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PowerHour FAQs

An Introduction to Distributed Generation Applications

The electricity market has evolved to include distributed generation as well as traditional utility grid electricity. Distributed generation is a broad category—some applications are obvious, others are not as well known. Distributed generation may not be top-of-mind when customers are developing their energy strategy or considering onsite generation. Learn more about categories of distributed energy applications, and possible approaches for successful solutions.

To learn more about the distributed generation applications, please join the Cummins PowerHour webinar:

Following this PowerHour participants should be able to:

- Describe energy ecosystem trends and the needs driving the evolution of distributed generation
- Identify the categories of distributed generation applications and components of the system
- Define possible distributed energy approaches to customer energy needs

Why are utilities interested in developing microgrids?

Obviously, utilities want to make money. They make money by providing power; they make even more money if they can reduce their costs. Major transmission and distribution infrastructure is expensive. Sometimes a microgrid is better and cheaper than investing in large-scale infrastructure. Also, utilities have sustainability goals. Their customers are demanding renewable resources. Distributed generation is one way to integrate renewable power into the utility's existing infrastructure.

How does a behind-the meter-system help an industrial customer reduce their electricity bill?

Utilities charge their customers for the electrical power that flows through the meter. But the charges may vary depending on conditions. The most common example of variable pricing is peak premiums. Utilities often charge more for power delivered during peak usage times. Power supplied in the middle of the night can be considerably cheaper. So if the customer can avoid using power during peak times, they can save a lot of money.

There are also incentive programs that reward industrial customers for utilizing renewable sources and storage for part of their power system.

Can a building be 100% powered by solar or photovoltaic?

In most cases solar panels alone do not make up the building's full power system. One of the reasons is that solar inverters are usually grid-following, which means they need a reference voltage to sync to and to follow. Typically, solar panels are combined with some other power source – a battery, a generator or the utility grid – that acts as a voltage reference.

In an off-grid prime power application using a generator set or a distributed generation system, does this application require a voltage reference, as was referenced in the previous answer?

Yes, a reference voltage is required for grid-following inverters such as solar panels, but the reference voltage does not have to be from a utility. The generator set or the battery could be used as the reference. You can have a fully autonomous system without a utility.

Do you need a utility interconnect agreement with the local utility if you install a behind-the-meter microgrid?

If your behind-the-meter power sources run in parallel with the utility grid, you are most likely going to need an interconnect agreement with the utility. This has always been the case for generators. But now it also applies to renewable resources and battery storage systems. So you almost always have to go through the process of coordinating with your utility.

Do you think the utilities will reduce their requirements for connecting a microgrid to the utility power grid? With today's requirements, it can be difficult to fulfill all of the requirements for connection.

Yes, I think the interconnection rules will be simplified eventually. There are many different utility companies and they all have their own rules for interconnection. They see some of the benefits but they also are aware of the risks. Now that IEEE 1547 has been updated with guidance for interconnection, many utilities are using that as their reference. So that's helping make the rules more consistent. But we still have a long way to go. Of course, our current power grid system was developed over a period of more than 100 years, so it will take some time to further evolve.

In a distributed generation application, is stationary storage a valid means of balancing a microgrid of intermittent sources such as photovoltaic or wind?

My short answer is yes, probably. But there are risks: batteries are only going to stay charged for so long; at some point they need to be recharged. So, for an off-grid application, you can have a battery to draw from when solar power isn't available. But you could have a situation when the battery is depleted and the solar power isn't functioning. When that happens, it's nice to have a gas or diesel generator available.

Can fuel cells be included in a distributed generation system?

Yes, fuel cells could be one component of a distributed generation system. Conceptually, a distributed generation system consists of multiple assets, with each component filling the void or deficiency of another. Fuel cells could certainly be one of the assets.

If a customer's power system includes a diesel generator for emergencies but the customer would also like to use the generator to reduce costs during peak demand periods, does the EPA require the generator be Tier 4 Final certified?

Yes, in that scenario, the generator set needs to be EPA Tier 4 certified. Tier 2 certification would not be sufficient because Tier 2 has defined rules of when you can operate the generator. The generator can only be used when utility power is unavailable. So with Tier 2 certification you can run the generator a few hundred hours a year for testing but you can't use it for peak shaving.

Where can I find a finance company for a distributed generation system

There are alternative finance options for distributed generation systems. You could email DGinfo@cummins.com with a description of the application and the location, and we can help you narrow the list of choices for financing.

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