

# MAKING THE GRID Smarter

## Did you know...

*Our current electric grid was built in the 1890s and improved upon over the years as technology advanced. Today, it consists of more than 9,200 electricity-generating units with more than 1 million megawatts of capacity connected to more than 300,000 miles of transmission lines.*

## OPPORTUNITY

Although the electric grid is considered an engineering marvel, we are stretching it to its capacity. To move forward, we need a "Smart Grid." By "smart," we mean updating our existing power grid with new communication technologies, equipment and controls to manage the increasing complexity and needs of electricity in the 21st Century.

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## ARGONNE'S WORK

Argonne researchers are working to ensure that new Smart Grid technologies will interact seamlessly with electric vehicles (EVs). Our Smart Grid research includes:

- ▶ **EV Charging Pilot Program:** Argonne's on-site solar array and EV charging station allow for data collection and field tests on new prototype technologies.



*Argonne researcher Glenn Keller charges a test vehicle using the laboratory's solar-powered charging station.*

- ▶ **Electric Vehicle-Smart Grid Interoperability Center:** Argonne is the home to one of two international centers dedicated to facilitating worldwide interoperability between EVs and charging infrastructures. The center is a partnership between the U.S. Department of Energy and the European Commission.

- ▶ **Codes and Standards Development:** Researchers are helping to establish international interoperability standards that will ensure that you can connect to the grid with any EV. These standards will govern technologies such as:

- Charging connectors
- Wireless charging
- Communication between vehicles and the utility grid



*Argonne helped to develop the standard for a uniform plug-in vehicle connector that facilitates both charging and communication.*

- ▶ **Smart Grid Metrology:** Engineers are developing a new system to measure and communicate energy usage information at a fraction of the cost and size of today's technology.



*A prototype of Argonne's compact metrology system. These systems are end-use measurement devices (EUMD) that measure and communicate energy usage information to ensure accurate consumption readings and fair billing.*

