Remarks of Commissioner Mike Florio to the
CESA Market Development Conference:

2.23.16

Bottom Line:

Achieving California's targeted carbon reductions from the power sector will require more generation from variable generators, especially wind and solar. At expected penetration levels our traditional approach to providing electric service – central supply follows distributed load -- will be turned on its on head. Load will follow supply. This change requires us to rethink our analytics, markets, and regulations.

Context:

- Climate Changes is real and requires urgent action.
- In California, we're growing the economy while we reduce emissions.
- In California, we have political will to move forward quickly.

Facts and Assumptions:

- Fact: Carbon targets are 40% below 1990 levels by 2030. Renewable generation targets are 50% by 2030.
  Assumption: Because renewables cost are so low and energy efficiency savings so hard to verify, renewables will be the centerpiece of our low carbon future. Energy efficiency and other elements of the Loading Order remain important, but renewable generation has excelled.
- Fact: share of renewables that is variable outweighs dispatchable/base load, making for an increasingly variable power supply.
  Assumption: While we expect some progress in dispatchable wind and solar thermal generators, growth in variable renewable supply will continue to outpace alternatives supply sources to 2030 and perhaps beyond.

- Fact: The rise of variable production introduces a paradox: we currently see increasing risks from both excess supply AND scarcity. Whether its feast of famine depends on where and when, with variations at increased levels of granularity.
  Assumption: This trend will grow as variable supply increases.

- Fact: there are two known ways to realign supply and demand: alter supply or alter demand. Typically, increased supply has been the tool used.
  Assumption: This time should be different. Why? Altering demand will be a) better for the climate (Carbon neutral or better); b) better politics (because people don't want large infrastructure near their homes); c) more flexible (lots of modules, rather than few big generators/transmission lines); and d) a contribution to technological and behavioral progress that could move the needle globally.

Implications:

- This fundamental change in mindset – load follows supply -- requires us to rethink the fundamentals of our industry, including our analytics, markets, and regulations.
    - Analytics:
        - Load forecasts currently underpin all planning for supply. But they are too high-level, opaque, and inflexible. We need load management, not just better load forecasts.
        - Current valuation of distributed energy resources is too technology specific and insensitive to time, location, and dependability of delivery. We need an approach to valuation which reflects time, location and dependability.
    - Markets:
        - The granularity of products and services being exchanged lacks clear resolution. We're currently adjusting our rabbit ears and

wondering why our picture isn't HD? We need targeted valuation and product definitions. We need the MRTU equivalent for distribution reliability services. We need a means of clearing supply and demand for not only energy and resource adequacy, but for distribution capacity, distribution voltage and power quality, distribution reliability and resiliency.

- And we need the sellers of distributed energy resources to get used to the idea that their output will be valued based on when, where, and how dependably they deliver. Compensation and incentives should be available for distributed energy resources that solve problems and withdrawn from those that create them.

- Regulations:

  - Data: liberalize through a) easy customer access and transfer to third-parties and b) transparency in distribution system analyses. Can we balance security, privacy, and making data available to support third party services to customers and utilities? We must.

  - Dual-use: utilities need to appreciate that behind the meter DER serve the adopting customer as well as the system. For example, BTM storage reduces capacity payments AND provides distribution capacity, voltage and power quality support, as well as reliability and resiliency. Can we co-optimize the control of these systems to secure the full value stream? We must.

  - Justification/Avoided cost: traditionally DERs are justified on an avoided cost basis. Going forward, we need to align supply and demand at a level of granularity and speed which will challenge our capacities to determine avoided cost. At the

same time, ratepayers deserve to know that they're contributions are of good value. Can we find a new balance between the administratively heavy-handed approach we currently use and the other end of the spectrum, a blank check? Again, we must.

- Broadly speaking, with D15-09-022 the Commission took on its part of rethinking these fundamentals. We committed to:
    - developing "an end-to-end framework for integrating distributed energy resources, including relevant valuation methodologies and sourcing mechanisms;"
    - to developing methodologies which reflect the local value of distributed energy resources, thereby enabling the stacking of value streams while ensuring the streams are a good deal for both participating and non-participating customers;
    - and to developing an incentive structure that is technologically neutral, whereby distributed energy resources can sink or swim on their own merits. This includes a re-examination of the traditional incentives that motivate utility behavior.
- If you're not already a part of the Commission's proceedings dedicated to developing this framework, we encourage you to join in and bring your best ideas. There are many challenges and the stakes are high.
- Now… what does this all mean for storage?
    - Storage is uniquely positioned within this evolving framework. It **IS** load management, sensitive to valuation based on time and location, dependable, easy to verify through metering, and dual-use. As we make good on our desire to value these qualities, storage stands to benefit.
    - But there are also foreseeable challenges. Let me discuss a few:

    - Component costs must continue to come down. Our interest in seeing load follow supply are technologically neutral. Storage will be competing with other ways of accomplishing the same objective, including demand response. I'm ambivalent whether energy management systems, auto demand response, storage or good old fashioned homo economicus carries the day. For storage to do so, progress on costs need to continue.
    - Dual or Multi-Use: The holy grail of distributed energy resources, including storage, is the stacking of revenue streams, each reflecting a service provided. We know behind-the-meter batteries can bring value to a customer in managing their bill by reducing demand charges, but can they accomplish that objective wile provided grid services, such as resource adequacy, distribution capacity deferrals, and wholesale energy? Each of these services presents a potential source of revenue, yes. But also a set of obligations. A challenge for storage will be how to manage those obligations if/when they are competing.

- Thank you.
- Are there any questions?