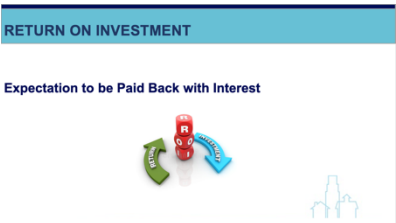




Slide 1: This is the third webinar in the Developing Town Center Microgrids series. The full series can be found at [www.microgrids.io](http://www.microgrids.io).

Today, for any microgrid to exist, someone has to make an investment of capital funds to build it. Regardless if a town center microgrid offtaker is paying for the energy consumed or building and owning its own microgrid, someone’s capital dollars are used to pay for it. Financing microgrids generally, and town center microgrids specifically, is involving commercial activity with obstacles to overcome. In this webinar, we will review the challenges that go into financing decisions.



Slide 2: Our first challenge is a basic of economics in a market society; for an investment to be made, the investor expects their money to be returned on an agreed upon schedule and along with interest on the outstanding unpaid amount at an agreed upon rate of return. Our economy represents the risk of repayment primarily as a higher or lower interest rate.



Slide 3: To help establish the rate, the next step is an assessment of the project owner’s ability to manage the financial and public policy risks, understand who bears the risks, and how the risks are managed or mitigated, and how they are reflected financially. These risks will vary for each project.

The greater the risk borne by the developer, the more expensive the project’s financing cost will be, as the investor will expect a higher return for taking on greater risk. Greater risk can be absorbed by offtakers by reducing the costs of financing, but this shifts the risk to increased long-term costs for the offtaker.

## UNDERSTANDING FINANCIAL PRO FORMAS

### Provides Full Financial Picture

- Vary revenues, development, operational & maintenance costs, and investor returns
- Test different scenarios
- Test robustness of financial projections
- Identify weaknesses and risks



| Year | Revenue | Operating Costs | Capital Costs | Depreciation | Interest | Taxes | Profit |
|------|---------|-----------------|---------------|--------------|----------|-------|--------|
| 2010 |         |                 |               |              |          |       |        |
| 2011 |         |                 |               |              |          |       |        |
| 2012 |         |                 |               |              |          |       |        |
| 2013 |         |                 |               |              |          |       |        |
| 2014 |         |                 |               |              |          |       |        |
| 2015 |         |                 |               |              |          |       |        |
| 2016 |         |                 |               |              |          |       |        |
| 2017 |         |                 |               |              |          |       |        |
| 2018 |         |                 |               |              |          |       |        |
| 2019 |         |                 |               |              |          |       |        |
| 2020 |         |                 |               |              |          |       |        |
| 2021 |         |                 |               |              |          |       |        |
| 2022 |         |                 |               |              |          |       |        |
| 2023 |         |                 |               |              |          |       |        |
| 2024 |         |                 |               |              |          |       |        |
| 2025 |         |                 |               |              |          |       |        |
| 2026 |         |                 |               |              |          |       |        |
| 2027 |         |                 |               |              |          |       |        |
| 2028 |         |                 |               |              |          |       |        |
| 2029 |         |                 |               |              |          |       |        |
| 2030 |         |                 |               |              |          |       |        |



Slide 4: Another challenge is ensuring that parties understand the full financial picture of the project. This is most often done through a financial pro forma schedule.

Usually calculated on an Excel worksheet, a pro forma displays the project's projected revenues, development and operational and maintenance costs, as well as financing costs. All of the variables can be adjusted and tested under different scenarios. A careful analysis will test the robustness of the financial projections and estimates, and can identify weaknesses and risks.

Both the developer and offtaker attorneys, engineers, and experts must understand the business and electrical supply needs of the parties so the pro forma can be tested with underlying assumptions and variables. We cannot underestimate the need for project team members to conduct due diligence, careful analysis, and ensure understanding the strengths and weaknesses of technical and financial proposals.

Developing this understanding by government officials is critical because a developer will have a better grasp of financial and energy supply issues than the government representatives. This is known as asymmetry of information.

Also, decision-makers cannot abdicate their understanding to their experts; they need to understand the critical elements. This can be practically demonstrated by the ability of elected and appointed officials to explain key elements of a contract to others for example, in a public forum. This process cannot be underestimated.

## UNDERSTANDING FINANCIAL IMPACTS ON OFFTAKERS

### Offtaker Impacts

- Example: Undergrounding as to capital costs that need to be recovered



### Warrant Consultation with EDC and Regulators



### Regulatory Policy Changes May Be Necessary

### Industry Standard Agreements/Package Deals



Slide 5: Another element are the implications of microgrid design on offtakers. For example, if a microgrid requires the installation of parallel or undergrounding of distribution lines, switches, and controls, it adds to the capital to be recovered in rates paid by the microgrid's offtaker(s), unless initially subsidized.

These and other offtaker impacts warrant consultation with the EDC and potentially regulators as part of the contract negotiation process. In some cases, regulatory policy changes may be necessary to facilitate some projects.

Remember, it's not just the offtaker officials who need to understand the process; the investor also needs to understand it. It's their capital at risk.

The development of industry standard agreements and processes to package deals can make projects more attractive to investors. For example, projects that are consistent with the standards of the time can benefit from a competitive bidding or RFP process as that can lower the costs to offtakers. If less customization is required, it's easier to do.

Alternatively, complex or non-standard projects can result in reduced competition or negotiating with just a single contractor. Those projects have often added risks that can increase financing costs.

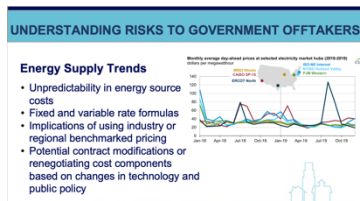


Slide 6: Before we leave the subject of offtakers, keep in mind that government offtakers can only take on so much financial or operational risk before political risks become an issue. This highlights the importance of a knowledgeable and competent team, a sound development process, and the diligence that goes into contract negotiations. The speed and overlapping nature of changes in the economy and microgrid industry further adds uncertainty that will affect public and private capital investments.

Now let's move to another range of risk and mitigation strategies, many of which are project-work dependent. We'll spend a few minutes highlighting some of the issues.

We'll start with Energy Supply Agreements regardless of whether they're PSA, energy as a service, or a power purchase agreement. Supply agreements may have offtaker rates tied to regional or state price indexes that are influenced by energy market elements that affect price calculations. These can be affected by changes in regional generation supply and costs. That can include solar photovoltaics and wind, the potential of early-stage evolving fuel supply like renewable natural gas, green hydrogen, and small and modular nuclear plants. We also have changes in independent system operators and their regional transmission organization practices. Their actions can in turn complicate locally driven policies that are affected by state

and federal regulatory environments. These generally concern competition-related supply incentives, subsidies, and changes in market rules.

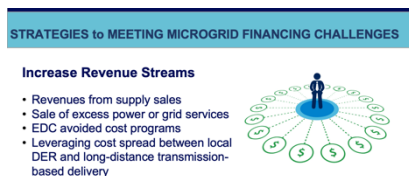


Slide 7: Government off-takers negotiating contracts also need to understand risks related to a range of energy supply trends and issues. These include:

- Managing the unpredictability in energy source costs. That can be done using contract hedging strategies that are driven by sophisticated financial analysis.
- Another element are the implications of rate formulas that have fixed and variable rates. That can be a strategy for both off-takers and investors.
- Using industry or regional benchmark pricing, like ISO/RTO day-ahead markets, especially when used in conjunction with inflation or supply-based formulas.
- And, finally, the potential of mid-term contract modifications or renegotiating cost components based on changes in technology and public policy.



Slide 8: We also cannot ignore Operational Risks. These include things such as unanticipated changes in costs. Those can be managed with sound and attentive management with good track records. Strategies like inflation protection practices and formulas can also help the system hedge the impact of cost changes to prevent an adverse impact on project finances. Other risks to be managed include the potential of stranded investments from technological and supply market changes, investment time horizon changes, and replacement and retirement costs.



Slide 9: Our final point is to talk about strategies to meet financing challenges. One approach is to access multiple revenue streams. That can mitigate risk and adds cost-stability for any project.

So system developers should try to take advantage of strategies that offset development costs and lower or moderate the cost of supply to off-takers. Some of these strategies include:

- Revenues from supply sales to third-party offtakers. These would be other people that are part of your critical-facilities microgrid.
- Selling excess power or services like frequency regulation to the EDC or the region's independent system operator.
- Taking advantage of EDC-avoided costs programs. These can provide revenue by keeping demand off the grid or demand response programs.
- Leveraging any cost spread between local DER and long-distance transmission-based delivery, the former costing less and the latter costing more.
- Consider ancillary revenues such the sale of renewable energy certificates or leverage excess conduit capacity by selling it to third parties such as telecommunications providers.

**STRATEGIES to MEETING MICROGRID FINANCING CHALLENGES**

**Reduce Costs**

- Incentivizing building automation and accelerating electrification
- Enhance offtaker credit security
- Support for projects with lower costs or risk absorption
- Incorporating Energy Efficiency Practices
- State Government Support




Slide 10: Our final element is how we can reduce costs of a microgrid development. A project's financial success can also be supported through efforts like:

- Incentivizing building automation and accelerating electrification of traditional natural gas-based activities. This can include replacing gas-fired furnaces and hot water heaters with heat pump-based systems.
- We can also look at enhancements to offtaker credit security. That can support investor risk calculation and lower variable rates. So, for example, if the offtakers wanted to make their own capital contribution, that can reduce the amount of money being borrowed by or invested by the developer, which can then reduce the interest costs.
- We can look at incorporating energy efficiency practices like using less energy to perform the same task to reduce energy supply needs. There's a lot of interest in energy-efficiency programs and a lot of programs out there that can also be used to underwrite the cost.
- Finally, take advantage of state government support for feasibility and design studies, direct development cost contributions, or financing preferences for low interest loans. Many states have Green Bank-type programs that can be tapped for microgrid development, as well as other incentives along the way that can help reduce the costs.

That's it for this session. For our next session, we'll be talking about Public Policy Risks that are facing town center microgrids. See you there!

