



# Smart Energy Homes and Buildings

Smart, Efficient Low Carbon Building Energy Solutions

## MISSION

*Enabling building sector decarbonization by transforming homes and buildings to be efficient and flexible grid assets.*

The region is moving towards a renewable electric grid, increasing deployment of distributed energy resources, and electrifying several key end uses. It is critically important that homes and buildings are not only efficient, but flexible and able to interact with the grid to meet both grid and customer needs. NEEP's [The Smart Energy Home: Driving Residential Building Decarbonization](#) report, as well as a forthcoming 2019 NEEP Assessment report on Grid-interactive Efficient Buildings (GEBs), lay out several opportunities to accelerate the realization of smart energy homes and buildings across the region.

NEEP serves as a regional and national convener and subject matter expert to guide and accelerate this market transformation. Together state and federal programs, efficiency program administrators, and industry work to harness the power of smart energy homes and buildings that enable an affordable, reliable, resilient, and low carbon energy system.

## Regional Trends and Leaders:

- In 2018, DOE launched a new Grid-Interactive Efficient Buildings (GEBs) Initiative focused on conducting research to help bring connectedness – and the related energy savings – across the entire building sector, commercial and residential alike. GEBs research will allow American businesses and families to save energy and reduce their utility bills without impacting comfort or productivity.
- Many Home Energy Management System (HEMS) as well as major home appliance manufacturers now equip new products (HVAC, water heaters, and plug loads/appliances) with smart controls to serve customer needs while responding to a variety of potential grid load management signals.
- Efficiency programs in MA, MD, NY, and VT offer smart energy home pilots to assess and demonstrate a variety of new smart technologies and home performance contractors in MD, NJ, NY, and VT increasingly offer smart home energy products and systems integration as a customer service.
- MA and VT Efficiency programs, Fraunhofer Institute, and Vermont Energy Investment Corp (VEIC) are partnering to test and assess the role of smart thermostats to optimize efficient home thermal energy performance.

## NEEP's 2020 Project Outcomes:

1. All Northeast States offer smart energy home and building programs that optimize building energy performance and enable buildings to serve as flexible grid resources.
2. Six regional utilities/energy efficiency programs identify the highest priority grid services to be enabled by smart energy homes and buildings (i.e. demand response, responsiveness to time-of-use signals, load shifting, off peak usage, frequency regulation etc.).
3. A multi-state project in the Northeast advances to assess the in-field performance of smart energy homes and buildings (with a focus on HVAC and water heating).

## LONG-TERM MARKET TRANSFORMATION GOALS

### By 2025:

- 50 percent of Northeast homes and buildings are “energy smart” with either two “energy smart” systems or smart building management systems able to respond to grid service needs.

### By 2030:

- 90 percent of Northeast homes and buildings are “energy smart” (as defined above).
- 30 percent of existing homes and building are retrofitted to reduce carbon emissions 50 percent.

**Stakeholder Engagement:** NEEP will engage diverse stakeholders - industry, efficiency programs, state and local government, national labs, U.S. DOE, U.S. EPA and advocates - to develop and advance long-term regional market transformation strategies to speed the market introduction and adoption of smart energy home and building technologies that facilitate building decarbonization.

- Quarterly Smart Energy Homes Working Group (in partnership with the Building Performance Association)
- Quarterly Smart Energy Buildings Working Group
- Monthly email updates and announcements
- Invited presentations and briefings on decarbonization and the role of smart energy homes and buildings

**Tracking and Analysis:** NEEP will continue to track and report on relevant smart energy homes and buildings technologies trends and program activity, pilots and technology demonstrations across the region, including the role of such devices to optimize energy performance, enable grid services and support efficiency program evaluation, measurement and verification.

- Smart Energy Homes and Buildings Market Tracking and Analysis
- **New!** White Paper: Design Requirement Laws to Drive Market Adoption of Appliances with Connected or Grid-Interactive Functionality

**Tools and Guidelines:** NEEP will provide tools and strategies to speed the market introduction and adoption of smart energy home and building technologies.

- Web-Based Regional Smart Homes and Buildings Website

**National/Regional Collaboration:** NEEP will track, contribute to, and help disseminate relevant research, policies, programs and initiatives, and attend related conferences and events regionally and nationally to build market momentum to overcome identified market, technology and policy barriers.

- Monitor, communicate, present, and coordinate with national and regional organizations (e.g., Regional Energy Efficiency Organizations, U.S. DOE, U.S. EPA, Building Performance Association, ACEEE, CEE, E-Source, advocacy organizations, etc.)

**Additional Activities Pending Additional Funding:**

- Regional Workshop: the Future of Smart Energy Homes and Buildings
- Report: Opportunities for Smart Homes and Buildings technologies to conduct remote audits and inform home and building energy ratings
- Demonstration Project: NEEP to partner with NREL. The project is titled, “Exploring Potential Grid Response from Residential Building Equipment”. NEEP would initially help define priority grid services for smart energy homes from the utility and ISO perspective (Awaiting decision from U.S.DOE on submitted proposal)

## Project Staff



Dave Lis



Giselle Procaccianti



Derek Koundakjian