



# **MT Potential of a Broader Ecosyst-HEM**

**ACEEE – CEE Market Transformation  
Symposium, Session A4**

April 4, 2017

# Today's Speakers

- Moderator – Lieko Earle, Senior Research Engineer in the Buildings and Thermal Systems Center, NREL
- Presenters
  - David Wells, Director of Utility Sales, Bidgely
  - Chris Ebert, VP & GM, Americas and EMEA, People Power
  - Susan Mitchell, Consultant, Apogee Interactive
  - Noel King, Director Business Development, Sense

# What is a *Smart Home*?

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## smart home

*noun*

a home equipped with lighting, heating, and electronic devices that can be controlled remotely by phone or computer.

"you can contact your smart home on the Internet to make sure the dinner is cooked, the central heating is on, the curtains are drawn, and a gas fire is roaring in the grate when you get home"



Translatio



***Home Energy Management Systems (HEMS)*** refers to any hardware and/or software system that can:

Monitor and provide feedback about a home's energy usage,  
and/or enable advanced control of energy-using systems and devices in the home.

# HEMS are improving homes in many ways:

- more healthful to occupants because of improved comfort and indoor air quality
- more energy efficient, and therefore less costly to operate
- more convenient because of automated features
- more secure because of integration of security systems and real-time data
- more durable because building materials are in better controlled environments
- major equipment lasts longer because of automated fault detection and proper maintenance

# Key Trends in HEMS Technologies

- **Measurement & Control:** Plug Loads & Miscellaneous Electric Loads, End-use Disaggregation
- **Computing & Intelligence:** Context Awareness, IoT
- **Systems Integration:** Intelligent Buildings, Distributed Energy Resources (DER), and the Utility Grid
- **Barriers to Broad Market Adoption:** M&V, Documentation, Communication

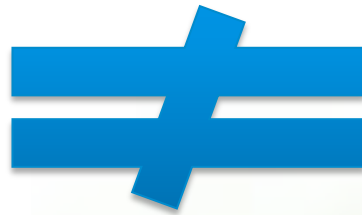


## HEMS devices are increasingly able to understand and take cues from their physical environments

- Smart thermostats can tell whether you are home or away and use that information to adjust the temperature or control other devices in your home
- Multiple points of connectivity throughout the home provide more granular occupancy data (e.g., kitchen is occupied but not bedrooms)
- Fitness trackers and smart watches provide even more detailed information about what people are doing (sleeping? working out?)
- Personal preferences can be accommodated if devices know who is home and who is not, as well as each person's typical schedule



# HEMS and the Utility Grid



**We need grid-level intelligence and coordination, not just inside the home.**

**HEMS must be a part of the solution.**

**→ Why is it taking so long for HEMS to reach broad market acceptance?**



## Panel Includes Diverse Perspectives

DIY Energy  
Monitoring  
Technology

Smart-meter  
Based  
Disaggregation  
Software

Leveraging the  
Internet of  
Things to Enable  
Smart Homes

Residential  
Energy  
Programs for  
Utilities