

MINI-GRID COMMISSIONING



A proven option for better meeting operational commitments, and optimizing the financial performance of your commissioning phase.

By Bill Cook

Bill Cook is a wind energy specialist at Aggreko. For more information about Aggreko's mobile temporary power solutions, visit us.aggreko.com.

THE PRACTICE OF MINI-GRID COMMISSIONING.

utilizing mobile temporary utility systems to create a simulated power environment, is giving developers nationwide more flexibility and confidence in meeting legal and financial commitments during a facility's commissioning phase.

Despite a range of ever-present risks in our industry—from the price volatility of a kilowatt hour (kWh) to the changing political and regulatory landscapes all of the industry's players must navigate—there is no room for risk, when it comes to a project's commissioning phase.

THE POTENTIALLY STEEP PRICE OF MISSED COD

Project stakeholders in a field's construction phase still are acutely aware of the critical, finite time frame between two contract milestones: The Interconnection Agreement (ICA) date, whereby your system is tied into the power grid, and Commercial Operation Date (COD), which is a contractual obligation within your Power Purchase Agreement (PPA). It is the second date—the promise that you'll be able to fulfill your obligation to whatever party is buying the new facility's power—that may cost you when failing to commission on time.



If your field cannot deliver power by its COD, it may be liable for damages—first on that actual date, and again for each day beyond that power is not being produced, for the amount under the prescribed terms.

Because potential damages can run into high dollar amounts, project stakeholders must always be prepared to review the scale of their facility's construction and commission, to ask themselves: How confident am I that I can commission each of my turbines comfortably prior to the COD date? In addition, there are financial incentives to commissioning early. So missing the COD

means not only punitive measures but significant opportunity cost.

There are also investor relations and tax implications of not meeting this commitment. So as wind energy development scales nationwide, developers and contractors are looking for new ways to better manage the risk of not meeting their COD commitments.

WHAT IS MINI-GRID COMMISSIONING?

This practice developed from the desire of project stakeholders, both to avoid the risk of missing the COD within their PPA, and to capitalize on the financial returns of early completion. Mini-Grid Commissioning involves creating a simulated environment with mobile temporary utilities—for the purposes of testing and successfully commissioning a turbine. This enables a developer to complete all testing and commissioning prior to the grid actually being energized. In this way, if, say, the transformer you were expecting doesn't arrive or your interconnect does not go as planned, the potential bottleneck in testing and commissioning equipment is reduced or eliminated.

Mini-Grid operation requires the provision of mobile generators to power critical equipment and infrastructure, a suitable load bank, a circuit breaker, a transformer and supporting equipment. Regarding actual field infrastructure, the mini-grid is usually used to:

- Energize the circuit to confirm the installation performance
- Test the pad mount transformers, and
- Start energizing the turbines themselves through this auxiliary power network—load testing and commissioning while also managing the subsequent power created by this test environment.

Each project will vary based on the dynamics of the site and turbines, as well as the specific commissioning requirements each manufacturer demands. Typically this Mini-Grid will run the system for 12-24 hours, commissioning 2-4 turbines at the same time. The Mini-Grid can be set up in a number of locations on the project site, and be managed by a small crew. As with any use of external resources, close communication, coordination, safety compliance and pre-project planning are all essential.

BUDGETING MINI-GRID INTO UPFRONT CONSTRUCTION PLANNING

A number of wind energy developers are building this practice into every construction plan, to ensure that there is nothing left to risk in relation to the efficiency of planned tests and commissioning.



Others use it as a stopgap when unforeseen circumstances threaten their commissioning timelines. It is a useful technical solution, no matter which school you subscribe to, as long as you recognize that the economics change slightly from one scenario to the other.

When considered as part of the construction plan by default, cost planning can become more accurate and predictable. Mini-Grid Commissioning teams can be planned in advance. Availability of a team is guaranteed. The provider gets to know the intricacies of how the developer and contractors prefer to manage their projects and work together. And because nothing is rushed, the logistics of the team and its assets are more conventional and cost-effective. These teams, and the process in general, represent a tiny fraction of the developer's construction budget. But adding them to every new build does add a new cost, however marginal.

Calling in a Multi-Grid Commissioning team only as a one-off crisis management tool avoids adding a recurring cost to all new projects, but the tradeoff is that you will likely be fighting other developers on the team's availability. There aren't many companies that provide this service, and developers who are planning ahead are always at the front of the queue. Either way, with the big-picture risk and potential opportunity costs, it is obvious that this practice has gained traction.

COD COMMISSIONING RISK TRIGGERS

2013 has been a busy year for wind energy developers. The PTC and ITC extensions—a moderate domestic economic recovery and improving technology costs and performance—mean steady activity. At the same time, low energy cost of competing fuels such as natural gas and the realization that tax credits won't live forever mean that many are cautious. This push-pull has given 2013 supply chains more volatility than in the previous year. Manufacturers are cautious and many have slowed production. Some developers have experienced slow delivery of wind towers and turbines. These types of delays can happen to anyone. In addition to slow delivery, a developer's COD can be put at risk by:

- Late delivery of transformers
- Receipt of faulty equipment or equipment that fails factory testing
- Missing your interconnection cut-in with the utility
- Your project's substation not being energized on-time
- Utility power isn't available for whatever reason

Whatever the cause, when your interconnect date and COD are uncomfortably close together, you only have so many options. And when you

look at the economics of this early phase of your project, there are many reasons to keep Mini-Grid Commissioning in mind as an option as projects move forward.

OTHER ECONOMIC IMPACTS

Punitive damages that are avoided constitute a “big stick” waved to those who are in danger of missing her COD. But along with that stick come quite a few carrots! Developers and contractors who consider Mini-Grid Commissioning to be a reasonable standard protocol (as opposed to a crisis-management process) are placing a premium on the ability to fast-track commissioning.

After all, Mini-Grid Commissioning means faster commissioning. Faster commissioning also means those who might wish to sell their facility can get their investment out just that much more quickly (every bit counts, especially when it’s your money). Faster commissioning delivers power to market more quickly, accelerating project ROI in general. In fact, commissioning all manufacturers’ equipment onsite by the interconnect date can enable a field to begin saleable generation prior to its PPA taking effect. This may mean an extra few weeks or even a month of bonus revenue. In addition, developers must consider the importance of maintaining investor confidence. Once a commitment is made to add a certain number of kWh to the market, it is set in stone.

In addition to creating a faster way to construction completion, systematically accelerating commissioning timelines through Mini Grid Commissioning also means quicker access to tax incentives, which can be a major motivator.

If you are a developer of wind power assets, you are aware that on January 2 this year, President Obama signed into law an extension of the federal PTC for renewable energy projects breaking ground before January 1, 2014. A similar extension of the ITC was also enacted. As a part of the ITC, developers are awarded 30 percent of their construction cost upon completion—and then earn 2.2 cents per kWh for 10 years through the PTC. The cost of bringing in a Mini-Grid Commissioning team is marginal and considered part of a facility’s construction budget, so 30 percent of the cost of Mini-Grid Commissioning goes away almost automatically. There are also local tax incentives to be had, the details of which depend on facility location.

HELP WANTED: OEM COMMISSIONERS

The wind energy generation industry’s 10 or so major manufacturers of equipment only have so many people dedicated to the commissioning of their equipment. It’s not that global players such as Siemens, GE and Vestas don’t have the manpower or partners. The real problem is that



canwea
TORONTO 2013

CANADIAN WIND ENERGY ASSOCIATION ANNUAL CONFERENCE & EXHIBITION

TORONTO, ONTARIO
OCTOBER 7–10, 2013

This premier event will bring together over 2,500 experts from around the world to discuss opportunities in Canada’s growing wind energy industry. It will provide an exclusive opportunity to network and generate new business leads.

COME AND NETWORK AT CANADA’S LARGEST WIND ENERGY CONFERENCE



www.canwea2013.ca

 canwea
CANADIAN WIND ENERGY ASSOCIATION | ASSOCIATION CANADIENNE DE L'ÉNERGIE ÉOLIENNE



since investors and developers tend to respond to the same market and regulatory drivers, projects tend to come in waves. Since so many project participants must overcome the inability to get a busy rep on site, their schedules become risk “endangerment by bottleneck.” Mini Grid Commissioning helps you give the manufacturer a larger time window within which you plan your investment so that you are not scrapping for their time at the last minute.

VENDOR SELECTION CRITERIA

Most developers don’t keep specialized Mini-Grid Commissioning teams mobilized, necessitating work with an outside specialist. The most important criterion to remember when you explore your options? Experience. Your facility commissioning schedule carries not just significant financial, but also strategic, importance.

Instead of gambling on a partner with little experience, find someone who has done this before with multiple wind facility start-ups. Ask tough questions. Nobody wants their project to be a part of someone else’s learning curve. The provider should be familiar with and prepared for the process and the potential problems—such as the power spikes generated from the turbines and miles of underground cable. You want someone

who can speak the manufacturers’ language up front to find quick solutions as unforeseen events arise. And have them verify results in the field over time through multiple project references.

CONCLUSION: IT’S GOOD TO HAVE OPTIONS

2013 is the perfect year to use Mini-Grid Commissioning as a tool to improve project profitability and confidence. It’s a new trend—not yet a part of every major developer’s construction plans. That means you can find a crew when you need one.

But at the same time, it’s not so new that it’s not accepted by the mainstream as a proven technical solution to a critical issue. A developer could turnaround dozens of projects without ever needing Mini-Grid Commissioning as a way to ensure COD compliance—and never miss out on the benefits of systematically commissioning equipment early. But it’s still a solid, proven option for both ensuring operational milestones and strengthening financial performance through the intelligent use of external resources. Whether or not you choose to make Mini-Grid Commissioning a part of your future construction plans, it’s always good to know your options—and empower your organization to more aggressive operational risk management whenever the chance presents itself. ✨