

EDC CHALLENGES



Slide 1: Greetings. This is Marc Pfeiffer with the fifth in our Developing Town Center Microgrid webinar series. All the webinars, their accompanying Fact Sheets, and the full report can be found at www.microgrids.io.

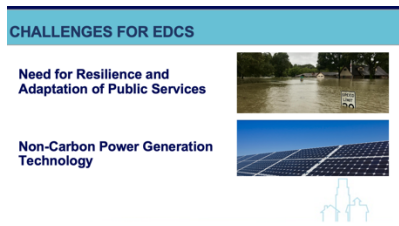
This session is about how Town Center Microgrids face unique and significant challenges from EDCs - their local Electricity Distribution Company. These challenges are varied across the country as EDCs are regulated by state public utility regulators. At the same time, as they continue to evolve, microgrids of all types - Town Center, single-site, or campus - are among the many disruptions facing EDCs.



Slide 2: EDCs can present significant barriers to TC microgrid success. Outside of specialized use cases, the regulatory and economic environment regulating EDCs generally stymie the development of TC microgrids. These barriers include:

- Franchise rights that impede EDCs from taking on customers.
- Because EDCs serve a wide range of customers, they require costly regulatory burdens that may be unnecessary for a TC microgrid to do the same.
- The EDCs have a legal right of preferred access that allow it to cross multiple public rights-of-ways, an authority that is not normally available to a non-EDC facility.
- Technical and engineering issues concerning the management of DER are an ongoing issue.

All of this leads to EDC management and fiscal uncertainty. That affects the risk of developing and maintaining their systems and ensuring necessary investor cost-recovery.

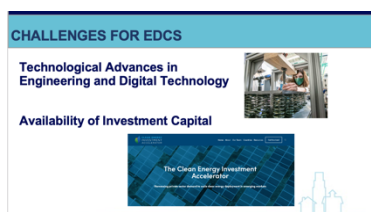


Slide 3: Clearly, microgrid technology is a fundamental element in the evolving change and disruption being experienced in energy supply and distribution, both nationally and globally. Here's how disruptive that actually is: microgrid technology is implicated both as a cause and a solution to supply and distribution issues. And at the same time, it is also an investment opportunity. So it's the cause, it's a solution, and it's an opportunity for investors.

For the rest of this session, we'll discuss examples of those changes and disruptions, which of course, like everything else we've been discussing, are all interrelated.

Let's start with the reality that critical public services are affected by environmental concerns, this includes changes in weather patterns. The effect of those changes started the idea of TC microgrids: the need for power supply resilience and reliability as an adaptation response to disruptive weather events. That's been the thing underlying so much of the interest in town center microgrids; your response to what happens when the lights otherwise go out, predominantly because of a weather event. We can add to that the international public policy requirements to reduce atmospheric carbon.

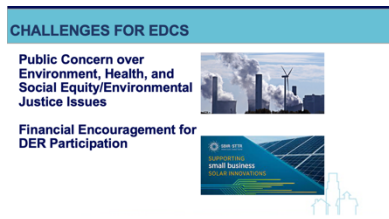
Next on the list is non-carbon power generation technology and how it has been advancing. That has led to increased supplies of solar, wind, hydrogen, and biofuels like renewable natural gas. Depending on location, some of these are now at price points that are lower or competitive compared to carbon-based fuel supply.



Slide 4: Technological advancements are significant disruptors. For example, consider efficiency and cost improvements in generation technologies like combined heat and power, fuel cells, photovoltaic solar panels, and battery storage. Also consider digital technology controls for voltage and frequency management and switching. Advancements in all of these have facilitated the growth in DER supplies, behind-the-meter solutions, and the ability to interconnect supply with transmission and distribution grids.

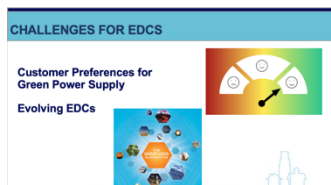
We also have the availability of investment capital. It is attracted by potential returns from the lower cost of DER-generated power, especially when coupled with behind-the-meter solutions. The potential for above-market returns attracts venture capital and private equity investors. So

all of these things are now coming together, at least in theory, to create an opportunity for microgrids and TC microgrids.



Slide 5: There are additional disruptions. The public is showing increased concern over environmental, health, and social equity and environmental issues. These are driving state-level government policymaking, regulatory study, and decision-making. Regulators are considering and adopting new policies focused on reducing carbon-based energy supplies and replacing them with environmentally cleaner supply. They are also bringing in equity of access to clean supply as an important consideration.

Energy markets and government incentive programs are our next disrupter. They are providing financial encouragement for DER participation in supply transactions at the federal, regional, state, and local levels. Residential and community solar programs are prime examples of this driver.



Slide 6: We are also finding that customer preferences for green power supply are playing a more important role in decision-making. Unfortunately, this market has participants that engender customer confusion, obscured supply sources, unclear contract terms, and deceptive marketing practices. It is hard for reliable and ethical vendors to stand out.

Finally, with the advent of DER, EDCs and their regulators are wrestling with new technical, regulatory, and financial challenges to manage and deliver local supply on their grids. This is uncertainty, and one of the things that makes managing a private company challenging is uncertainty for management, as well as their investors.

To wrap this up, these disruptions collectively affect the operating and financial underpinnings of a traditional investor-owned EDC utility model in each state. Depending on state and local circumstances, they are forcing utilities to respond, innovate, adapt, and become more market-driven and customer-centric, in addition to dealing with the issues of environmental concern and social equity.

Microgrids and DER are just one slice of the power grid modernization issues that EDCs are working through. The task of finding pathways for their development is necessary as part of an overall approach to managing DER and grid modernization.

