

Implementing EV-Based Grid Services for Microgrids and VPPs

Peter Asmus
Research Director

Scott Shepard
Senior Research Analyst

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The projected growth in plug-in EVs (PEVs) offers both challenges and opportunities to distribution utilities. If not managed in an intelligent way, these PEVs can pose a threat to overall grid reliability. Yet, if aggregated and optimized with smart controls, they can offer diverse grid services integrated with new business model platforms such as microgrids and virtual power plants (VPPs). While the primary purposes of these platforms differ—resiliency versus bidirectional value exchanges—they share the common goal of extracting value from distributed energy resources (DER) portfolios. This report discusses how to develop a strategy to explore, test, and tap location-specific value pools embedded in PEV batteries, charging loads, and charging infrastructure to help support microgrid and VPP deployments. Navigant Research provides actionable recommendations for PEV microgrid and VPP stakeholders when implementing PEV-based applications within the next 5 years.

Context

This report covers the following:

- Microgrids and VPPs are platforms that aggregate and optimize diverse DER, including PEVs.
- Grid services can take EVs from a grid challenge to a grid solution.
- Several early global deployments are tapping PEVs as DER for microgrids and VPPs.
- PEVs are emerging as a viable enabling technology for microgrids and VPPs within the next 5 years.

Recommendations

Navigant Research recommends the following:

- PEV ecosystem stakeholders should support development of communication standards, shape regulations on frequency regulation services, and explore new energy as a service (EaaS) business models.
- Microgrid ecosystem stakeholders should focus on how PEVs provide value internally to the microgrid during emergency islanding and pair PEV fleets with stationary storage devices.
- VPP ecosystem stakeholders should use advances in artificial intelligence, advocate for market reforms, and seek opportunity in the distributed energy resource management system (DERMS) market.

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