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Chairman Robert Weisenmiller
Commissioner Karen Douglas
California Energy Commission
Docket Office, MS-4
1516 Ninth Street, MS-4
Sacramento, CA, 95814-5512

Re: "Docket #11-IEP-1G Renewables" Implementation of 12,000 MW of Distributed Generation Goal by 2020.

The Los Angeles Department of Water and Power (LADWP) respectfully submits the following comments in response to the California Energy Commission (CEC)'s request that parties address the questions in the panel discussion and public comment portions of the workshop.

The City of Los Angeles has supported renewable energy development and distributed generation development to serve our long-term resource goals. As LADWP looks into the future, most of the issues influencing strategic and resource planning are based on the critical issues that LADWP is facing in the areas to address greenhouse gas emissions (GHGs), the Renewable Portfolio Standard (RPS) goals of 33% as mandated by state law, and the integration of increasing amounts of renewable resources.

LADWP currently has approximately 350 MW of customer installed DG (primarily combined heat and power)on its electrical grid, producing approximately 1,700 Gigawatt hours (GWh) annually, most of which is consumed on-site, although some (approximately 400 MWh) is exported back to LADWP.

The amount of customer DG installed in the future will depend on several factors, as noted on our answers below, including power system reliability, cost of technologies, and the harmonization of the existing and future mandates and programs (RPS, GHG, energy efficiency, demand side response, etc). Considering also that LADWP is already self-sufficient in resource capacity, it is thus very important for LADWP that utilities be provided with the flexibility to find the optimum amount of DG to integrate based on the value provided to the

customers and the utilities, and the consideration of all economical and environmental options available to them.

Attached to this letter, please find responses to the various questions posed by the California Energy Commission on the subject of DG. LADWP also fully supports the California Municipal Utilities Association's responses being filed concurrently.

The LADWP looks forward to continue working with CEC staff and stakeholders in the development of additional renewable local generation policies and goals.

If additional information is necessary concerning this matter, please contact Mr. Oscar A. Alvarez at (213) 367– 0677 or Mr. Oscar Herrera at (213) 367 - 4880.

Sincerely,

Randy S. Howard
Power Engineering Manager

OH:ms
Enclosures
c/enc: Mr. Ronald O Nichols
Mr. Aram Benyamin
Mr. Randy S. Howard
Mr. Oscar A. Alvarez
Mr. Oscar Herrera

Attachment
Request for Comments

The IEPR Committee requests that parties address the following in the panel discussions and public comment portions of the workshop and in written comments. The questions are organized by topic in the workshop.

Written comments are due to the Energy Commission by 5:00 p.m. on **May 23, 2011**.

Please see the workshop notice for instructions on how to submit written comments:
http://www.energy.ca.gov/2011_energypolicy/notices/2011-05-09_workshop_notice.pdf

I. Developing Interim and Regional Targets for 12,000 MW by 2020

1Q **Please suggest a methodology for setting interim and regional targets building to the 12,000 MW goal by 2020. Considerations to address include: state and local policies, the capability of the distribution system, economics, and resource availability. To aid discussion, staff has identified the following options for parsing out the goal:**

- **Set targets for each load serving entity or county**
- **Set targets per sector, for example, residential, commercial, public, or other**
- **Set separate targets for installations that serve on-site load and for projects that produce energy for wholesale**
- **Set targets by utilities portion of coincident peak**
- **Set targets based on resources potential and/or best use of the distribution system.**

1A

As LADWP pursues distributed generation (DG) to reach its renewable energy goals of 33% by 2020, it considers the delivery of reliable power to its customers at a reasonable cost as its main and foremost priorities.

LADWP also considers existing mandates and programs as key markers that need to be harmonized when adding renewable energy to our resource mix. These mandates include:

- The already approved bill (SBx1-2) that mandates utilities to reach 33% of renewable energy by 2020 with incremental targets;
- LADWP has already achieved 22% reduction on CO2 emission level from 1990 and continues to seek alternatives for additional reductions:
- The LADWP solar incentive program has as a goal of installing of 280 MW of customer installed solar PV systems by 2016 with a budget of $313 million over 10 years however because of LADWP's lower electric rates, a higher

incentive amount has been offered which will reduce the expected amount of customer installed solar to approximately 130 MW; and

- Pursuant to the requirements of AB 2021, the LADWP developed and submitted its first set of Board-approved energy efficiency savings goals to the CEC. LADWP has achieved significant increases in annual energy savings over the last several years. During the 2009-2010 fiscal year, 183 GWH of energy savings were achieved on expenditures of $44 million.
- A Feed-in-Tariff program which will pay generators for each kWh of renewable energy generated. The program is expected to add 150 MW of solar DG.

Furthermore, LADWP pays for excess energy produced by co-generation customers, whether it is renewable or not. DG can be developed to serve on-site load or feed the grid.

Another factor that LADWP considers is the extent of the need for renewable distributed generation. LADWP has a peak load of approximately 6,100 MW and a generating capacity of approximately 7,266 MW. Thus, LADWP is self-reliant in terms of resources and any added distributed renewable generation, up to 2000 MW, needs to bring reliability and economic value to LADWP and its customers. Otherwise, it will strand existing generating assets and negatively impact the local economy.

In terms of load growth, LADWP has only a 1% load growth rate and already has significant programs in place to ensure capacity is available for such growth. Examples of such programs are Energy Efficiency, Demand Side Management, DG, Feed-in-Tariff, etc.

At the distribution level, any amount of DG installed is greatly dependent on customer participation, fuel prices, DG equipment prices, outside incentives, etc., and an overall 2000 MW goal for DG in LADWP's service territory is technically too high considering that is about 1/3 of LADWP's system peak and 100% of its minimum load. This amount may result in problems controlling and operating the distribution and transmission systems. It is clear that utility-owned DG can be managed more easily than customer-owned DG because it is designed based on the needs of the system. But even under these conditions, LADWP feels that a 15% penetration of the peak load is more realistic and possibly achievable, but probably not by 2020.

LADWP feels that setting enforceable goals or targets for DG is inappropriate at this time. There are already existing mandates and programs that need to be harmonized. LADWP, as a fully resourced municipal utility with excess capacity, will need to consider the various alternatives discussed above and be provided with the flexibility to reach the optimum DG integration based on the best value that customers and the LADWP will receive, after considering all available options.

2Q Related to the above question, some utilities have noted in the California Public Utilities Commission's Rule 21 Working Group and its Renewable Distributed Energy Collaborative (Re-DEC) that up to 15% of peak load for individual circuits

could reliably interconnect with minimal system upgrades. Other utilities have said that individual circuits could handle distributed generation additions for up to 50-100% of minimum load. Could a 15% of peak load or 50-100% of minimum load penetration rate be implemented statewide? If so, how much renewable capacity would be installed per utility?

2A LADWP is currently advancing new two-way Advanced Metering Infrastructure (AMI) meters to further understand and interact with the loads in its system (for example, via real-time pricing, dynamic reads, remote switching, outage management, integration of customers' generation, wireless meter reading, power quality measurements, engineering analysis, load balancing, and demand response). LADWP is also developing a Smart Grid program that might provide tools to monitor and manage DG levels at15%, but that will take time and will be cautiously implemented.

LADWP's distribution system is loaded and designed distinctly along geographical areas, and, thus, any interconnection needs to be handled on a circuit-by-circuit basis to determine how current and future penetration levels affect circuit voltage stability, regulation, and protection.

Furthermore, LADWP notes that Interconnection requests, studies, upgrades, and fee structures should be the sole responsibility of the local distribution utility as they are held responsible for the reliability of the distribution system. Additionally, throughout the state, and throughout various service territories, the power distribution systems can vary widely in age, design, and loading conditions, and so the utility should be responsible for the unique analysis of such DG interconnections and the determination of DG levels appropriate to its service territory.

3Q Please provide comments on any methodologies discussed at the workshop. Indicate whether you support or oppose a particular approach and the rationale for your position.

3A LADWP supports a case-by-case methodology of evaluation based on customer proposals, while LADWP ensures successful integration of DGs into its network based on the number of interconnection requests, the diversity of technologies interconnected to a circuit, and cluster-level studies to prevent overloads and potential system problems.

LADWP also supports a policy that assigns costs of distribution upgrades necessary for interconnecting customers, to be paid for by the interconnector.

4Q Should the state create incentives or penalties to ensure achievement of targets? If so, please suggest program design and implementation?

4A There is no need for the state to create additional incentives or penalties for DG implementation. As indicated in Question 1 response, there are already existing mandates and programs (e.g. RPS goals, CO_2 regulations, etc.) to install DG and other alternatives.

Furthermore, if DG is advantageous to customers and they have or seek the expertise to do it, they will. The current state of the economy should also be considered as it limits the ability of customers to pay higher rates to support utilities' DG incentive programs. The downturn in the state's economic condition has created excess generation and the need for new generation such as DG is limited in the near term.

LADWP fully supports the consideration of DG in their resource planning processes, but does not believe that it needs to be mandated if it is not cost effective or sustainable. Existing renewable mandates already perform much of the "heavy lifting" needed for DG to flourish.

LADWP, as other utilities, is also looking at implementing Energy Efficiency, Demand Side Management, Smart Grid, and Electric Vehicles as options to support and/or complement renewable DG.

5Q If the state established regional targets, should there be options to trade allocation requirements?

5A The option to trade allocation requirements is almost necessary to ensure that utilities are not over-allocated DG requirements. As noted above, LADWP has a low load growth rate (around 1%) and already possesses excess resources. The additional capacity that will be generated utilizing DG may potentially lead to unnecessary costs incurred by our customers and the possibility of stranded resources. LADWP is already committed to meet its future load growth utilizing other resources, such as energy efficiency and demand response.

Another option is to allow utilities to count existing programs that are just as effective as DG into the utilities allocation requirements. For example, in utilizing energy efficiency measures, LADWP has achieved significant increases in annual energy savings over the last several years. During the 2009-2010 fiscal year, 183 GWH of energy savings were achieved on expenditures of $44 million. And unlike DG, energy efficiency does not add stress to the existing distribution infrastructure.

LADWP does caution that there are already existing RPS and carbon markets that will need to be orchestrated with potential DG trading programs to avoid duplicative or complicated trading structures.

6Q What are the near-term and long-term actions needed to achieve 12,000 MW by 2020?

6A As noted previously, LADWP near-term and long-term programs are guided by existing programs, and they are being successfully integrated by LADWP:

- LADWP's Solar Incentive Program has been developed with a goal of encouraging the installation of 280 MW of customer installed solar PV systems by 2016 with a budget of $313 million over 10 years, however because of LADWP's lower electric rates, a higher incentive amount has been offered which will reduce the expected amount of customer installed solar to approximately 130 MW. An additional 150 MW of distributed solar is expected to be installed through a new feed-in tariff program;
- Pursuant to the requirements of AB 2021, the LADWP developed and submitted its first set of Board-approved energy efficiency savings goals to the CEC. LADWP has achieved significant increases in annual energy savings over the last several years. During the 2009-2010 fiscal year, 183 GWH of energy savings were achieved on expenditures of $44 million.

It is the successful integration of these various programs that will guide LADWP towards the extent and penetration of the various alternatives, taking into account reliability, economic, and environmental factors.

Another important aspect to consider when addressing long-term goals is the Research Development and Demonstration (RD&D). Private and public RD&D needs to be pursued to ensure that PV and wind technologies at the distribution level become competitive with other types of technologies, and the resolution of integration and intermittency issues.

II. Discussion on European experience integrating large amounts of DG

7Q How are European electrical distribution systems similar to or different from California?

7A LADWP's secondary voltage level of 120/240V, and 167 KVA capacity per transformer on the distribution system on public property, which is lower than those of the European countries. In essence, we use many smaller transformers versus several large transformers for the distribution network on public property.

8Q What challenges have European countries encountered from integrating distributed renewables that are applicable to California, what actions did they take to address the challenges, and what lessons are applicable to California?

8A In September 2010, LADWP invited a group of German delegates to share with us 'lessons learned' on their Feed-in Tariff program.

Germany has a 'must take' interconnection policy for renewables and this has caused some excessive system upgrade costs to interconnect remote customers. Customers did not have to procure an interconnection agreement prior to the installation of a solar system; they simply send a bill to the utility stating the amount of energy they supplied to the grid to receive payment. As more renewables are installed, Germany fears that without better distributed generation interconnection coordination, grid operation may be exposed to cascading outages.

Germany has started discussions for the implementation of smart grid technology to achieve greater grid reliability. Smart meters will allow operators to manage the generation and flow of renewable energy in their system. For example, during conditions when demand is low and there is overgeneration from these DGs, the operator can turn off the wind or solar plants remotely; however, the German Renewables Act (EEG) requires that the renewable plant operators are compensated for the lost generation.

Smart meters are also expected to provide grid operators with more information from the DGs to be able to perform backup, balancing, and firming activities to reshape the intermittency energy from these renewables.

9Q As California builds out its distribution system, what lessons can be learned from the European experience?

9A According to the German delegates, the original EEG policies were driven by environmentalist and did not represent the interests of system operations and feasibility. The German power system infrastructure is 10 years behind their renewable energy program, and to further compound the issues, solar development was mainly concentrated in Southern Germany, while most of the demand is located in Central Germany. This set of circumstances has required that numerous grid extensions be installed to bring the energy to its users.

It is estimated that Germany has invested around one Billion Euros to extend the grid. Despite this level of investment, operators still do not have enough resources to reliably manage the grid, and to accurately forecast solar energy.

The German Delegation recommended that utilities carefully perform system studies to determine the grid capacity for solar, and integrate the FIT at a manageable level to ensure system stability.

In contrast, it is worth noting that LADWP is no longer building out its distribution system, as its entire service territory is urbanized. Any modifications to its system would result in replacement of existing facilities.

III. Discussion of "Developing Renewable Generation on State Property, Installing Renewable Energy on State Buildings and Other State-Owned Property"

10Q **Please provide comments on the staff report and on lessons learned from the European or local experience that may be applicable to California.**

10A No comments on renewables for State-Owned Property

IV. How Research Development and Demonstration (RD&D) can Help Advance Distributed Generation

11Q **What is the role of RD&D in advancing distributed generation and helping achieve the Governor's *Clean Energy Jobs Plan* and other current and future state policy goals such as the Renewable Portfolio Standard and AB32?**

11A As noted above, RD&D efforts at all levels in the power industry need to make sure that PV and wind technologies at the distribution (and transmission) level become competitive with other types of technologies, and the resolution of integration and intermittency issues. As has been noted previously, installation, operating and maintenance (O&M) costs are very high compared to combustion, microturbine technologies, and alternative resources (e.g. Energy Efficiency or Demand Side Management). The financial model is important so as to be a savings to customers and not just another expense on their energy bill.

12Q **Please comment on the maturity of distributed generation technologies. Which technologies or components should RD&D efforts focus on to address some barriers for advancing DG deployment?**

12A Currently reciprocating engines and gas turbines are the mature technologies at the distributed generation level, although large scale solar costs have come down. Wind power is slowly developing small package applications for residential and commercial applications.

Small scale storage is in its infancy due to technology and cost. Electric vehicles hold the best promise for customer-based off-peak load.

Fuel cell technologies continue to have high installation and O&M costs. RD&D is needed to level this type of technology with other DGs.

13Q **Are currently existing technologies and tools enough to power facilities with nearly 100% renewables in a technically and economically feasible manner? What are some emerging technologies that may be able to reduce costs when produced at scale?**

13A

The current state of technologies and tools do not allow to power facilities with nearly 100% renewables in a typical large urban area. Unregulated injection of power to the distribution grid invites problems as they have seen in Europe.

The utility schedules power delivery and provides voltage regulation, VAR support, and power quality that cannot be sustained on an ad-hoc basis.

As noted above, Smart Grid and AMI with control features offer some emerging opportunities for DG control. Additionally, new types of demand response are being explored that can control load with minimal impact to customers.

14Q What issues impede the deployment of distributed generation technologies in utility distribution territories that RD&D can help address? If so, please identify the issue and how RD&D can help in a manner that benefits both the utilities and customers?

14A RD&D can help utilities and customers investigate the issues of costs, space requirements, air pollution and emissions, and infrastructure needs of DG. RD&D can also help utilities and customers identify how to make DG a cleaner and more efficient source of electricity (e.g. micro-turbines operating on natural gas can be a good source of DG, but the fact they are not renewable does nothing to help a utility reach their RPS targets set by SBX1-2).

Furthermore, RD&D can help utilities understand the true costs of DG and, as noted above, how increased integration of DG can affect the reliability of the distribution system and control of energy sources. Control of DG is a very key issue for utilities, and RD&D may help utilities best deal with DG curtailment issues, and how DG will interact with the deployment of smart grid technologies such as demand response and substation automation.

15Q What other future research direction, focus, strategies or initiatives may be recommended to FIER to undergo so that RD&D can better help advance DG?

15A Concentrate research on areas that will help utilities achieve the regulatory requirements of RPS and reducing green house gas emissions (AB32). These are expensive initiatives and to the extent utilities and customers can do it economically; these viable renewable technologies will provide real value to utility customers. There is also need for RD&D that promotes customer efficiency, including electric vehicles utilization as an energy storage element of the power system.

As noted above, RD&D should focus on providing utilities and customers research on how the costs of DG can be brought down to parity with alternative sources of generation. Demonstration projects and research should be conducted on the effects of

increased amounts of DG on the reliability of the electric grid, and the mechanism of integration and control of DG within the context of smart grid technologies and grid automation.

RD&D should also investigate the role of energy storage as related to increased DG integration, and how the costs of storage can be decreased to the utility.