



Northeast Energy Efficiency Partnerships

Collaborative Opportunities in the Connected Home

Brad Piper, LME

In coordination with Claire Miziolek

Northeast Energy Efficiency Partnerships

ENERGY STAR Partner Meeting, October 25th, 2016



About NEEP

Mission

Accelerate energy efficiency as an essential part of demand-side solutions that enable a sustainable regional energy system

Approach

Overcome barriers and transform markets via ***Collaboration, Education and Enterprise***

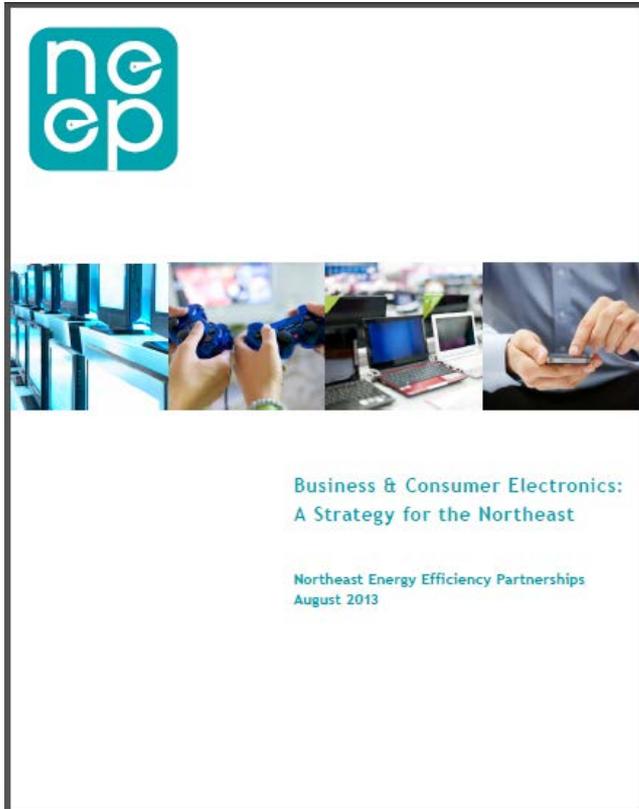
Vision

Region embraces **next generation energy efficiency** as a core strategy to meet energy needs in a carbon-constrained world



One of six regional energy efficiency organizations (REEOs) funded by the US Department of Energy (US DOE) to link regions to US DOE guidance, products and programs

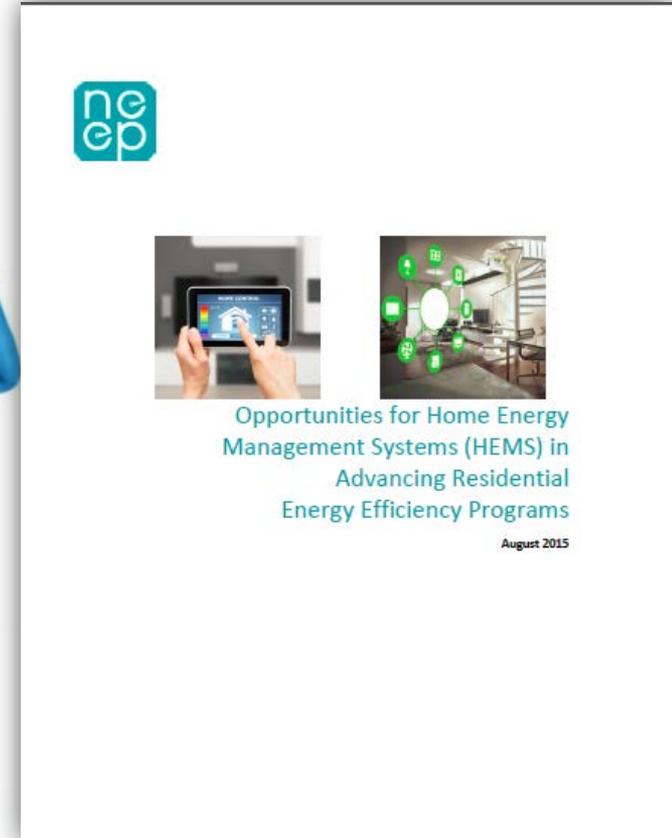
NEEP's "Smart" History



2013



2014



2015



BRAND NEW REPORT!



The Smart Energy Home: Strategies to Transform the Region

October 2016

Smart Potential for Appliances

- Smart Appliances are not all created equal. Assuming all products are ENERGY STAR and efficient, adding the smarts will...
 - (red/deep orange are bigger opportunities)

Smart Product	Energy savings	Demand response	Load shifting	DER integration
Smart Thermostat	Red	Orange	Orange	Yellow
Smart Water Heater	Red	Orange	Red	Red
Smart Appliances: On-Demand/inflexible (refrigerators, stoves, ovens, small appliances)	Yellow	Yellow	Yellow	Yellow
Smart Appliances: Flexible timing (clothes dryers, clothes washers, dishwashers)	Yellow	Orange	Orange	Yellow

- Smart home vs. “smart *energy* home”

2016: NEEP's Regional Market



Transformation Strategy and Goal

Truly smart energy homes will delight the resident and optimize the energy components of a home

Regional Goal: By 2030, more than 50% of total homes (75% of new construction) in the Northeast and Mid-Atlantic have at least two “energy smart” major systems (HVAC, water heating, plug load). This means they:



Optimize major system energy savings

Can optimize distributed energy resources

Can optimize devices for the grid (through time-of-use pricing, load shifting, demand response)

Can drive other home improvements through a feedback mechanism

How can we get there?

NEEP is building a path

- Strategies focus on:
 - home performance opportunities
 - advancing smart water heating
 - streamlining evaluation of smart thermostats
 - building infrastructure of smart devices in homes
 - engaging with security and service providers in HEMS
 - beyond rebate roles for program administrators
 - investigating new technologies with potential for ease of use
 - pushing advancement of variable-use pricing



HEMS Pilot

2016 Partner Meeting

New Orleans, LA
10/25/16



Brad Piper
Project Manager

Barriers and Opportunity



Participation in working groups and market research identified the following barriers:

- Very few published savings studies of “smart products” (thermostats included)
- Published studies lack 3rd party validation of savings
- Savings numbers advertised by large “Non-Traditional Manufacturers” (ADT, ComCast, Time Warner, etc...) are based solely on thermostat studies above
- In order to gain EE program acceptance, savings studies need to be done
- Traditional Pre-Post study methodology is not cost-effective or reliable enough due to numerous variables (weather, dwelling, home owner, etc...)
- Execution of pilots within this product category using this new more effective methodology

HEMS Pilot Objective



LME is implementing a Home Energy Management System (HEMS) Pilot for NYSERDA.

– 50 homes, 20 weeks

The objective of this pilot is to validate a test methodology for HEMS products and locate some initial savings.

Methodology



Without influencing or changing the consumers product settings or lifestyle, we are installing, monitoring, logging and analyzing the following measures live:

- Plug load- Smart outlets
- Lighting- Smart lamps, Switches and/or Dimmers
- HVAC- Smart Thermostat

This data will then be combined with occupancy and geo-fencing data in order to locate a baseline usage and identify opportunities for automatic actions that can be taken by the system to save energy and/or shed load.

Possible Measures



Due to the flexibility of the SmartThings system and our DCP tool being integrated at the code level, we have the ability to monitor ANY product or with SmartThings API, this includes but is not limited to:

- Plug load
- Switch/Dimmers
- Lamps
- Fixtures
- Appliances
- Smart Water Heaters
- Whole Home Power Meters
- Whole Home Power De-aggregators
- Windows (Open/closed)
- Doors (Open/Closed)
- HVAC
- In Home Display (interaction)

New way to look at Savings



Passive vs. Active savings

Energy Savings has traditionally based on a “passive” methodology

For example: a lamp is sold, installed and the kWh associated with the lamp is accredited. The same falls true in the Appliance and Home Electronics categories

Technology is evolving, and so must our approach and understanding of the potential savings. We (the industry) needs to get a better grasp of the potential of “Active” savings

For example: Lamps, fixtures or switches, appliances, electronics or HVAC left “on” while the room or dwelling is left unoccupied can be automatically turned “off” without a negative impact on the customer life.

