PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

ENERGY DIVISION

I.D. #6654
RESOLUTION E-4076
May 24, 2007

REDACTED

R E S O L U T I O N

Resolution E-4076. Pacific Gas and Electric (PG&E) Company requests approval of the BioEnergy renewable resource procurement contract. This contract is approved without modifications

By Advice Letter 2979-E filed on February 2, 2007

SUMMARY

PG&E's renewable contract, which relates to biogas injected into a Natural Gas Pipeline, complies with the Renewable Portfolio Standard (RPS) procurement guidelines and is approved

PG&E filed Advice Letter (AL) 2979-E on February 2, 2007, requesting Commission review and approval of a contract executed with BioEnergy. The Agreement between BioEnergy and PG&E is for 10 years of digester gas (biogas) production and delivery.

Generating Facility	Type	Term Years	MMBTUs	MWh	Online Date[1]	Location
BioEnergy	Digester Gas	10	≤ 8000	≤ 389,000	5/2010	Fresno, CA

Deliveries from this contract are reasonably priced, and the contract price is fully recoverable in rates over the life of the contract, subject to Commission review of PG&E's administration of the contracts.

Confidential information about the contract should remain confidential

This resolution finds that certain material filed under seal pursuant to Public Utilities (Pub. Util.) Code Section 583, General Order (G.O.) 66-C, and D.06-06-066 should be kept confidential to ensure that market sensitive data does not influence the behavior of bidders in future RPS solicitations.

[1] BioEnergy expects to begin initial delivery from Vintage Dairy in September, 2007.

BACKGROUND

The RPS Program requires each utility to increase the amount of renewable energy in its portfolio

The California Renewables Portfolio Standard (RPS) Program was established by Senate Bill 1078 (Chapter 516, statutes of 2002, effective January 1, 2003) and codified at California Public Utilities Code Section 399.11, et seq. The statute requires that a retail seller of electricity such as PG&E purchase a certain percentage of electricity generated by Eligible Renewable Energy Resources (ERR). Originally, each utility was required to increase its total procurement of ERRs by at least 1 percent of annual retail sales per year so that 20 percent of its retail sales are supplied by ERRs by 2017.

The State's Energy Action Plan (EAP) called for acceleration of this RPS goal to reach 20 percent by 2010[2]. This was reiterated again in the Order Instituting Rulemaking (R.04-04-026) issued on April 28, 2004[3], which encouraged the utilities to procure cost-effective renewable generation in excess of their RPS annual procurement targets[4] (APTs), in order to make progress towards the goal expressed in the EAP.[5] On September 26, 2006, Governor Schwarzenegger signed Senate Bill 107[6], which officially accelerates the State's RPS targets to 20 percent by 2010.

In response to SB 1078, the Commission has issued a series of decisions that establish the regulatory and transactional parameters of the utility renewables procurement program. On June 19, 2003, the Commission issued its "Order Initiating Implementation of the Senate Bill 1078 Renewable Portfolio Standard Program," D.03-06-071. On June 9, 2004, the Commission adopted its Market Price Referent methodology[7] for determining the Utility's share of the RPS seller's bid price, as defined in Public Utilities Code Sections 399.14(a)(2)(A) and 399.15(c). On the same day the Commission adopted standard terms and conditions for RPS power purchase agreements in D.04-06-014 as required by Public Utilities Code Section 399.14(a)(2)(D). Instructions for evaluating the value

[2] The Energy Action Plan was jointly adopted by the Commission, the California Energy Resources Conservation and Development Commission (CEC) and the California Power Authority (CPA). The Commission adopted the EAP on May 8, 2003.

[3] http://www.cpuc.ca.gov/Published/Final_decision/36206.htm

[4] APT - An LSE's APT for a given year is the amount of renewable generation an LSE must procure in order to meet the statutory requirement that it increase its total eligible renewable procurement by at least 1% of retail sales per year.

[5] Most recently reaffirmed in D.06-05-039

[6] SB 107, Chapter 464, Statutes of 2006

[7] D.04-07-015

of each offer to sell products requested in a RPS solicitation were provided in D.04-07-029.

In addition, the Commission established an APT for each utility, which consists of two separate components: the baseline, representing the amount of renewable generation a utility must retain in its portfolio to continue to satisfy its obligations under the RPS targets of previous years; and the incremental procurement target[8] (IPT), defined as at least one percent of the previous year's total retail electrical sales, including power sold to a utility's customers from its DWR contracts.

The Commission has established bilateral procurement guidelines for the RPS Program

The Commission has issued a series of decisions that establish the regulatory and transactional parameters of the utility renewables procurement program. On June 19, 2003, the Commission issued its "Order Initiating Implementation of the Senate Bill 1078 Renewable Portfolio Standard Program," D.03-06-071.

On June 9, 2004, the Commission adopted its Market Price Referent methodology[9] for determining the Utility's share of the RPS seller's bid price, as defined in Public Utilities Code Sections 399.14(a)(2)(A) and 399.15(c). On the same day the Commission adopted Standard Terms and Conditions for RPS power purchase agreements in D.04-06-014 as required by Public Utilities Code Section 399.14(a)(2)(D). Instructions for evaluating the value of each offer to sell products requested in a RPS solicitation were provided in D.04-07-029.

While the focus of the RPS program is procurement through competitive solicitations, D.03-06-071[10] allows for a utility and a generator to enter into bilateral contracts outside of the competitive solicitation process. Specifically, D.03-06-071 states that bilateral contracts will only be allowed if they do not require Public Goods Charge (PGC) funds.[11]

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[8]IPT - The incremental procurement target (IPT) represents the amount of RPS-eligible procurement that the LSE must purchase, in a given year, over and above the total amount the LSE was required to procure in the prior year. An LSE's IPT equals at least 1% of the previous year's total retail electrical sales, including power sold to a utility's customers from its DWR contracts

[9] D.04-06-015, http://www.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/37383.htm

[10] http://www.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/27360.htm

[11] SB 107 (Public Resources Code section 25473(b)(1)(F)) confirms that bilateral contracts cannot receive Supplemental Energy Payments (SEPs), stating that to receive SEPs a project must have resulted from a competitive solicitation.

In D.06-10-019, the Commission interprets D.03-06-071, stating that bilaterals are not eligible for Supplemental Energy Payments (SEPs), and that bilateral contracts must be deemed reasonable. Going forward, D.06-10-019 states that the Commission will look further at evaluation criteria for bilateral RPS contracts, including the issue of whether some RPS bilateral contracts should be eligible for SEPs, as SB 107 may allow[12]. However, in the interim, utilities' bilateral contracts can be evaluated prior to establishing formal evaluation criteria.

CEC certifies digester gas as RPS eligible

The California Energy Commission (CEC), in its Renewables Portfolio Standard (RPS) Eligibility Guidebook adopted March 14, 2007, determined that biogas, derived from digester gas, is an RPS eligible renewable energy resource[13].

> Biogas Injected into a Natural Gas Pipeline
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> RPS-eligible biogas (gas derived from RPS-eligible biomass or digester gas) injected into a natural gas transportation pipeline system and delivered into California for use in an RPS-certified hybrid facility may result in the generation of RPS-eligible electricity. The biogas must meet strict heat content and quality requirements within a narrow band of tolerance to qualify as pipeline-grade gas. Quantifying RPS-eligible energy production requires accurate metering of the volume of biogas injected into the transportation pipeline system and the measured heat content of the injected gas. Although blending the biogas into the transportation pipeline system mixes the biogas with other pipeline gas, natural gas regulations require gas entering the system to be "nominated" for use at a specific power plant or to a pipeline system owned by a publicly owned utility or other load-serving entity (LSE). Consequently, the amount and energy content of the biogas or other RPS-eligible gas produced can be measured and either nominated for use at a specific power plant or nominated to a pipeline system owned by an LSE. If the biogas is nominated to a pipeline system, the owner of the system must designate the facility in which the biogas will be used.
>
> The operator of a facility to which biogas is nominated (or designated) must certify its facility as RPS-eligible, recognizing that the facility will use a blend of RPS-eligible and ineligible fuel. The amount of RPS-eligible electricity produced shall be calculated by multiplying the generation of the facility (MWh) by the ratio of the biogas used and the total gas (biogas

[12] D.06-10-019 pp. 31-32.
[13] http://www.energy.ca.gov/2007publications/CEC-300-2007-006/CEC-300-2007-006-CMF.PDF

and natural gas) used by the facility. The electricity generated and gas use must be measured over an equal period (such as MWh produced per month and gas used per month).

Any production or acquisition of gas that is directly supplied to the gas transportation pipeline system and used to produce electricity may generate RPS-eligible electricity as follows:

1. The gas must be produced from an RPS-eligible resource, such as biomass or digester gas.

2. The gas must be injected into a natural gas pipeline system that is either within the WECC region or interconnected to a natural gas pipeline system in the WECC region that delivers gas into California.

3. The energy content produced and supplied to the transportation pipeline system must be measured and reported annually, disaggregated by month. Reporting shall be in units of energy (e.g. MMBtu) based on metering of gas volume and adjustment for measured heat content per volume. In addition, the total amount of gas used at the RPS-eligible facility must be reported in the same units measured over the same period and the electricity production must be reported in MWh.

4. The gas must be used at a facility that has been certified as RPS-eligible. As part of the application for certification, the applicant must attest that the RPS-eligible gas will be nominated to that facility or nominated to the LSE-owned pipeline serving the designated facility.

5. In its annual verification report, the Energy Commission will calculate the RPS eligible energy produced using the same methodology discussed above. When applying for RPS and SEP pre-certification, certification, or renewal, the application must include the following: (1) an attestation from the hybrid facility operator of its intent to procure biogas fuel that meets RPS eligibility criteria, and (2) an attestation from the fuel supplier that the fuel meets eligibility requirements.

PG&E requests approval of a renewable energy contract

On February 2, 2007, PG&E filed Advice Letter (AL) 2979-E requesting Commission approval of a renewable procurement contract between PG&E and BioEnergy. The contract results from bilateral negotiations and Commission approval of the contract will authorize PG&E to accept future deliveries of incremental supplies of renewable resources and contribute towards the 20

percent renewables procurement goal required by California's RPS statute.[14] Procurement from this the Proposed Agreement will contribute towards PG&E's APT starting in 2007.

PG&E requests final "CPUC Approval" of Contract

PG&E requests the Commission to issue a resolution containing the findings required by the definition of "CPUC Approval" in Appendix A of D.04-06-014. In addition, PG&E requests that the Commission issue a resolution that finds the following:

1. Approves this Contract in its entirety, including payments to be made by PG&E, subject to CPUC review of PG&E's administration of the agreement.
2. Finds that electricity generated through the use of the biogas procured under this Agreement is produced by an eligible renewable energy resource for purposes of determining PG&E's compliance with any obligation that it may have to procure eligible renewable energy resources pursuant to the California Renewables Portfolio Standard (Public Utilities Code Section 399.11 et seq.), D.03-06-071, or other applicable law, subject to CEC certification that the use of digester gas to generate electricity creates an eligible renewable energy resource as defined by Section 399.12 of the Public Utilities Code.
3. Finds that electricity generated through the use of the biogas procured under this Agreement constitutes incremental procurement or procurement for baseline replenishment by PG&E from an eligible renewable energy resource for purposes of determining PG&E's compliance with any obligation to increase its total procurement of eligible renewable energy resources that it may have pursuant to the California Renewables Portfolio Standard, CPUC D.03-06-071, or other applicable law, subject to CEC certification that the use of digester gas to generate electricity creates an eligible renewable energy resource as defined by Section 399.12 of the Public Utilities Code.
4. Finds that payments made under the Contract and any indirect costs of renewables procurement identified in Section 399.15(a)(2) shall be recovered in full over the life of the contracts in the Energy Resource Recovery Account as a utility fuel cost.

[14] California Public Utilities Code section 399.11 et seq., as interpreted by D.03-07-061, the "Order Initiating Implementation of the Senate Bill 1078 Renewables Portfolio Standard Program", and subsequent CPUC decisions in Rulemaking (R.) 04-04-026.

5. Finds that the costs associated with this Contract between PG&E and Sellers are reasonable and in the public interest.

PG&E's Procurement Review Group participated in review of the contracts

In D. 02-08-071, the Commission required each utility to establish a "Procurement Review Group" (PRG) whose members, subject to an appropriate non-disclosure agreement, would have the right to consult with the utilities and review the details of:

1. Overall transitional procurement strategy;
2. Proposed procurement processes including, but not limited to, RFO; and
3. Proposed procurement contracts before any of the contracts are submitted to the Commission for expedited review.

The PRG for PG&E consists of: California Department of Water Resources (DWR), the Commission's Energy Division, Natural Resources Defense Council (NRDC), Union of Concerned Scientists (UCS), Division of Ratepayer Advocates (DRA), and The Utility Reform Network (TURN).

PG&E briefed its PRG on July 19, 2006, on the prospect for dairies producing pipeline-quality biogas (digester gas) as a viable renewable resource. On September 25, 2006, PG&E confirmed that it was negotiating gas supply contracts with developers, and expanded on the statewide potential, and unique benefits of digester gas.

None of the PRG members have expressed any objection to the price or terms presented to them in connection with the Proposed Contract. Although Energy Division is a member of the PRG, it reserved its conclusions for review and recommendation on the contracts to the resolution process.

NOTICE

Notice of AL 2979-E was made by publication in the Commission's Daily Calendar. PG&E states that a copy of the Advice Letter was mailed and distributed in accordance with Section III-G of General Order 96-A.

PROTESTS

Advice Letter 2979-E was not protested.

DISCUSSION

Description of the project

The following table summarizes the substantive features of the Contract. See confidential Appendix A for a detailed discussion of contract terms and conditions:

Generating Facility	Type	Term Years	MMBTUs	MWh[15]	Online Date	Location
BioEnergy	Digester Gas	10	≤ 8000	≤ 389,000	5/2010	Fresno, CA

Contract is consistent with PG&E's CPUC adopted 2006 RPS Plan

California's RPS statute (SB 107) requires the Commission to review the results of a renewable energy resource solicitation submitted for approval by a utility. PG&E's 2006 RPS procurement plan (Plan) was approved by D.06-05-039 on May 25, 2006. In its 2006 Plan, PG&E stated goals of procuring approximately 1-2 percent of retail sales volume or between 700 and 1,400 GWh per year. Projects offering as-available, baseload, peaking and/or dispatchable deliveries by the start of 2008 were especially sought. BioEnergy fits PG&E's stated need for projects that offer baseload deliveries with a 2007on-line date.

Contract is consistent with RPS bilateral contracting guidelines

The proposed contract is consistent with Commission decisions regarding RPS bilateral contracts[16] as neither project seeks Supplemental Energy Payment (SEP) funds. They are ineligible for such awards because they did not result from a competitive solicitation[17].

The Commission intends to include more explicit standards and criteria for the reasonableness of RPS bilateral contracts in a decision in the near future. Until

[15] The calculation for annual deliveries in MWhs is: 8,000 MMBtu/day at 8,000 Btu/kWh Heat Rate = [(365 days/year)*(8,000 MMBtu)*(1,000,000 Btu/MMBtu)]/[(7,500 Btu/kWh)/(1000000 kWh/GWh)] = 365 GWh/year. (Assumes a heat rate of 7500MMBtu/kWh)

[16] "[The CPUC]…will allow prudent bilateral contracts only when such contracts do not require any PGC funds" (D.03-06-071 p. 59, CoL 31, OP 29).
"For now, utilities' bilateral RPS contracts, of any length, must be submitted for approval by advice letter. Such contracts are not subject to the MPR, which applies to solicitations, but they must be reasonable (D.03-06-017, *mimeo*., p. 59)… No bilateral contracts are currently eligible for SEPs" (D.06-10-019, pp.31-32).

[17] "[The CPUC]…will allow prudent bilateral contracts only when such contracts do not require any PGC funds" (D.03-06-071 p. 59). "Applicants for eligible renewable facilities must compete for NRFP funding [otherwise known as SEPs] by participating in competitive RPS solicitations held by PG&E, SCE and SDG&E." p. 3, CEC's New Renewable Facilities Program Guidebook, April 2006.

such decision is approved, the Commission will continue to consider the approval of RPS bilateral contracts on a case-by-case basis.

Contract Price is Reasonable

Energy Division staff administers price reasonableness review for bilateral contracts on a case-by-case basis, and finds this contract reasonable. Staff compared the contract price to the 10-year-fixed price for PG&E Citygate[18] at the time of contract execution. In addition to gas forecast price, PG&E included a value for the environmental attribute of a renewable gas product. Biogas, produced from dairy waste, is a new resource eligible for California's Renewables Portfolio Standard. The Commission may adopt a standard price reasonableness test for RPS gas contracts, the evaluation methodology used here is not precedent setting. See confidential Appendix B for a detailed discussion of contract price.

Consistency with Adopted Standard Terms and Conditions

In D.04-06-014, the Commission set forth standard terms and conditions to be incorporated into all RPS power purchase agreements. While AL 2979-E refers to the biogas contract as a power purchase agreement, no electricity is delivered under the contract. As such, we decline to require that the biogas contract strictly comply with D.04-06-014, specifically the Decision's "Definition and Ownership of RECs", at this time. Since the electricity that will be produced by combusting the biogas delivered under the contract must be RPS eligible, however, we require that the seller convey all environmental attributes necessary for the production of RECs, as they are defined in D.04-06-014 and PU Code §399.12(g)(2). See confidential Appendix A for a detailed discussion of the terms and conditions in the contract.

<u>"May Not be Modified" Terms</u>

The "Definition of Renewable Energy Credits (RECs) was adopted in D.04-06-014 pursuant to PUC § 399.12(g)(2) which defines:

> "Renewable energy credit" to include all renewable and environmental attributes **associated with the production of electricity** from the eligible renewable energy resource, except for an emissions reduction credit issued pursuant to Section 40709 of the Health and Safety Code and any credits or payments associated wit the reduction of solid waste and treatment

[18] PG&E Citygate price is the Henry Hub gas price plus transportation costs to "Citygate",defined as any point at which imported gas meets PG&E's local transmission and distribution system.

> benefits created by the utilization of biomass or biogas fuels. [emphasis added]

RECs, as statutorily defined, are not created until electricity is generated, therefore, biogas digesters, unlike wind turbines and geothermal facilities, have no RECs to convey. Since the biogas will be used to generate RPS eligible electricity, it is necessary that the contracts convey to PG&E any and all environmental attributes necessary to make the electricity RPS eligible. The contract conveys all "Gas Environmental Attributes", defined as follows:

> "Gas Environmental Attributes" means any and all credits, benefits, emissions reductions, offsets, and allowances, howsoever entitled, attributable to the production of Biogas, and its displacement of conventional fuel sources used to generate electricity. Gas Environmental Attributes include but are not limited to: (1) any avoided discharge of carbon dioxide (CO2), methane (CH4) and other greenhouse gases (GHGs) that have been determined b the United Nations Intergovernmental Panel on Climate Change to contribute to the actual or potential threat of altering the Earth's climate by trapping heat in the atmosphere, and (2) any avoided discharge of pollutants to the air, soil or water such as sulfur oxides (SOx), nitrogen oxides (NOx), carbon monoxide (CO) and other pollutants.

Any other environmental attributes that may be created from the gathering and production and use of biogas, "Additional Gas Environmental Attributes", are retained by the seller, and are defined in the contract as:

> Any and all credits, benefits, emissions reductions, offsets, reporting rights and allowances, however entitled, and whether or not tradable, that are attributable to the generation of electricity using Biogas, but those which are in addition to those qualifying as a Gas Environmental Attributes . . . For the avoidance of doubt, any of the foregoing that relate back in any way in calculation of their value to a date prior to the Effective Date may not be counted as Additional Gas Environmental Attributes. Additional Gas Environmental Attributes shall not include emissions reduction credits encumbered or used by Seller in order to remain in compliance with local, state or federal laws governing the production of Biogas at the Site(s).

The relationship between RPS eligibility and/or compliance requirements, and Additional Gas Environmental Attributes, is an open question that will be developed by the state at a future time, and is not addressed in this resolution. Furthermore, the relationship between RECs and any carbon attributes may be generated as a result of the conversion of manure to biogas is an unsettled question of policy that may be addressed in a future Commission proceeding. We approve the contract without prejudging these policy matters and with the understanding that RECs may include carbon allowances or offsets generated by the biogas conversion process.

The Commission, in coordination with other state agencies, is in the process of developing a recommendation for the implementation of AB 32 as it applies to the electricity and natural gas sectors. In R.06-04-009, the Greenhouse Gas Proceeding, the Commission will address whether utilities will be permitted to procure offsets to meet their GHG reduction targets. We decline, therefore, to make a determination on this issue at this time.

For further clarification, we include the non-modifiable standard term "Definition and Ownership of RECs" as modified by Decision D.07-02-011.[19]

> " 'Green Attributes' means any and all credits, benefits, emissions reductions, offsets, and allowances, howsoever entitled, attributable to the generation from the Project, and its displacement of conventional Energy generation. Green Attributes include but are not limited to: (1) any avoided emissions of pollutants to the air, soil or water such as sulfur oxides (SOx), nitrogen oxides (NOx), carbon monoxide (CO) and other pollutants; (2) any avoided emissions of carbon dioxide (CO2), methane (CH4), nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride and other greenhouse gases (GHGs) that have been determined by the United Nations Intergovernmental Panel on Climate Change, or otherwise by law, to contribute to the actual or potential threat of altering the Earth's climate by trapping heat in the atmosphere; (3) the reporting rights to these avoided emissions, such as Green Tag Reporting Rights and Renewable Energy Credits. Green Tag Reporting Rights are the right of a Green Tag Purchaser to report the ownership of accumulated Green Tags in compliance with federal or state law, if applicable, and to a federal or state agency or any other party at the Green Tag Purchaser's discretion, and include without

[19] D.07-02-011, "Opinion Conditionally Accepting Procurement Plans For 2007 RPS Solicitations" http://www.cpuc.ca.gov/WORD_PDF/FINAL_DECISION/64640.PDF

limitation those Green Tag Reporting Rights accruing under Section 1605(b) of The Energy Policy Act of 1992 and any present or future federal, state, or local law, regulation or bill, and international or foreign emissions trading program. Green Tags are accumulated on a MWh basis and one Green Tag represents the Green Attributes associated with one (1) MWh of Energy. Green Attributes do not include (i) any energy, capacity, reliability or other power attributes from the Project, (ii) production tax credits associated with the construction or operation of the Project and other financial incentives in the form of credits, reductions, or allowances associated with the project that are applicable to a state or federal income taxation obligation, (iii) fuel-related subsidies or "tipping fees" that may be paid to Seller to accept certain fuels, or local subsidies received by the generator for the destruction of particular preexisting pollutants or the promotion of local environmental benefits, or (iv) emission reduction credits encumbered or used by the Project for compliance with local, state, or federal operating and/or air quality permits. If the Project is a biomass or landfill gas facility and Seller receives any tradable Green Attributes based on the greenhouse gas reduction benefits or other emission offsets attributed to its fuel usage, it shall provide Buyer with sufficient Green Attributes to ensure that there are zero net emissions associated with the production of electricity from the Project."

"3.4 Green Attributes. Seller hereby provides and conveys all Green Attributes from the Unit(s) to Buyer as part of the Product being delivered, as such term is described in the applicable Transaction confirmation for the period set forth in such confirmation. Seller represents and warrants that Seller holds the rights to all Green Attributes from the Unit(s), and Seller agrees to convey and hereby conveys all such Green Attributes to Buyer as included in the delivery of the Product from the Unit(s)."[20]

[20] A letter dated April 17, 2007, was sent to the Commission's Executive Director and served on the service list, consistent with Rule 16.5, by Green Power Institute (GPI), Pacific Gas and Electric Company (PG&E), San Diego Gas & Electric Company, and The Utility Reform Network. The letter alerts the Commission of a possible inadvertent error involving the definition of "Green Attributes" as modified by D.07-02-011. The discrepancy in language is considered to better define the terms, and is not considered a substantive change. At the time this resolution is being written, the Commission has not ruled on the letter.

"May be Modified" Terms

Some commercially reasonable modifications were mutually agreed to during the negotiations of the contract.

Contract is a viable project

PG&E believes an abundance of fuel and the use of proven technology make the project viable

Project Milestones

The contract identifies agreed upon project milestones.

Sponsor's creditworthiness and experience

The Proposed Agreement contains performance assurances intended to motivate the developer to perform in accordance with all terms and conditions.

David Albers, president of BioEnergy Solutions, a Central Valley waste-to-company, has 30 years of commercial experience in the dairy industry and agriculture business. While this project will be BioEnergy's first of its kind, PG&E believes the developers' experience significantly contributes to the viability of this project.

Technology

A. Anaerobic Digestion

Anaerobic digester systems have been used for decades at municipal wastewater facilities, and more recently have been applied to industrial and agricultural wastes. Vintage Dairy will utilize a Covered Lagoon Digester System (Digester). Vintage Dairy houses its cows indoors where waste is flushed into the Digester several times per day. As the manure is anaerobically digested by bacteria at the bottom of the lagoon, methane is produced and is trapped underneath a floating cover, collected, and piped into a cleaning system[21].

B. Biogas Cleaning System[22]

1. Initial Gas Compression and H2S Removal

[21] http://www.coalinfo.net.cn/coalbed/meeting/2203/papers/agriculture/AG079.pdf

[22] Sourced from Honeywell

- The gas is recovered from the digester at low pressure. For a lagoon covered by a membrane, the pressure under the cover varies from slightly negative to possibly 0.25 inches of water positive. Gas flow is provided by the initial compression device, in this case GC103, a roots type blower. This blower can provide vacuum to move the gas from under the cover through the iron sponge unit. The iron sponge unit typically requires 6 inches of pressure drop to move gas through the iron sponge bed.
- The complete gas train, with all unit operations and equipment as described here, is sized for a maximum raw biogas flow of approximately 230 cfm. This translates to a daily methane flow of 200,000 cfd of methane. The process flow would be similar for other raw gas flow rates; however, unit sizes and horsepower would vary.
- The iron sponge unit, in this case a vessel 10 ft. in diameter with a 10 ft. sidewall and removable lid, is built to function in an outdoor environment. The vessel is constructed of low-flame spread resin and fiberglass for corrosion resistance. The iron sponge's bed/filter material is made of wood chips saturated with iron oxide. This technology has been used to clean H_2S from gases for over 100 years and the materials it uses are biodegradable.
- Before cleaning, the raw biogas typically contains 2500 ppmv of H_2S, 40% $C0_2$ by volume, with the balance of gas methane, CH_4. The raw biogas is saturated with moisture and has significant particulate (as received from the lagoon).
- After passing through the 8-foot deep iron sponge bed, most of the particulate will be filtered out. The iron sponge bed also removes water particulates.
- Following its pass through the iron sponge bed, the gas is pressurized to approximately 10 psig by a roots-blower type gas compressor and flows to the CO_2 scrubber system for final cleaning. If the CO_2 scrubber cannot accept the pressurized gas, a gas regulator directs it to an auto-ignition flare for disposal.

2. CO_2 Scrubber and Compression System

- Before the gas enters the CO_2 scrubber and final compression system, it passes through a KO (knock out) pot where liquid water is removed. The gas is now admitted into the first two-stage compressor, where it is elevated in pressure from 5 psig in the first stage to approximately 40 psig in the intermediate area.
- The 40 psig gas is cooled by passing through an air-cooled intercooler; liquid condensed after this cooler is removed with a drip trap. The gas then goes to the second stage of compression where the pressure is raised to 200 psig, and again the gas is cooled and liquids are removed.
- The two-stage compressor is powered by a 60-horsepower electric motor and is driven by a variable-frequency drive to allow for flow rate variations in the system.
- The 200 psig gas is then admitted to another single-stage compressor (40 HP) where the pressure is raised to 670 psig. After compression the gas passes through a pre-filter for particulate removal and is then admitted into the CO_2 scrubber's Seperax Membrane filter system.

3. Seperax Membrane Filter System

- The Seperax Membrane is a spiral-wound membrane which separates the $C0_2$, H_2S and water vapor from the CH_4. Essentially, the raw gas is admitted to the filter at 670 psig, while the CH_4 is rejected by the filter and exits at 660 psig (approximate utility pipeline pressure). The other gases are retained by the filter, then exit the filter at atmospheric pressure and are vented to the atmosphere or applied to onsite applications.
- The membrane is designed to retain 95 percent of the unwanted gases, and therefore, if the $C0_2$ initial concentration is 40% by volume, the product gas will contain 2% $C0_2$ by volume. Similar reductions of 95% are experienced by the other gases and water vapor. The outlet concentration of H_2S, based on an inlet concentration of 30 ppmv, would then be 1.5 ppm.

4. Final Gas Drying and QA/QC

- After gas cleaning treatment is completed, the gas is further dried by passing through a zeolite-type gas dryer to reduce the dew point to below the utility's pipeline requirements.
- The scrubbed gas is sampled by QA/AC instrumentation to assure the final biogas product meets the utility's pipeline specifications. If gas falls below pipeline minimums, the system would be shut down and the gas would be redirected to the flare system described above. If all systems were inoperable, gas would be vented from the lagoon cover.

Interconnection with PG&E's Gas Transmission System

In order to be accepted into PG&E's Gas Distribution System (System), the facility must meet Rule 21 requirements, of which pressurization is pertinent[23]. The dairy interconnection agreements are standard agreements and apply to all parties with no exceptions. PG&E will provide the tap, metering, and installation for no charge, provided Seller achieves negotiated milestones. PG&E will provide the test equipment for assessing the quality of the gas being injected into the pipeline. Biogas is required to meet PG&E's Gas Rule 21, Section C, which defines eligible-gas qualifications. Pursuant to PG&E's Gas Rule 21, Section C, the biogas may not exceed 1% carbon dioxide (CO_2) and 4 parts per million (ppm) hydrogen sulphide (H_2S)[24]. If the gas fails to meet PG&E gas quality standards, the gas will be diverted to a flare to be combusted on-site.

Fuel Supply

Vintage Dairy estimates its 3,000 dairy cows will produce approximately 200 MMBtu/day.

The CEC provides the following biogas production formula:

DAIRY POWER PRODUCTION PROGRAM - Supported by the California Energy Commission[25]

Step 1: How much biogas can be produced from a farm with 1000 dairy cows?

Assumptions:

1. One dairy cow weighting 1000 lbs generates 10 lbs (dry weight) of volatile solids (VS) per day (Source: American Society of Agricultural Engineering Standard).

[23] California Electric Rule 21 - Generating Facilities Interconnections
[24] http://www.pge.com/tariffs/
[25] http://www.energy.ca.gov/pier/renewable/documents/dairy_calc.doc

2. 60% of VS can be degraded during anaerobic digestion process.
3. 12ft^3 of biogas can be generated per pound of VS destroyed.

$$1000cow \times 10\frac{lbs(VS)}{cow-day} \times 60\% \frac{lb(VS)destoryed}{lb(VS)} \times 12\frac{ft^3 biogas}{lb(VS)destroyed}$$
$$= 72000\, ft^3 biogas / day$$

Step 2: What is the Btu content for the biogas produced from a farm with 1000 cows?

Assumptions:

1. Methane content in biogas is about 50%.
2. Energy content of methane is 1000 Btu/ft^3

BTU content of the biogas produced:

$$= 72000\frac{ft^3 biogas}{day} \times 50\% \frac{ft^3 methane}{ft^3 biogas} \times 1000\frac{Btu}{ft^3 methane}$$
$$= 36{,}000{,}000 Btu / day$$

Production Tax Credit

The contract is not contingent upon, nor is the pricing dependent on, the extension of federal production tax credits as provided in Section 45 of the Internal Revenue Code of 1986, as amended.

Mobilization among State Agencies and Stakeholders

The gathering and production of biogas at dairies has support from state regulators, permitting agencies, and stakeholders for its environmental and economic benefits.

Processing animal manure using anaerobic digestion (AD) is an efficient means of managing solid waste; it can also solve potential air and water quality problems brought about by waste disposal, and it produces biogas, which is a source of renewable energy. Thus, AD can address both environmental and energy concerns. [26]

Confidential information about the contracts should remain confidential

[26] http://www.energy.ca.gov/2006publications/CEC-500-2006-115/CEC-500-2006-115B.PDF

Certain contract details were filed by PG&E under confidential seal. Energy Division recommends that certain material filed under seal pursuant to Public Utilities (Pub. Util.) Code Section 583 and General Order (G.O.) 66-C, and considered for possible disclosure, should be kept confidential to ensure that market sensitive data does not influence the behavior of bidders in future RPS solicitations.

COMMENTS

This is an uncontested matter in which the decision grants the requested relief. Therefore, pursuant to Public Utilities Code § 311(g)(2), the otherwise applicable 30-day period for public review and comment is being waived.

FINDINGS OF FACT

1. The RPS Program requires each utility, including PG&E, to increase the amount of renewable energy in its portfolio to 20 percent by 2010, increasing by a minimum of one percent per year.
2. D.04-06-014 set forth standard terms and conditions to be incorporated into RPS Power Purchase Agreements.
3. The contract is for the purchase of biogas and not electricity.
4. The Seller conveys to PG&E any and all Additional Gas Environmental Attributes that may be required for the electricity generated from the biogas supplied to be RPS eligible.
5. D.06-05-039 directed the utilities to issue their 2006 renewable RFOs, consistent with their renewable procurement plans.
6. The contract is consistent with commission rules regarding bilateral RPS contracts, is reasonably priced and is consistent with applicable adopted standard terms and conditions.
7. The price reasonableness evaluation discussed in this resolution does not set a precedent for Commission review of RPS eligible biogas contracts.
8. The Commission required each utility to establish a Procurement Review Group (PRG) to review the utilities' interim procurement needs and strategy, proposed procurement process, and selected contracts.
9. PG&E filed Advice Letter 2979-E on February 2, 2007, requesting Commission review and approval of a renewable energy contract with BioEnergy.

10. PG&E briefed its Procurement Review Group on July 19, 2006, and September 25, 2006 on issues related to digester gas as a renewable resource, and its contract negotiations with biogas developers.

11. The Commission has reviewed the proposed contract and finds it to be consistent with PG&E's approved 2006 renewable procurement plan.

CONCLUSIONS OF LAW

1. The Commission has reviewed the proposed contract and finds it to be consistent with PG&E's approved 2006 renewable procurement plan.
2. The Standard Terms & Conditions adopted in D.04-06-014 were developed specifically for Power Purchase Agreements.
3. Electricity generated from the biogas delivered under the contract will be RPS eligible.
4. The contract does not include RECs but does include the underlying environmental attributes necessary for the creation of RECs.
5. The costs of the contract between PG&E and Seller(s) are reasonable and in the public interest; accordingly, the payments to be made by PG&E, other than those made for the purchase of Additional Gas Environmental Attributes, are fully recoverable in rates over the life of the project, subject to CPUC review of PG&E's administration of the contract.
6. Certain material filed under seal pursuant to Public Utilities (Pub. Util.) Code Section 583 and General Order (G.O.) 66-C, and considered for possible disclosure, should not be disclosed. Accordingly, the confidential appendices, marked "**[REDACTED]**" in the redacted copy, should not be made public upon Commission approval of this resolution.
7. Procurement pursuant to this Agreement is procurement from an eligible renewable energy resource for purposes of determining Buyer's compliance with any obligation that it may have to procure eligible renewable energy resources pursuant to the California Renewables Portfolio Standard (Public Utilities Code Section 399.11 et seq.), Decision 03-06-071, or other applicable law.
8. The relationship between RPS eligibility and/or compliance, and Additional Gas Environmental Attributes, is an open question of policy that may be developed by the Commission in a future proceeding, and is not addressed in this resolution.

9. The reasonableness of PG&E's option to purchase Additional Gas Environmental Attributes is conditional on questions of policy that will be addressed in R.06-04-009 or other future proceedings.

10. The Commission, in coordination with other state agencies, is in the process of developing a recommendation for the implementation of Assembly Bill 32 as it applies to the electricity and natural gas sectors. Rate recovery for the exercise of PG&E's option to purchase Additional Gas Environmental Attributes is not approved by this resolution.

11. Procurement pursuant to this Agreement constitutes incremental procurement or procurement for baseline replenishment by Buyer from an eligible renewable energy resource for purposes of determining Buyer's compliance with any obligation to increase its total procurement of eligible renewable energy resources that it may have pursuant to the California Renewables Portfolio Standard, CPUC Decision 03-06-071, or other applicable law;

12. Any indirect costs of renewables procurement identified in Section 399.15(a)(2) shall be recovered in rates;

13. AL 2979-E should be approved without modifications.

THEREFORE IT IS ORDERED THAT:

1. Advice Letter AL 2979-E is approved without modifications.

2. The costs of the contract between PG&E and Seller is reasonable and in the public interest; accordingly, the payments to be made by PG&E, other than those incurred through exercising the option to purchase Additional Gas Environmental Attributes, are fully recoverable in rates over the life of the project, subject to CPUC review of PG&E's administration of the contract.

3. Not with standing ordering Paragraph #2, approval of this contract is conditional on Seller conveying to PG&E any and all Additional Gas Environmental Attributes that may be necessary for electricity generated from the use of the biogas supplied to qualify as RPS eligible generation.

4. This Resolution is effective today.

I certify that the foregoing resolution was duly introduced, passed and adopted at a conference of the Public Utilities Commission of the State of California held on May 24, 2007; the following Commissioners voting favorably thereon:

_____
PAUL CLANON
Executive Director

Confidential Appendix A

Contract Summary: BioEnergy

Confidential Appendix B

Contract Price Analysis

Confidential Appendix C

Project Viability Matrix

Confidential Appendix D

Contribution to RPS Goal