

Helping Make the U.S. Power Grid Smarter

The smart grid will move our country's electrical grid into the digital age. By integrating real-time, two-way communication technologies into the power grid, the nation will have a more robust and efficient system that empowers consumers to "talk" to the grid to choose where their electricity comes from and when they want it delivered.

The Challenge

President Barack Obama has called for one million plug-in hybrid electric vehicles (PHEVs) to hit the road by 2015. Subsidies encouraging both PHEVs and electric vehicles (EVs) support this goal. If the combined demand for PHEVs and EVs skyrockets, utilities' power networks could be strained to the limit, requiring upgrades.

The Solution

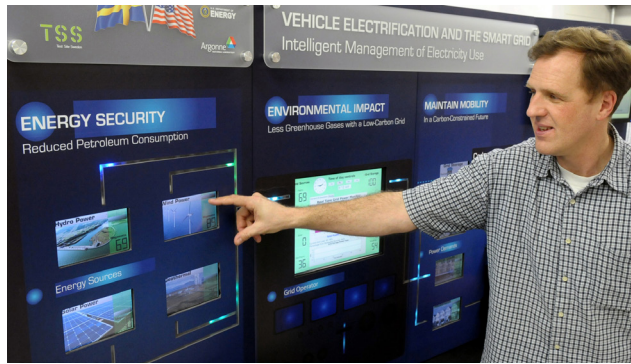
A multidisciplinary mix of scientists and engineers from Argonne National Laboratory is working to help develop a smart grid that will not only adapt in real-time to handle larger electricity loads, but also operate more efficiently and reliably than the existing grid.

The Results

Argonne transportation engineers are working to develop suitable standards for PHEVs and EVs, enabling cost effective (smart) interaction with the grid.

Researchers from Argonne's Center for Energy, Environmental, and Economic Systems Analysis are modeling the generation capacity needs and potential strain on the transmission grid if millions of new PHEVs and EVs were to plug in every night.

A team of Argonne materials scientists, chemists and engineers—already renowned for their successes in the field of advanced battery development for vehicles—is working to develop large-scale energy storage technologies that will capture energy whenever it's available and store it for use at a later time.



Argonne created an interactive smart grid demonstration to show the possible relationships between energy supplies, operators and utilities, PHEVs and consumers. Here, engineer Ted Bohn uses the display to demonstrate how the smart grid can play a role in lessening our country's dependence on foreign oil.



Vehicle charging stations, like Coulomb Technologies' ChargePoint, will enable communication between the vehicle, consumer and electric utility companies. Argonne engineers are active in validating these technologies.

"The smart grid doesn't propose to revolutionize the way we do power," said Ted Bohn, electrical engineer, Argonne National Laboratory. "It's just about doing the same things more efficiently—smarter."