

THE POWER GRID

When it was first built, the U.S. power grid was hailed as one of the wonders of the modern world.

On this page we will help you understand “the grid.”

The History of the Grid

In the early years of the 20th century, there were no power grids.

Large industrial facilities were the first large-scale adopters of electricity, because it enabled mechanization in manufacturing. Factories installed their own electric generators and ran their own power systems. They even ran their own backup power systems to ensure reliability. Industrial facilities built, owned, and operated the original microgrids.

Neighboring factories realized they could reduce resiliency costs by syncing their power systems and sharing backup resources. This created a local network of overhead power lines; nearby homes were ultimately connected, since they were typically owned by the factories or employees of the factories. These local power networks were created and operated by factories and ultimately became the steppingstone to form power grids.

Deregulation woke the sleeping giant of corporate energy purchasing. The power grid has never been the same.

From 1920 – 1960, the electric grid centralized power production, because at that time it was more cost-effective to generate a lot of power at a central location and then distribute it. This is the moment when monopolistic electric utilities were formed and end-users lost control of the power grid. Factories became customers and the energy supply was no longer theirs.

The Public Utilities Regulatory Policies Act (PURPA) was passed in 1978 and The National Energy Policy Act was passed in 1992. These two groundbreaking pieces of legislation built the foundation for deregulation. With deregulation, customers gained access to alternative generation suppliers. This introduction of market options for the first time in 70 years prompted industrial customers to realize the shenanigans utilities had been perpetuating. Deregulation woke the sleeping giant of corporate energy purchasing and the power grid has never been the same.

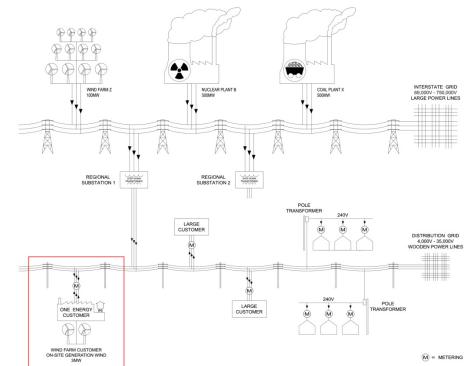
Corporations who operate energy-intensive businesses have spent the last 25+ years relearning about energy. This period has given rise to energy-efficiency projects, demand response, peak shaving, and on-site generation projects. Corporations want to control their supply chain, of which energy is a vital part.

Corporations are now actively exploring ways to further take control of their energy purchasing. The single biggest thing they can do to take control of their energy needs is to make their own power on site.

WHAT'S ON THIS PAGE?

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- Industrial Power Distribution Systems (Plant Grids)

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Understanding the Grid
Wind turbines and the United States electric grid.

Deregulation woke the sleeping giant of corporate energy purchasing.

The power grid has never been the same.



The History of the Grid (cont.)

After 100 years of not being in control, end-users are fed up and they are taking back the power grid.

Industrial Power Distribution Systems (Plant Grids)

Electric utilities used to do all the hard work. For decades, electric utilities would bring power to a factory's property, move it around the factory, and then provide and operate transformers to give customers power at the low voltage they required. The utility's domain was high voltage, and a factory's domain was its low-voltage system.

As facilities became larger and more sophisticated, factories started purchasing their own transformers and having the utility provide just the high-voltage services, at a slightly lower rate.

Serving these large industrial facilities introduced two things utilities struggle with: accountability and customer service. To solve this problem, utilities began encouraging new industrial facilities to build their own on-site high-voltage distribution systems, and utilities began selling their existing on-site distribution systems to customers, in order to shift responsibility to the customer.

The result is that now, many industrial facilities own the high-voltage networks that move power around their sites, and they take power from the utility at the edge of their property. Utilities prefer this; however, it creates challenges:

1. The inherited systems are archaic; they are based on outdated design principles, are dangerous to operate, and completely lack any digitization or automation.
2. The new factory-built systems are designed by people who don't understand high-voltage systems. Most electricians go their entire lives without touching high voltage (15kV and up). Most plant teams don't even understand what technology is available at high voltage – let alone how to implement it.

This empty space in the market is why One Energy created Managed High Voltage.

High-voltage systems are capable of just as much automation and control as low-voltage systems, if not more. Moreover, high-voltage systems are actually safer to operate because they operate at smaller currents than low-voltage systems.

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When One Energy installs a high-voltage plant distribution system, it physically inserts itself between the utility and the factory. One Energy, on behalf of the customer, takes power from the utility at the edge of the property and then moves it around the factory's property to where the load is. The systems One Energy installs are state-of-the-art high-voltage systems that use underground cable (more robust), use modern relay-controlled switchgears (safer and customizable), are designed for expansion (to enable growth or adoption of DERs), and are internet connected to enable remote monitoring and control.



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Industrial Power Distribution Systems (Plant Grids) (cont.)

The factory ends up with a system that is ready to grow with them and ready to protect them. And, for the first time in history, the electric utility does not directly interconnect with the customer. One Energy physically inserts its system in the middle; it has been One Energy's experience that both the utility and the customer prefer it that way. Customers don't have to deal with the utility, and utilities don't have to interface with the customers' engineering teams, who are typically not familiar with distribution planning and engineering.

With Managed High Voltage, our customers' factories end up with a system that is ready to grow with them and ready to protect them.