

Final Workshop Summary
2006 California Geothermal RPS Workshop
Davis, California
May 24, 2006

California Geothermal Energy Collaborative
P.O. Box 1677
Davis, CA 95617

Prepared by:
Davis Power Consultants
2980 E. Capitol Expressway
Suite 50-309
San Jose, CA 95148
<http://www.davispower.com>

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Updated and Edited by:
Geothermal Education Office
664 Hilary Drive
Tiburon, CA, 94920
<http://www.geothermal.marin.org>

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1. OVERVIEW

On May 24, 2006, the California Geothermal Energy Collaborative (CGEC) conducted a RPS Workshop, funded by the California Energy Commission (CEC). The meeting was held at the UC Davis Alumni and Visitor's Center in Davis, California. The purpose of the workshop was to bring together California's governmental agencies, utilities, and industry leaders to examine how the RPS Program is functioning in the geothermal industry and what suggestions can be made for improvement. Each party brought its own viewpoint to the table, and through interactive discussions, developed shared ideas for streamlining California's RPS program for geothermal power development.

The objectives of the workshop were carried out through presentations and facilitated discussion sessions. The following sections summarize these presentations and discussions. Over 30 people attended the workshop. The meeting agenda is provided as Appendix A, the attendee sign-in list is provided as Appendix B, and a summary of the meeting evaluations is included as Appendix C. Copies of all the presentations provided at the RPS Workshop can be found on the CGEC website at <http://cgec.ucdavis.edu/>

2. RPS SUMMARY

Jack Pigott, Director of Renewable Affairs at Calpine Corporation welcomed the attendees to the 2006 RPS Workshop, thanking the group for their efforts over the past year in support of the Geothermal Collaborative. He gave an overview of California RPS law, explaining that it was active in 2002, with SB 1078 which became effective in 2003. This law required load serving entities to have 20% of their generation comprised of renewable resources by 2017 – which was accelerated to 20% by 2010. Mr. Pigott introduced the members of the first session for the Utility and Industry Panel and Discussion including members of the three major California IOUs.

2.1 Session One – Utility and Industry Panel and Discussion

2.1.1 Steve Yasko, San Diego Gas and Electric (SDGE)

Steve Yasko representing San Diego Gas and Electric began the RPS presentations. SDG&E has a 1.3 million-customer base, smallest of the Investor Owned Utilities (IOUs). Its service territory covers 4,100 sq. miles. In 2005, it had electric sales of 19,124 GWh and a peak demand of 4,058 MW. SDG&E's RPS position as of May 2006 is 7.9% of signed CPUC approved renewable generation. It also has 4.3% pending approval, bringing total 2010 contribution to 12.2%, with geothermal making up 0.9% of the renewable mix. The Esmerelda Project in the Imperial Valley would raise the total, perhaps to 20%. There is a gap between what they signed up and what is currently online, because these projects are predicated on transmission, transmission, and more

transmission and are based on Sunrise and Greenlines coming from the Imperial Irrigation District (IID). SDG&E has to rely on additional sources outside their service territory for power generation. Mr. Yasko expressed the view that there is not a lot of geothermal resource in the SDG&E area.

2.1.2 Mark Irwin, Southern California Edison (SCE)

Mark Irwin, Manager of Renewable Planning and Procurement gave an overview on Southern California Edison. SCE encompasses much of the southern part of the state of California serving 4.6 million customers. It covers 50,000 sq. miles and has 14,041 employees. In 2005, it had 13 billion renewable kWh and a 21,934 MW peak demand. SCE's generating capacity resources in 2005 were 10,536 MW. SCE's renewable generation mix is dominated by geothermal (60%), then wind (19%), biomass (9%), small hydro (7%), and solar (5%). SCE is currently negotiating contracts and has various renewable contracts signed.

Some upcoming activities for SCE are: RFP to be issued, and a Request for Information (RFI), to see what others are developing and what major transmission projects may be needed. The roadblock is timing with transmission. Mr. Irwin posed the question: "What is the next big transmission project after Tehachapi?" His answer was to look towards eastern California and western Nevada.

2.1.3 Charles Post, Pacific Gas and Electric (PG&E)

Charles Post from Pacific Gas and Electric explained that to date, PG&E has added about 670 MW of 2006 procurement activities, two of them being geothermal projects. PG&E likes the idea of the resource being a base load, but price matters during head-to-head comparison. Technology's bids were various renewables. PG&E has signed projects north and west for geothermal and wind. Mr. Post expressed the view that there was not a tremendous amount of renewable sources in the PG&E service territory, but it is always looking for base load, peaking, and dispatchable units. Some major contract terms were fixed, per unit, for terms of 10-20 years. The next PG&E RPS solicitation will be June 8, 2006.

PG&E's 2005 Protocol and Contract is available at:

http://www.pge.com/suppliers_purchasing/wholesale_electric_supplier_solicitation/renewables2005.html

2.1.4 Dan Schochet, ORMAT of Nevada

Dan Schochet, from the Nevada office of ORMAT began his presentation with a short company profile. ORMAT started in 1965 as a solar energy company. In the geothermal resource field, the company began as a technology supplier to other companies. ORMAT was directly involved in installing a 1 MW geothermal plant in Wabuska, NV in 1984 and now has about 750 MW of power generation in 21 countries, 200 MW in the U.S. ORMAT's field-proven technology has modular plants that range from .3MW to 130 MW. ORMAT is attempting to do heat recovery in existing plants, as well as, attempting to build a 5 MW plant that will be unattended and will be considered green for the RPS. To date, ORMAT has financed or participated in financing of over 1.5B\$ in IPP and project financing.

ORMAT became a plant operator in the beginning of 2001, when it acquired the Brady Project, Desert Peak, East Mesa Project (flash technology), Heber plant, and the Puna Project (developed and built for Constellation Energy). With improvements to these plants and a new plant addition at Steamboat they have 250 MW net onto the grid. Most of these power plants are binary based. All turbines are 1800 RPMs; that reduces bearing and maintenance costs, as compared with low speed turbines. Ormat also utilizes the Combined Cycle Geo Power Plants.

2.1.5 Jonathan Weisgall, MidAmerican Energy Holdings (parent of CalEnergy)

Jonathan Weisgall said that MidAmerican Holding Company is a large, diversified energy company. It started with a small renewable contract at Coso, and now has seven different platforms, two IOUs, including PacifiCorp, two natural gas pipelines, a large distribution, etc. Geothermal is a small part of its current operations. MidAmerican has upwards of 18,000 employees and 20 billion in assets. CalEnergy, the geothermal subsidiary of MidAmerican, has ten geothermal power plants, including operations in the Salton Sea area and plants in the Philippines. It has a permit to build a 250 MW geothermal plant at the Salton Sea in Imperial County that has been stalled for a variety of reasons. This would represent a huge plant for geothermal.

Mr. Weisgall said that in the late 90's, MidAmerican watched Calpine soar. Soon thereafter Warren Buffet's company, Berkshire Hathaway, bought into MidAmerican and took it private. Since geothermal development is a long term process, quarterly results are unimpressive. Today MidAmerican is doing some domestic geothermal work, mostly in Utah. However, as a holding company, it has 3000 MW of generation from geothermal, wind and solar, comprising some 15% of its portfolio. One current issue is the cost of transmission. MidAmerican prefers to negotiate with utilities, rather than bidding. Two and half years ago, there was no wind power generation in Iowa, but MidAmerican now has 260 MW and 545 MW of prospective generation. The company is frustrated in its attempts to develop renewables in California.

2.1.6 Steve Munson, Vulcan Power Company

Steve Munson started with facts about Vulcan Power Company, explaining that it consists of a team of scientists, managers, and engineers with combined experience in the development of over 700 MW of geothermal. Vulcan is evolving into a project developer. It has 120, 000 acres in the states of Nevada, California, Oregon, and Arizona. Vulcan has been an exploration company for a long time with 50% issued leases, 30% expected leases issued by August 2006. By late 2006, Vulcan Power expected another 40,000 acres to be acquired in Nevada. It and its predecessors have expended over \$50 million to date on geothermal exploration. It is currently conducting Nevada field operations and filing development plans.

Vulcan has a projected drilling program. Mr. Munson spoke of an agreement for drill rigs; development financing from European bankers with nine-figure project debt rights; and a nine-figure institutional private placement underway. Vulcan has also worked with others at Mt. Shasta on a native plant restoration and native culture restoration project. It

has four executed power agreements: 120 MW of geothermal from NV to SCE, 22 MW of biomass in Sierra foothills to SCE, 20 MW of geothermal from CA and OR to PG&E (up to 120 MW), and 40 MW of biomass from OR to PG&E.

2.2 Panel Discussion:

The following summarizes the discussion between the panelists in the morning session:

2.2.1 Land Procurement, Licensing

Mr. Munson commented that acquiring leases in Nevada and getting them turned into geothermal leases takes a lot of time and effort:

Mr. Schochet also commented that resource confirmation is an expense that carries with it high risk. Ormat's philosophy is to get online as soon as possible. What does it take to do a 25 MW project to resource confirmation -- 2.5 to 10 million dollars, and that is the hardest money to raise. Production wells, that are \$ 1 million to \$2 million and provide 3MW to 5MW each, would have a timetable of about 36 months. Financing the geothermal construction is difficult. Equity investment is about 30%, and returns are targeted in the high teens. Geothermal projects are capital intensive and have their issues. He has recommended to DOE that they reinstate their loan guarantee program.

Where developers have created a market and demonstrated a viable resource, they are confident of obtaining power purchase agreement (PPAs). The industry needs a higher standard of performance. For true integrated resource planning, when a developer applies for a PPA, it should have a bankable reservoir report.

One way to reduce risk is to negotiate contracts for development at alternative sites. In that way contracting parties can expend funds with the expectation that one or more sites will be productive. Both the developer and the purchaser can protect themselves with appropriate conditions.

Mr. Munson, in a response to a question about how a project north of Mt. Shasta might be received, said the area is 30 miles from Medicine Lake. Vulcan has undertaken a proactive and transparent approach. The project area is contained within an area on the north flank, near Military Pass Road near Weed. Access is by Highway 97, immediately on west side of the railroad. It is covered by a dying forest afflicted with blight. New plantation seedlings died four years in a row – perhaps related to global warming. Vulcan has run ethnology studies. It is working with the Shasta tribe and on Native American and native plant restoration projects. Five years ago Vulcan gave up 4000 acres of geothermal leases near Panther Meadow due to sensitivity.

2.2.2 Production Tax Credit (PTC) and Renewable Portfolio Standard (RPS)

Mr. Weisgall spoke of the Production Tax Credit (PTC) as an integral component of a project (such as at the Salton Sea, where resources are expensive to develop). Mr. Munson stated their projects were not reliant on a PTC. Mr. Schochet noted that with levelized costs, life-cycle costs, geothermal is competitive.

Mr. Weisgall noted that with the PTC you don't get a credit until you've actually built a plant. In his opinion it is as good a tax as can be imposed. Wind has had a PTC since 1992. It has expired three separate times and led to boom and bust cycle in wind. 360 MW in wind contracts were contingent on a PTC as a driver. Geothermal was eligible for the production tax credit in 2004 and at the Salton Sea, it is a major driver. All renewables need to all be on the same footing. The placed-in-service date of 12-31-07 works for wind, which moves very quickly. Mr. Weisgall suggested that changes in the 10-year PTC program could allow that, if you miss the in-service date by a year, you only get 9 years of a PTC, if you miss by 2 years, you get a PTC for 8 years. It's more valuable in the years 1, 2 and 3 than in years 8, 9 and 10.

He stated that using the analogy of the carrot and the stick that ultimately, as a developer, the carrot approach (PTC) is a better one. The Renewable Portfolio Standard (RPS) is seen as the stick.

Mr. Schochet commented that, without an RPS, only fossil fuel plants will get built. States without RPSs only have wind. An RPS encourages the investment community – the PTC provides the carrot.

Mr. Munson noted that utilities have opposed RPSs in some states.

2.2.3 Request for Offer Process and Future Markets

Mr. Post noted that to meet the RPS obligations, utilities must issue a Request for Offers. Bottom line: give developers eight weeks to respond, bid to the contract, submit an offer, create and submit a shortlist, and hope to sign on with everyone on the short list. Brings everything to a set time – otherwise how would you compare. There are procurement Review Groups - least cost/best fit analyses. All IOUs have interveners; TURN, CEC, CPUC, acting in the interests of ratepayers – not renewables at any cost.

There were comments on the timing and cost involved in geothermal projects – oil and gas projects can get dollars back in 6 months – in geothermal, it can be as much as ten years.

The Western Governors' Association Report predicts a total estimated, near-term U.S. geothermal capacity of 7000 MW. Currently, 2500 is under operation, 800 MW w/ PPAs. Contract terms must recognize geothermal attributes and timetables.

Some of the benefits of geothermal are:

- Lifetime supply of fuel capitalized.
- Developer has taken the fuel price risk.
- Small inflation index.
- Power Plant operates at full output.
- Consistent Baseload capacity
- Gets energy and environmental benefits.
- Small impact of weather on production.

Utilities are overprotecting the ratepayer. And there are challenges on both sides: Bonding requirements. RFO culls fairly mature projects. Doesn't cultivate the next crop.

Need an assurance of market. With the paradigm of individual small developers, how can utility do something other than a contract – an MOU or some lesser document – have we really got a commitment?

SDG&E Representative - Several options: RFO cull % option, turnkey, BOT option, joint venture option, asset acquisition option.

Consider Greenfield development start to finish: will utility allow them to take risk on shareholders? How would risk be financed? It will be challenging.

Mr. Gawell: Was the PTC really for the developer or the ratepayer? What happens to the PTC if the utility can use them?

Market Price Referent (MPR)

In PUC process you are not supposed to pay more for renewables than cost for the model -- combined cycle gas considered reasonable. Experience bidding into California market referent price... 6.1 cents kWh. If they are not what you were anticipating, then you can file for the SEP (Supplemental Energy Payments). Market price referent (MPR) for this year is 8 cents kWh – huge change. Contracts indexed to cost of natural gas? Pricing contract bids asking for levelized fixed payments. Hedge value against natural gas.

2.3 Session Two – Governmental Panel & Discussion

Daniel Frank from San Diego Gas & Electric noted that SDG&E is very committed to RPS program, in the renewable procurement plan to CEC, they are trying to procure 24% by 2010. Mr. Frank introduced the next panel of speakers.

2.3.1 California Public Utilities Commission

Susannah Churchill from California Public Utilities Commission began Session Two by explaining the CPUC's role in the RPS implementation and how to improve upon it. The CPUC's basic Energy Action Plan (EAP) requires that Load Serving Entities (LSE) get 20% of their retail sales from eligible renewables by Dec. 31, 2010. She said Governor Schwarzenegger has proposed an additional goal to have renewable generation as much as 33% by year 2020 but that goal has not yet been adopted. She said that contracts of ten years or more are the preferred procurement mechanism for developing new renewable infrastructure. However, the challenge to meeting these goals include lack of existing capacity, two to three years project lead-time and transmission constraints.

Concerning RPS compliance, it is only achieved with actual delivered MWh. Banking and borrowing of procurement is allowed, where excess procurement can be banked indefinitely and deficits can be rolled forward for three years. "Earmarking" is allowable but a limited excuse for non-compliance. Earmarked contracts with future deliveries must actually deliver in order to be used for compliance. The CPUC is currently considering ways to increase liquidity of renewables market, for example, use of Renewable Energy Credits and short-term contracts.

Ms. Churchill then went over how CPUC oversees the solicitation process. The goal of the CPUC is to promote the transparency of the procurement process to ensure that solicitations are fairly administered and that the Least Cost/Best Fit selection process works. They also plan to require the use of Independent Evaluators for all RPS solicitations in 2006 and beyond. She gave a list of the CPUC's Oversight of the RPS Solicitation Process:

- 1) IOUs submit yearly procurement plans and draft RFOs; CPUC must approve before IOUs begin solicitation
- 2) IOUs issue solicitation
- 3) CPUC calculates Market Price Referent (MPR) shortly after the last day of the solicitation
- 4) IOUs submit shortlists, IE reports, description of contract evaluations
- 5) IOUs submit contracts to CPUC for approval

Ms. Churchill explained that even though the goal is to achieve 20% of renewables by 2010, the CPUC will not comply at any cost. They are seeking a balance between quality and quantity of contracts based on price, collateral, transmission availability, and project viability. She also broke down CPUC's Contract Review Process:

- 1) IOUs submit advice letter
- 2) Contracts at or below MPR go to CPUC only; contracts above MPR go to CEC and CPUC simultaneously. CPUC contract approval needed for SEP awards.
- 3) Going forward, IOUs will be required to submit quarterly Project Development Status Reports, showing progress of existing projects. IOUs must notify CPUC if project milestones are missed.

The next steps for 2006 RPS are to approve 2006 short term plans and RFOs, to review and approve contracts from 2005, to clarify RPS reporting and account rules, to determine IOU compliance for 2003-2005, to develop rules for participation, and to participate in the Lessons Learned workshop.

2.3.2 California Energy Commission

Jason Orta, California Energy Commission (CEC) was the next presenter, speaking on the California's Renewable Portfolio Standard's (RPS) role in geothermal power generation. He outlined the differences between the CEC and CPUC roles in the RPS collaboration.

The summary of their roles are as follows:

CEC's ROLE	CPUC's ROLE
<ul style="list-style-type: none"> • Certify eligible facilities • Establish criteria for "incremental" output from existing geothermal facilities • Award and distribute supplemental energy payments 	<ul style="list-style-type: none"> • Set RPS baseline & procurement targets • Approve/ deny IOU procurement plans • Develop methodology for MPR, calculate

<ul style="list-style-type: none"> • Develop accounting system to track and verify RPS compliance 	<ul style="list-style-type: none"> • Develop least-cost-best-fit process IOUs use to evaluate bids • Develop and implement rules for flexible compliance • Set standard contract terms & conditions • Ensure that RPS solicitations are competitive • Approve or reject proposed contracts • Define rules for ESPs & Community Choice Aggregators
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Mr. Orta then discussed the RPS eligibility of geothermal facilities. Facilities that were online/built/under contract before September 26, 1996 are eligible for the RPS only to establish or adjust a retail seller’s RPS baseline and not eligible for Supplemental Energy Payments (SEP). Facilities that were built from September 26, 1996 to January 1, 2002 are eligible to meet both baseline and IPT for the RPS, but again, not eligible for SEPs. Facilities post-January 1, 2002 are eligible to meet both baseline and IPT for the RPS. Mr. Orta then discussed that incremental geothermal should not be confused with the Incremental Procurement Target (IPT). Mr. Orta provided a list on the requirements for Incremental Geothermal Certification.

- Complete CEC-RPS-1A or CEC-RPS-1B.
- Proof that incremental generation from the facility resulted from an eligible capital expenditure.
- Expected production increase from each capital improvement.
- List and describe capital improvements.
- Historical and forecasted generation.
- How and why capital improvements are assigned to a particular facility.
- The sustainability of increased production.
- The methodology used by the generator.

To be eligible for Supplemental Energy Payments (SEP), the projects must also be eligible for RPS. In addition, the project must also be new or re-powered. Mr. Orta briefly listed the steps to apply for SEPs. SEPs funding is backed by an investment plan allocation of \$633 million 2007- 2011. Many variables will affect the sufficiency of SEP funds. They should be sufficient if: high success rate for RPS, low above-market costs, high future RPS contracts without SEPS, etc. There has to be maximum flexibility needed to respond to changing market conditions.

Next he mentioned the delivery requirements for RPS (delivery anywhere in California from in-state or out-of-state facility) and what the different verification methods are. The main purpose of the RPS verification report is to verify the eligibility and procurement of renewable resources. The new RPS methodology is an interim tracking system, but will be replaced with Western Renewable Energy Generation Information System (WREGIS).

Additional Information can be retrieved from the California Energy Commission in the following publications:

- Overall Program Guidebook for the Renewable Energy Program describes how the REP will be administered (Publication #CEC-300-2006-008-F).
- Existing Renewable Facilities Program Guidebook describes funding eligibility requirements specific to the Existing Renewable Facilities Program (Publication #CEC-300-2005-022).
- New Renewable Facilities Program Guidebook describes the process for applying for Supplemental Energy Payments (SEPs) (Publication #CEC-300-2006-006-F).

2.3.3 Western Renewable Energy Generation Information System

Rasa Keanini, CEC Western Renewable Energy Generation Information System (WREGIS), was the final speaker in Session Two and discussed the Western Renewable Energy Generation Information System. WREGIS is a voluntary, independent renewable energy registry and tracking system for the Western Interconnect Region. It is composed of two components, an information system, and the program housed at the Western Electricity Coordinating Council (WECC).

Some of the primary goals of WREGIS are to support account holders by providing information necessary, to assist in showing compliance with regulatory and voluntary programs, to support regulators and voluntary program administrators by providing information to assist in the verification of compliance, and support market participants in their transactions involving WREGIS Certificates. WREGIS has three policy drivers: Western Governors' Association, Western Regional Air Partnership, and the California Renewables Portfolio Standard (SB 1078).

Ms. Keanini provided an explanation of a Renewable Energy Certificate (REC). The REC, also known as WREGIS Certificates if issued by WREGIS, represent the environmental attributes. These certificates are expected to have value in both regulatory and voluntary markets. A WREGIS Certificate is an electronic record of reported generation and its attributes that include both static information and dynamic information. WREGIS accounts may be opened by Generators, retail sellers, marketers, and others. For each MWh of renewable energy generated, WREGIS issues a WREGIS certificate, and these certificates can be transferred between WREGIS account holders

WREGIS's future plans include software development, having a technical operations contractor selected by third quarter of 2006, establishing a contract between CEC and WECC by third quarter of 2006, and having the WREGIS administrator targeted to begin the third quarter of 2006. WREGIS has a planned operational date of mid-2007. More information on WREGIS can be found at <http://www.westgov.org/wieb/wregis>.

2.4 Session Three – Workshop Wrap-Up

In the final session, Jack Pigott from Calpine and Daniel Frank from SDG&E opened the floor to questions from the attendees. The following are some questions that were posed.

Q> On the SEP program, is it expected to be over-allocated, holding up to the anticipated renewable energy investment plan?

A> Last month there was a workshop, prior to adoption of new Guidelines. Draft of SEP Annual Agreement. Section 11. – Payment can be suspended if no funds are available. Issues include the sanctity of PPA, the creditworthiness of each utility, earmarking or putting into trust. Attendees included Commissioner Geesman's staff, SDG&E, TURN, UCS, and one solar developer. Where was geothermal?

Q> Does WREGIS handle the dollar amount between selling and trading WREGIS certificates?

A> No, they just look at where the certificate ends up at the end of day. WREGIS will not track delivery requirements. The WREGIS system tracks unbundled energy certificates. It will not be a trading platform and won't be recording prices. And environmental attributes won't be disaggregated.

Q> When will "consideration" be concluded, and operation proceed, with respect to for RECs for compliance? Can it be implemented without legislation?

A> WREGIS won't be doing compliance.

Q> Tracking delivery for existing QFs when they come off of contracts?

A> Should encourage as much new generation as possible. See the CPUC white paper on RECs.

Q> Utility is supposed to do contracts for renewables, so now you are unbundling too?

A> WREGIS does not require unbundling.

Q> For WREGIS, if the meter is at the generator side, will they account for losses?

A> They will not account for losses.

The RPS Workshop adjourned at 1:20 p.m.

Appendix A: Meeting Agenda

California's RPS Workshop: May 24

8 a.m. – Check in

8:15 a.m. – Welcome

Moderator: Jack Pigott, Calpine Corporation

8:30 a.m. – Utility and Industry Panel & Discussion

California's utilities have conducted several CPUC-sanctioned renewable solicitations to comply with RPS requirements. Several new power purchase agreements for geothermal power have been announced. The panel will describe experiences from both sides of the table and discuss how the process can be improved.

*Utility Panel: Steve Yatsko, SDG&E; Mark Irwin, SCE; and Charles Post, PG&E
Industry Panel: Dan Schochet, Ormat; Jonathan Weisgall, MidAmerican; and Steve Munson, Vulcan Power*

10:30 a.m. -11:00 a.m. – Brunch Break

11:00 a.m. – Governmental Panel & Discussion

The CPUC develops and enforces rules for the load serving entities that are under its jurisdiction to comply with the RPS. The CPUC also oversees utility solicitations and approves power purchase agreements. The CEC certifies eligible renewable projects, administers Supplemental Energy Payments, and conducts studies and prepares reports on the RPS program. Additionally, the CEC supports development of the Western Renewable Energy Generation Information System (WREGIS), which is being designed to track renewable transactions and support the use of renewable energy credits.

Jason Orta, CEC Renewable Energy Program; Susannah Churchill, CPUC RPS Program; and Rasa Keanini, CEC Renewable Energy – WREGIS

12:30 noon – Workshop Wrap-up and Question & Answer Session

Moderators: Daniel Frank, San Diego Gas & Electric and Jack Pigott, Calpine

1 p.m. Adjourn

Appendix B: Attendee List

<i>Last Name</i>	<i>First Name</i>	<i>Affiliation</i>
Batham	Mike	SMUD
Blair	Robert	Southern California Edison
Carter	Anna	Geothermal Support Services
Churchill	Susannah	California Public Utilities Commission
Clutter	Ted	Geothermal Resources Council
Combs	Jim	Geo Hills Associates
Cortopassi	Ted	HSEF
D'Olier	William	Consultant & Geologist
Davis	Ronald	Davis Power Consultants
Fischette	Judy	CA Geothermal Energy Collaborative
Frank	Daniel	SDG&E
Gawell	Karl	Geothermal Energy Association
Gilles	Dennis	Calpine Corporation
Glassley	William	California Energy Commission
Gutierrez S.	Pablo	California Energy Commission
Hagerty	Sean	Bureau of Land Management
Harlan	Lawrence	Fort Bidwell Indian Community
Hill	Roger	Sandia National Lab
Hodgson	Susan	Consultant
Hoops	Richard	BLM
Irwin	Mark	Southern California Edison
Kagel	Alyssa	Geothermal Energy Association
Keanini	Rasa	California Energy Commission
Lemes	Marco	SMUD
Lewis	Bill	POWER Engineers, Inc.
Lovekin	Jim	GeothermEx, Inc.
Lund	John W.	Geo-Heat Center
Merrick	Dale	Merrick Consulting
Monastero	Francis	Geothermal Program Office
Morris	Christy	Nevada Division of Minerals
Munson	Steve	Vulcan Power
Nelson	Guy	Utility Geothermal Working Group
Nemzer	Marilyn	Geothermal Education Office
Olsen	David	Consultant
Orta	Jason	California Energy Commission
Phelps	Richard	High Sierra Energy Foundation
Pigott	Jack	Calpine Corp
Post	Charles	Pacific Gas and Electric Company
Quach	Billy	Davis Power Consultants
Raemy	Bernard	Helvemas Inc.
Schochet	Daniel	ORMAT
Sison-Lebrilla	Elaine	California Energy Commission
Wardlow	Charlene	Calpine Corporation
Weisgall	Jonathan M.	MidAmerican Energy Holdings Company
Wiggett	Gail	California Energy Commission
Yatsko	Steve	SDG&E

Appendix C: RPS Evaluation

CGEC RPS WORKSHOP May 24 2006 Evaluation Form Tally

Rate the overall RPS Workshop: 1 (poor) to 10 (excellent)

The Workshop increased your knowledge of geothermal energy's current status 8.7

Panel & Report Sessions - rate from 1 (poor) to 10 (excellent):

Session One – Utility and Industry Panel and Discussion

- Presentation helpful 9.0
- Presenters knowledgeable 9.2

Session Two – Governmental Panel & Discussion

- Presentation helpful 8.5
- Presenters knowledgeable 9.0

Session Three – Workshop Wrap-up

- Presentation helpful 8.7

What information did you find the most helpful at the RPS Workshop?

Session One; Utility-IPP interplay and IOU perspective on the RPS was most helpful; Comments exchanged in session one and Q&A exchanged in session two; WREGIS info; The discussion on how to provide incentives to utilities to promote geothermal development (session one) and development costs (Dan S.). The college setting was great. In addition it brought back memories; Great job, Judy; Interaction on the same panel of industry and the utility guys; The views of the utilities - They are the purchasers and really control the entire process; Elements and revisions of CA RPS and utility view of RFO process. Utility role and process and SEPs.

What improvements would you suggest or what additional material would you have liked to see covered?

Discussion on the transmission issues with RPS getting all parties up to speed; Provide a list of attendees at the workshop with an update electronically later to account for late and walk-in registrations; Direct attack on identified barriers. I thought the Steve Munson proposal should be discussed as a proposal next time. Basic overview of legislation first – second panel tended to presume knowledge; Several of the presenters strayed away from the RPS theme, spilling over to corporate sales talks. If we are going to make any progress on including geothermal as a larger part of the CA generation base, then we have to figure how to make it more attractive to the utility purchasers. In order to determine this, we need to talk directly and bluntly with those utility power purchasers; I would have welcomed more details on the RFO process – timelines, problems, streamlining. What do the utilities want from the developers and vice versa? It was good to have all size developers represented, such as in this event.

Appendix D: Vulcan Power Geothermal Return Estimates

May 23 2006 9:19PM HP LASERJET FAX

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VULCAN POWER COMPANY					
	California New Gas Plant Costs 2008 (\$900,000/MW)	IOU Return 1 Year		IOU Return 20 Years	
		Rate of Return		Rate of Return	
		10%	12%	10%	12%
250 MW Avg New Gas Plant (Large Frame 7)	\$225,000,000 40% Utility Equity: \$90,000,000	\$9,000,000	\$10,800,000	\$180,000,000	\$216,000,000
Ten New Gas Plants 2,500 MW (Large Frame 7)	\$2,250,000,000 40% Utility Equity: \$900,000,000	\$90,000,000	\$108,000,000	\$1,800,000,000	\$2,160,000,000
For 250 MW New Geothermal					
	MPR Price Range:	\$0.081	\$0.083		
	Less: Possible Utility Income:	(\$0.003)	(\$0.005)		
	Possible Renewable Cap Price:	\$0.078	\$0.078		
	Output x hrs/yr x Capacity x Possible Income Rate/kwh =			Possible Utility Income Per Year	Possible Utility Income 20 Years (w/o NPV)
	250 MW x 8,760 x 96% x \$0.003/kwh =			\$6,307,200	\$126,144,000
	Output x hrs/yr x Capacity x Possible Income Rate/kwh =			Possible Utility Income Per Year	Possible Utility Income 20 Years (w/o NPV)
	250 MW x 8,760 x 96% x \$0.005/kwh =			\$10,512,000	\$210,240,000
For 2,500 MW New Geothermal					
	MPR Price Range:	\$0.081	\$0.083		
	Less: Possible Utility Income:	(\$0.003)	(\$0.005)		
	Possible Renewable Cap Price:	\$0.078	\$0.078		
	Output x hrs/yr x Capacity x Possible Income Rate/kwh =			Possible Utility Income Per Year	Possible Utility Income 20 Years (w/o NPV)
	2,500 MW x 8,760 x 96% x \$0.003/kwh =			\$63,072,000	\$1,261,440,000
	Output x hrs/yr x Capacity x Possible Income Rate/kwh =			Possible Utility Income Per Year	Possible Utility Income 20 Years (w/o NPV)
	2,500 MW x 8,760 x 96% x \$0.005/kwh =			\$105,120,000	\$2,102,400,000

Handout from Vulcan Power shows the possible utility income for one year and twenty years.