

Equitable Clean Energy Transitions for Small Communities

NREL Supports Kingston, New York, in Building a Community-First Approach to 100% Renewable Energy

An Ambitious Vision: In 2017, the city of Kingston, New York, committed to meet 100% power consumption with renewable energy sources by 2050. Leading by example, Kingston had already made significant strides in energy efficiency in city buildings; however, meeting the new goal meant that maintaining energy and housing affordability could be a challenge. The poorest residents of the city face a significant energy burden, spending up to a quarter of income on power and heating bills.

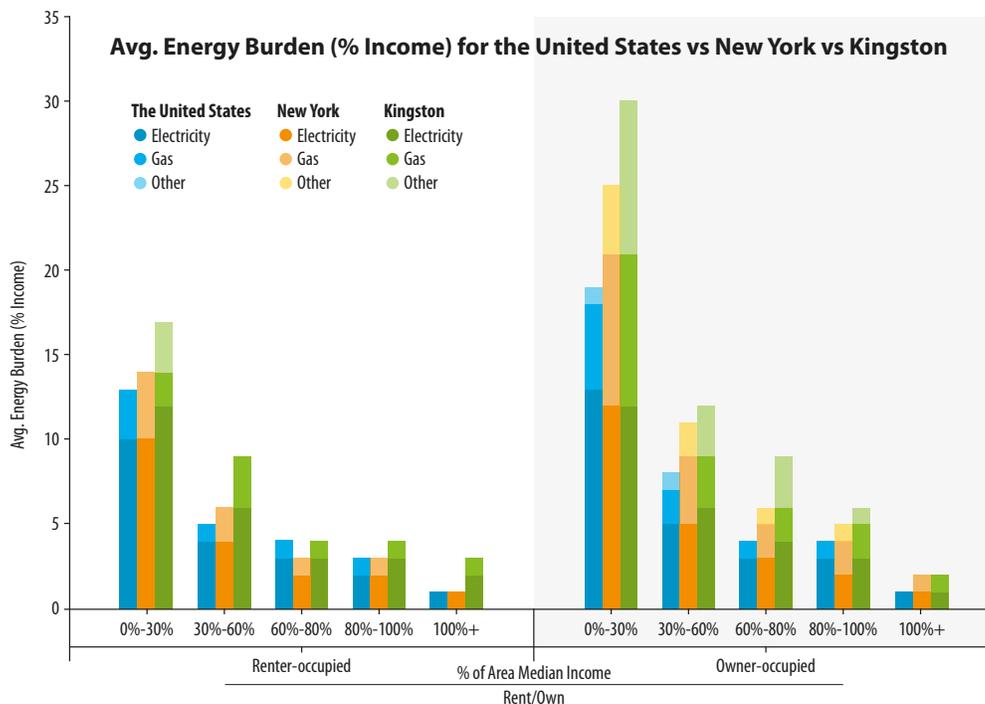
Affordable and Inclusive Solutions: Funded by the NoVo Foundation, NREL collaborated with city leadership to identify project priorities, which included:

- Going green while decreasing energy bills for low-income residents
- Practical local investment
- Community jobs.

The NREL team and partners deployed the lab's broad suite of modeling tools, focusing on the potential for the following:

- Community renewable energy generation
- Energy efficiency measures
- Opportunities to grow resiliency.

The in-depth analysis took a layered approach to realizing the city's vision.



Low-Income Energy Affordability

Renter-occupied households earning 0%-30% of area median income (~1,471 households) spent an average of 17% of income on utility bills in Kingston, NY.

~4,070 Kingston households (43%) spend >9% of their income on utility bills.

Owner-occupied households earning 0%-30% of area median income (~404 households) spent an average of 31% of income on utility bills in Kingston, NY.



Front and back photos from the City of Kingston



124 Franklin Street will become the new Land Bank offices and is a candidate for deep energy efficiency retrofitting.



Residential Opportunity: NREL examined a subset of 15 vacant residential buildings set aside to preserve housing stock affordability by the city of Kingston’s Land Bank. NREL discovered the following:

- Deep energy efficiency retrofits could save an average of \$2,400 in energy costs annually per home, bringing meaningful new economic security for those with the highest energy burden;
- Minisplit heat pumps provide the most efficient heating and cooling system in these buildings, utilizing half the energy of other heating and air conditioning approaches, while improving indoor air quality, health, and safety, and supporting the city’s goal to eliminate fossil fuel consumption; and
- Installing rooftop solar was economically favorable for those homes not significantly shaded by trees.

City-Led Transformation: Evaluating immediate opportunities for city action, NREL found:

- Efficiency retrofits could save the city \$76,000 annually across nine city-owned buildings;
- An analysis demonstrating efficiency and solar potential for the Central Fire Station, which could deliver energy savings of up to 66%, is informing current renovation plans; and
- The Andy Murphy Community Center, which serves as an emergency shelter, could cost-effectively implement a battery storage and rooftop solar system to create sustainable yet affordable resiliency.

Local Economic Impact: By pursuing these efficiency and solar opportunities on 24 Land Bank and city buildings, Kingston could generate 20 full-time-equivalent jobs or more.

District Horizon: Challenged to assess the possibility of a net-zero district, NREL investigated the rooftop solar potential of 58 properties in a key revitalization area. NREL modeling demonstrates that, with energy efficiency implementation, rooftop solar generation can meet annualized electricity consumption in the district while creating energy savings and 18-52 new jobs.

Collaboration: By partnering with the CADMUS Group, NREL’s analysis supported the evaluation of a suite of possible policy scenarios to meet city-defined objectives. Creative approaches to community-choice aggregation, energy efficiency programs, and incentivized, localized solar could deliver Kingston residents affordable, 100% clean energy.

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.



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.

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