Duke Energy Florida

Behavioral Managed EV Charging Program

OVERVIEW

Duke Energy Florida, one of America's largest utilities, made a bold move towards grid sustainability by implementing engagement programs that enlist customers in helping to manage grid load. Working with Itron Inc., the utility designed and deployed a four-year behavioral managed EV charging program which shifted residential EV charging to off-peak periods, resulting in a 95% reduction of on-peak EV charging, and enrolling 4,000 vehicles.

Duke Energy, a Fortune 150 company headquartered in Charlotte, N.C., is one of America's largest energy holding companies, supplying and delivering energy to approximately 8.2 million U.S. customers. Duke Energy Florida, a subsidiary of Duke Energy, owns 10,500 megawatts of energy capacity, supplying electricity to 1.9 million residential, commercial and industrial customers across a 13,000-square-mile service area in Florida.

Duke Energy Florida's EV Adoption Landscape

Sales of EVs in the state of Florida have been growing, now at an average of 28% per year (compounded annually) from 2023 to 2032 per a Guidehouse Insights Q1 2024 report. Additionally, net population migration to Florida averages over 200,000 people annually, with approximately 10% of those moving to Florida already owning EVs – further contributing to the rise in EV ownership in the state and ranking as one of the top 3 U.S. states in terms of EV ownership according to the U.S. Department of Energy in a 2022 publication. At the end of 2022, Florida had 167,999 registered EVs, and Guidehouse projects that the total population of EVs in Florida will be over 3.6 million by 2032.

SERVICE TERRITORY

Central and North Florida

GOALS

- Shift residential EV charging from peak periods to off-peak periods
- Target enrollment of 1,000 new participants each year
- Participants earn a $10 bill credit per month

TECHNOLOGY

- DER Optimizer
- IntelliSOURCE® - Distributed Energy Resource Management System (DERMS)

SOLUTION

Duke Energy Florida Implements Residential Off-Peak Charging Credit Program

With the increase of EV ownership in Florida, Duke Energy Florida worked with Itron to address the looming challenges associated with the proliferation of EVs, taking a long-term approach and betting on customers to play the key role in this solution. The goal of the program was to shift residential EV charging from peak periods to off-peak periods to reduce Duke Energy Florida's system peak demand and the associated strain on the low-voltage distribution grid. Participants are allowed to charge their EVs during on-peak hours up to twice per month and earn a $10 bill credit. Duke Energy's program targets enrollment of 1,000 new participants each year, with a cumulative enrollment target of 4,000 vehicles over four years.

DER Optimizer Solution

Itron's DER Optimizer solution, built on the foundation of Itron's IntelliSOURCE® demand response platform, provides Duke Energy Florida with the ability to offer their Off-Peak Charging Credit Program to ***any*** EV owner in their service territory with a Level 2 charger, using a combination of EV telematics and AMI load disaggregation. DER Optimizer also handles all aspects of customer and vehicle enrollment, charging session monitoring, incentive tracking, customer support, and reporting – providing Duke Energy Florida with a comprehensive suite of turnkey program implementation services.

RESULTS

Enrollment Success

Duke Energy Florida's Off-Peak Charging Credit Program easily met its recruitment and participation goals in both 2022 and 2023, enrolling 1,000 participants in each year, respectively. The program was so popular that customers were put on an enrollment waitlist before the end of each calendar year--because enrollment targets were achieved well before year-end in both 2022 and 2023.

Load Shift Success

Since the launch of Duke Energy Florida's Program in January 2022, EV charging among program participants has accounted for over 10.0 GWh as of July 2024 of electricity consumption. Within that total charging consumption, less than 5% of the charging has occurred during Duke Energy Florida's peak demand periods – providing strong evidence that Duke Energy's Program has been quite effective in shifting residential EV charging to off-peak periods. Indeed, this overall share of on-peak charging among program participants has been remarkably stable since program inception – indicating that the behavioral change motivated by the program is not transient and temporary but long-term and reliable.

EXPAND SUCCESS

Next Steps

To capitalize on the demonstrated program success, Duke Energy Florida is considering pursuing the next steps to broaden the impact of shifting load to off-peak. Expansion of the current program to keep pace with EV adoption trends in Florida will further relieve on-peak charging pressure on the grid. The Department of Energy estimates that 80% of EV charging is performed at the EV owner's residence. According to Price Waterhouse and Coopers consulting the state of Florida is projected have 58,110 GWhs of load by 2040. Expansion Duke Florida's off-peak charging program may enable 55,205 GWhs to be off peak.

Itron

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