

# Synthetic Resiliency Modeling on Extended Power Outages

RUNWITHIT Synthetics (RWI), in collaboration with EPRI, will apply synthetic modeling to forecast human impacts to help the City of Nashville and Nashville Electric Service (NES) assess the outcomes of a widespread outage on residents, particularly vulnerable populations, and the benefits of distributed energy resource (DER) deployments against measured impacts.

**BUDGET**

## \$160K

**\$80K**

TVA Connected Communities

**\$80K**

Electric Power Research Institute (EPRI)

## Background



### City Resilience Planning

Nashville, like many places across the country, has faced several severe weather events that have caused city-wide 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 will help to predict the benefits of DER adoptions across the city.

**THE OPPORTUNITY**

### Outage Planning

Providing Nashville and NES with a better understanding of the impacts of a city-wide outage due to a cold weather event will help city planners and officials with 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 will model, measure and present various options for DER to manage and mitigate outages and measure the benefits. This modeling can help pinpoint pockets of need to aid in the planning of resiliency hubs.



## Performance

### Key Performance Indicators

- A 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

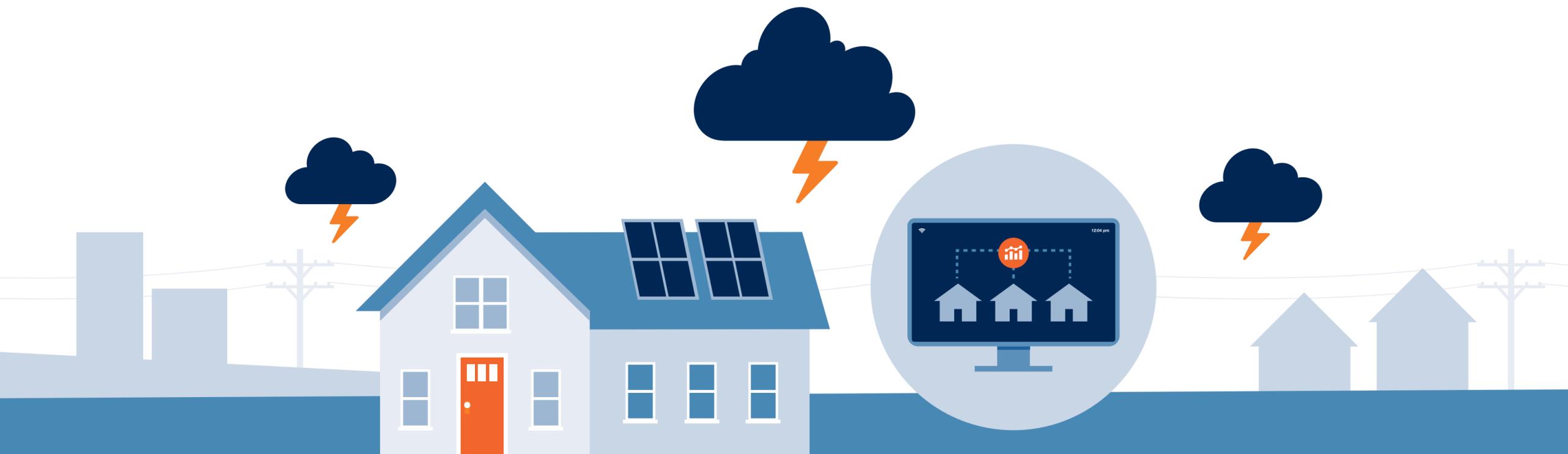
Electric Power Research Institute

Nashville Electric Service

City of Nashville

RUNWITHIT Synthetics

Tennessee Valley Authority



## Timeline

August 2022

Develop use cases with partner organizations

December 2022

Draft story frame of modeling results

February 2023

Draft videos of modeling results

March 2023

Report out/project close

