

# Synthetic Resiliency Modeling on Extended Power Outages

RUNWITHIT Synthetics (RWI), in collaboration with EPRI, is applying synthetic modeling to forecast human impacts to enhanced community response planning. This helps the city of Nashville and Nashville Electric Service (NES) assess the outcomes of a widespread outage, particularly on vulnerable populations, and the benefits of potential distributed energy resource (DER) deployments.

**BUDGET**

## \$160K

**\$80K**  
TVA Connected  
Communities

**\$80K**  
Proposed  
Match

## Background



### City Resilience Planning

Nashville, like many places across the country, has faced severe weather events that have caused outages over the last decade. These outages interrupt the lives of residents and have negative impacts on businesses. Combining simulated city-wide outages with DER adoption modeling helps predict the benefits of DER adoption across the city.

**THE OPPORTUNITY**

### Outage Planning

Provides Nashville city planners and NES with a better understanding of the impacts of a citywide outage due to a cold weather event and supports future planning efforts.

**WEATHER**

**4**  
extreme weather  
events in the  
last decade

**1**  
cold weather  
event modeled

## Scope



### Simulate a Weeklong Outage

and study the impacts at 24 hours, three days and one week into the outage.



### Assess Benefits of DER Deployment

against the measured impacts from outages of varying lengths.



### Forecast Human Impacts

of an outage across Nashville, including economically disadvantaged and vulnerable populations.

**OUTCOMES**

### Detailed Outage Scenarios

for both short- and long-term events

### Enhanced Information

about the benefits of DERs and microgrids for Nashville during outages

**THE GOAL**

### DER Modeling

This pilot project models, measures and presents various options for DER to manage and mitigate outages and measure the benefits. This modeling helps pinpoint needs to aid in the planning of community resilience hubs.

## Performance

### Key Performance Indicators

- Number of Nashville neighborhoods evaluated and measured
- Multiple scenarios developed and analyzed
- Expanded and measurable insights of community resilience

## The Value

Understanding the Benefits of DER Adoption During an Outage Event

Enhanced Knowledge for City and Emergency Management Planners

Future Planning for Outage Events

## Key Partners

### PROJECT LEAD

Electric Power Research Institute

### ADDITIONAL PARTNERS

City of Nashville

Nashville Electric Service

RUNWITHIT Synthetics

Tennessee Valley Authority



## Timeline



Learn more about this pilot project

### Month 1-4

Develop use cases with partner organizations

### Month 5-6

Draft story frame of modeling results

### Month 7

Draft videos of modeling results

### Month 8

Report out/project close