Supplemental Project Notice

FLEXIT: FLEXIBLE INTEROPERABLE TECHNOLOGIES INITIATIVE

VPP/DER REGISTRY AND INTEGRATION INTERFACE

PROJECT HIGHLIGHTS

- Improve the understanding of aggregator types and awareness of available DER.
- Guide and standardized framework for integrating DER via VPP/aggregation to maximize value.
- Identify and manage potential risks associated with third-party aggregation, including cyber and longevity of solutions provided.
- Increase the range of opportunities for customer participation and choice by strengthening confidence in commercial aggregation.
- Prepare a non-proprietary, non-confidential Final Report covering all aspects of the initiative, including the universal registry and integration interface.

Background

Preparing the electric grid for increased electrification, variable renewable generation, growing demand from data centers, and more — all while improving energy resilience — takes investment in and deployment of all available resources. By increasing the use of existing assets, like distributed energy resources (DER) and the assets of virtual power plants (VPPs), we can help bridge the gap towards a reliable clean energy transformation.

Given the expected growth of DER, including generation, storage, and manageable load, improved visibility of these devices is required. It can be beneficial for utilities to directly integrate with the growing number of entities developing systems, like VPP and DER aggregation, to reduce the complexity of integration.

However, using third-party aggregation of DER may introduce risk and complexity. Many of these risks may stem from a lack of clarity in the business processes like availability, defining requirements contracts, service definitions, operational integration, and post-deployment measurement and verification.

Objectives

The goal of this initiative is to improve visibility of available aggregated DER resources and VPPs within an electric company's footprint; to simplify integration through standardizing service definitions and interfaces; and to develop a future-proof implementation strategy.

This project aims to:

- Deliver technical specifications for the platform needed to provide for DER discovery and visibility.
- Establish standards for the core utility-to-VPP/aggregator interactions involved in the provision of T&D grid services.
- Educate stakeholders regarding the benefits of effective and standardized DER registration, discovery, and integration.
- Identify and harmonize existing standard services, communication protocols, and cybersecurity requirements.

Benefits

Public and funder benefits include:

- Reducing the cost of integrating energy supply from virtual power plants/aggregations through clarifying and standardizing requirements.
- Increasing opportunities for customer participation and choice by increased awareness for all parties.
- Improving the security and robustness of DER integration.
- Enable stakeholders to leverage and integrate reliable, accurate, timely, and actionable DER data into real-time distribution grid operations.
- Expanding the ability of the grid to accommodate clean energy resources without compromising safety or security.

Project Approach and Summary

The project builds upon a breadth of research previously delivered by EPRI and others in the areas of DER management systems (DERMS), VPPs, DER group management, communication protocols, and cyber security.

This initiative is structured into two workstreams:

WS1: Universal Registry for Aggregated DER

- Creation of an implementation-ready specification for a universal registry to improve DER visibility and discovery. Design to provide utilities, VPP/ aggregators, and DER owners with appropriate and authorized access to the DER information needed.

WS2: Standard Framework for VPP/Aggregator Integration

- Develop detailed technical framework for the utility-to-VPP interface. Streamline integration through standardized service definitions, protocols, and business arrangements. Address potential risks associated with third-party aggregation, including cyber.

To support these workstreams, EPRI aims to facilitate a working group of diverse stakeholders to understand perspectives and develop consensus.

Deliverables

WS1: Universal Registry for Aggregated DER

- Technical universal registry specifications that are documented and implementation ready.
- Public guide to VPP/aggregation, outlining and categorizing service types and limitations, and identifying challenges.

WS2: Framework for Aggregator Integration Interface

- Technical specification for standardized utility-to-VPP/aggregator integration interface
- Supporting reference server and client code (e.g., IEEE 2030.5) with specifications

The non-proprietary results of this work will be incorporated into EPRI's R&D programs, and available to the public for purchase, or otherwise.

Price of Project

Price per participant: $100K

This project requires at least 10 utilities to conduct the full scope. This project qualifies for Self-Directed Funding (SDF) and can be paid over two years.

Project Status and Schedule

The project is expected to continue for 24 months from initiation to completion. Initial deliverables are expected early and at regular intervals throughout the project.

Who Should Join

Utilities considering expanding DER utilization. This research is applicable to those who intend to manage DER directly and/or through aggregators.

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