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A pivotal moment for microgrid policy – What California is getting right and where it's heading from here

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○ It feels like 2001 again in California. Rolling power outages are impacting hundreds of thousands of electric utility customers in numerous counties across the state, spanning Sacramento in the north to Riverside in the south, and Monterey on the coast over to Kings in the Central Valley. Luckily, it's August 2020 and not 2001.

Almost 20 years later, advancements in technology, financing, law and regulation allow forward-thinking utility customers to “ride-through” the outages, like those of the past few days, without loss of power. That's because these customers are benefiting from microgrids.

Microgrids have only just recently become economically practical, and only a small group of early adopters has been able to fully benefit. Changes in regulations are needed to facilitate much broader commercialization, especially in an era of power outages — planned and unplanned — that are often caused by wildfires (or even just their threat) and extreme heat waves.

Fortunately, the California Legislature through SB 1339 (2018) directed the California Public Utilities Commission (CPUC) to develop standards and guidelines so that the regulations catch up to the market. The CPUC's current microgrid proceedings are the vehicle to achieve that statutory mandate, a successful outcome which will lead to the mass adoption of microgrids for the benefit of all.

We are at a transformative time in the microgrid market and the CPUC's microgrid regulatory proceedings also stand to be a bellwether for microgrid development policy across the country. Track 1 of those proceedings are nearly complete and show progress toward some of the easier fixes that will help spur broader microgrid commercialization.

CPUC staff recently published their Proposals for Track 2 of the proceedings, and while they have their strengths, the efficacy of these proposals in achieving greater microgrid commercialization is in doubt because of the incomplete perspectives that staff bring to the discussion. We aim in this article to broaden the CPUC's perspectives by sharing our understanding, as a microgrid project developer, of the barriers to commercialization, and our understanding of our customers' needs, concerns, and objectives.

With the end-users front-of-mind, we ultimately need advancements in policy that provide a cost-effective path to energy resilience and reliability. For the economic livelihoods of utility customers and the communities in which they are located, that path must be cleared swiftly, and the CPUC and the investor-owned utilities it governs must be compelled to execute quickly their roles in microgrid project implementation.

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Before analyzing key impacts of Track 2 and these proceedings, it is crucial to assess the economic backdrop of microgrid development. Technology and capital markets have been quickly evolving, driving down costs and moving out financial risks. The proposals need to reflect more fully these market advancements. Today's realities are different than they were in 2018, when SB 1339 was enacted, and as there will continue to be rapid innovation in microgrid technologies and project financing, today's realities will also be different from the realities of 2022 and beyond.

Each of the five recommendations included in the CPUC's staff proposal will have a direct impact on energy consumers throughout the state. However, "Proposal #3: Direct Utilities to Develop a Microgrid Rate Schedule" is where the impact will be particularly weighty on California's energy consumers and, potentially, on national microgrid policies. As is often the case, the CPUC will be the first state regulator to address the financial complications of regulating and nurturing a new asset class in energy markets.

Proposal #3 seeks to overcome inter-related regulatory and financial barriers. The identified regulatory barrier is the high number of individual rate options for different distributed energy technologies, and the identified financial barriers are high initial costs and high operating costs. Simplification, clarification, and increased certainty in the tariff structures for distributed energy resources are undoubtedly needed, and likewise, so is a rethinking of departing load, standby and other charges.

We also see additional opportunities here to a) leverage how capital markets function, b) account for the revenue side of the equation, and c) facilitate innovation in the private sector to explore different business models for delivering microgrids to the marketplace. The extent to which California chooses to incorporate such market-based models and thinking in their microgrid ratemaking will have significant impacts on microgrid solution providers and their customers.

What role should capital markets have?

There is the potential for hundreds if not thousands of microgrids. When financial models — shaped in part by the outcome of these CPUC proceedings — allow for microgrids that meet both end-users' and microgrid developers' requirements, capital needed to build all of those microgrids will be plentiful.

We see a clear example of this healthy dynamic in solar+storage projects of all sizes.

Just as a large solar+storage farm can attract \$100 million or more in capital investment because the sellers and buyers of the farm's energy services enter into a binding contract that will satisfy all parties' needs, the same now holds true for a \$5- or \$50-million microgrid. What historically has enabled capital to flow more easily to solar+storage projects than to microgrid projects is that the regulatory framework for the former has evolved along with the reductions in costs and financial risks.

As regulators begin to provide a more stable and predictable framework for microgrids, more private capital will flow into the microgrid market resulting in larger scale adoption of the microgrid approach. Worthy projects will then be able to find the capital needed to get off the ground because the technology has proven itself, the supply chain has matured, and there is market demand for the value that microgrids can deliver to end-users.

To the extent that capital markets see risk in microgrids, those risks lie in large part in the uncertainty that current regulations create.

The Revenue Side Of The Equation Matters

Proposal #3 addresses only the operating cost side of the financial equation, which is incomplete without a discussion of the revenue side. Revenue remains a gray area of microgrid policy and practices and, as a result, creates an obstacle to capturing the full economic value that microgrids can deliver to end-users, utilities, and the overall grid. A key question related to the revenue side is how the owners of the microgrid's generation assets will be able to realize revenue models with diverse off-takers even during blue sky operations.

Our analysis of the five proposals did not uncover discussions addressing revenue opportunities for microgrids; however, we are encouraged that the CPUC staff concept paper spoke to them (published in tandem with the proposals), including a foreshadowing of a robust grid services market.

This is an area of important focus for the future evolution of California's microgrid marketplace.

Business Models Are Evolving

One of the key business models that has emerged as microgrids mature as an asset class is the third-party financing model, a.k.a. energy as a service. The idea is not new. Power purchase agreements and various leasing models have been serving the solar industry well for years.

What's new is the ability to apply it to more complex microgrid systems that rely on a broader mix of assets for generation, storage and distribution. The ability to quantify and guarantee system performance ensures the reliability that is in such demand from energy consumers across the board from residential to commercial to industrial and agricultural.

However, bringing it back to the current rule making and regulations, the proposals and the concept paper imply a limited view of the business models that microgrid developers and customers can utilize in pursuit of broad microgrid commercialization.

If the proposals are adopted as is, microgrid business models may be restricted, which could limit options for energy users and reduce the flow of much needed private investment in electric power infrastructure.

If CPUC regulations governing microgrids are predicated on a narrow view of microgrid business model options and limited definitions of use cases, the regulations will inhibit innovation. We see the potential for such limits in Proposal #3 — as well as in Proposal #2 — which both focus on microgrids that are narrow in their scope: serving the resiliency needs of loads on only one or two parcels. The CPUC is clearly recognizing the importance of enabling microgrids that serve multiple loads on multiple parcels, but it is also potentially setting up severe limits to their applicability in Proposals #2 and #3.

Clusters of businesses that perform similar functions and/or are part of each other's supply chains are natural candidates for a microgrid; think of a cluster of food processing companies all located within a mile or so of each other, and not necessarily adjacent to one another. An extended power outage can lead to millions of dollars of lost inventory. The interconnectedness of these firms' operations can mean that power loss in one can create financial losses for others. It makes sense to provide energy resiliency to all firms in the area. It also makes sense to be able to connect these firms to the same microgrid to reap the economic (and operational) benefits of scale.

Whether the regulations will fit such collaborative approaches will be critically important to microgrid development and solutions everywhere.

California is leading the development of regulatory policies and program designs. The CPUC's work to implement SB 1339 will likely kick-off a nationwide effort to support the commercial deployment of microgrids that deliver energy security, operational resilience, and economic benefits to communities, customers and the utilities that serve them. We need to make sure that the CPUC gets it right.

About Concentric Power Inc.

Concentric Power, based in Campbell, Calif., and founded in 2011, creates high-efficiency energy systems taking a modular approach to onsite electric power generation and low temperature refrigeration. By generating electric power and thermal energy at the same time, Concentric Power captures heat that would otherwise be lost during the production of electricity and instead provides a clean energy solution. Concentric Power's "power plant as a product" delivers the most energy efficient method today for agriculture and industrial sectors seeking an economical, efficient power and refrigeration solution. Concentric's microgrid strategy for energy infrastructure provides upwards of 25 to 50 percent reduction in greenhouse gas emissions and energy costs for customers. Concentric is a licensed General Engineering Contractor.

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