![NREL Transforming ENERGY]

Innovative Energy Transformation for Smart and Connected Communities

Real Communities | Real Projects | Real Impact

Smart and connected communities use technology to better manage their urban energy systems and improve the quality and performance of government services by leveraging big data for data-driven decisions. NREL helps these communities reach their clean energy goals through cutting-edge expertise with data, models, planning, analysis, and technology implementation.
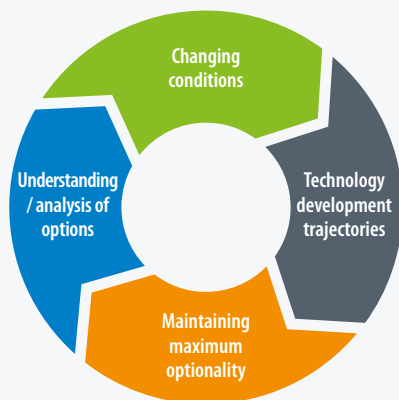
Challenge:

Communities around the world are setting clean, sustainable energy goals, but transforming energy systems is a complex challenge. Reaching goals will require transforming aging electrical systems, improving mobility while decreasing energy use, building charging infrastructure for electric vehicles, and improving building efficiency. Technology is evolving, costs are decreasing, and options are expanding. Planning a path to reach

Technology Planning Guided by Robust Scenario Analysis

- Grounded in practical realities of the current system
- Anchored in aggressive goals
- Guided by expert perspectives on development trajectories
- Tested using well-informed, robust scenarios

aggressive goals in the context of this rapidly evolving landscape can be overwhelming for officials in any size jurisdiction.

Solution:

NREL's experts help cities work with their unique challenges and resources. We help communities understand their full range of options to reach aggressive goals through designing, planning, and implementing practical deployment strategies. Leveraging edge computing to control the data explosion from the internet of things, NREL helps cities harness the proliferation of data using advanced data analytics to drive better decisions. Mapping needs and resources against likely technology development trajectories helps cities identify near-term steps toward long-term goals while keeping options open to emerging new technologies. Informed by cutting-edge urban, computational, and data science, NREL's 40+ year expertise with advanced energy systems, data collection, modeling, and analytics can position your city at the leading edge of energy transformation.

Connected Community Challenges: Dynamic and Evolving

- Changing conditions
- Technology development trajectories
- Maintaining maximum optionality
- Understanding / analysis of options

Changes happen across myriad variables. NREL capabilities support planning, analysis, and execution within a dynamic environment.

NREL Capabilites

Data and Computational Capabilities	Integrated Energy Systems Planning and Analysis	Data-Driven Technology Implementation

Data and computational capabilities:

- Manage and merge actual system data with modeled data to develop robust and realistic scenarios

- Identify, collect, optimize, and integrate grid-edge data, controls, and architecture

- Design effective cyber, security, and resilience solutions.

Integrated energy systems planning and analysis:

- Model residential, commercial, and industrial building energy usage

- Identify and create new opportunities for distributed energy demand, supply, and storage

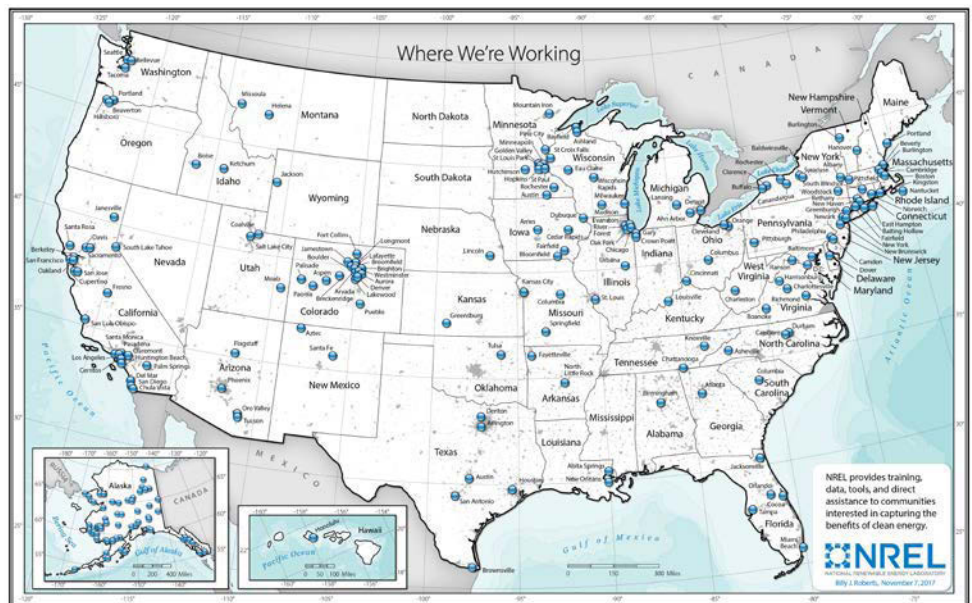- Consider many scales, from district- to city- to region-level distribution.

Data-driven technology implementation:

- Provide independent expert support for transition from systems reliant on high-carbon sources to clean, renewable energy generation

- Support data-driven technology implementation to optimize throughout the energy transition, maintain optionality as technology advances, and steadily progress towards goals.

Why NREL?

NREL's world-class researchers and facilities enable us to catalyze innovation, provide multidimensional perspective, and lower risk for transitions to new energy technologies.

- Leading energy systems innovation and integration for 40+ years

- First-of-a-kind unique capabilities unavailable anywhere else in the world

- Nearly 900 active partnerships with public- and private-sector organizations

- NREL's living laboratory campus is an example of applying energy innovation in the real world.

Where We're Working

NREL provides training, data, tools, and direct assistance to communities interested in capturing the benefits of clean energy.

Billy J Roberts, November 7, 2017

Partner With Us

Contact NREL and discover how we can apply NREL's capabilities to your most difficult, smart, and connected community challenges while building capabilities that can inform work with cities around the globe.

Contact Scott.Haase@nrel.gov | 303-275-3057

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