Setting the stage

When you see EnergyHub, you probably think about the Home Base...

but...

We’ve changed our focus a bit lately...

and with 100K thermostats already running our software...

it seems we’re onto something big here
How we got here...
WHY THERMOSTATS?
Residential thermostats control 11% of US energy use

Source: LBNL, 2009 and 2011
The average US single-family home spends $2,200 on their energy bills. 46% of that bill is spent on heating and cooling. Source: LBNL, 2009 and 2011.
Peak Energy Demand Occurs at ~ 3 pm

Power (MW)

Normal Electric Energy Use
Energy Use with Demand Response

Time of Day
UNFORTUNATELY, MOST THERMOSTATS SUCK
90% of thermostats are not programmed properly, or at all

5 out of 6 people find their thermostats confusing

Source: LBNL, 2009 and 2011
WHY IS THERMOSTAT PERFORMANCE SO BAD?
The good old days of thermostats

Off switch

Off switch
Everyone thought...
Much better, right?
HOLD BUTTON = HUGE PROBLEM
>50% of thermostats are on hold

People are wasting $hundreds/year heating and cooling empty houses
WHY HASN’T SOMEONE FIXED THIS ALREADY?
50-100 million of these stranded in people’s homes

no data
no thanks

Your Price: $665.00
LBNL tested these thermostats...
Time to complete various programming tasks

Source: LBNL, 2009 and 2011
ALRIGHT. SO NOW WHAT?
Surely, these can help...

That’s more like it
SO WE MADE SOMETHING SMART
The Mercury Smart Thermostat Platform
PSYCHOLOGY IS IMPORTANT
+3° change
19% to 25% increase in heating costs
85% of people choose high, or super efficiency.
Percentage (%) of thermostats with daytime heat setbacks:

56% of standard, programmable thermostats (self-reported, EIA) vs. 72% of Mercury-powered communicating thermostats
Thermostats on Hold:

Average 53% vs. Mercury 33%

Source: LBNL, 2009 and 2011
WHAT’S NEXT?
End goal: greater residential energy efficiency and conservation = fewer kWh and fewer therms

**Behavioral Opportunities**
- Guiding users to lower-energy comfort setpoints
- Increasing the size and duration of energy-saving setbacks
- Ensuring unoccupied spaces not unnecessarily conditioned
- Providing real-time impact assessment

**Equipment Opportunities**
- Identifying candidates for retrofit (insulation, windows, duct/door sealing)
- Promoting proper HVAC maintenance (filter changes, periodic servicing)
- Pre-cooling and pre-heating
- Recommending equipment upgrades to more efficient compressors/furnaces
Every 100k thermostats generate:

1.7 billion check-ins
1.1 billion temperature readings
895 million relay logs
80 million runtime logs

= 5.3 billion datapoints per month
100k homes = 400+ MW of total load

Shave 100+ MW without significant impact on comfort
109 MW Far Rockaway Power Station
$22B/year on central A/C
$49B/year on heating

We can save:
$8.1B/year savings
32.5 TWh/year of electricity
442 billion ft$^3$ natural gas
1.4 billion gallons of fuel oil and LPG