



# NREL + HOLY CROSS ENERGY

NREL is collaborating with Holy Cross Energy (HCE) to demonstrate breakthrough approaches that will allow HCE to develop and validate new grid visualization, control paradigms, and business models for rural cooperatives and municipally-owned utilities through the integration of grid-friendly distributed energy resources (DERs). This project will help modernize distribution system operations by enhancing a utility's use of field measurements for situational awareness and asset management.

## R&D STRATEGY

The cross-cutting team includes NREL, HCE, Survalent and the National Rural Electric Cooperative Association (NRECA). The research will leverage novel, real-time distributed control algorithms and an advanced distribution management system (ADMS) capability recently developed under work that is supported by the Department of Energy's ARPA-E, Grid Modernization Initiative, Solar Energy Technologies Office, and the Advanced Grid Research group, and use data from the Survalent's Supervisory Control and Data Acquisition (SCADA) and AMI engines deployed at HCE combined with NRECA's MultiSpeak® software interoperability specifications.

The team will evaluate the full benefits of the advanced control algorithms using real data acquired from HCE's distribution management system, and test the integration of new algorithms and communication protocols with multiple legacy and advanced systems. The goal will be to demonstrate active control of DERs as part of distribution system operation strategies, using NRECA's MultiSpeak® in a way that provides real-time grid services, increases DER hosting capacity, and avoids capital expenditures. NREL's ADMS capability will be used to evaluate the use cases in a realistic environment that includes megawatt-scale hardware testing of HCE's system.

## IMPACT

While most large, investor-owned utilities have already taken actions to modernize their grids to address the challenges caused by high DER penetrations, the associated cost is extremely prohibitive for small municipal utilities and rural cooperatives. This research will enable HCE to fully leverage DERs as part of their strategy to provide reliable, resilient, secure and affordable electric services to its customers.



NREL and HCE are demonstrating approaches to integrating grid-friendly DERs. *Photo by Dennis Schroeder, NREL 45156*

## Partner with NREL at the ESIF

User facility access to the ESIF is awarded through the review and approval of user proposals, depending on the scientific merit, suitability of the user facilities, and the appropriateness of the work to DOE objectives, and includes a signed user agreement for the facility.

For more information, please visit:

[www.nrel.gov/esi/working\\_with.html](http://www.nrel.gov/esi/working_with.html)

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The Energy Systems Integration Facility (ESIF) at the National Renewable Energy Laboratory (NREL) provides the R&D capabilities needed for private industry, academia, government, and public entities to collaborate on utility-scale solutions for integrating renewable energy and other efficiency technologies into our energy systems.

To learn more about the ESIF, visit: [www.nrel.gov/esif](http://www.nrel.gov/esif).

## National Renewable Energy Laboratory

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