CHATTANOOGA & KNOXVILLE, TENNESSEE

ELECTRICC

By validating efficient low-carbon energy & digital twin modeling for Connected Communities, this pilot will model grid benefits and energy savings while also demonstrating the benefits of Distributed Energy Resources (DER) technologies.

BUDGET

$12.3M

$11.3M in potential funding from DOE and other partners

$1M committed by TVA in FY22-23

$TBD in EnergyRight® Home Uplift matching funds

QUANTITY

4.3M buildings in the Valley

TYPE

All buildings with a focus on those served by KUB & EPB

PHASE 1

Modeling

DIGITAL TWIN MODELING (DTM)

Estimate grid benefits of DERs

- First-of-its-kind modeling approach by ORNL
- Used to predict performance of installed grid enabled technologies and energy conservation measures
- Provide recommendations on what can be done where (e.g., electric vehicle charging stations, rooftop solar, residential smart thermostats, etc.)

QUANTITY

625 buildings

375 - Knoxville
250 - Chattanooga

TYPE

Existing buildings for limited-income homeowners

PHASE 2

DER deployments

RETROFITS

Energy efficiency measures + smart thermostats

- Install weatherization measures (e.g., upgrades to building envelope, HVAC and appliances)

MICROGRIDS

Building-level microgrids

- Residential and commercial solar
- Residential and commercial battery storage
- Electric vehicle charging infrastructure
- Deployed at five to ten critical community buildings to support load flexibility and grid interactivity
- Boost community resiliency

MEASUREMENT & VERIFICATION (M&V)

Validate modeling

- Evaluate how a group of distributed energy resources can be collectively utilized to impact bulk load requirements and grid demand flexibility during both summer and winter peak periods
- Create a “How-to-Guide” for use by other communities

TVA TENNESSEE VALLEY AUTHORITY

POINTS OF
Leverage

1

Significant energy savings

DER deployments in this pilot could result in up to

845,000 kWh

in annual energy savings and up to

1,411 kW

in load reductions.

2

A guidebook for scalability

The “How-To-Guide” created in this pilot will include best practices and project lessons; validated savings and grid benefits; and analysis of policy, regulatory, and other potential barriers.

THE
Value

Consumers

Benefit from measures that make their homes and critical commercial buildings more energy efficient while managing peak demand.

LPCs

Better understand how DERs and models can be leveraged as grid resources to support load flexibility and inform distribution planning.

TVA

Able to explore the impact of scaling this approach across the Valley in future Integrated Resource Plans.

KEY
Partners

TVA
Georgia Caruthers
Bonnie Latta
Chris Quillen

TDEC
Molly Cripps
Ryan Stanton
Alexa Voytek

ORNL
Josh New

EPB
Bill Copeland

City of Chattanooga
Erik Schmidt

City of Knoxville
Brian Blackmon

KUB
Chasity Hobby
Mike Bolin

NASEO
Rodney Sobin

Timeline

Financing

- **10/13/20** DOE FOA released
- **3/09/21** DOE proposal submitted
- **7/1/21** Selection notification deadline
- **10/1/21** Project starts and continues for 5 years

Phase 1

- **12/21** Intellectual Property Management Plan
- **06/22**
  - ✓ Data for DTM
  - ✓ M&V Plan
- **09/22**
  - ✓ DTM development
  - ✓ Technology Deployment Plan & process updates

Phase 2

- **09/23** Technology deployment stage 1
- **09/24**
  - ✓ DTM development
  - ✓ Technology deployment stage 2
  - ✓ Preliminary M&V analysis
  - ✓ Reporting, dissemination and education stage 1
- **09/25** Replicability & scaling
- **03/26** Final M&V report
- **06/26** Dissemination and education stage 2