



# Do Smart Home Devices Belong in the Utility Toolkit or the Consumer Toybox?

August 2019  
Denver, CO



**Monica Castillo**

Senior Data  
Specialist



**Jes Rivas**

Managing Director



**Lara Bonn**

Director of Emerging  
Technologies and Services



**Bethany Sparn**

Senior Research Engineer



# Monica Castillo

nationalgrid





### Role National Grid Should Play in Smart Home Technology

Incentives/rebates for smart technology



Expected Role

Education about benefits of smart technology



Personalized recommendations for technology based on usage



Solid Prospects

In-home EE audit with smart home integration



Installation of smart home technology



Sales of smart home technology



Low Energy

Skills for speakers to provide energy efficiency information



Servicing of smart home technology

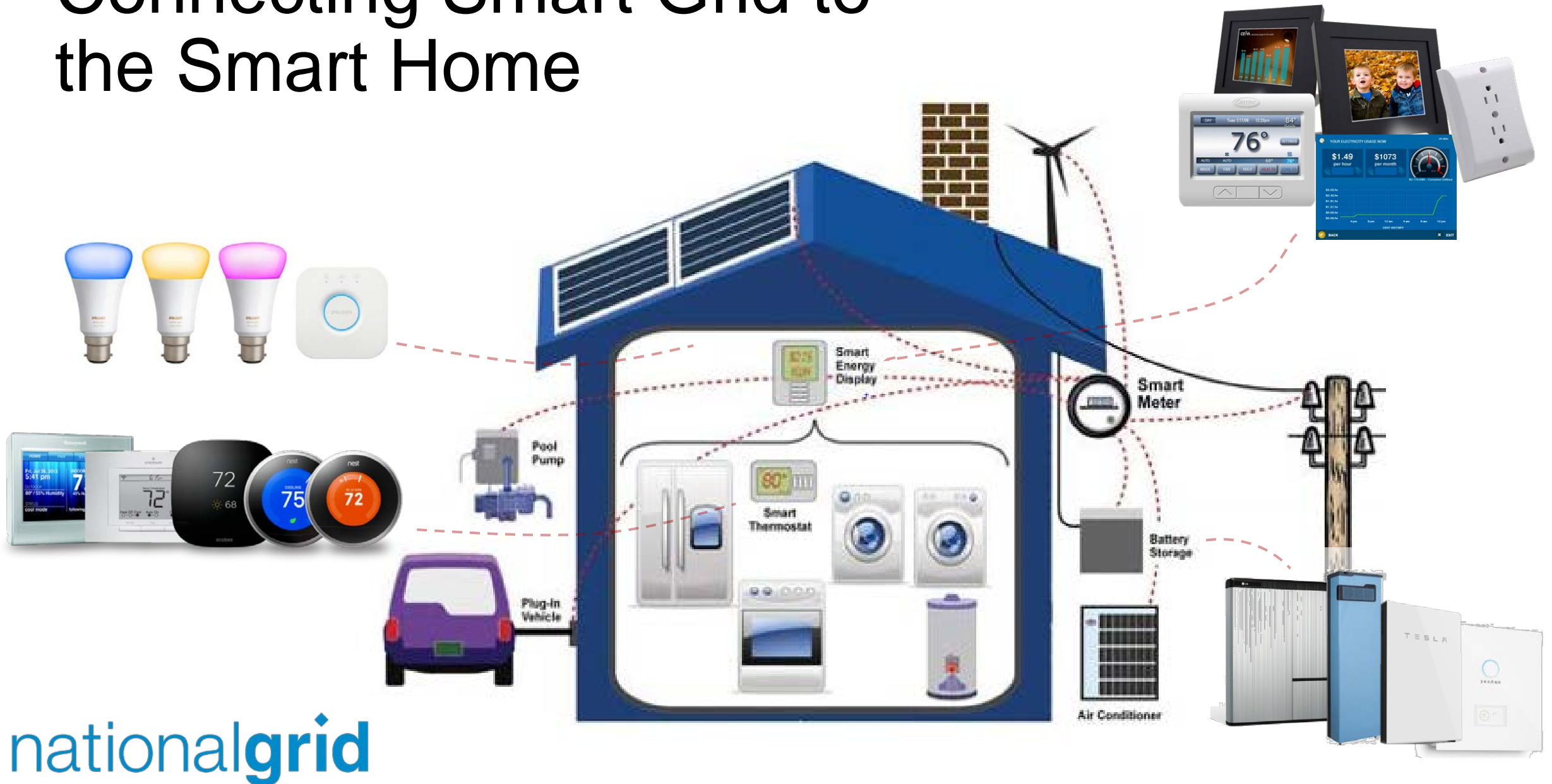


Maintenance of smart home technology



Limited Appeal

# Connecting Smart Grid to the Smart Home





Jes Rivas    Managing Director  
ILLUME Advising

## WHAT MAKES IT A SMART HOME?



## RECENT SMART HOME PILOT EVALUATIONS

A recent evaluation of a smart home pilot showed a **16% reduction** potential in total home electricity consumption.



**NYSERDA, 2017 – 50 homes**  
**Equipment:** Direct installation of a hub, lightbulbs, switches, outlets, occupancy sensors, smart thermostat, power meter

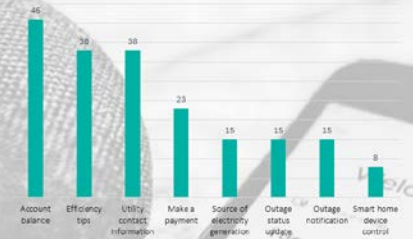


**Efficiency Vermont, 2015 – 15 homes**  
**Equipment:** DIY installation of hub, outlets, lightbulbs

## HOW ARE UTILITIES USING SKILLS?

Most utility skills are limited and lack the richer functionality that customers are seeking.

% of Utilities Offering Feature in Skills or Actions



- ✓ Skills need to be **reliable** and **robust** – extensive user tests prior to releasing the skill is critical for customer satisfaction.
- ✓ Skill **purpose** and **functionality** needs to be clear – educate customers on how to fully use all the skill features



MOTIVATIONS ARE NOT UNIFORM



AGING IN PLACE & BABY BOOMERS

EPA  
SMART HOME ENERGY  
MANAGEMENT SYSTEMS  
WORKING GROUP

Consumer research and usability testing  
Offering design  
Technology assessment and tracking  
Pilot design  
Evaluation  
Strategy

# There is still much to learn

- Savings beyond the thermostat
- Cost-effectiveness
- DR potential (with and without TOU rates)
- Non-energy impacts



**NYSERDA, 2017 – 50 homes**  
~16% reduction in total home electricity use



**National Grid, 2017 – 11,000 homes**  
~0.12 kW to 0.60 kW reduction during peak events



AUGUST 2019

---

**Lara Bonn**

Director of Emerging Technologies  
and Services

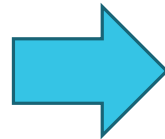




# Smart Homes @ Efficiency Vermont

## 2019 Strategy Redesign & Focus Activity

- Catalog & Characterize
- Technology assessments
- Long term strategy



# Who are Smart Home programs for?



# Introduction

## Bethany Sparn, Senior Research Engineer

- Residential Buildings Group at NREL (9+ years)
- Lab work on smart homes and buildings-to-grid research



# National Renewable Energy Laboratory



## National Renewable Energy Lab (NREL)

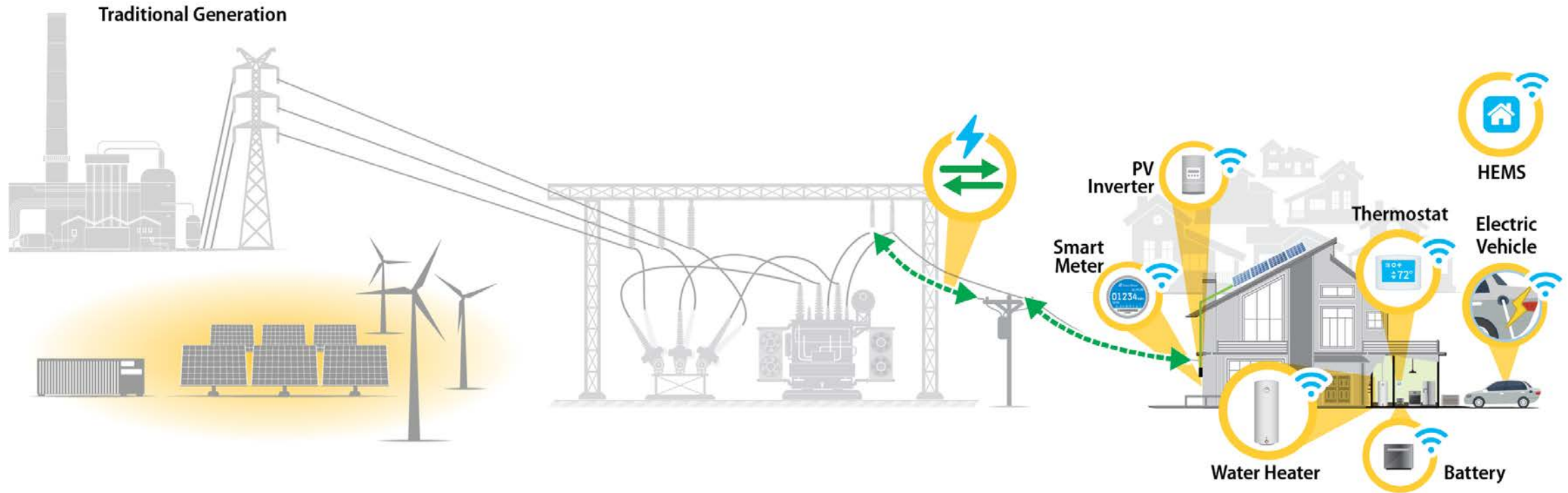
- Department of Energy National Lab
- Located in Golden, CO
- ~2000 full time staff
- Entirely focused on energy efficiency and renewable energy research.

## Systems Performance Lab (SPL)

- 3 “homes” with typical electrical and water infrastructure
- DERs include: EVs, PV, batteries, generators
- Used to investigate smart home research questions



# How can smart home products facilitate buildings-to-grid integration?



- More, better data from the home
- More control means homeowners can save money (TOU rates, DR programs)
- Flexible loads can also support increased renewable generation on the grid



# Do Smart Home Devices Belong in the Utility Toolkit or the Consumer Toybox?

August 2019  
Denver, CO



**Monica Castillo**

Senior Data  
Specialist



**Jes Rivas**

Managing Director



**Lara Bonn**

Director of Emerging  
Technologies and Services



**Bethany Sparn**

Senior Research Engineer

