



x45\x6e\x65\x72\x4e\x65\x78\x20\x53\x65\x63\x75\x72\x69\x74\x79



DER Integration

Distributed energy resources (DER) refers to a variety of small, grid-connected devices that generate, store or manipulate the consumption of energy. The power grid is in the early stages of transforming from a centralized generation design to a system that utilizes these decentralized DER systems. Renewable energy sources, such as wind and photovoltaic generation, have emerged as mainstream energy resources in many areas, with their intermittency and distributed nature representing a new set of challenges for the power grid.

DER challenges and concerns include:

- *Volt/Var Management*
- *Power Quality*
- *System Protection*
- *Load/Generation/Storage Balance and Optimization*
- *Evolution of New Utility Business Model*
- *Command and Control*
- *Planning, Modeling and Simulation*

DER systems can be successfully managed to support the connected grid or be used to create localized, small-scale grids (Microgrids) that can disconnect from the centralized grid and operate independently.

EnerNex helps facilitate microgrid development for utilities, campus owners/operators, and commercial and industrial facilities through all stages of the project.

EnerNex's team of experienced power and systems engineers possess the unique ability to address the most complex engineering, system development, and implementation issues inherent with connecting new electric power resources. EnerNex will help your organization leverage DERs through our extensive experience performing System Interconnection Studies, such as:

- Short circuit analysis to help specify equipment ratings;
- Steady state power flow analysis to determine if renewable electricity plants can be operated to meet specified voltage and power factor requirements; and
- Stability, quality and protection studies that ensure system reliability exists across the dynamic T&D Network.

To assess the impact of internally owned, as well as external DERs, including wind, solar PV and energy storage systems, EnerNex also performs a variety of plant operation studies, including TOV analysis, and insulation coordination studies.





/wEP
Dk0NzAwDz
-PvAh4Evg

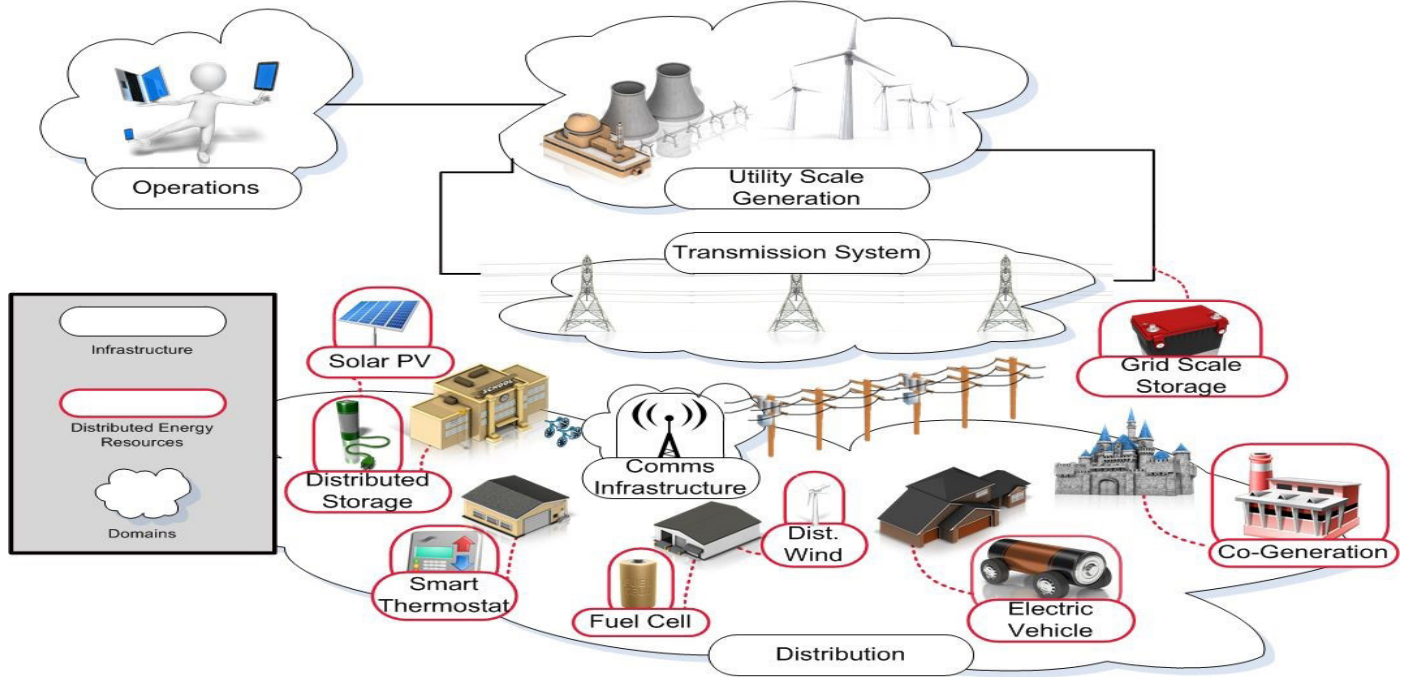
DER Integration

Utility of the Future

Utilities are developing new business models and operations practices to facilitate and accommodate new generation, energy storage and load management technologies. EnerNex is at the forefront of rethinking the utility business model through our efforts with multiple utility planning projects. The EnerNex approach creates and applies architectures and frameworks such as EPRI's Integrated Grid to integrate systems, manage technology change and implementation risk.

As the utility industry continues to shift, many utility executives see distributed energy resources as both the largest operational challenge as well as the largest growth opportunity over the next five years.

DERs in the Electricity System



EnerNex has the experience to assist with developing integrated DER architectures and infrastructures. We have the experience to support studies on changes in regulations and tariffs that expose both the intended and unintended impacts to all stakeholder groups.

The EnerNex cyber security team possesses the skills to address the challenges that occur as the grid decentralizes, and mitigate threats from malicious actors.

