SIERRA CLUB CALIFORNIA

May 20, 2011

California Energy Commission
Dockets Office, MS-4
Re: Docket No. 11-IEP-1G
1516 Ninth Street
Sacramento, CA 95814-5512

Electronically submitted to docket@energy.state.ca.us

RE: Renewables, Docket No. 11-IEP-1G
Committee Workshop on Renewable, Localized Generation May 9, 2011
Preparation of the 2011 Integrated Energy Policy Report (2011 IEPR)

Sierra Club California appreciates the opportunity to provide comments on this workshop, **Renewables, Docket No. 11-IEP-1G,** as an important component of the 2011 IEPR report.

First, we would like to express our strong support for Governor Brown's Renewable Energy Goals as outlined in the first slide of Michael Pickers presentation. The only caveats we would have are that we believe that there is very little need for much additional transmission beyond projects already under construction or approved. This is further supported by RPS scenarios currently being run through the CPUC's LTPP proceeding in which scenarios are showing the need for no or minimal additional new transmission. Secondly, the Governors proposed CHP target of 6,500 MW by 2020 should be clearly understood to be in addition to the 12,000 MW DG target.

FITs and Net Metering
Sierra Club California has been and remains a strong and consistent advocate of best practices, cost based FITs. This FIT structure used in Ontario, Canada, Europe and round the world is the policy mechanism used to fund 75% of the world's PV and 45% of the world's wind as of last year according to NREL. We recommend that the IEPR report continue to recommend the development and implementation of this mechanism in California to provide the financial structure support system to enable the successful accomplishment of the 33% RPS and 12,000 MW of DG by 2020. Existing programs including the RAM, SGIP and FIT (currently being revised under SB 32) are not optimally structured, are too modest in size and potentially will overpay for renewables compared with a well-designed FIT program.

One of the ancillary benefits of a FIT program is that it can be modified to provide incentives to optimize the program and its many specific objectives. For example, an adder could be applied for DG projects built in low-income areas (Ontario, Canada has an adder for projects built by indigenous

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peoples.), for projects built in high priority areas for load balancing or where distribution circuit upgrades are not needed, to effectively increase capacity on a distribution grid circuit to support new loads and save the cost of circuit upgrades, etc.

Heather Raitt presented an approach calling for 5,000 MW of behind the meter and 7,000 MW of wholesale capacity to meet the 12,000 MW DG target. She proposed that 3,000 MW of the behind the meter capacity would be met with the 3,000 MV target from the million solar roofs program combined with 2,000 MW of new net metered DG.

"Net Metering" carries with it two significant features of program design:

1. One is a technical assumption that there is a single net meter on the customer's site that only reports net energy produced or required to the utility.
2. The second is a financing structure assumption in which the customer only pays for excess electricity required so that on-site production is fully covered by the on-site system.

There is a serious problem with the first feature which is that the utility is blind to the full amount of local production and local consumption. This makes it impossible for the utility to understand the impact on power they might have to provide should the production stop, the impact of EE measures, demand response, etc. They effectively cannot plan, manage or back up this on-site generation or consumption. We believe that if the net metering approach is to be expanded, this technical shortcoming must be addressed. Any additional expansion of net metering beyond its current size must be altered from a technical perspective to provide the capability for the utility to have real time data on both production and consumption. The financial model of having all production offsetting as much consumption as possible and the customer only being charged for excess could be continued.

Our preferred financing mechanism for DG is a cost based FIT but a re-designed net metering program as described above could co-exist as an alternative with a FIT. One of the advantages of a FIT is that it can incent a customer /developer to build out as large a generation capacity as practicable and not just size the project to cover on-site use and no more.

Diversity of Renewable Resources

While PV solar is often the assumed resource being thought of in DG programs, we need to continually plan to include program features, designs and financing programs to support the full range of DG renewable resources including but not limited to wind, CHP, biomass, biogas, geothermal. All of these can play a role and several can provide baseload and dispatchable generation to help balance intermittency.

European Experience in Integrating High Penetration Renewables– KEMA report

Presently, the CAISO and IOUs are not well prepared to cost effectively manage large amounts of new intermittent renewables several years in the future but have begun efforts to become properly prepared. They lag the capabilities of Germany, Spain and other European countries that have successfully upgraded their distribution networks, control centers, engineering design and operational simulation planning tools, DG generation forecasting abilities and other capabilities that have enabled them to successfully accommodate rapidly growing portfolios of renewables. The good news is that California can benefit from the European experience with confidence and modify as necessary to meet some of the differences in our environment.

We believe that a fundamental paradigm shift in the vision, strategic and business planning in the CAISO and IOUs is necessary to meet the rapidly changing needs of the energy industry over the coming years. Rather than taking reactive and short term tactical approaches, a new vision would drive proactive behavior and allow these agencies to get ahead of the needs of our rapidly changing electricity system. The long term vision should assume that the State will be at 100% renewables by 2050 or possibly sooner. Such a vision would then drive the strategic and business plan on how to accommodate this goal. These entities would then begin a deliberate, planned, sequenced process, for example to begin defining new equipment, technical and operational standards for the distribution grid and begin upgrading and building to those standards in a prioritized fashion.

The IOUs have referenced that they have a lot on their plates right now and they do – new RPS standards, GHG emissions reduction programs, RAM, FIT, SGIP and other financing programs, demand response, CHP, energy efficiency, etc. However, these types of initiatives are needed by society and required in law. The utilities would benefit by fully recognizing that this is a steep hill to climb and must be done more rapidly than the industry has ever had to move before. Such a task must also be done in a way that continues a reliable and safe system. In order to respond to these challenges, they would be well advised to ramp up and mobilize the needed human resources, via new staff, consulting resources, assembling special new project teams to deal with these issues, etc. A large part of this effort would have been needed anyway as much of our existing system infrastructure is very old and needs to be replaced or upgraded. Such upgrades should be accomplished with equipment and design that will support the new system needs or any investments in technologically obsolete new equipment will be wasted.

The KEMA preliminary report provides insights; best practices and lessons learned that should be incorporated into California's approach to better manage both the growth and operation of increasingly larger portfolios of intermittent renewables.

Some of these insights suggest that California should implement the following practices:

1. **Remote monitoring and dispatch capability; DG ancillary services.** As the report notes, "Unlike Germany, the ISO has no visibility of the energy production of DG resources and cannot send dispatch commands to these DG resources."
   Statewide requirements for new DG projects over 100KW should have:
   a. Real-time telemetry monitoring capability (Financial incentives should be made available to larger existing DG plants - e.g. greater than 500KW - to encourage them to add these capabilities.)
   b. Steady State Voltage (Reactive Power)
   c. Dynamic Grid Support (Fault-ride-through) and
   d. Remote Control Active Power Dispatch Reduction.
   e. These new requirements should apply to all LSEs and all new DG projects even if they are financed through a net metering financial policy.

2. **Substation Back Flow Capability** – old systems in California need to be replaced with "Four-quadrant" protection systems and new solid state relays need to be "reprogrammed" to support back flow to allow installation of greater DG capacity on distribution circuits. Whenever new distribution circuit / substation equipment is installed or existing equipment is upgraded, it should be upgraded to state of the art four-quadrant protection systems allowing backflow.

3. **Improved DG forecasting** – The KEMA report states, "The potential consequences of ignoring this requirement for improved forecasting models that reflect the amount of DG on the system include major over-commitment of thermal generating units on days/hours when they are not needed and this cost (potentially millions of dollars annually) is passed on to the ratepayers."

California needs to put in place a plan and schedule to greatly improve its renewables generation forecasting to accuracy levels matching Germany. This will better enable the state to better integrate intermittent renewables into the grid, reduce the volume of needed back-up dispatchable generation, and reduce costs to ratepayers for market purchases that may be needed now due to excessively large forecast errors.

4. **Renewables Control Center / function** – conceptually modeled after Spain's successful Control Center for Renewable Energy (CECRE), California would benefit from a similar control center or functional equivalent within the CAISO control center taking advantage of real-time monitoring of DG resources, real-time DG generation forecasting for wind and solar, etc. in order to better integrate these renewables. The CAISO has taken the first step in this direction by establishing a new renewable forecasting position on the control room floor. However, there is much more that needs to be done to actually get fully functioning capacities in this area similar to Spain.

5. **Dispatcher Training** – More extensive dispatcher training utilizing sophisticated simulation facilities will better prepare current and newly hired dispatchers to more effectively handle the increasingly complicated dispatching decisions required today and in the future.

6. **Costs of DG Interconnection** – DG developers should only need to bear the cost of connecting to the closest PCC. Any incremental costs to upgrade the distribution grid to support the DG project should be "socialized" or rate based.

7. **RE Curtailment** – If the above recommendations are implemented and increased monitoring and control of renewables becomes available to the CAISO and other California balancing agencies, then as in Spain for example, curtailment of RE should only be done in an emergency and as the tactic of last resort.

8. **Ancillary load balancing resources** – In Germany, there has been little need for additional storage to balance renewables intermittency. This is due in part to very accurate forecasting combined with planned use of other dispatchable resources and market agreements in adjacent countries. As the report notes, "Therefore, it should be possible for market participants in other regions of the WECC to bid on and provide a significant component of the California ISO's ancillary service requirements." Accurate forecasting can greatly reduce the wasted expense of otherwise unneeded backup services which just add unnecessary expense to ratepayers. The approach suggested by KEMA combined with other strategies such as upgrading pumped hydro storage turbines to variable control, strategic use of batteries that today can cost effectively compete with gas fired peakers for some services, etc. can meet integration needs requiring much less storage than previously thought. Other strategies being researched via PIER research and other researchers on integrated storage with renewables, ancillary services, etc., would mean less need for these services at the grid level.

Barriers to DG

1. **Interconnection Barriers –** A key barrier to interconnection is the time it takes to complete an interconnection study by the IOUs or CAISO. The new cluster programs promise to decrease wait times from over two years to 400 days but this is still excessive. Contributing solutions to this problem include:
   a. IOU installation, adoption and use of a power system design simulator such the New Power Systems - Energynet Power System Simulator described at the workshop. This product was described in even greater detail at the CPUC's ReDEC workshop. This simulator gathers real-time system data from distribution networks and allows the planner to insert various new RE generation projects connected to the grid and then review the impacts that the projects would have on the system. It would greatly accelerate the process of engineering design review for new proposed projects.
   b. Having the costs of interconnection beyond the cost of connecting to the closest point of connection socialized and rate based would reduce the number of design permutations often explored over multiple iterations currently.

2. **Uneven Tax assessments** – One barrier that was pointed out by Michael Picker in his presentation is that different counties conduct tax assessments on community wind differently and in some cases this creates a financial barrier. The state would be well advised to develop a consistent approach to tax assessment that would be fair but supportive of new DG.

3. **Cumbersome and expensive permitting processes –** local jurisdictions all have different forms, inspection processes, backlogs and permitting fees all of which adds to the time and expense of completing DG projects. In some cases these burdens cause projects to be canceled. It would be very helpful if the state could implement a model permitting process and either though law or incentives have local jurisdictions adopt more streamlined and consistent processes e.g. utilizing on-line applications, and a standard approach to permitting fee levels that do not discourage projects.

Developing Renewable Generation on State Property – We applaud and support the proactive plan outlined in this staff report and the approach as stated thus far appears to be well conceived and excellent.

Thank you for your consideration

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