

Smart Grid = More Renewables

Renewables are the future of energy

Imported energy is exacting a costly toll on the American economy. Carbon emissions from fossil fuels are raising concerns about global climate change. The renewable energy industry is growing exponentially to meet escalating global demand for clean power. At the intersection of these front-page issues, a consensus is emerging that renewable energy should play a larger role in our energy future. The electric power sector accounts for 40% of the energy consumed in the U.S., and it faces a wave of new investment to meet rising demand, replace aging assets, and comply with renewable generation mandates. We must upgrade our energy infrastructure to a smart grid to tap the full potential of renewable power.

Challenges to broad renewable deployment remain

With rising performance and falling costs, wind and solar power are leaders in the race toward fuel- and carbon-free energy. However, these attractive renewable energy sources face two fundamental challenges: intermittency and transmission.

The wind blows and sun shines unpredictably, so it is difficult to depend on these energy sources for reliable electric power. This also hampers profitability, since power generated from wind and sun must be sold at the market price at the instant it is generated, rather than at the more profitable peak price. Similarly, ideal locations for utility-scale wind and solar projects often are located far from where demand is greatest, harnessing these energy sources also frequently require expensive transmission infrastructure. And the challenges in securing associated siting approvals are formidable and time-consuming.

The smart grid addresses these challenges

A ubiquitous communication network connecting the power grid would enable demand response and facilitate distributed energy resources, both key tools to overcoming the major obstacles facing renewables. By communicating price signals to motivate demand response or by controlling energy-intensive appliances directly, grid operators can use the smart grid to dial electricity demand up or down to offset intermittent wind and solar power. A smart grid that allows for distributed energy storage assets, such as parked plug-in electric vehicles, also could remedy intermittency. And connecting distributed renewable generation close to, or even in the middle of, population centers through the smart grid reduces the need for transmission to renewable projects. The smart grid lets us know real-time information about decentralized demand and distributed energy, helping renewables to power our future.

Conclusion

Renewable energy is the centerpiece in the effort to address global climate change, improve energy security, and develop a clean energy industry. To tap the full potential of renewables, a smart grid is necessary to offset intermittency, reduce the need for new transmission, and accelerate deployment of distributed renewable generation. The smart grid and renewable energy go hand-in-hand.