



# SMART ENERGY PLAZA LEVERAGES SOLAR CANOPY AND ELECTRIC VEHICLE CHARGING STATIONS FOR RESEARCH

## A former gas station has been transformed into a green transportation and energy hub at Argonne National Laboratory.

The facility is part of Argonne’s Center for Transportation Research (CTR), which provides innovative solutions to challenges involving fuel efficiency, emissions, durability, safety, design and operating efficiency, petroleum dependence, interoperability, compatibility, and codes/standards compliance and harmonization.

The focus of this research and development effort is to provide practical applications that enhance market acceptance of plug-in vehicles and charging infrastructure, including:

- Enabling technology development to support EV–grid integration,
- Enabling communication to manage vehicle charging loads,
- Reducing the cost of EV charging infrastructure,
- Enhancing the viability of fast/consumer-friendly charging, and
- Harmonization of global connectivity standards.

Between 2017 and 2018, Argonne remodeled its old gas station building and parking lot to support CTR’s research. Green energy and transportation enhancements were made in the parking lot, including installation of two 40-kW solar canopies, six dual alternating current (AC) Level 2 EV charging stations, and two 50-kW direct current (DC) fast charging stations. The building renovation also included the installation of high-efficiency glazing, a climate control system, lighting, and a repurposed EV battery for energy storage in the building.

CTR researchers support emerging technology development in grid connectivity, bridging the needs of electric vehicle (EV) manufacturers and utilities.



Argonne team receives recognition for the Smart Energy Plaza project and employee electric vehicle charging program. Left to right: Dan Dobrzynski (ES), Jason Harper (ES), Keith Hardy (ES), Bob Swale (NWM), Catherine Hurley (PMO), and Chong Cao (ES)

In FY 2018, Argonne also implemented a rainwater gutter system for the canopies and stormwater drainage system for surface drainage. Infrastructure was installed to support higher-powered DC charging equipment (up to 320 kW) and wireless charging for EVs.

Known as Smart Energy Plaza, this facility utilizes an integrated communication and control system to support the development of energy management strategies based on the energy generated onsite, building energy use, and the demands of EV charging. The Plaza is a key experimental facility for grid integration studies and supports several projects of the Department of

Energy's (DOE's) Vehicle Technologies Office, as well as the Grid Modernization Laboratory Consortium. Smart Energy Plaza serves as the DOE's EV-Smart Grid Interoperability Center. In collaboration with facilities run by the European Commission's Joint Research Center, the Plaza provides a venue for global industry-government cooperation that focuses on the joint development of EV standards and test procedures.

The EV charging stations and solar canopy also support the laboratory's site sustainability goals. Solar energy generation at Argonne has increased by 70% with the solar canopy, and the EV charging stations are available for use by Argonne's employee EV charging program participants. Smart

Energy Plaza now has the capacity to simultaneously charge 14 electric vehicles at one time, creating a new model for centralized electric vehicle charging. With the addition of a second solar canopy, the building is now net-zero energy; the solar canopy generates more energy than the building uses.

Argonne's work at the former gas station supports clean and environmentally friendly EV transportation. It also demonstrates the collaborative power between researchers and site sustainability programs at the DOE.

**FOR MORE INFORMATION  
PLEASE EMAIL**

**Sustainability Program Manager  
[sustainability@anl.gov](mailto:sustainability@anl.gov)**