ESG NEWSLETTER

MICROGRID AND OWNERSHIP: UNLOCKING RESILIENT, SUSTAINABLE ELECTRICITY DELIVERY

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Electric utilities are in a period of transition. The traditional model of delivering electricity from large plants to small communities is being disrupted by advances in scalable technologies, including, solar, batteries and engines. Along with them has come the discovery of the values of Distributed Energy Resources (DERs) employing microgrid technology to distribute power.

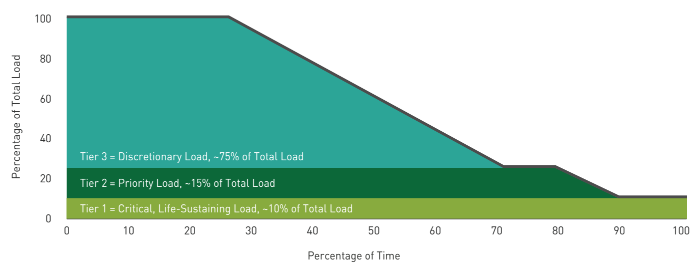
The concept of DER is that physical and virtual assets deployed across a distribution grid can be used individually or in aggregate to provide value to the grid, individual customers, or both. For example, DERs can aggregate solar, storage, energy efficiency and demand management assets to provide services to the electric grid.

When constructing a microgrid, project developers first consider whether to cover a limited portion or all of a municipality's geography. They then define how much of that geography's electricity consumption the microgrid will aim to serve. The microgrid can be installed as a separate dedicated system, like a home generator, and it can be integrated with the local or state grid.

A California group, the *Clean Coalition*, is popularizing microgrid delivery through cleaner resources. The customers of the coalition fall into three buckets: 1) life-sustaining, 2) priority needs and 3) the large remainder. The microgrid back-up system can serve any or all those identified with emphasis upon valuing the resilience of the first two the 25%. (See Figure 1).

Thus far, microgrid approaches have been piloted by communities, but since the protracted blackouts of Superstorm Sandy and, more recently, California's wildfires, many state utility commissions are taking a closer look including New York (*Governor Cuomo Announces $11 Million Awarded for Community Microgrid Development Across New York*) and, now Pacific Gas & Electric (PG&E).

FIGURE 1: IDENTIFYING AND PRIORITIZING ELECTRICITY SERVICE DELIVERY FOR A MICROGRID[1]



Source: Clean Coalition, as of January 27, 2020.

Local growth of microgrid puts into question whether shareholder or publicly owned utilities offer a more competitive solution. To explore the question, we consider the approach of each, using PG&E and the City of Glendale, California, as examples. PG&E is a large Northern California investor-owned utility while Glendale operates its own independent electric system exclusively serving residents of the city.

PG&E'S APPROACH

Delivering value for shareholders of an investor-owned electric utility depends upon uninterrupted electric service to its customers. This is where microgrid comes in. Blackouts happen and microgrid's first duty is to provide backup.

During 2019, many California residents repeatedly faced multi-day blackouts as the state and PG&E sought to prevent starting more fires. To improve system reliability, PG&E submitted a *Request for Offers* to energy project developers at the end of December 2019. It intends to rapidly develop the capacity to provide microgrid services to 20 communities in its service territory before the 2020 wildfire season begins this June.

Features of PG&E's Request for Offers include 1) sizing the microgrid to the full, 100% electricity needs of each community, 2) using a locally-dedicated system to alleviate blackouts, with electricity otherwise returned to PG&E and 3) allowing private developers the discretion to select which resources make up their offer.

System size is a significant cost factor. PG&E's aim to cover 100% of backup energy needs is an expensive solution. This works for shareholders because the company will recoup all costs and the shareholders receive the equity return. For systemwide ratepayers, the electricity produced beyond blackouts could be redeeming, but not necessarily enough to compensate for the expense of battery storage. Those additional costs must be balanced on them and the local ratepayers who most value the batteries. It is also worth noting that PG&E's solicitation of bids for fossil-based systems could invite local conflict.

GLENDALE, CALIFORNIA'S APPROACH

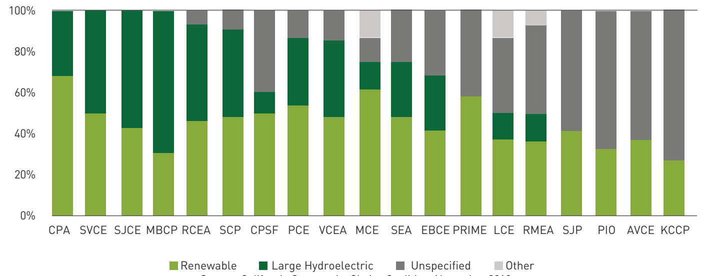
The community of Glendale is slightly larger than most of the 20 communities that PG&E selected, while being much smaller than the utility. Its plan does not target microgrid, specifically, but offers attributes and some advantages.

Importantly, Glendale's customers own the electric system that serves them. They have autonomy to decide utility rates and can provide input into resource planning. In *Why Electricity Bills Are Becoming Just as Complicated for the Utilities Themselves*, we wrote about how customers who feel excluded from the decision-making process may be less willing to pay their bills. As shown in Figure 2, ratepayers' decisions about the type of power they select can vary significantly across communities. For Glendale's system, the customers are choosing the source of power, not the developers or PG&E, and can decide which form of power it delivers.

In contrast with PG&E's intent to serve 100% of needs, Glendale seeks to meet just above 25%—as the Clean Coalition's model suggests—through a local solar array, batteries and an engine. The system will be smaller and less extravagant, but perhaps adequate relative to the limited time it would operate as a dedicated microgrid.

To help mitigate the negative effects of a multi-day blackout, the Glendale system can serve beyond its life-sustaining and priority loads, using a process of rolling blackouts, which could reduce inconveniences, such as food spoilage, and may be a lesser-evil for victims of PG&E's 2019 systemwide, multi-day blackouts.

FIGURE 2: POWER DELIVERED TO CALIFORNIA CUSTOMERS THROUGH COMMUNITY CHOICE AGGREGATION[2]



Source: California Community Choice Coalition, November 2019.

CONTRASTING OWNERSHIP MODELS

Overall, Glendale's plan offered flexibility and the city arrived at a solution that is both resilient and financially efficient. The same autonomy Breckinridge views as fundamental to municipal revenue bond security—local decision-making—was a prominent feature. The same decision-making approach is not available to ratepayers of a shareholder owned utility.

CONCLUSION: MICROGRIDS REPRESENT A TREND TOWARD SELF-SUFFICIENCY

Microgrids aren't unique to California, but the state's wildfires helped to accelerate their practical development. Some of the most severe, including the deadly Paradise Fire, were caused by faulty transmission lines. Apart from fire or flood resilience, policymakers are studying microgrid's ability to avoid wire costs and answer local preferences, such as for cleaner energy. These benefits contribute individual value that can be compensated within a value-stack.

Glendale's decisions were made free of an approach where—beyond a mutual desire for reliability—shareholders can be reluctant to let go of ratepayer costs upon which equity returns depend. Ratepayer costs coming from transporting fuels or building and maintaining wires can hold appeal for shareholders, even as renewable energy's lower commodity and transportation costs help provide savings for solutions like microgrid. Considering our two examples, Glendale's solution offers synergies and some welcome sensibility for Californians. The state is currently deciding between fixing a bankrupt PG&E, or increasing public ownership through what could be an estimated $10 billion or more in tax-exempt bonds. In times of a changing U.S. energy landscape, we believe many challenges away from wildfire risk can also be competitively addressed through a public-ownership model, like Glendale's.

FOOTNOTES:

1. Percentage of time online for Tier 1, 2, and 3 loads, based on UC Santa Barbara as the location. The levels of solar-driven resilience in this chart are achieved via a net zero level of solar combined with energy storage capacity equating to two hours of the nameplate solar production (e.g., 200 kWh of energy storage for 100 kW of solar).
2. The communities represented in Figure 2 are Apple Valley Choice Energy = AVCE, Pico Rivera Municipal Energy = PRIME, Clean Power Alliance = CPA, Redwood Coast Energy Authority = RCEA, Clean Power San Francisco = CPSF, Rancho Mirage Energy Authority = RMEA, East Bay Community Energy = EBCE, Sonoma Clean Power = SCP, King City Community Power = KCCP, Solana Energy Alliance = SEA, Lancaster Choice Energy = LCE, San Jose Clean Energy = SJCE, Monterey Bay Community Power = MBCP, San Jacinto Power = SJP, Marin Clean Energy = MCE, Silicon Valley Clean Energy = SVCE, Peninsula Clean Energy = PCE, Valley Choice Energy Authority = VCEA, Pioneer Community Energy = PIO.