

CASE STUDY

DER Interconnection Pilot



Background

Distributed energy resources (DER), such as photovoltaic solar panels and battery storage, are expanding in communities throughout the Tennessee Valley Authority's (TVA) service region.

These resources play a critical role in the clean energy transition. However, as DER deployment increases, challenges are emerging, including lengthy interconnection times and regulatory and technical barriers. Developing and implementing interconnection

more consistent processes and standards across the service region can streamline the DER interconnection process and lower costs.

It is critical for TVA and local power companies (LPCs) to align their interconnection processes and standards relative to their individual DER penetration levels, system characteristics, capabilities and organizational structures — as this will support faster and more cost-effective integration of DER across the region.

Goals

THE PILOT PROJECT TARGETED GOALS ACROSS THESE TOPIC AREAS:



Application Management

includes administrative procedures, tools and online services offered to applicants.



IEEE 1547-2018 Readiness

includes issues specific to application of IEEE Standard 1547-2018.



Technical Review

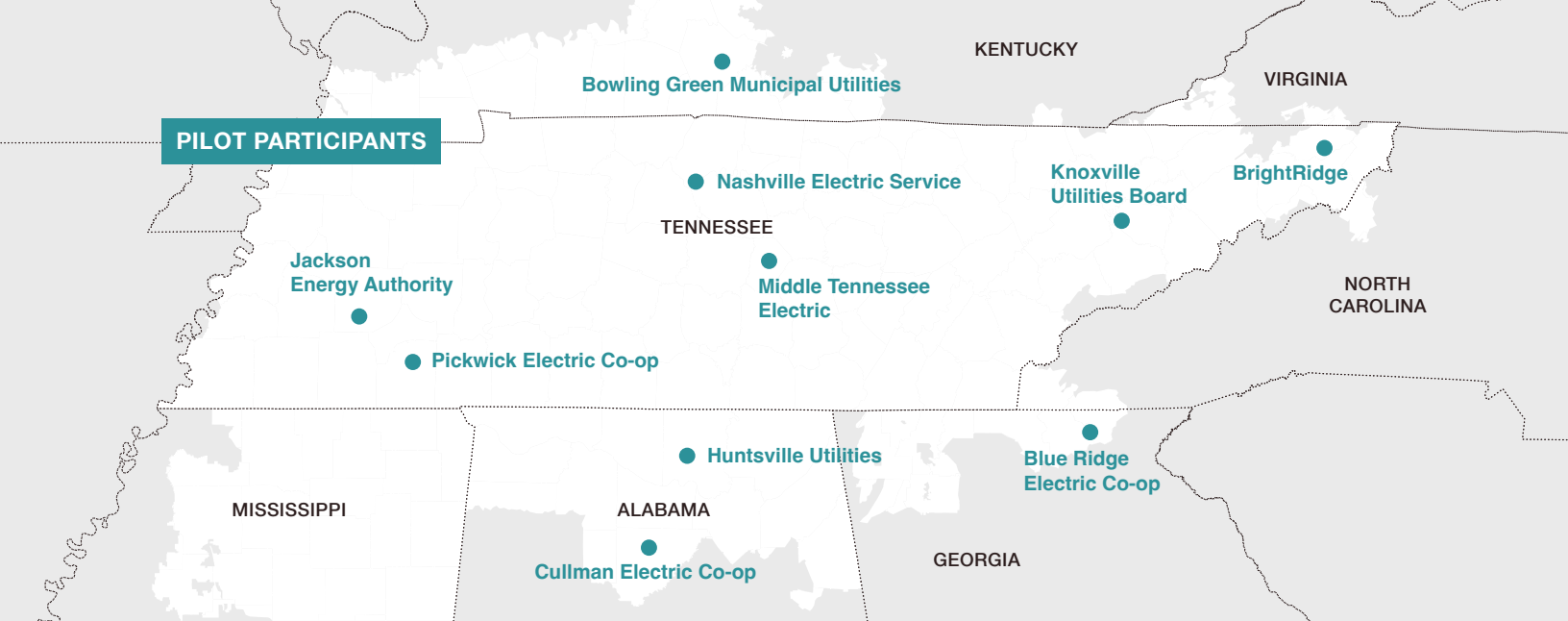
includes procedures, tools and data surrounding technical review process for solar and energy storage.



Internal Infrastructure

includes the physical tools and infrastructure that enable interconnection.

Best practice recommendations are tied to a progression model, where recommendations become more critical as annual DER application activity and/or DER penetration on a LPC's distribution feeder(s) increases.



Approach

Collaborating with ten LPCs, TVA followed the below process to expand understanding of industry DER interconnection standards and best practices, apply these standards to distribution interconnections and develop consistent practices across the region.



Conducted educational workshops

to establish goals, transfer general knowledge and bolster LPCs' awareness of interconnection practices and standards.



Completed a maturity assessment

to gauge the current state of DER interconnection practices and develop well-informed recommendations.



Developed recommendations

for standardizing interconnection processes and adopting best practices that are well-suited to each LPC's unique needs.



Proposed a governance approach

(based on LPC input) to help maintain consistent interconnection practices long-term.



Led harmonization efforts to align

the interconnection process between TVA and LPCs.



Provided LPC training

to share project results and recommend approaches for applying the newly established interconnection standards within their organizations.

Results

Partnering with the Electric Power Research Institute (EPRI), TVA developed two sets of recommendations: custom reports specific to the circumstances of participating LPCs and 82 recommendations more generally aligned with advancing interconnection practices across TVA's service region.

Collectively, these 82 recommendations provide a standardized template for adopting leading practices on DER interconnection processing and technical review.



These recommendations can improve transmission and distribution grid reliability and safety while streamlining the evaluation and processing of DER interconnection applications.

82
recommendations

29
MINIMUM STANDARDS

Obligatory, enforceable practices designed to ensure safety and reliability.

53
GOALS

Voluntary goals, based on North American utility best practices, for improving LPC efficiencies.

MINIMUM STANDARDS

The key to maintaining a safe and reliable grid.



24
recommendations

related to the adoption or implementation of IEEE Standard 1547-2018



5
recommendations

focused on reliability and safety



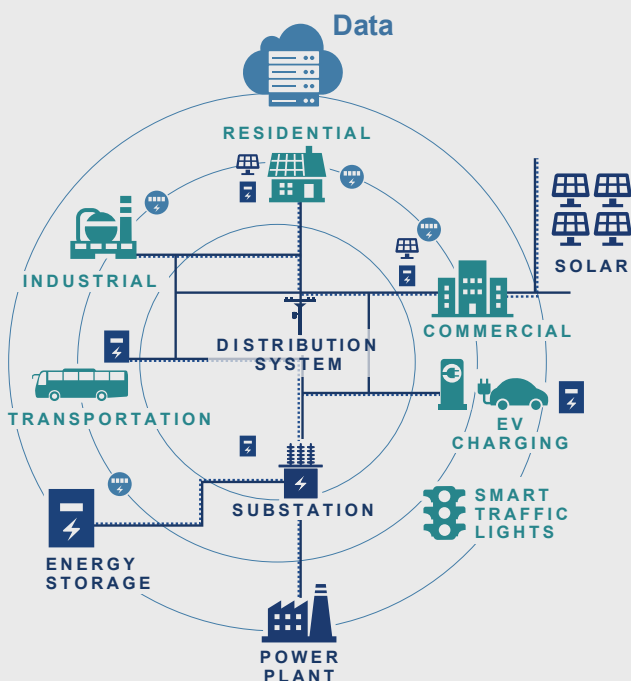
Next Steps

The recommendations and lessons learned from this pilot are in the best interest of both TVA and LPCs. Through their adoption, these recommended minimum standards and goals will allow for a standardized process, increased cooperation across the service area, and efficiency improvements in preparation for the growth in DER.

During the maturity assessment, it became evident that there was a lack of consistency and standardization in LPC approach to the DER interconnection process. IEEE standards, along with establishing new minimum standards and goals that are aligned with the LPC and TVA-led Capability Progression Model, will encourage LPCs to standardize and streamline their DER interconnection

processes in preparation for the changing energy landscape. The Capability Progression Model (CPM), developed collaboratively by LPCs and TVA, serves as a comprehensive roadmap that outlines key stages and milestones for enhancing LPC capabilities. One significant aspect of this model is the DER Interconnections capability, which focuses on optimizing the integration of DERs into the grid.

TVA's support will be vital for ensuring LPC cooperation. Timing of adoption will be adjusted based on LPC circumstances to avoid overwhelming them in applying these standards. The proposed NERC facility interconnection requirements (FAC-001 and 002) may require more consistency and visibility regarding DERs, setting the stage for future collaboration with LPCs.



LEARN MORE

The Regional Grid Transformation (RGT) initiative is a collaboration between local power companies and TVA to transform the power grid into a more resilient, flexible and integrated system to meet customer expectations and changing world conditions.

Visit tva.com for details.