



# Is a Microgrid Right for Your Commercial Facility?

Four Questions to Ask



This is the first installment of Black & Veatch's three-part series exploring business cases of microgrids across multiple industries that are moving towards greater energy reliability, lower energy costs and a more sustainable future.

Commercial organizations are deploying solar photovoltaic (PV) panels and battery energy storage systems (BESS) at record rates to slash carbon emissions and get more control over energy production, storage and use. Some facilities take energy resilience a step further by deploying a microgrid for localized control on and off the grid. Should you? Before you make the leap, consider these four questions.

### 1. Do you have power when and where you need it?

Organizations deploy microgrids to gain increased energy resiliency, reliability and operational flexibility for their operations. While utilities have adequate generation capacity, their distribution infrastructure (such as overhead power lines) often is incapable of carrying the amount of required energy when and where power-hungry facilities need it. Mission-critical facilities such as data centers rely on microgrids to protect essential operations. If a data center goes down, the impact is immense: transactions and trades are stopped, flights are grounded, and critical records cannot be accessed. A data center can consume as much power as 80,000 homes<sup>1</sup>, so operators often supplement utility power supply with a microgrid combined with BESS.

Microgrids ensure steady distribution of stored energy day and night to effectively reduce power interruptions and intermittency from renewables. They also serve as control centers to seamlessly transition to different types of power generation — such as solar, combined heat and power, fuel cells or onsite generators — that allow organizations to diversify their power options for greater resiliency. The idea of a modular energy design is gaining traction; an organization can start with a microgrid-BESS design and integrate more clean technologies over time. With more energy options, you further diversify onsite energy at a reduced cost and decarbonize more of your business and supply chains.



### 2. Are you storm-stable?

Increasingly extreme weather events threaten grid stability. For example, planned and emergency power outages are frequent in western states where wildfires have their own yearly season. When neighboring facilities are offline for hours or even days during these events, microgrids provide a localized solution to mitigate outages at facilities with greater climate risks.

As climate change events become more concerning, organizations are tapping climate analytics to identify the likelihood of climate hazards and the resulting impacts on their operations<sup>2</sup>. With this knowledge, organizations prioritize funding towards adapting their buildings, systems and functions to address the predicted risk. Microgrids are a top mitigation measure because they protect against outages, nixing costly operational downtime and protecting critical community functions such as emergency services. By providing localized power, microgrids also strengthen the central grid during extreme events by reducing peak demand.

### 3. Do you want to save money? (Who doesn't!)

Facilities with microgrids and BESS can seamlessly transition off the central grid to their own systems as needed, which is especially beneficial if the utility charges time-of-use rates. Onsite generation, storage and a microgrid provide reliable energy often at lower rates than organizations can purchase from the electric utility, which reduces operational costs.

Additionally, organizations can sell stored surplus power back to utilities, creating a revenue stream that offsets costs of building and operating the microgrid. For example, utilities anticipate high loads during the summer when air conditioning use is high. Utilities then will issue a demand response signal to incentivize customers to decrease their loads during this time; this compensation can be significant at the commercial scale. Organizations with microgrids can expect more predictable expenses, worry less about volatile energy price spikes and obtain energy at the lowest cost possible.

#### 4. Are you going green?

Driven by climate change and sustainability goals, many organizations are delivering their goods and services from green buildings, facilities and campuses. Green buildings focus on all systems to design an ideal clean structure, but the energy system affects nearly every facility function, including transportation as electric fleets and vehicles continue their rise<sup>3</sup>.

For this reason, many development and retrofit projects include solar generation and BESS to power buildings with

clean energy, reduce emissions and lower operational costs. Depending on the end use and location, an organization can add a microgrid to ensure redundant, reliable energy supply and management. In this scenario, microgrids decrease carbon footprints by leveraging decentralized, renewable power at the point of consumption. Microgrids powered by renewable sources such as solar panels or wind turbines exemplify sustainable practices and help businesses meet their “green energy” goals.



#### Leverage Digital Twin Technology to Optimize Your Microgrid

Digital twin technology has gone from a futuristic ideal to a present-day reality that benefits the entire infrastructure lifecycle. While Building Information Modeling (BIM) is impactful throughout design and construction, digital twin technology takes this a step further by enabling data-driven, real-time simulations of the systems and processes within the facility. **Here are two major ways in which using digital twins helps developers ensure operational success of their onsite microgrids:**

- **Plan and design more cost-effectively.**

Digital twin technology eliminates geographical barriers in the initial site due diligence and design phases. The entire team can virtually walk the project to proactively identify and mitigate potential issues. It's much more expensive to make changes after construction has started; it's best to “design twice, build once” by gaining operational insights before breaking ground.

- **Optimize facility operations and maintenance.** Data-driven operational intelligence boosts efficiency by streamlining day-to-day operations and maintenance practices. Digital twins allow developers and/or operators to use real-time data from any device with internet access and visualize system behavior through simulation of the facility and its microgrid. These highly specialized models can also be used to simulate energy demand response impacts, evaluate backup generator systems, identify pressure points and monitor operational costs.



### **Next Steps:** Collaborate with an Expert Advisory Partner to Guide Your Reliable Power Journey

As organizations seek energy independence and reliability in a decarbonized era, microgrids are emerging as a cost-effective technology that solves several pain points. With many applications, the right microgrid design depends on what you're trying to achieve. Whether you're building a new facility or modernizing an existing asset, it's essential to analyze current power needs and to understand how available technologies can enhance existing assets.

In some cases, microgrids may not be the best technology addition; organizations may be better served by onsite storage and solar, or simply applying energy efficiency measures to sustainably reduce energy costs. An advisory partner, like Black & Veatch, provides technical insight and evaluates the business implications of a microgrid or alternative solutions. This journey starts with a customized roadmap to guide your microgrid and energy strategy from decision-making

to commissioning. With a trusted partner, organizations will balance volatile energy environments and integrate a range of technologies to cost-effectively achieve resilience, sustainability and growth.

For more insight regarding the business case of microgrids, be on the lookout for the next installment of this educational series: *Is a Microgrid Right for Your Utility?* **Visit our website to learn more about Black & Veatch's advisory solutions.**

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<sup>1</sup> [Source: McKinsey & Company](#)

<sup>2</sup> [Source: Black & Veatch](#)

<sup>3</sup> [Source: Black & Veatch](#)

