



NREL + EATON

Electrification of transportation fleets provides an opportunity for optimizing multiple distributed energy resource (DER) technologies, such as solar and energy storage. NREL is partnering with Eaton to evaluate control strategies for managing electric bus (E-bus) fleets for grid services. The project team will develop a replicable platform for evaluating EV fleet management and quantifying benefits from grid services.

R&D STRATEGY

NREL will perform a REopt analysis for EV fleet grid services to identify the different grid services and the US regions where those grid services will provide highest benefits. The effort will utilize NREL's Fleet DNA data, a clearinghouse of commercial fleet vehicle operating data that helps vehicle manufacturers and developers optimize vehicle designs and helps fleet managers choose advanced technologies for their fleets.

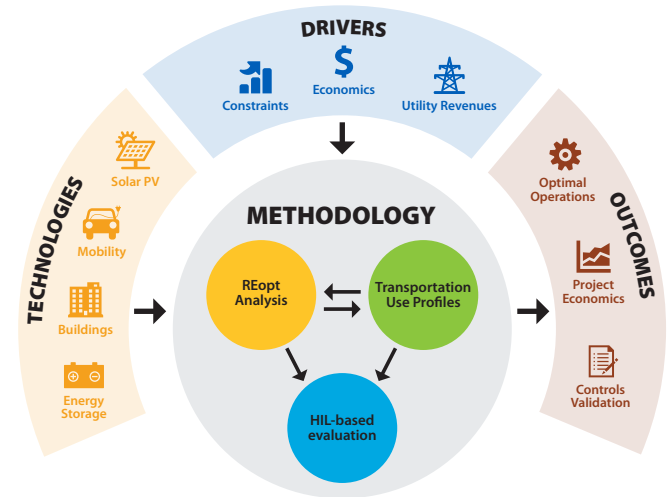
The project team will develop different scenarios in which the E-bus fleets will operate. Factors that influence transportation use and battery load profiles will be identified and representative profiles will be developed for each scenario. Factors include commute distance, gradient, vehicular speed, and grid services being performed.

Fleet charge management control strategies will be evaluated utilizing the Hardware-in-the-Loop (HIL) simulation capabilities at NREL's Energy Systems Integration Facility (ESIF). The results from the HIL simulations will inform a techno-economic analysis to support the creation of the EV fleet management platform

These activities will demonstrate baseline integration of mobility, storage, buildings and PV technologies through HIL simulations with Eaton's PowerExpert Energy Optimizer (PXEO) site controller. Synergistic site controls will demonstrate how to unlock additional value streams and accelerate technology adoption.

IMPACT

This high-impact project will leverage opportunities from the electrification of transportation fleets for optimizing multiple DER technologies at a site. The outcome of the project will be a co-optimization framework for optimal integration of mobility with other DER technologies, which can serve as a key resource for regional transportation and utility partners who are moving toward a more sustainable future.



In partnership with Eaton Corporation, NREL researchers will study the mutual optimization of electrified transportation fleets and multiple DER technologies at a sites. *Illustration by Brittany Conrad of NREL*

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/esif/work-with-us.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.

National Renewable Energy Laboratory

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