NASHVILLE, TN

The ARCHER Project, Resiliency Planning Framework

The ARCHER (Accelerating Resilience of the Community through Holistic Engagement and use of Renewables) project is engaging key stakeholders to develop a community-based resiliency planning framework that uses distributed energy resources (DER). The framework enhances resiliency by helping prevent power disruptions caused by extreme weather events while considering the impact on North Nashville neighborhoods.

BUDGET

$1.25M

$1M
DOE Project Funds Awarded to EPRI

$250K
Project Participant Cost Share

Background

Disruptions to Communities

Nashville, like many other communities, has faced several severe weather events that have caused outages over the last decade. There are opportunities for communities and utilities to collaborate to use DER, such as solar, to limit outages – and rapidly restore – electricity should there be a power disruption.

THE OPPORTUNITY

Increased Resiliency

Development of community-based plans and guides to increase resiliency across communities provides benefits to residents, businesses, local government agencies and local power companies (LPCs).

COMMUNITY IMPACTS

Extreme Weather Events
cause various burdens on individuals and communities.

Electric Grids
face vulnerabilities to extreme weather and other events.

Scope

Inform Investments

in community resilience by accounting for energy and social burden differences, access to services and living conditions.

Develop a Framework

to create planning guidelines, practices and measures for community energy resilience.

Test and Validate

the framework's value in a test case against traditional and operational planning.

THE GOAL

Community Energy Resilience

ARCHER provides a methodology to understand risks – social, energy, environmental and grid – that can minimize the burden of power outages on local residents, especially disadvantaged communities.

OUTCOMES

Deploy Framework
in a historically Black neighborhood that was impacted by tornadoes and a derecho in 2020.

FOCUS AREA
Enhanced Community Resiliency

TVA TENNESSEE VALLEY AUTHORITY

Performance

Technical and Analytical

- Publication and application of a Community Engagement Guide
- A metric for energy resilience planning
- Planning framework applied to two communities

Value Evaluation

- Participants rate guidelines as useful in planning for energy resilience
- Identify optimal and cost-effective locations for one or more resilience hubs

Stakeholder Engagement

- 15 or more community members involved throughout the process
- The community and utility provide a positive rating regarding ARCHER's application and usefulness
- A science, technology, engineering and math (STEM) course for local students with positive feedback

Industry Engagement

- Interest from industry stakeholders when sharing findings of the project

The Value

Communities

- Provides guides, methodologies, plans and other resources that align an overall strategy for community energy resiliency
- Develops an energy resilience metric to gauge community needs
- Optimizes existing energy resource utilization
- Identifies essential community resources, needs and services that must continue operations during extreme weather events

Local Power Companies

- Links community needs to utility improvements
- Allows for grid evaluation against a variety of factors (socioeconomic, environmental, etc.) to identify optimal resilient energy pathways
- Provides an economic analysis to compare DER and grid options for energy resiliency

Key Partners

PROJECT LEAD

Electric Power Research Institute

ADDITIONAL PARTNERS

City of Nashville

Department of Energy

Nashville Electric Service

Tennessee State University

Tennessee Valley Authority

Learn more about pilot projects

Timeline

Year 1: Community Energy Resilience Planning

- Community engagement strategy
- Identification of essential needs
- Evaluation of existing energy resources
- Combine social, energy and grid vulnerabilities into common energy resilience metric
- Preliminary community resilience data exchange platform work
- Testing, validating and adjusting the community energy resilience framework

Year 2: Fusion of Planning and Electric Utility System Resilience and Operationalization

- Develop procedures to link community needs to types of extreme weather events
- Prioritize energy and grid resilience projects
- Conduct an economic analysis of DER options
- Develop and teach STEM course for local schools
- Final version of community resilience data exchange platform
- Testing, validating and adjusting the community energy resilience framework

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