BEFORE THE CALIFORNIA ENERGY COMMISSION

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Distributed Generation
Getting to 12,000 MWs by 2020

Comments of Amonix, Inc.

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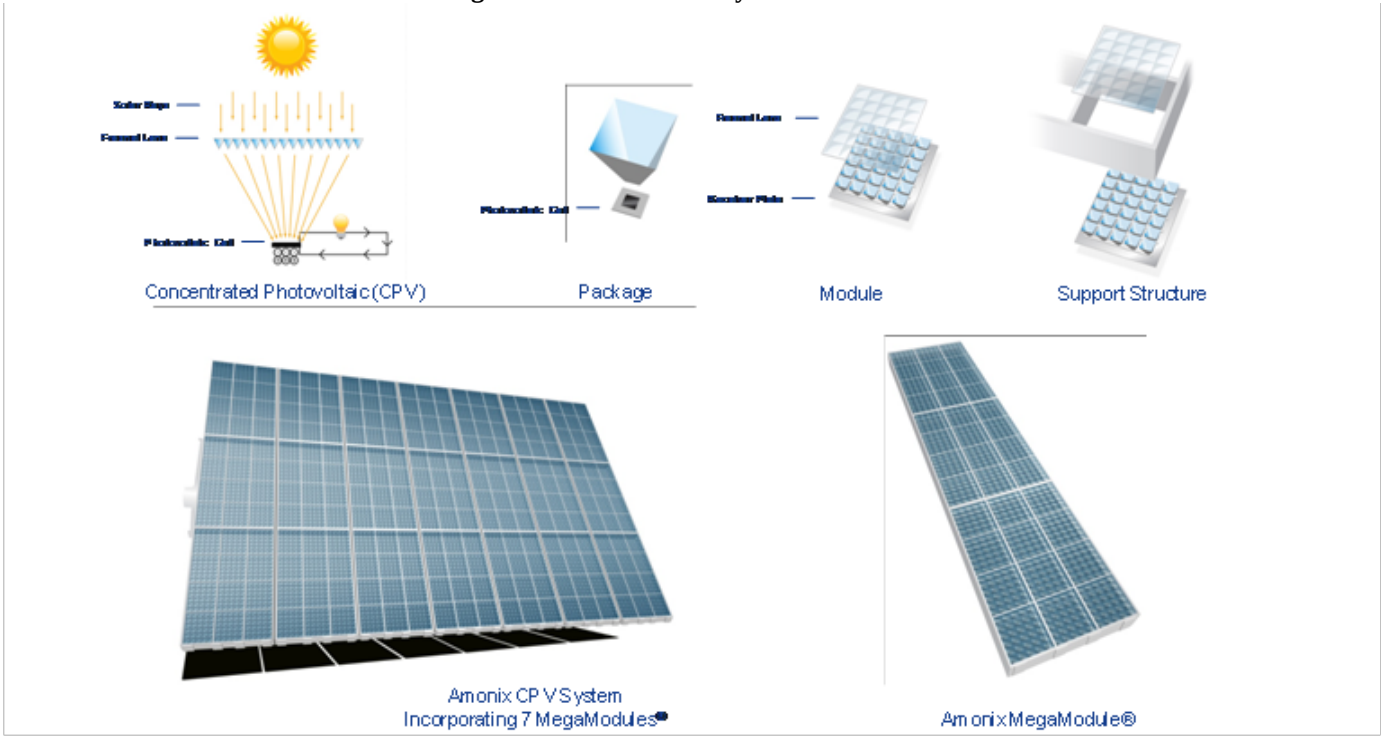
Introduction

Amonix is the global leader in the design and manufacture of concentrated photovoltaic (CPV) solar systems. Founded in 1989, and headquartered in California since, Amonix is an American company with 21 years in business, 16 years of CPV field experience, and seven generations of system evolution. Projects utilizing our technology are in active development throughout the Southwest, including the 30 MW solar project in the Alamosa Valley, Colorado that recently received a conditional commitment for a Section XVII Loan Guarantee from the US Department of Energy.

CPV utilizes acrylic lenses to focus sunlight by many times its normal intensity onto small multi-junction solar cells. The systems are entirely ground-mounted on pedestals, and utilize dual-axis tracking to follow the sun throughout the sky. A schematic of the technology is below.

Figure 1. Amonix 7700 System



The technology utilizes land more efficiently than any other solar technology (~4 acres/megawatt), and uses no water in power production. In addition, land grading is not necessary for the installation of our systems. Finally, Amonix boasts one of the lowest levelized costs of energy (LCOE) and the highest solar to electric efficiency (~25%) in the solar industry.

Amonix respectfully submits the following comments to the California Energy Commission on Governor Brown's goal of 12,000 megawatts (MW) of distributed generation by 2020.

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

1) ***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:***
    a. ***Set targets for each load serving entity or county.***
    b. ***Set targets per sector, for example, residential, commercial, public, or other.***
    c. ***Set separate targets for installations that serve on-site load and for projects that produce energy for wholesale.***
    d. ***Set targets by utilities' portion of coincident peak.***
    e. ***Set targets based on resource potential and/or best use of the distribution system.***

Comment: In general, Amonix recommends that state agencies avoid setting prescriptive or restrictive requirements for implementation of the 12 GW goal, including regional targets or those focused on customer class. Instead, the state and industry would be best served with a mixture of: determining technology eligibility; data collection; streamlined interconnection processes; establish incentives to encourage behaviors by both distributed generation developers and customers that further both the goals of this effort as well as other, related, public policy goals; and, limit speculation.

Technology Eligibility

As a first step, the state should decide which technologies or attributes of technologies will be counted toward the goal. Examples of technological attributes that the state should consider include, but are not limited to, the following:

- Minimum capacity factor and/or fuel-to-electric efficiency;
- Fuel type;
- Maximum system capacity, including whether or not the capacity must be a standalone project or can be a component or add-on of an existing project;
- Overall land consumption and disruption of habitat areas and connectivity between habitat;
- Emerging technologies that could benefit from a scale-up in deployment; and,
- Total greenhouse gas and/or criteria pollutant emissions.

Data Collection

Throughout the duration of the program, data should be collected and made publicly available, including, but not limited to, the following:

- Progress toward overall, and any interim, capacity goal(s);
- Overall program cost and any cost reductions over the program period;
- Fuel type, technology type, and average capacity of systems procured to meet the goal; and,
- Tracking of any credit trading between responsible entities or jurisdictions.

Streamline Interconnection Processes

The CPUC, CAISO, electric utilities and independent developers are all engaged in examining interconnection barriers and recommending solutions. Amonix shares the view of many that interconnection for distributed generation up to 20 MWs should be streamlined and expedited. However, Amonix is concerned that, in this process of streamlining, that the interconnection requests for small generators will be "lumped in" with larger projects that trigger moderate to major transmission and distribution upgrades, thus delaying interconnection of smaller projects unnecessarily, and adding costs. Amonix is currently having this experience at several project sites. In addition, this concern is augmented by two recent Orders of the Federal Energy Regulatory Commission (Docket No's: ER11-2977 and ER11-3004), in which the FERC approved the requests of PG&E and SCE to consolidate and streamline interconnection processes, and simultaneously rejected proposals to either shorten the time between interconnection request and actual interconnection to the grid, or allow for more than one interconnection window per year.

Establish Incentives to Encourage Behaviors

Amonix recommends that state agencies: 1) consider co-equal public policy goals; 2) consider the extent to which behaviors to achieve those goals are currently incented in the market and whether or not those incentives are sufficient; and 3) establish incentives to encourage industry behavior.

Limit Speculation

In whatever system is designed, it is important to also have a way to penalize or otherwise discourage speculation. Speculation is encouraged when, for example, Requests for Proposals (RFPs) allow for bids for production several years from the RFP date. Prices predicted now for a project that will be delivering energy 2-3 years from now will not be accurate. It is also important to both penalize developers for not building, and to create meaningful barriers to entry for bidders.

2) ***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 percent 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 to 100 percent of minimum load. Could a 15 percent of peak load or 50 to 100 percent of minimum load penetration rate be implemented statewide? If so, how much renewable capacity would be installed per utility?***

Comment: No comment at this time.

3) ***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.***

Comment: No comment at this time.

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

Comment: Yes, with care in how the incentives or penalties are designed. As a general comment, the industry responds to incentives and penalties that are meaningful in the market place. Regulation and law are not the only players in determining what these are, but are quite important actors. In other words, if not mandated, monetized, or otherwise incented, the least-cost approach will generally be pursued. As mentioned in response to Question 3, we recommend that the state clearly decide which behaviors it wants to encourage, determine the extent to which those behaviors are sufficiently encouraged in the marketplace, and establish additional incentives where needed.

Three key examples of behaviors that are consistently stated goals for the state that are not currently incented in the market include:

a) ***Minimize or eliminate the use of water in power generation and system cooling.*** The simplest way to incent minimized use of water is to establish a baseline optimal level of water use and score procurements of DG against that baseline, ie - create a "box to check" in scoring bids. This "box" does not currently exist. Water consumption should be measured in terms of gallons per unit of energy produced on an annual basis.

b) ***Maximize development on disturbed lands with reasonable access to transmission.*** At present, no explicit incentive exists to develop projects on disturbed lands, such as brownfield sites, fallowed farm land, landfills or quarries. Agencies could approach this goal in a multi-step process. First, define "disturbed land/sites" that can be developed for purpose of generating energy (ie- sufficient acreage, land slope, and access to the grid). Second, identify and establish a map of disturbed sites that reasonably meet the definition. Third, overlay a map of available capacity on the transmission and distribution grid. Fourth, determine the incentive. The incentive can be any of the following factors, or a combination:

- Expedited permitting and/or interconnection to the grid;
- A "box to check" in scoring bids in procurement;
- An "adder" to any predetermined tariff, expressed in monetary terms; or,
- An award of monies, allocated based on energy production, from a pre-determined fund, on a competitive basis. This could be a potential future use of Public Goods Charge (PGC) funds, once and if the legislature re-authorizes the PGC in the 2011-2 session.

c) ***Minimize land disruption and grading in site preparation and construction, where possible.*** Like the prior two items in this list, no incentive currently exists in the market to avoid disrupting and grading sites. Granted, other legal and regulatory requirements (ie-fire codes) dictate that sites be graded, but these do not universally apply. As with our response in subsection b., we believe that minimizing land disruption could be incented by creating any of the following mechanisms, or a combination:

- A "box to check" in scoring bids in procurement;
- An "adder" to any predetermined tariff, expressed in monetary terms; or,
- An award of monies, allocated based on energy production, from a pre-determined fund, on a competitive basis. This could be a potential future use of Public Goods Charge (PGC) funds, once and if the legislature re-authorizes the PGC in the 2011-2 session.

Finally, as mentioned in response to Question 1, in whatever system is designed, it is important to also have a way to penalize or otherwise discourage speculation. Speculation is encouraged when, for example, Requests for Proposals (RFPs) allow for bids for production several years from the RFP date. Prices predicted now for a project that will be delivering energy 2-3 years from now will not be accurate. It is also important to both penalize developers for not building, and to create meaningful barriers to entry for bidders.

5) If the state established regional targets, should there be options to trade allocation requirements? If so, how should this be implemented?

Comment: Yes. While we would encourage the state to de-emphasize regional goals, should it choose to do so, credit trading makes a lot of sense. Credit trading for the program should be tracked, monitored, and enforced using a reporting mechanism. For example, the local jurisdiction (a utility or local government) is tasked with collecting data (verifications of both the actual procurement of DG and technology eligibility requirements). Any entity should be eligible to both purchase and sell credits, including utilities, local governments, schools and universities, commercial and industrial customers and residential customers. It is important that non-confidential data delineating customer class, up-to-date level of procurement for each jurisdiction, and credit trades, be publicly available.

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

Comment: Amonix responds to this question in terms of steps, in a "bottom-up" approach.

- The first step must be to determine what is eligible to be counted toward the goal.
- The second step is to determine how progress toward the goal will be measured, which will include which entities are ultimately responsible for proving achievement of the goal.
- The third is to define a baseline level of barriers that exist to achieving the goal.
- The fourth step in program design is to very clearly define and communicate the mechanisms to achieve each piece of the goal. If legislative changes are required, clearly define those changes. If modifications in regulatory policy are required, clearly define those changes and develop a plan and timeline for achieving them. If it is simply modifications to practices of either the procurement entity itself, the transmission operator, permitting agencies, project developers, technology developers, etcetera, then clearly define those.
- Finally, a mechanism of penalties, rewards and adjustments in approach should be developed.

II. Discussion on European experience integrating large amounts of DG

7) ***How are the European electrical distribution systems similar to or different from California?***

Comment: No comment at this time.

8) ***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?***

Comment: No comment at this time.

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

Comment: No comment at this time.

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

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

Comment: No comment at this time.

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

As an overall comment, it is important than any RD&D efforts, via the Public Interest Energy Research program, or another mechanism, provides support for technology innovations that directly drive cost reductions in the DG market.

11) 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 AB 32?

The primary role of RD&D should be to support technology innovations to increase performance, reduce cost and improve reliability of emerging renewable technologies like CPV for distributed generation.

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

When compared with society's existing power generation technologies, DG is just beginning to emerge. A focus on DG deployment of ground-mounted systems is needed to reduce total system and installation costs below those of roof-mounted systems.

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

Existing technologies and tools are not enough to power most facilities with nearly 100% renewables in a technically and economically feasible manner when connected to a distribution network. It's less a question of scale for reducing cost than a question of a need for advanced technologies to further reduce cost.

14) 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.

RD&D to reduce the cost of CPV will greatly benefit both utilities and customers.

15) What other future research direction, focus, strategies or initiatives may be recommended for PIER to undertake so that RD&D can better help advance DG?

The best strategy for PIER is to start funding targeted cost-reduction projects for emerging DG technologies such as CPV.