

Sargent & Lundy

Trends in Grid Modernization



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Electric Power Industry Trends

Broad Changes

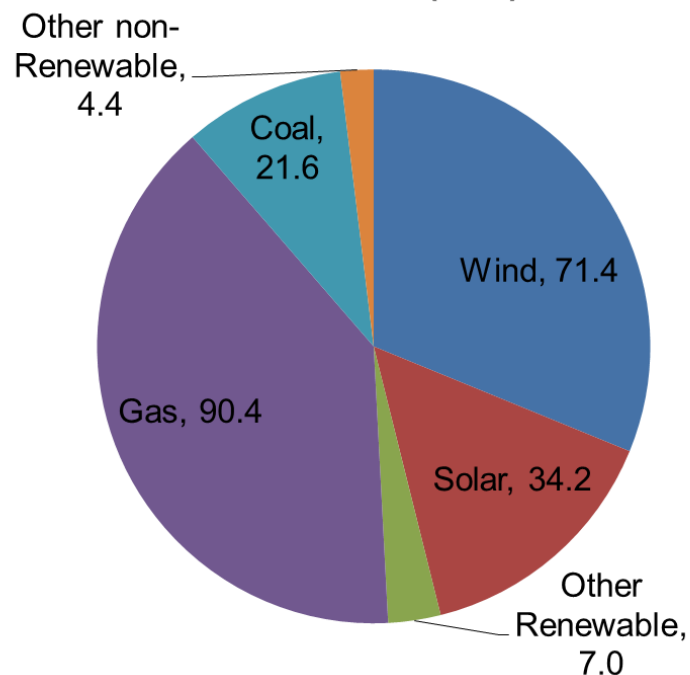
Large Scale Generation

- Abundance of low priced natural gas → increased gas-fired generation
- Significant growth of wind and solar

The Grid

- More DERs (two way power flow)
- Digitalization of the electric grid
- Smart grid
- Grid modernization

2007 to 2016 U.S. Electric Capacity Additions (GW)



Grid Modernization

What is it? Examples include:

- Storm hardening
- Smart switches
- Smart substations
- Smart meters (AMI)
- Energy storage
- Smart inverters
- Distribution automation (e.g., fault location, isolation, and service restoration [FLISR])

• What are the benefits? Examples include:

- Reducing outage impacts (less frequent and shorter outages)
- DER integration
- Improving utility workforce and asset management

Illinois Leading the Charge

- Illinois is a national leader in grid modernization

A banner for the 'NextGrid: Illinois Utility of the Future Study'. The banner features a dark blue background with a white grid pattern and a stylized globe icon. The text 'NextGrid: Illinois Utility of the Future Study' is written in large, white, sans-serif font. A thin white horizontal line is positioned below the banner.

NextGrid: Illinois Utility of the Future Study

- NextGrid working groups:
 - New Technology Deployment and Grid Integration
 - Metering, Communications and Data
 - Reliability, Resiliency and Security
 - Customer and Community Participation
 - Electricity Markets
 - Regulatory and Environmental Policy Issues
 - Ratemaking

Sargent & Lundy's Involvement

- Substation Automation Engineering and Design
- Substation Physical Security and Cybersecurity
- Transmission Line Upgrading
- NERC Facility Rating Assessment and Remediation
- Storm Hardening
- HVDC/FACTS
- Transmission and Resource Planning
- Battery Energy Storage
- Industrial IoT and Data Analytics
- DER Planning, Engineering, Advisory

