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February 19, 2016

RE: Commission's Investigation of Value and Cost of Distributed Generation
Docket No. E-00000J-14-0023

To My Colleagues and Interested Parties:

It's a truism that residential rate design concepts, which originated in the early part of the 20th-century, need to be updated.

As we all know, this Commission previously determined that DG customers contribute less towards APS' recovery of lost fixed cost revenue than non-DG customers. As such, in 2013, the Commission ordered APS to implement a $0.70 per KW per month interim LFCR adjustment for all residential DG installations.[1]

With this fact and determination in mind, both cost-of-service and value-of-solar considerations deserve a deep dive, as does the manner in which DG penetration affects the grid.

The grid is, of course, a complex network consisting of power generation, transmission and distribution systems, all of which are subject to non-stop maintenance and expansion. As experiences in Germany, Hawaii and elsewhere have illustrated, and as EPRI's study on the "Integrated Grid" has demonstrated, increasing PV penetration levels require utilities to spend substantial sums to modernize the grid, in part to manage large amounts of variable and two-way energy flows.

In the past, there has been agreement on broad principles, at least between utilities and local installers: Their joint statement issued at the Commission's June 20, 2014 Workshop on the Value and Cost of Distributed Generation broadly outlined the "cost and benefits of distributed solar generation and the electric grid." They stressed a "forward-thinking," "customer-focused" approach, promoting "affordable and fair" service — as well as customer choice, an expectation of reliability, a desire for transparent rate design, and an emphasis upon "accurately reflect[ing] the services and products that customers use and provide."

SunPower's 2014 "Roadmap" has also proven to be a helpful resource.[2] I quote approvingly

[1] Decision No. 74202, Docket No. E-01345A-13-0248 (Ariz. Corp. Comm'n Dec. 3, 2013).
[2] SUNPOWER, BRIDGING THE DIVIDE: A ROADMAP TO INTEGRATING DISTRIBUTED GENERATION (2014), *available at* http://us.sunpower.com/solar-resources/.

SunPower's Vice President of Policy, Tom Starrs: "The PV industry is recognizing we can't go it alone and finding ways to work with utilities instead of being antagonists is crucial to our long-term success."[3]

Policy considerations enumerated in the roadmap include:

1. The use of smart tools to improve grid performance;
2. A desire to maintain the growth of solar power via net metering until penetration levels adversely affect utility fixed-cost recovery or require the imposition of distribution system upgrades;
3. Heightened solar penetration may require the gradual implementation of rate structures and service arrangements which send appropriate price signals to improve grid reliability, efficiency, and resiliency;
4. Rate structures and market services should be predictable and transparent;
5. Minimum monthly bills may be superior to fixed charges in ensuring that all users contribute to the costs of maintaining, upgrading and operating the distribution system;
6. Customers' rights to own, deploy, and interconnect behind-the-meter technologies must be preserved;
7. DG interconnection should be subject to simpler, more uniform standards to protect the reliability of the network and the safety of utility personnel; and
8. A greater emphasis on cost-effectiveness regarding grid upgrades, as they relate to the placement of distributed resources.

The following questions, although not exhaustive, are intended to inform both cost-of-service and value-of-solar considerations within the context of the forthcoming evidentiary hearing:

1. The Commission's May 7, 2014 Workshop on the Value and Cost of Distributed Generation included debate on whether a remote solar generation station should receive equal treatment with rooftop solar, with regard to calculating the value of solar. What are the parties' thoughts?

2. Why argue that a value-of-solar proceeding is important only for resource-planning purposes, given that discussions about cost-shifts are informed by discussions on the value of DG?

3. In 2014, lost fixed costs associated with EE programs amounted to $24.1 million out of $34.5 million in total cost shifts. Do recoverable EE lost fixed costs constitute a greater proportion of the total lost fixed cost revenue at hand? Discuss how value-of-solar discussions are informed by comparing the impacts of solar versus EE on the grid. Is the per-customer shift larger for solar versus EE customers? Why is the greater customer accessibility of EE programs relevant to this discussion? How does the average DG user's demand curve differ from an EE user, and describe its effect on the grid, given that the EE user is not in need of backup power, unlike the solar DG user.

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[3] Herman K. Trabish, *How Solar Owners can be 'Good Citizens of the Grid': A New SunPower Roadmap Points to Solutions for the PV Challenges Utilities Face*, UTILITYDIVE (Nov. 19, 2014), http://www.utilitydive.com/news/how-solar-owners-can-be-good-citizens-of-the-grid/334932/.

4. How do we calculate regressive social costs into the value of solar, given that non-solar utility customers subsidize solar customers?

5. Are solar DG users being overcompensated or undercompensated for remitting excess solar power to the utility at the retail rate?

6. To what degree do intermittency and non-dispatchability affect the value of solar?

7. How will increases in productivity be incentivized once the value of solar is estimated? In addition to the declining cost of panels, is it appropriate to factor relatively high U.S. installation costs into a value-of-solar determination?

8. In value-of-solar discussions, are we attributing a unique value to DG, which other power sources also have? In other words, are there alternatives to DG that may be more efficient in reaching the same desired outcome of reducing carbon dioxide emissions at lower instillation costs? How does the cost and value of DG compare with alternative renewable resources? In pursuing DG, what alternative forms of renewable energy are we displacing? How does the cost and value of DG compare with that of utility-scale and community-scale solar? Is DG as efficient as alternative forms of solar? Is the value of solar lessened for DG versus utility-scale or community-scale solar?

9. How should we go about attempting to quantify largely externalized and unmonetized factors, such as projected financial, energy security, social, and environmental benefits? How are long-term forecasts accurately incorporated into present value-of-solar calculations?

10. Despite recognized advantages, a number of states are reexamining their traditional net metering policies and underlying rate designs. The increasingly pervasive review of conventional net metering policies by states is attributable to a multitude of trends, including decreasing solar rebate incentives, rapid encroachment of renewable portfolio standards, the realization of net metering caps, as well as raised public awareness surrounding prospective cost-shift concerns.

    For instance, the Hawaii Public Utilities Commission brought an end to the state's net metering program when it cut payments to new solar customers by approximately half the going rate.[4] Nevada alternatively reduced payments to existing solar customers from the retail to the wholesale rate and raised customers' fixed charges to cover the cost of using the grid.[5] Moreover, the California Public Utilities Commission recently approved a NEM 2.0 successor tariff, which effectively preserves retail rate payments for residential DG systems while imposing new interconnection fees, non-bypassable charges, and a shift to time-of-use rates for DG customers. [6]

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[4] Decision No. 33258, Docket No. 2014-0192 (Haw. Pub. Utils. Comm'n Oct. 12, 2015).
[5] Document IDs 8412 & 8414, Docket Nos. 15-07041 & 15-07042, (Nev. Pub. Utils. Comm'n Dec. 23, 2015).
[6] Decision No. 16-01-044, Docket No. R.14-07-002 (Cal. Pub. Utils. Comm'n Jan. 28, 2016).

a. Given this context, how did Hawaii, Nevada, and California value the costs and benefits of net-metered solar?

b. What analyses on the cost of solar did these states use when they changed their net metering policies in light of an acknowledged cost-shift? Did such analyses adequately account for the costs associated with redesigning and maintaining the distribution system to accommodate DG?

c. How would a value-of-solar methodology facilitate the successful implementation of similar updated policies in Arizona?

Sincerely,

Bob Stump
Commissioner
Arizona Corporation Commission

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