MICROGRID KNOWLEDGE SPECIAL REPORT

Think Like a Financier to Win Funding for Your Microgrid Project

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Mind the Gap

It's far easier to finance a microgrid today than it was just a few years ago thanks to new financing mechanisms and a greater understanding of the technology by investors. Still, some great microgrid projects do not see the light of day because of the gap between a developer's vision and a financier's scrutiny.

Developers, sponsors and engineers who work on microgrid projects think in terms of equipment, configurations and benefits, such as resiliency and sustainability. As much as they may agree with the policy goals and beneficial aspects of a microgrid, financiers bring a different point of view to a project. They look at the bottom line and think in terms such as internal rate of return, risk-reward ratios and debt-service coverage ratios. The gap between the two points of view often creates a gulf into which a microgrid project can fall and never reappear into the light of day.

It is possible to bridge the gap, however, by taking the time to understand what financiers look for in a microgrid project.

This white paper lays out how investors and other financiers think about energy projects. The aim is to help move a microgrid from the drawing board to reality by preparing engineering firms, developers and project sponsors to think like those in the lending community.

For the purposes of this paper, we can define a microgrid as an electric power system that generates enough energy to meet or exceed loads within a defined geographical boundary. A microgrid may or may not operate within a utility grid, but if it does, it has the ability to "island," i.e., to disconnect from the surrounding grid and operate autonomously to ride out a blackout or other adverse conditions.

The ability to operate as an island is a distinguishing characteristic of a microgrid. It is also often the source of some of a microgrid's chief benefits. Being able to island during a storm or an emergency enables a microgrid to keep the electricity flowing to critical municipal facilities, hospitals, data centers, grocery stores, gas stations and others that provide services society depends upon. The reliable power offered by microgrids is also important to businesses that lose products, manufacturing capabilities or sales during power outages.

As laudable and valuable as microgrid benefits may be, from the perspective of some financiers, they also present challenges. In their view, islanding requires complicated technology that is unfamiliar to them compared to conventional energy equipment, such as gas turbines, which have long track records both in terms of operations and as part of successfully financed deals.

So, while the ability to island enables a microgrid to provide resilience, not all financiers understand how to turn energy resilience into a source of cash flow. Because power outages are sporadic and unpredictable, financiers do not always know how to assign a financial value to resilience, although a great deal of **analytical work** on the concept has been conducted recently.

That is one of the reasons government grants helped fund several early microgrid projects. Among the early backers were the U.S. Department of Energy, the U.S. Department of Defense and state agencies, such the Connecticut Department of Energy and Environmental Protection, the New York State Energy Research and Development Authority, and the California Energy Commission's Electric Program Investment Charge.

Today, state governments continue to provide backing, but microgrids also are tapping into private sources. Many projects are financed on the balance sheet of a vendor, usually a company that specializes in microgrids or the equipment used in microgrids. Private capital, too, has come into play. For instance, Warburg Pincus teamed up with Scale Microgrid bringing an equity commitment of up to **$300 million**.

While microgrids have more avenues for financing than ever before, the problem remains that microgrid developers and the financial world don't always speak the same language. What do project sponsors need to know—and do—to create a proposal that will get a nod from investors?

Getting to Bankable

In order to have a "bankable" microgrid, developers must first understand the obstacles they face. Microgrids are complex and have many moving parts. A single microgrid could include one or two generators, such as solar panels and a gas turbine, an energy storage device, and a variety of controls to monitor grid conditions, balance loads, and connect and disconnect from the grid. This technological complexity may add complexity from a financing point of view.

Over the past several decades, financiers have developed financial mechanisms as the power market has undergone changes brought about by deregulation, decentralization and the proliferation of renewable energy resources. The key project financing technique for independent power plants (IPPs) is the power purchase agreement (PPA) in which a utility or other creditworthy party anchors a development project by agreeing to purchase the electrical—and/or the environmental benefits—of a power generation project. The PPA was later augmented to facilitate the use of the federal production tax credit (PTC) for wind power projects by implementing a partnership-flip structure. Financiers also devised lease arrangements for solar installations that are eligible for the federal investment tax credit (ITC).

Compared with a microgrid, however, those projects require relatively simple financing structures because they are anchored by a stream of payments for energy and green attributes produced. A microgrid could be financed the same way, but that would not account for, or value, many of the abilities and benefits of a microgrid.

Developers and financiers alike face the challenge of attaching monetary values to microgrid attributes in order to create value streams. If the costs of a microgrid are not offset by a predictable value stream on the revenue side of the ledger, it will be more difficult to finance and could become unbankable. Microgrid sponsors should review these obstacles before they approach financiers for financing.

In addition to matching a microgrid's technological attributes and operational benefits with monetary value streams, sponsors should be aware that financiers view microgrids as relatively untested. Many in the microgrid industry may argue this point, but nonetheless, it's a reality they may face when seeking financing. There are several aspects of this status that need to be considered.

Government agencies and industry players, in an effort to stimulate emerging technologies, have often promoted efforts to standardize project design as well as contractual arrangements so as to attract financing.

Financiers lend money based on projections into the future.
The more certainty that can be associated with those projections, the higher the likelihood of securing funding and securing it at better terms.

Financiers may see microgrids as new technology.
Individual components, such as solar panels or gas turbines, may not be new but when configured into a single project they constitute a new entity. Financiers may require additional data to support the operational claims of microgrids. In addition, some of the components, such as microgrid controllers, are, indeed, new technology and financiers may seek more operational history to demonstrate their viability.

These track record concerns are compounded by the fact that microgrids to date have been built to meet specific requirements. A microgrid project at an urban university that is designed to provide power and heat for campus buildings and be a test bed for electric vehicle charging stations will have a very different configuration than a microgrid in a rural setting designed to provide backup generation for public safety and health functions during emergencies.

The unique design characteristics of microgrids may be beneficial for the clients they are intended to serve, but they pose an informational hindrance when it comes to financing. Financiers want to have data that not only forecasts operational and financial performance, but also compares data across several microgrid projects. In fact, government agencies and industry players, in an effort to stimulate emerging technologies, have often promoted efforts to standardize project design as well as contractual arrangements so as to attract financing. From a financier's perspective, standardized projects lead to efficient financing.

Another key consideration for financiers is the creditworthiness of project participants.
This applies across the board from technology to off-takers. Financiers look for projects with equipment from known and trusted vendors that will be in business if a warranty needs to be invoked. In the same vein, financiers prefer to deal with developers and sponsors with a proven track record in moving projects from conception to fruition, demonstrating the developer/sponsor's ability to successfully negotiate with vendors and to navigate regulatory requirements. And, finally, financiers look for creditworthy counterparties or off-takers; that is, they want to know that the party making payments for the microgrid's energy has the financial wherewithal to meet its obligations.

In addition to track record and creditworthiness, microgrid sponsors also need to consider at least four other factors when approaching a financier or financial institution: revenue streams, capital stack, ownership and risk allocation.

Revenue streams

The greater number of moving parts in a microgrid can be viewed as a liability by financiers, especially those not familiar with the asset class, but the complexity of a microgrid also creates opportunities for a wider variety of potential revenue streams.

In some locations and jurisdictions, a microgrid can create value for the sponsor or host by reducing demand charges or time shifting load. Innovative financial structures can incorporate those savings into revenue streams for microgrids.

In addition to being able to supply energy under a PPA, a microgrid's ability to multitask can make it eligible to receive payments from wholesale power markets for ancillary services, such as capacity, voltage control or frequency regulation.

Microgrids, especially those that incorporate energy storage, can also provide benefits by reducing demand. In some locations and jurisdictions, a microgrid can create value for the sponsor or host by reducing demand charges or time shifting load. Innovative financial structures can incorporate those savings into revenue streams for microgrids.

Tax credits are an important revenue stream for wind and solar projects, specifically the production tax credit (PTC) and the investment tax credit (ITC), offered by the U.S. government. But not all parties can take advantage of tax credits. Nonprofits, municipal utilities and even some for-profit companies do not have sufficient tax appetite to benefit from tax credits. Additionally, some components of a microgrid are eligible for accelerated depreciation and, until 2023, 100% of the system can be depreciated in the year it is placed in service.

Capital stack

That is important for a sponsor to understand when considering ownership structures and different tiers of capital—what financiers call the capital stack. Financiers have devised structures that allow tax credits to flow to other entities within the project structure. In many solar projects, financial institutions that can use, or monetize, tax credits share ownership of the project until the tax credits expire, or a target return is met, at which point ownership reverts from the tax equity investor back to the sponsor.

Both tax considerations and ownership are important considerations when structuring the capital stack. Some parties may not have a lot of tax appetite. Potential owners of microgrid projects have varying degrees of tax appetite. Strategic players like utilities often can take a hefty equity stake in a project. Most developers, on the other hand, prefer to retain their capital and, instead, rely on leverage to earn their required returns.

Generally speaking, the capital stack of most projects is structured to take advantage of the lowest cost capital. So, a typical deal would place the lowest cost capital, tax equity investors with a preferential interest, ahead of sponsor equity and lenders.

Risk allocation

The appetites of the various parties in any financial arrangement are largely a function of risk appetite, which determines the risk allocation of a project. One of the largest risks in any energy project is fuel supply and price risk. Financiers have devised a number of tools to hedge the risk, such as options and swaps to offset the volatility of fuel costs. In many cases, the best financial outcome requires the customer to procure and take the risk of fuel costs. Because the marginal cost of grid delivered electricity is often highly correlated to natural gas prices, the customer should be indifferent to taking this risk.

Other risks to be considered include:

- **Regulatory**
  Can developers secure needed permits?
- **Construction**
  Will construction be completed on time and on budget?
- **Operational**
  Will the project operate as planned?
- **Counterparty credit**
  Will counterparties, such as PPA counterparties, uphold their obligations?

Developers need to carefully consider what risks they will take. Developers often take regulatory risk. For example, construction companies have been known to share construction risk, or even guarantee timely completion. Financiers are keenly focused on which party will assume what risk, and the assignment of risk plays a key role in determining the pricing of a deal. As a general rule, the less risk the financier takes, the better deal they are willing to offer the sponsor. Risk allocation is also a key factor in choosing the right financier. Financiers have varying risk appetite and different practices. Some are willing to lend to or acquire a project anywhere in the development process. Others are unlikely to lend to or acquire a project until construction is complete.

Ownership

Ownership has a tight function with the already mentioned factors. If a party does not have tax appetite, they are less likely to take ownership of a project in which an ITC plays a key role in financing. Developers often shy away from a large ownership stake. They prefer to "keep their powder dry," that is, preserve their capital to develop the next project. That said, financiers often prefer to see a developer show they have "skin in the game" by retaining an equity stake in a project. Strategic investors, on the other hand, often prefer an equity stake.

Third Party Ownership Models

The interlocking, and sometimes conflicting, interests and risks associated with revenue streams, ownership and capital requirements are the key drivers in drawing up the financial structure of an energy project.

Because advanced microgrids—those that use sophisticated controls with multiple generation resources—are relatively new, financiers look for characteristics in the projects that are familiar to them.

> Solar power firms have made wide use of lease arrangements as a way of attracting residential customers wary of making a large upfront payment.

Such investors are likely to be familiar with the financial structures used for asset classes that are similar to microgrids, such as stand-alone independent power plants that use PPAs. Or, more recently, project financing backed by hedges. PPAs for microgrids can cover energy sales and green, or environmental, attributes, but they do not necessarily cover other potential revenue streams such as sales of ancillary services or the benefits of meeting reliability or sustainability goals.

Microgrid financing is evolving, however, and as investors become more familiar with the market and the asset class, they have adopted tried and true structures created to remove financial risk from the microgrid host. One financial tool is leasing.

This isn't a new approach—solar power firms have made wide use of lease arrangements as a way of attracting residential customers wary of making a large upfront payment. Instead, they lease the equipment from a solar company that pays the installation costs and, in turn, receives regular payments from the homeowner for the energy.

There are a couple of different varieties of lease arrangements, including sale-lease back arrangements, but, overall, lease arrangements have been one of the largest contributors to the rapid growth of rooftop solar installations.

Energy-as-a-Service

Another tool that is becoming very popular for microgrids is the energy-as-a-service (EaaS) model. Although it was introduced only a couple of years ago, almost 44% of microgrids use the EaaS model, according to Guidehouse Insights. (Graphic below.)

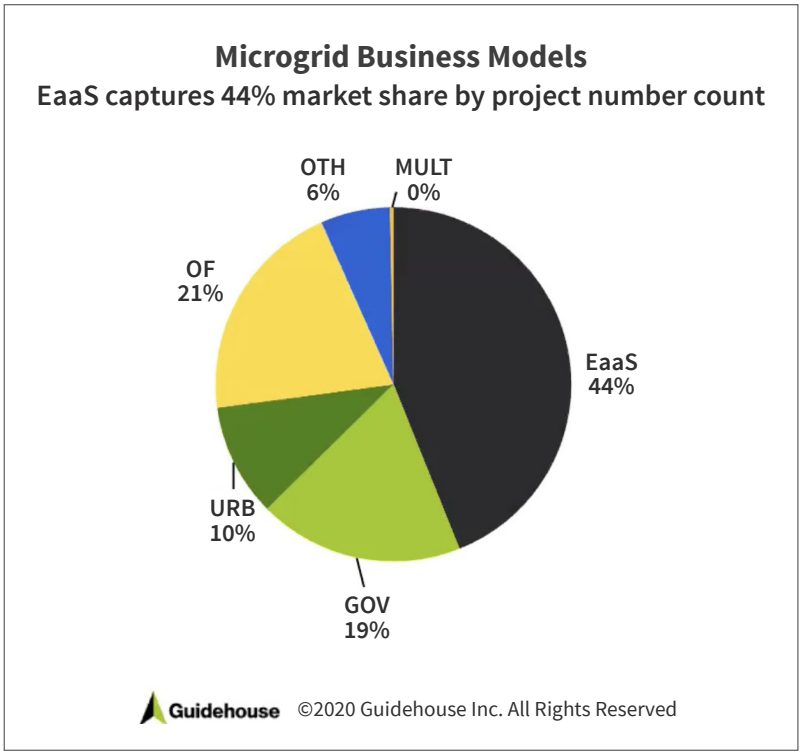
In some ways, the EaaS model resembles the leasing or sale-lease back model. The microgrid host makes regular, recurring payments structured as payments for system use.

For the host, an EaaS arrangement is very similar to paying a utility for energy, except that the host can contract with the developer for additional services that capture the broader range of a microgrid's capabilities, such as resilience—i.e., the host will receive energy even if the surrounding grid suffers an outage.

Often an EaaS agreement is structured so that the client's payments are competitive with what they ordinarily pay for utility services. In some cases, the EaaS payments are lower than utility payments because there are other income streams or incentives available to the EaaS provider, such as sales of ancillary services to the utility or grid operator.

Another advantage of the EaaS model is the flexibility that can be built into the contract. The agreement can be written so that the project can be scaled up in size over time. The EaaS model can also allow for the upgrading of technology over time as microgrid equipment improves.

Guidehouse Insights is forecasting that EaaS will become the preferred model for structuring microgrid deals.



Finding the Right Fit: Profiles of Financial Advisors

In addition to understanding how financiers look at microgrid projects, developers and sponsors should also spend time understanding what kind of financial institution best suits their needs.

Sapling Financial Consultants

The financing needs of energy industry projects require deep, industry-specific knowledge. That makes it even more important to have an advisor that can present the economics of your project(s) in the best possible light while advising you on what investors are looking for. As a boutique financial modelling and data analytics consulting firm with industry-focused expertise in microgrids and electricity, Sapling Financial Consultants is such an advisor.

Microgrids can include components ranging from solar panels and energy storage devices to gas turbines and demand response mechanisms.

> Sapling provided a detailed financial model for the rollout of several wind farms that incorporated analysis of capital needs and workload changes that resulted in staffing changes and recognition of the need for additional investing rounds.

Sapling Financial Consultants has a track record that includes several clients in the energy sector and several types of energy projects, including high voltage direct current (HVDC) transmission systems, wind farms, solar farms, residential solar projects, vertical wind turbines and peaking plants.

Sapling Financial is well suited to the needs of a burgeoning industry such as microgrids. Many microgrid development companies are still in the early years of their growth curve, making it difficult for them to support in-house capabilities such as a full range of financial analysts. For those companies, Sapling can act as their financial development department, providing the expertise to move a project across the finish line.

For instance, working with an independent alternative energy company that installs on-site power units at industrial sites, Sapling developed a tool to determine the appropriate price the company should charge its clients.

Sapling was then able to build a collection of unique models specific to each customer and adaptable to the requirements of both the customer and the product sold. Sapling took the concept even further, aggregating the test models into a single model the company could use to forecast its business outlook and determine its financing requirements.

In another case, Sapling worked with a power management organization to evaluate the integrity of their financial modelling in the alternative energy space, including the general costs required in the construction and maintenance of solar farms and windmill farms.

Sapling also provided a detailed financial model for the rollout of several wind farms that incorporated analysis of capital needs and workload changes that resulted in staffing changes and recognition of the need for additional investing rounds. The company used the model to support its valuation in discussions with a strategic investor as well as hiring plans and product pricing, as well as a tool to support a more realistic and reasonable offer from the investor.

In addition, Sapling has worked with a transmission operator that needed capital for a project to move electricity from a low-cost to a high-cost jurisdiction. Sapling built a model to assist with pricing the transmission service and obtaining financing. The model provided detailed calculations of the debt/equity split, interest during construction, among other considerations, and it was able to show that a reasonable debt/equity split was likely to generate a satisfactory internal rate of return over 30 years.

Sapling's size and temperament is well suited to the entrepreneurial approach of many microgrid developers, allowing them to expand their capabilities to reach the next level of operation and success.

Sapling's Toronto-based professionals are entrepreneurs advising entrepreneurs.

Checklist for Meeting with a Financier

Having gained an understanding of how financiers think about microgrid development, what should project sponsors do to prepare for a meeting with a potential investor?

Microgrid sponsors should be ready to address the following risk-related items with their financiers:

- ✓ Technology risk
- ✓ Off-taker creditworthiness
- ✓ Operating risks
- ✓ Fuel volatility risk
- ✓ Revenue risks (wholesale price risk)

Microgrid sponsors should also have a game plan for key items that financiers are likely to ask about, such as:

- ✓ Does the project lend itself to a replicable, standardized format?
- ✓ Are there multiple revenue streams available to the project?
- ✓ Who will take on which risks? What is their financial wherewithal?

Armed with this knowledge, sponsors can approach financiers with greater confidence that they will reach a deal to make their microgrid a reality.

Scale Microgrid Solutions

Most financial services providers aren't experts in distributed energy technology and microgrids and let's face it, these are complex projects. Developers spend countless hours explaining their technology in order to receive financing, all while hoping the financier accurately understands where the real risks and value exist. The consistent message throughout the industry is that it's too difficult to get financing for complicated distributed energy projects.

In addition to their turnkey solutions for full-service microgrids, Scale is investing millions of dollars into distributed energy resources, providing asset-based financing for projects under development, as well as capital to developers or companies seeking to efficiently build out distributed energy and energy infrastructure project pipelines. These projects can include distributed energy such as solar, energy storage, dispatchable generation, microgrids and more or energy infrastructure such as EVs and charging assets.

Scale is backed by the institutional power and capital of Warburg Pincus, which has $62 billion under management and is one of the leading investors in the energy industry.

Scale is investing millions of dollars into distributed energy resources, providing asset-based financing for projects under development, as well as capital to developers or companies seeking to efficiently build out distributed energy and energy infrastructure project pipelines.

What differentiates Scale from the next financing provider? They have actual boots on the ground for these types of projects and not only know how they work but are the top experts in the technology. Scale offers first-hand knowledge of the inherent project risks and value.

By eliminating upfront capital costs and monetizing tax incentives, Scale's customers and partners can save hundreds of thousands, if not millions, of dollars in the first year alone.

Scale can deploy its capital in projects at any stage—from early development to engineering, procurement and construction, to asset management—and move a project across the finish line. The company can also support customers with tax equity, growth or working capital by direct acquisition or long-term ownership. Scale uses its balance sheet as a one-stop-shop for developers. Their partners benefit from the institutional size and scale of its capital, yet they retain the freedom to respond quickly and effectively to their needs.

Scale's business model is designed to eliminate the complexity of designing, building and financing distributed energy systems. By providing the capital needed to enable transformation and creating on-site solutions, Scale is paving the way to the infrastructure revolution. They are breaking down the barriers to deliver a more reliable, sustainable and cost-effective future that's accessible to all.