

**MEETING NOTES**  
**CALIFORNIA UTILITY PV MANAGERS MEETING**  
**JANUARY 29, 2004**

**Introductions**

On January 29<sup>th</sup>, representatives from 10 utilities and the CEC convened for the third time to discuss PV program issues (see attached attendance list). After introductions, attendees noted what they wanted out of the meeting and current PV project status. Specifically, Marty Bailey (City of Roseville) was interested in determining the value of PV to an electric utility and demonstrating that value to his utility's management.

Joe McCabe (CEC PIER) noted that the PIER program was working on several PV research projects developing new applications, and evaluating value of PV and other renewables to the grid. Current projects can be viewed on the PIER website [www.smud.org/pier](http://www.smud.org/pier).

Leslie Brown (Silicon Valley Power (SVP), City of Santa Clara) gave a status report on their Neighborhood Solar program, SVP's community solar program. To date, they have had 200+ sign-ups with participants paying a minimum \$5/month and up to \$25 per month to support the installation of local solar projects. Over \$3,000 has been raised with the first installation to go on a local school. Under SVP's PV rebate program, 16 residential systems were installed. The rebate program has been suspended.

Scott Terrell (Truckee/Donner PUD) was looking for PV designs that will support 120lbs/sq.ft. snow load and is developing a Green Building program.

Representatives from the Electric and Gas Industries Association (EGIA) have expanded their efficiency program to include solar contractors and financing for solar projects.

Resource sharing – on CSC CPVU page (new page to be posted)  
<http://www.californiasolarcenter.org/cpvu/cpvu.html>

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**Presentations and discussion****Tom Hoff, Clean Power Research**

Tom Hoff demonstrated his "Quick Quotes" software and led a discussion on "Standardizing" the PV industry. He noted that the PV industry lacks a standard for definition of watts and needs to establish a standard. There are 4-5 different definitions of 'watts' being used across the country for paying incentives, . . . which creates confusion in comparing data sets. The industry and regulators need to standardize, pick one for reference, and/or provide conversion factors. The lack of standardization has led to a lot of confusion for consumers, and opportunity for gaming by retailers. Tom recommended that this group could help guide this effort in adopting and using one definition for reporting and incentives. He also recommended that a "SolarGuide" Label – similar to EnergyGuide Label be developed that included kWh production for different areas. Tom also advocated publicizing Market Pricing data and making it available in consumer friendly manner. Currently, the CEC and LADWP have released pricing data thus far. Would others share their data? What's needed is a

- a. Solar Kelly blue book preferably web based that consumers could use to evaluate a solar purchase.

Such a blue book website would list:

- i. Installer/contractor & license #
- ii. Manufacturer
- iii. Model # for module and inverter (wind)
- iv. Total cost
- v. Size (watts cec-ac or both)
- vi. Rebate
- vii. Date of application
- viii. Date of installation
- ix. Zip code and/or city
- x. Type of installation- owner or dealer

Tony Brazil (CEC) offered to host the website on the CEC's renewable energy site if the utilities forwarded the relevant information. Name (PG&E) and Name (SDGE ) expressed concerned about the release of customer data and noted that a customer would have to sign a waiver to allow them to release the data. This would mean modifying current interconnection agreements and/or the CEC PV buydown form. They will explore this option with their management.

Tom also reviewed the features found in the Clean Power Estimator. The estimator has a shading tool; Calculates pollution based on local pollution avoidance data vs. national average by zip code reference; includes BIPV features; and allows user to input utility rates and escalation rates. The Estimator will incorporate new NREL satellite based weather data when it's available. Estimator can be found at <http://www.consumerenergycenter.org/renewable/estimator/index.html>

Joe McCabe reported that the PIER program (Endecon) is working on defining AC watts and establishing standard but that it was still several years away. There is also a PIER project McNeil?) that is evaluating PV's value to the grid, which will be incorporated in the Estimator. In general, the group expressed support for developing standardized reporting policies and making more information available to consumers. It was agreed that the following items would be discussed at the next meeting:

- development of an online market data tool for consumers, including standardized reporting who will maintain it
- development of a SolarGuide labeling
- standard watt reporting CEC ac vs DC stc or other
- adopting a standard for kWh production prediction to qualify for state/utility PV buydown

Attendees were asked to begin forwarding installation cost information to Tony Brazil.

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### **Tom Baker, California Construction Authority**

Tom Baker gave a presentation on PV activity on local state Fairs. The CCA has implemented a program of financing and constructing PCV on local fairgrounds across California. Tom has developed a standardized approach for fairground PV projects. As an electrical engineer, he designs the PV system. He then uses the CCA's purchasing arm to bid the purchase of PV equipment (modules,

inverters, and BOS) and installation services for the project. To date, 4 MW of been installed on 12 fairground sites at an average install cost of \$4.64per watt CEC ac. Tom plans to install an additional 8 MW on 38 sites and has an installation cost goal under \$4/watt. See cpvu page for ppt presentation.

In response to questions, Tom noted:

- uses a 25 year system life estimate based on 25 year warranty from PV manufacturers
- Because the Fairgrounds are independent entities with their own boards, he has to sell each project based on their own merits. Typically, Fair boards require that no out of pocket funds be used on a project; that the project result in a 20% savings over their existing utility bill and payback between 8-15 years.
- There's a 35% increase in performance due to cleaning of modules (dirt associated with fairground activity)!
- He monitors each system using a DAS system, downloading data once per day (contact: Jim Augustyn), System performance can be viewed at <http://www.solarcat.com/ccapv/>
- He discovered the inverters use power at night(!). As a result, he will install a controller to shut them down.
- He sizes the PV system sized to meet 75% of the facility's peak load, and doesn't export to the grid.
- Rates are a factor. In PG&E service territory he enrolls the facility in PG&E's TOU A6 rate and saves an additional 20% on the utility bill (<http://www.pge.com/tariffs/ERS.SHTML#ERS> or download the tariff <http://www.pge.com/tariffs/pdf/A-6.pdf>. He urged the other IOUS to adopt a similar rate.
- 100 kVA inverters best for this size systems.
- Estimated design, staff, and inspection costs at about 4% of project costs.
- PV installs are limited to comp roofs or metal roofs for now. Unistrut was used for mounting. Installer provided leakage warranty.

Project RFPs bid the equipment separately from installation. A system design was completed and provided to installers to bid on. Vs. Turnkey approach where there is a major mark up on equipment costs. RFP requires C10 contractors and pay prevailing wags. Installing contractor is also required to commission the system. Some had never installed PV before, yet went fine. Bottom line: PV is not rocket science! Some contractors came up with innovative ideas. .

He's willing to share RFP language with the group.

- CCA has their own building inspectors to inspect installations which is a major advantage. The inspectors now know PV and this has helped installers expedite completion of the projects.
- Bid a variety of PV modules (thin-film and crystalline), looking for lowest cost equipment. Settled on crystalline produce as lowest cost installed product .

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## **Bulk/ Coordinating Purchase of PV Equipment**

Mike Keesee then lead a discussion on the possibility of developing bulk and/or coordinated purchases of PV equipment. For example:

- Could the munis use their existing power purchasing agencies (NCPA/SCPPA) to arrange purchases of PV equipment for their members?
- Could munis piggy-back on the planned purchases of the CCA? SD? SF? UC? Community Colleges?
- Could GSA or DGS coordinate bulk purchases?
- Is there value in knowing who is planning to install PV? Could it be posted on shared website?

Several attendees noted that it may be difficult to participate in joint purchases due to the contracting requirements of their local jurisdictions (e.g., local content, prevailing wage, etc. conditions). – Nonetheless, the group agreed to continue to explore this issue at the next meeting. Mike and Tor will research PV project activity. Attendees were asked to bring PV project plans (scope, size and schedule) to the next meeting.

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### **Tim Tutt – RPS & DG wrt Solar Energy State Renewable Portfolio Standard (RPS) Status Report**

Tim Tutt, CEC, gave the group a status report on implementation of the State RPS. Ownership of the Renewable Energy Credits (RECs) is a major issue, including how the RECs will be valued and metered. The CEC is maintaining a webpage for RPS issues at <http://www.energy.ca.gov/portfolio/index.html>

Currently, comments on the RPS are being solicited. . Tor will provide link to site (<http://www.cpuc.ca.gov/proceedings/R0110024.htm>). Heather Raitt is the CEC contact person. A wide range of views is being received and the CEC will catalog the responses soon, with summary table / . The OII/OIR from the CPUC will be coming out soon. The CEC will summarize issues and any conclusions.

On a related note, the Selfgen program is requesting input on potential changes (due. 1/31/04). Any interested party can provide input. After a comment and response period, a public workshop may be held.

**Heather Raitt – key contact** Phone: 916-654-4735, E-mail: [hraitt@energy.state.ca.us](mailto:hraitt@energy.state.ca.us).

In the discussion that follows on ownership of RECs, PG&E rep reported that PG&E hasn't adopted a formal position but is leaning towards splitting the RECs – ½ with utility and ½ with any customer who uses buydown funds. John Gutenberger (LADWP) reported that LADWP plans to implement a policy that the REC belongs to the utility if a customer receives a rebate. It hasn't been decided whether this policy will be applied retroactively, nor how RECs will be measured.

A general discussion on the current value of RECs across the nation ensued. Some have suggested that the current market price for RECs is about 1¢/kWh. New Jersey's and Texas's RPS sets a price for not meeting a RPS goal of 15¢ and 5¢ per kWh, respectively, thereby setting a baseline for REC value.

The WREGIS website( <http://www.westgov.org/wieb/wregis/> ) tracks what? for renewables, including on and off-grid PV and solar thermal, online.

The discussion closed with a call for attendees to bring their utilities position on ownership of RECs to the next meeting.

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### **Zero /Low Interest Financing**

**Don Kazama, CEC**

**Don Kazama gave a presentation on the CEC's Energy Project Financing program (916-654-5072 [dkazama@energy.state.ca.us](mailto:dkazama@energy.state.ca.us)). Under the program, the CEC provides:**

Technical assistance, including proposal and project design review for energy efficiency and generation (PV included) projects. . PV projects are evaluated using **PVwatts** ([www.nrel.gov](http://www.nrel.gov)) as the primary analysis tool ([http://rredc.nrel.gov/solar/codes\\_algs/PVWATTS/](http://rredc.nrel.gov/solar/codes_algs/PVWATTS/))

1. Grants and Loans
2. 3.95% loan (15 years) up to \$3Million (Public schools, hospitals, local governments, special districts, public care institutions). Project must demonstrate a 10 year simple payback. Ok to loan up to 10 years worth of payback. Can combine with energy efficiency projects. Retrofit only currently.
3. working to get California Power Authority's Bonding power, and exploring new construction as an option.
4. Design Guide ([www.energy.ca.gov/reports/500-01-020](http://www.energy.ca.gov/reports/500-01-020))
5. Estimator ([www.consumerenergycenter.org/renewable/estimator](http://www.consumerenergycenter.org/renewable/estimator))

Conc: look for PV project to highlight online. Templates are online. Post this resource on cpvu page.

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### **Rich Illingsworth , SAFE-BIDCO [www.safe-bidco.com](http://www.safe-bidco.com)**

SAFE-BIDCO is a state sponsored lending institution that makes 4% interest rate loans to small businesses for

Both energy efficiency and PV projects.

Loan limits up to \$350,000 with a 5 year payment (unable to get legislature to extend this, may try this session)

Loans are limited to 10 x annual energy savings for a project.

BIDCO has \$2.75 Million annual budget revolving fund. Rich recommended that PV projects be integrated with energy efficiency measures.

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### **Eric Howarth , Electric & Gas Industries Association (EGIA) – [www.egia.org](http://www.egia.org)**

Per Eric, EGIA is a contractor network provides the missing financing products for the energy efficiency market. They are working with a collaborative of financing institutions (Fannie Mae, BofA, GMAC, etc) to develop financing for solar projects.

EGIA only provides loans for jobs where contractors have been qualified by EGIA. EGIA is considering NABCEP certification for its solar contractors. . They will be publishing Contractor guidelines this Spring, which will be updated annually.

EGIA developed a residential solar loan program in 2002 and a commercial solar loan program in 2003 (up to \$10M)

They will be rolling out a new program March '04. The new program will be based on

avoided cost loan for private sector, structure payments around performance of the system, and have a neutral cash flow up to 10 years. The program will require all systems > 100 kw to be monitored.

To date, EGIA has made \$45 million worth of residential solar loans refinancing which may include other home improvements, etc.) EGIA offers:

- \* unsecured loan – 8.99 to 12.5% no fees. Payable only to contractor after job is proved complete mostly only off-grid system uses this loan.
- \* Equity loan – prime + \_\_\_? 4-5% for 10 year term. Fee: \$500. + some other costs/fees.
- \* Second mortgage: ~1.25 added points front/backend fee.
- \* Commercial financing – 0.5 to 1.5 % fee.

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### **Bob Parkins, Consultant** (former WAPA C&RE Representative)

Bob discussed his participation in a shared energy savings project conducted at the US Marine Twenty-nine Palms facility. He explained that Executive Order 13123 (mid 1990s) order government facilities to reduce their energy usage by 15%. Currently, the Feds are encouraging green power purchase at federal facilities and developing onsite renewable generation. Eg. Navy base in Nevada developing geothermal resource. Most federal facility renewable energy projects have a strong champion. In the case of the 29 Palms Project, the local project manager saw a promotion opportunity. The project utilized an Energy Services Performance Contract (ESPC) to finance energy efficiency and PV. One advantage to using an ESPC is that it uses maintenance budget vs. capital funds. Under the ESPC, the facility owner pays no money down. The entire project is financed and operated by the contractor, who uses operational/maintenance funds to pay for system. Typically, the facility owner continues paying the same utility bill over a pre-determine period with the contractor collecting the utility bill savings and the tax credits and depreciation associated with the project. Some ESPCs include share savings agreements between the owner and contract. Johnson Controls was the contractor for the 29 Palms project, which included a 1.1 MW PV system. Although the Phase 1 PV project utilized Self-Gen buydown funds, a Phase 2 project with a 1 MW PV system was developed without benefit a Self-Gen PV buydown. Phase 2 was largely driven by the added benefits of the PV system, including providing shading structure for the tank maintenance bays (very valuable benefit in extreme hot temperature climate!) and providing the base an emergency power system independent of the grid. The Iraq war put the project on hold. Additional information on The FEMP ESPC Energy Saving Performance Contract can be found at <http://www.eere.energy.gov/femp/financing/espc.html>

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### **Case Studies**

#### **Stephen Frantz, SMUD Commercial/Industrial PV Program**

Stephen described how designed and implemented its 2004 C/I PV Program. SMUD revamped its C/I PV program to be a contractor driven program with a SMUD PV buydown supplementing the Self-Gen buydown. The SMUD PV buydown is \$2.50/watt AC. Program funding for 2004 is \$250,000. More than 600 kW worth of projects applied for program funding. As a result, the program is fully subscribed. Additional program funding is being investigated. A major focus of the program was to emphasize quality PV installations by develop a list qualified contractors. To qualify for a SMUD PV buydown, a contractor had to meet minimum qualifications, including:

1. 4 yrs exp. + completion of SMUD training.
2. install a minimum of 10 systems
3. submit references for their 5 most recent systems
4. Cal State Contractor License evidence.
5. 24hr/day availability

Currently, 10 contractors are qualified to receive SMUD PV buydown funds, including:

1. Global Solar
2. Powerlight
3. Roseville Solar
4. Shell Solar
5. Sunpower & Geo
6. Sunwize Technologies
7. SIT (Solar Integrated Technologies)
8. Team Solar (local Sacto)

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#### Marty Bailey. Roseville Electric, **Roseville Energy Park**

Marty reported on the city's proposed 160 MW natural gas combined gas/steam project. The project will also include 1 MW of utility scale PV. Project is scheduled to start in 2005 and be complete by late 2006. Currently he is working on documenting the value of the PV to his utility's resource planners. He anticipates having a RFP for the project in early 2005 and thinks there is the potential for leveraging the RFP for others to use. The project will utilize PBC funds for project [see ppt on cpvu page for images & project specs]

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#### **Grant Nelson, SMUD, Solarport/Meter Beater Projects**

Grant gave a detailed powerpoint presentation on two SMUD PV demonstration projects: a generic solarport and the Meter Beater ground mount PV system (refer to ppt presentation for data. – pictures and drawings). Team Solar (local solar company) manufactured the meter-beater tray for this pilot run, which can be adapted for any module. <http://www.teamsolarinc.com/index.htm>  
[see cpvu page for presentation]

Other options

SolarDock – Massachusetts. [ [www.solardock.com/mccenergy-ourproduct.html](http://www.solardock.com/mccenergy-ourproduct.html) ]

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#### **Net Metering/ Interconnection Issues**

Attendees were asked to bring samples of net billing summary to the next meeting to share. Tony Brazil asked the IOU reps if they could get authorization to share customer billing data. He is particularly concerned with verifying that a PV system is actually interconnected with the host utility. He would like to develop regular communication between the utilities and the CEC before the CEC pays out the PV Buydown rebate. Tony offered to develop a waiver form for the CEC Buydown application that allows the CEC to share customer data with the utility.

Name SDG&E noted that it takes SDG&E about a1 week to turn around to process an interconnection agreement and 2-3 days to do site visit and inspection after receipt of the final city permit.

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Mike Keesee, SMUD, Zero Energy Home Program

Mike gave a powerpoint presentation on SMUD's Zero Energy Home Program (see slides). He is investigating the potential of ZEH for reducing peak demand, while retaining offpeak power sales. He calculates watts. on AC basis (75% of rated DC stc). A Customer satisfaction survey is under way and he will bring the results to the next meeting. Major lessons from SMUD's new home program include; Builders' electricians and roofers are the ones to install, not PV contractors and electricians need a lot of handholding with DC. He is also investigating non-cash incentives to promote adoption of PV by home builders, including:

streamlining the interconnection and new service hook-up process and working with local jurisdictions to expediting entitlement process and permitting and/or reducing permitting fees. He recommended that others look into doing the same with their local governments.

The group recommended that new construction recommendations be developed further, especially in light of the governor's interest in promoting PV in new homes.

Coordinate additional discussion with CEC, as they are tasked with developing recommendations for the legislature/gov. CEC contact: Ann Peterson (916) 654-4024.

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Others sources of data include NREL project by Tom Hoff/Christy Herig, which evaluates the benefits to utilities using different analysis ([http://www.smud.org/pier/projects/pv1\\_3.html](http://www.smud.org/pier/projects/pv1_3.html)). Report online [http://www.smud.org/pier/reports/S-034,%201.3.5.2,%2012-02,%20DEL\(rev\).pdf](http://www.smud.org/pier/reports/S-034,%201.3.5.2,%2012-02,%20DEL(rev).pdf)

### Next Meeting

LADWP was asked to host the next meeting (and has agreed to do so) to be scheduled by July 31<sup>st</sup>.

#### Future discussion points

1. inspectors include performance as part of process - utility
2. compile projects lists.
3. compile data onto online tool
  - a. report on developing waiver for release of customer information (PG& E, SDG&E, others)
  - b. Agreement on what to report
  - c. Update on website hosting (Tony Brazil, CEC)
  - d. Recent system install information
4. Standardization – What Watt should we use? Recommendation
5. RECs – what is the value? If utility has RECs does this change perception of PV within utility for the better? Bring REC policy
6. Using existing agencies to coordinate purchase of PV equipment
  - a. Existing Power Agencies -NCPA and SCPA
  - b. State DGS
  - c. Federal GSA

- d. Other cities – SD and SF
- 7. Current Projects
  - a. Reports from attendees on current or planned PV projects
- 8. New Construction Activities
  - a. Reports from other utilities

#### ACTION ITEMS

Set up group website (Tor Allen)

Provide copy of State Fair PV Project RFP language (Tom Baker)

Report on current/future PV Projects (all attendees)

Contact SCAPPA, DGS, GSA , SD and SF on potential bulk purchasing arrangements (Mike Keese/Tor Allen)

NCPA (WAPA?) as potential bulk purchaser of PV (John Berlin)

PV project plans (scope, size and schedule) (all attendees)

Report on utility RPS/REC policy (all attendees)

Post SMUD C/I PV Contractors RFQ (Stephen Frantz)

Post SMUD Solar Port/Meter Beater CAD drawings online (Grant Nelson)