation on June 13, 2001, Energy Division learned from Capstone's biogas applications manager that the total cost for renewable fuel microturbine projects ranges from $1500-2500/kW, and may range slightly higher. The manager also indicated that a microturbine operating on nonrenewable fuel would cost about $1,000/kW. In an e-mail dated July 31, 2001, Capstone indicated to the Energy Division that the cost of a microturbine project sited at a landfill was $2,500/kW, or $2.50/W. Capstone's reply comments dated April 12, 2002, indicated two quotes for digester gas projects at $3,267/kW and $4,200/kW, and stated that the cost of a non-renewable fuel microturbine is less than $1,500/kW.[5] (See Appendix A.)

Current program data shows renewable fuel microturbine projects coming in at approximately $3.33/W, with a high of $4.33/W (which reaches the

[5] We note that the reply comments incorrectly indicated "kWh" instead of "kW" units.

$1/W cap). Non-renewable fuel microturbine projects are coming in at an average of $2.77/W, with a high of $5.67/W. There is no evidence in the record to support Capstone's claim that the cost of equipment for renewable fuel microturbine applications is "about two times more expensive than the equipment needed when operating using conventional fuels." Current data indicates capital costs that are neither aligned with Level 1 nor Level 2.[6] Therefore, the incremental cost for renewable fuel operation does not justify shifting these systems into another program incentive level. It is therefore appropriate to consider renewable fuel microturbines and engines as Level 3 technologies, eligible for the differential incentive described in this section.

Based on this information, we recommend the Commission allow Level 3-R projects, when operating on a renewable fuel, to be eligible for an incentive of $1.50/W up to 40 percent of system cost. The $/W limit was determined by computing 40 percent of the $/W average for the data points provided by Capstone in its reply comments ($3.74/W).

We recommend splitting the existing Level 3 into two sub-levels based on the fuel type used: Level 3-N (non-renewable fuel) and Level 3-R (renewable fuel). The creation of these sub-levels is based on the incremental incentive for renewable fuel units and additional recommended modifications to waste heat recovery and reliability criteria requirements for Level 3-R technologies as described in this report. Both sub-levels will draw on the same annual budget allocation for Level 3. For purposes of this report, and for recommended modifications to D.01-03-073, references to “Level 3” encompass both the 3-N and 3-R sub-levels.

[6] The dollar per Watt costs for Level 2 fuel cell projects range from $5.74 to $8.50, for an average of $6.87/W.

The program incentive matrix should be modified as follows:

Incentive category	Incentive offered	Maximum percentage of project cost	Minimum system size	Maximum system size	Eligible Technologies
Level 1	$4.50/W	50%	30 kW	1 MW	▪ Photovoltaics ▪ Fuel cells operating on renewable fuel ▪ Wind turbines
Level 2	$2.50/W	40%	None	1 MW	▪ Fuel cells operating on non-renewable fuel and utilizing sufficient waste heat recovery
Level 3-R	$1.50/W	40%	None	1 MW	▪ Microturbines operating on renewable fuel ▪ Internal combustion engines and small gas turbines operating on renewable fuel
Level 3-N	$1.00/W	30%	None	1 MW	▪ Microturbines operating on non-renewable fuel, utilizing sufficient waste heat recovery and meeting reliability criteria ▪ Internal combustion engines and small gas turbines operating on non-

					renewable fuel, both utilizing sufficient waste heat recovery and meeting reliability criteria

In creating Level 3-R, a new renewable category, the Commission will need to resolve an inconsistency that arises in the Decision:

> "Although the utilities may exercise full discretion in moving funds from non-renewable self-generation categories to the renewable category, a utility must seek approval through advice letter prior to shifting additional funds into either of the non-renewable categories." (p. 21).

We recommend that the Commission change the phrase "renewable category" to reflect the Level 1 incentive by making the following change:

> "Although the utilities may exercise full discretion in moving funds from the Level 2 and 3 incentive categories to Level 1, a utility must seek approval through advice letter prior to shifting additional funds into either the Level 2 or 3 categories."

The Commission should also affirm that the three-year warranty requirement for combustion technologies also applies to Level 3-R (specified in section 4.6.3 and Conclusion of Law 16).

Treating Fuel Clean-Up and Processing Costs

Self-generation technologies such as microturbines and engines are capable of burning waste gases to produce electricity. These gases are derived from landfills and digesters located at wastewater treatment plants, dairy farms, agricultural processing plants, and similar facilities. In order to turn these gases into a usable fuel for purpose of electrical generation, they require clean up to remove undesirable constituents that would damage the generation equipment. Such cleanup equipment

includes but is not limited to gas "skids," dryers/moisture removal, and siloxane removal towers.

Therefore, we recommend allowing Level 3-R technologies to include fuel cleanup equipment in the total project cost for purposes of computing the incentive payment. This equipment is typically an integral part of the generation facility package. The current program incentive structure allows fuel cells operating on a renewable fuel to include gas cleanup skids in the total project cost, and thus offers these systems a higher incentive than systems using natural gas. The Energy Division recommendations extend this approach to Level 3-R technologies.

Processing equipment for organic material in order to produce a usable fuel does not qualify as fuel cleanup equipment and therefore is not an eligible project cost. The organic waste itself cannot be used in any eligible technologies directly, and requires processing beyond gas cleanup in order to be used for electrical generation. Examples of such equipment are boilers, external combustion devices, and digesters (composting organic waste in an enclosed structure, capturing and piping the gas). These components are discrete and separate from the generation facility.

Because of the preference given in AB 970 to renewable and "super-clean" technologies, fuel cleanup and processing equipment for nonrenewable fuels, such as waste gases derived from fossil fuel drilling operations, and utilized in Level 3-N technologies, should not be eligible under the program's allowable project costs. Nothing in the record demonstrates that nonrenewable waste gases should qualify as "renewable" or "super-clean."

The Self-Generation Incentive Program presently has yielded limited data on fuel cleanup costs for renewable fuel self-generation units. This data suggests that the cost of fuel cleanup equipment ranges between 5 and 25 percent of the overall project cost. A customer's incentive eligibility is still limited to a percentage of total project cost, which limits the amount of program funds spent on this equipment. We believe it is reasonable to allow the fuel cleanup equipment costs for purposes of computing customer incentives. However, we advise the Commission to revisit this

issue after the annual program evaluations are completed. It may be appropriate at that time to limit the amount of allowable cleanup costs (e.g. as a percentage of total project cost) if those costs are unreasonably high.

Waste Heat Recovery Requirement for Renewable Fuel Units

We recommend waiving the waste heat recovery requirement for Level 3-R systems. Waste heat recovery is currently required for all existing Level 3 systems to mitigate concerns about offering incentives to nonrenewable technologies. Additionally, the adopted waste heat recovery standard references Public Utilities Code §218.5, which prescribes a formula that utilizes the value of "natural gas and oil energy input." The language proposed for "renewable fuel" in this document specifies that "[a] facility utilizing a renewable fuel may not use more than 25 percent fossil fuel annually." Since only the fossil fuel portion of the fuel input is used in the efficiency calculation, the result will exceed the 42.5 percent requirement, as evidenced by calculations of the program administrators. Waiving the waste heat recovery requirement for renewable-fuelled combustion technologies would follow the guidelines already established for renewable fuel cells.

3. Assurance that renewable fuel facilities would not later switch to a fossil fuel source

   The Commission seeks Energy Division's assistance to determine the likelihood that a facility that once qualifies for a "renewable fuel" incentive would not later switch to fossil fuel.

   While many such facilities are sited where a continuous source of renewable fuel is available, some may use natural gas to boost the heat content of the fuel. Some microturbines may perform initial startup using a fossil fuel input, then "back off" the fossil fuel for steady-state operation solely using the renewable fuel. Operation under these conditions would still allow the facility to meet the classification of renewable fuel proposed in Item 1 of this report. One microturbine manufacturer claims the unit's fuel control unit can increase the flow of gas to the turbine to compensate for the lower heat content of the

renewable fuel, thus allowing the unit to operate on a 100 percent renewable fuel source in steady state.

One microturbine manufacturer indicates minimal changes are required to alter its microturbine in order to accept a renewable fuel, and mostly involve a hardware change to the gas inlet and software changes to accommodate a different fuel flow rate (due to the higher heat content of natural gas). The reversion to natural gas operation would be a relatively simple procedure. However, switching to natural gas at a facility where a suitable flow rate of a renewable gas is available (such as a wastewater treatment plant, where the gas is produced as part of some other process) makes little economic sense to the customer. Therefore, we recommend requiring the program applicant to have suitable onsite renewable fuel (i.e. adequate flow rate) available for continuous operation of the self-generation unit.

The gas cleanup equipment used for the renewable fuel application is not required for natural gas operation. Given the cost of this equipment (limited data suggests between 5 and 25 percent of total project cost), its addition to the project likely would not favor natural gas operation on an economic basis. We recommend requiring the applicant to indicate the specific cost of any gas cleanup equipment to the program administrator in the project advancement stage of the application process. Currently, the applicant is required to submit an equipment purchase order within 90 calendar days of the date the program administrator issues a Conditional Reservation Letter. This purchase order should indicate the fuel cleanup equipment as a separate invoice item.

We recommend the program administrators develop an appropriate methodology to determine that a host customer has an adequate average flow rate of renewable fuel required to produce electricity at the self-generation unit's full rated capacity, or an appropriate de-rated capacity if supplemented with a fossil fuel. This information should be collected on the program application as well as verified during the on-site inspection prior to approval of the incentive. This process will ensure that self-generation units are adequately sized to operate on renewable fuel. The program administrators should ensure the fossil

fuel content does not exceed the proposed 25 percent threshold. Units whose annual fuel consumption exceeds the available renewable fuel plus the allowable nonrenewable supplement should not qualify for a differential incentive.

Capstone asserts in its petition that fuel source switching concerns can be addressed by incorporating a requirement for renewable fuel use in the unit warranty. While this requirement alone is not sufficient to prevent fuel source switching to natural gas, it may provide an additional assurance. We recommend requiring an affidavit from the applicant stating that the unit will comply with the program renewable fuel requirements, set forth in this report, for the duration of the incentive program (i.e. December 31, 2004) at minimum.

Since we offer a differential incentive to fuel cells operating on renewable fuel, the information and verification described in this section should be required of those applicants as well.

Compliance with the renewable fuel provisions should be monitored and evaluated under the annual program evaluation.[7] The program evaluation contract administrator should communicate this new evaluation scope for monitoring renewable fuel compliance to the selected contractor. The annual evaluation report will then provide the Commission with necessary information to determine whether fuel switching has occurred and to re-evaluate the renewable fuel incentive categories as needed. The approach should be sensible and not expend an undue amount of program funds.

4. Waiving Reliability Criteria for combustion technologies operating on a renewable fuel

Consistent with AB 970, D.01-03-073 requires that fossil-fired generators contribute to the reliability of the transmission or distribution system to qualify for incentives. The intent of the Decision is to require fossil-fuel

[7] The program administrators have jointly selected a single consultant to conduct the program evaluation.

generators to meet minimum efficiency standards and provide support to the T&D system. Any combustion technology must currently meet the efficiency standard (i.e. Public Utilities Code §218.5), although the Decision only applies the reliability criteria to *fossil*-fired generators:

> "In order to qualify for incentives, a fossil-fired facility must make a demonstrable contribution to the reliability of the transmission or distribution system. We expect the utilities to work with those customers seeking incentives for fossil-fueled facilities to determine whether a proposed facility will enhance transmission or distribution reliability and document those benefits prior to approving an incentive payment."
> (D.01-03-073, pp. 25-6)

Renewable fuel self-generation is not included in this classification, and thus should not be subject to the reliability requirement.

Summary of Recommendations

The Energy Division recommends the Commission take the following actions to address technologies operating on a renewable fuel for purposes of the Self-Generation Incentive Program.

1. Adopt the following language to describe a "renewable fuel":

> A renewable fuel is a non-fossil fuel resource other than those defined as conventional in Section 2805 of the Public Utilities Code, that can be categorized as one of the following: solar, wind, biomass, digester gas, or landfill gas. A facility utilizing a renewable fuel may not use more than 25 percent fossil fuel annually, as determined on a total energy input basis for the calendar year.

We note that organic material in a form that requires processing beyond the cleanup procedures described above does not constitute a renewable fuel for purposes of this program.

2. Allow combustion technologies, when operating on a renewable fuel, to be eligible for a new Level 3-R incentive (the lesser of $1.50/W or 40 percent of system cost). The program incentive matrix would be modified as shown in Item 2 in the report to split the existing Level 3 category into two sub-levels, 3-N (nonrenewable) and 3-R (renewable), to reflect the fuel type. It should be made clear that Level 3-R is a subset of Level 3 for purposes of budget allocation. Decision language allowing administrators to shift funds to the renewables category on page 21 would need to be modified with the addition of this technology category. We recommend the following language:

   > "Although the utilities may exercise full discretion in moving funds from the Level 2 and 3 incentive categories to Level 1, a utility must seek approval through advice letter prior to shifting additional funds into either the Level 2 or 3 categories."

3. Affirm that the three-year warranty requirement for combustion technologies also applies to Level 3-R.

4. Allow any eligible technology using a renewable fuel to include fuel cleanup equipment in the total project cost for purposes of computing the incentive payment. AB 970 gives preference to renewable and "super-clean" technologies. Therefore, fuel cleanup and processing equipment for waste gases derived from fossil fuel drilling operations should not be eligible under the program's allowable project costs. Processing equipment for organic material in order to produce a usable fuel does not qualify as fuel cleanup equipment and therefore is not an eligible project cost.

5. After the annual program evaluations are completed, the Commission should consider whether it is appropriate at that time to limit the amount of allowable fuel cleanup equipment costs.
6. Require applicants for the Level 3-R renewable fuel incentive and the Level 1 renewable fuel cell incentive to indicate the specific cost of any gas cleanup equipment to the program administrator in the project advancement stage of the application process. The applicant is currently required to submit an equipment purchase order within 90 calendar days of the date that the program administrator issues a Conditional Reservation Letter. This purchase order should indicate the fuel cleanup equipment as a separate invoice item.
7. Waive the waste heat recovery requirement for combustion-type self-generation systems operating on a renewable fuel.
8. Direct the program administrators to develop an appropriate methodology to determine that a host customer has an adequate average flow rate of renewable fuel in order to produce electricity at the self-generation unit's full rated capacity, or an appropriate derated capacity if supplemented with a fossil fuel. This information should be collected on the program application as well as verified during the on-site inspection prior to approval of the incentive. The program administrators should determine that the fossil fuel content does not exceed the 25 percent threshold. Units whose annual fuel consumption exceeds the available renewable fuel plus the allowable nonrenewable supplement should not qualify for a differential incentive. Since we offer a differential incentive to fuel cells operating on renewable fuel, this information and verification should be required of those applicants as well.
9. Require applicants for Level 3-R systems to submit an affidavit stating that the unit will comply with the program renewable fuel requirements for the duration of the incentive program (i.e. December 31, 2004) at minimum.

10. Clarify that the annual program evaluation should include compliance monitoring for renewable fuel use.

11. Level 3-R self-generation facilities should not be subject to the reliability requirement as set forth in D.01-03-073 for fossil-fueled facilities.

APPENDIX A TO ATTACHMENT 1

Self-Generation Incentive Program
Project Cost Data for Renewable Fuels Report

Summary prepared using March 2002 data

Level 1 Projects

	2001			2002		
			weighted			**weighted**
Administrator	**# apps**	**average**	**average**	**# apps**	**average**	**average**
PG&E	27	$9.18	2.986265	25	$8.33	2.509036
SCE	4	$9.24	0.445301	12	$10.88	1.573012
SDREO	5	$8.96	0.539759	3	$9.99	0.361084
SoCalGas	3	$8.15	0.294578	4	$9.09	0.438072
Total number applications:			83			
Sum of weighted averages:			**$9.15**			

Level 1 project specific data points not available. Average for Level 1 was computed using weighted averages for summary data supplied for program years 2001 and 2002.

Project No.	**$/W Cost**	**Administrator**
Level 2 Projects		
Project 1	$5.74	SCE
Project 2	$6.25	PG&E
Project 3	$6.99	'
Project 4	$8.50	'
4 projects	**$6.87**	**average**
Level 3 Projects		
Non-renewable fuel microturbines - SGIP data		
Project 1	$1.16	PG&E
Project 2	$3.35	'
Project 3	$3.50	'
Project 4	$5.05	'
Project 5	$1.60	SDREO
Project 6	$1.71	'
Project 7	$1.87	'
Project 8	$2.25	'
Project 9	$2.54	'
Project 10	$2.64	'

Project 11	$2.85	'				
Project 12	$3.14	'				
Project 13	$3.40	'				
Project 14	$3.43	'				
Project 15	$4.36	'				
Project 16	$5.64	'				
Project 17	$1.13	SoCal				
Project 18	$1.22	'				
Project 19	$1.40	'				
Project 20	$1.55	'				
Project 21	$2.00	'				
Project 22	$2.00	'				
Project 23	$2.11	'				
Project 24	$2.11	'				
Project 25	$2.14	'				
Project 26	$2.14	'				
Project 27	$3.47	'				
Project 28	$3.69	'				
Project 29	$3.84	'				
Project 30	$5.67	'				
30 projects	**$2.77**	**average**				
Renewable fuel microturbines - SGIP data						
Project 1	$2.59	SDREO				
Project 2	$3.08	'				
Project 3	$3.33	'				
Project 4	$4.33	PG&E				
4 projects	**$3.33**	**average**				
Renewable fuel microturbines - Capstone supplied bids						
Project 1	$3.27					
Project 2	$4.20					
2 projects	**$3.74**	**average**				