EnergyHub™
Seth Frader-Thompson, CEO

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

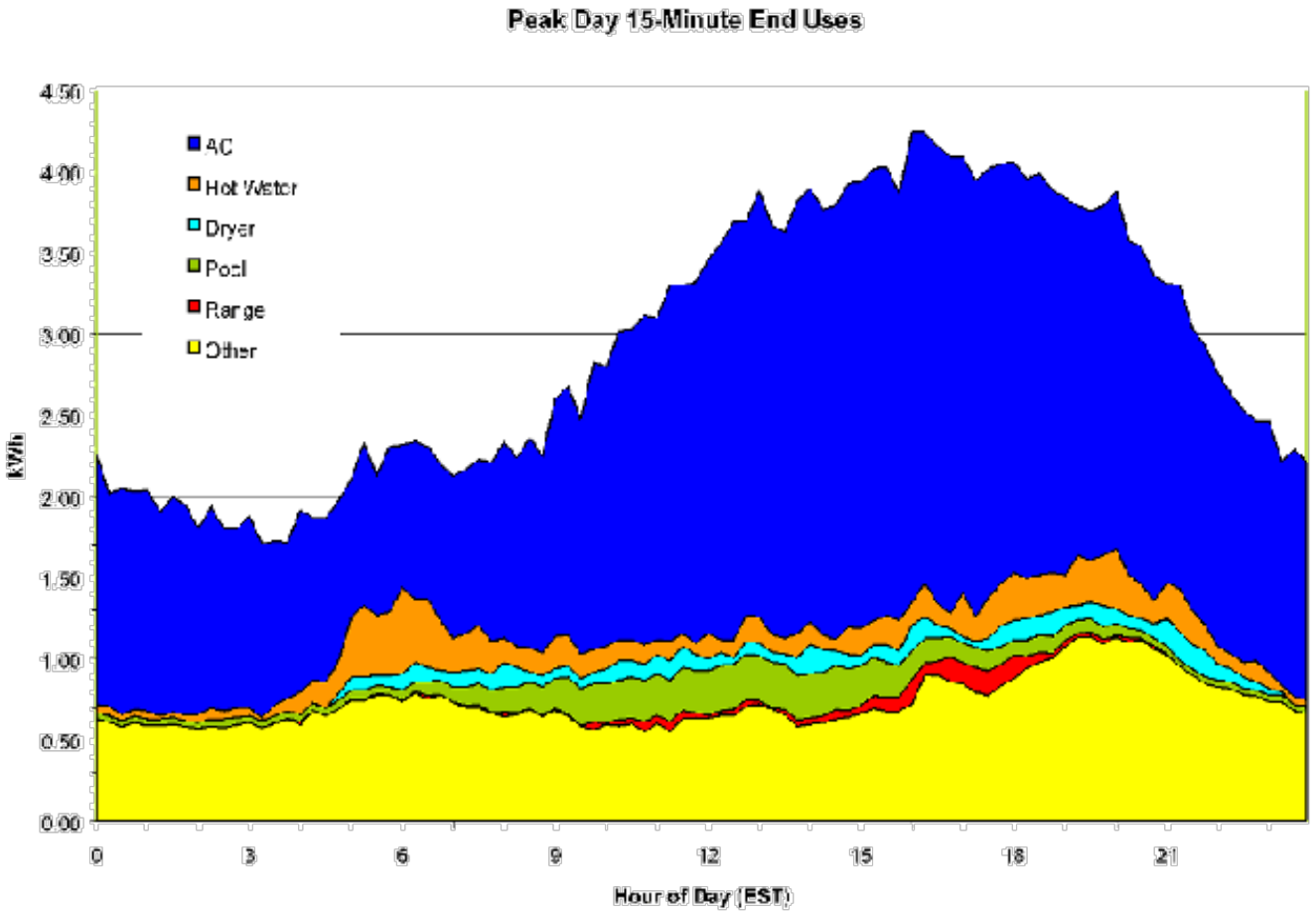
How we got here…

WHY THERMOSTATS?

Residential thermostats control

11% of US energy use

Source: LBNL, 2009 and 2011


Peak Day 15-Minute End Uses
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
kWh
AC
Hot Water
Dryer
Pool
Range
Other
0
3
6
9
12
15
18
21
Hour of Day (EST)

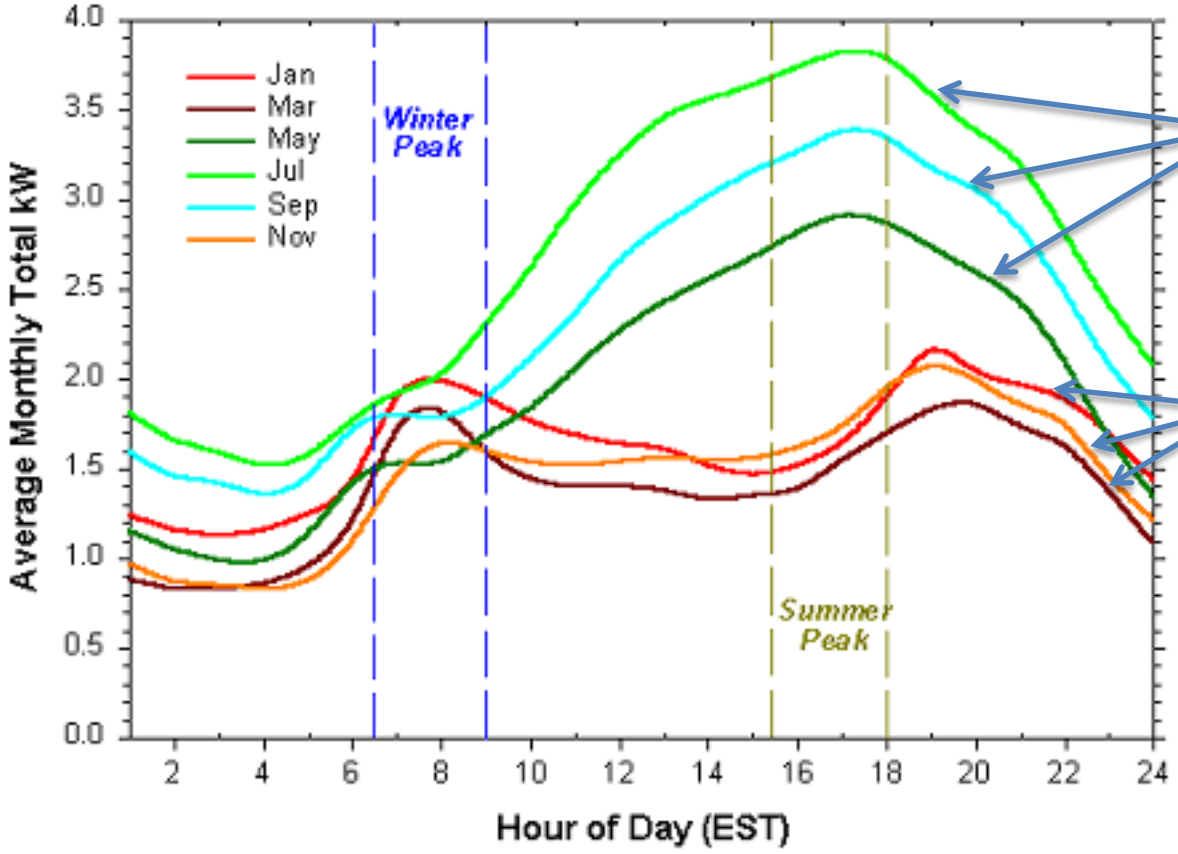
The average US single-family home spends

$2,200 on their energy bills

46% of that bill

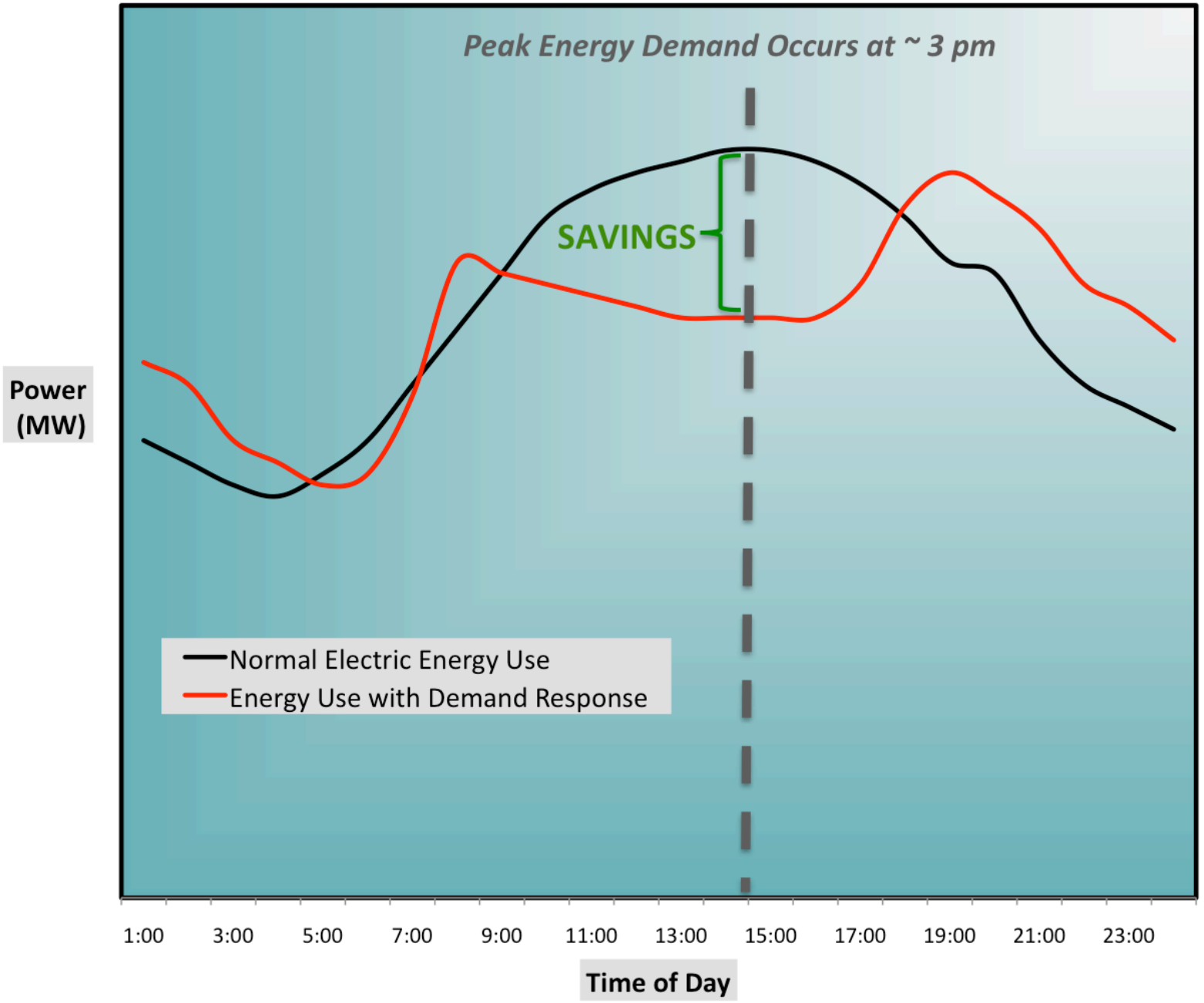
is spent on heating and cooling

Source: LBNL, 2009 and 2011



May, July, Sept

Jan, Nov, March


Peak Energy Demand Occurs at ~ 3 pm
SAVINGS
Power (MW)
Normal Electric Energy Use
Energy Use with Demand Response
1:00
3:00
5:00
7:00
9:00
11:00
13:00
15:00
17:00
19:00
21:00
23:00
Time of Day

UNFORTUNATELY, MOST THERMOSTATS SUCK

90% of thermostats

are not programmed properly, or at all

5 out of 6 people

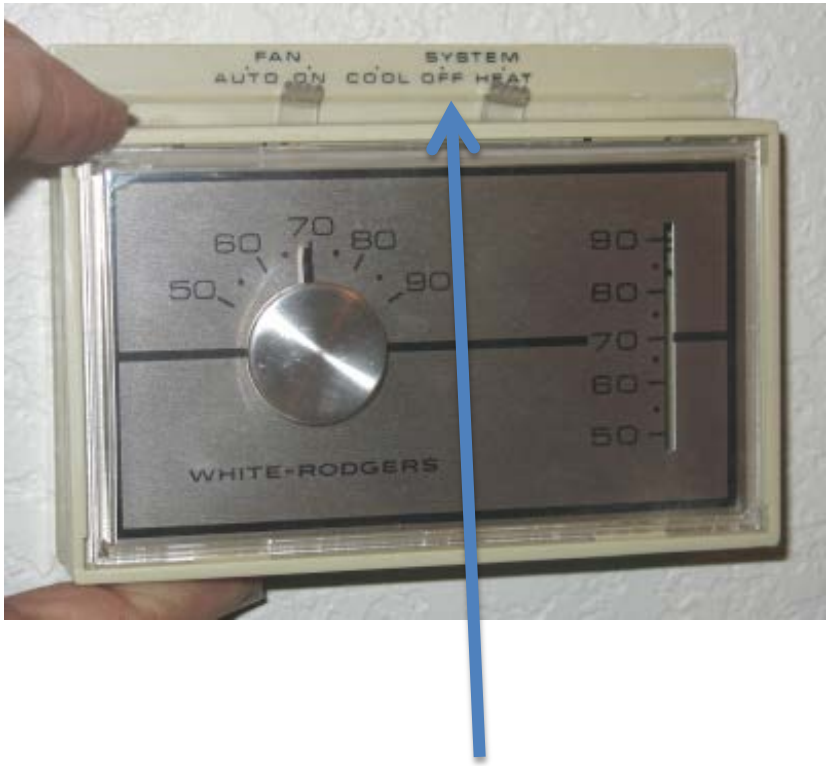
find their thermostats confusing

Source: LBNL, 2009 and 2011

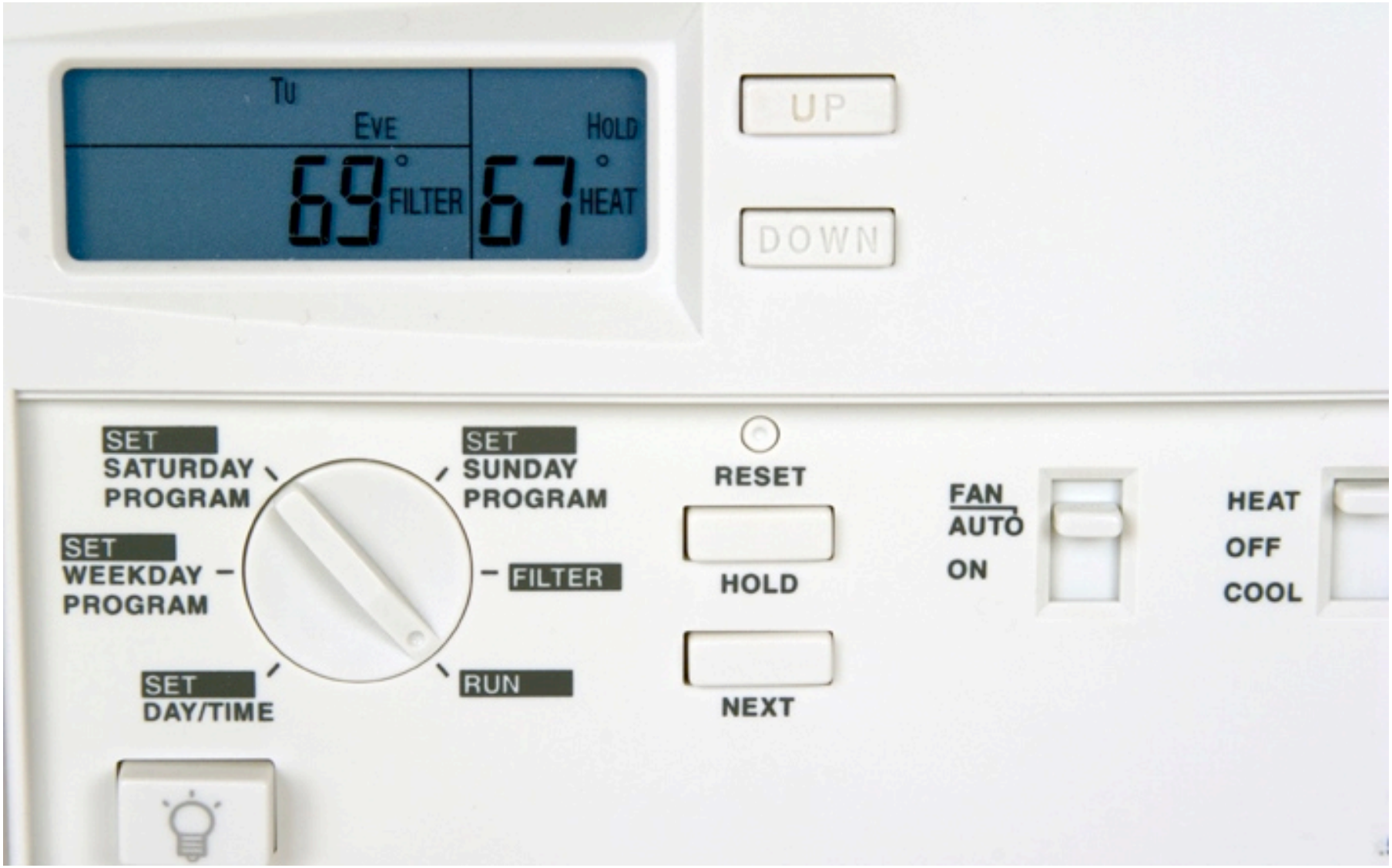
WHY IS THERMOSTAT PERFORMANCE SO BAD?

The good old days of thermostats

Off switch

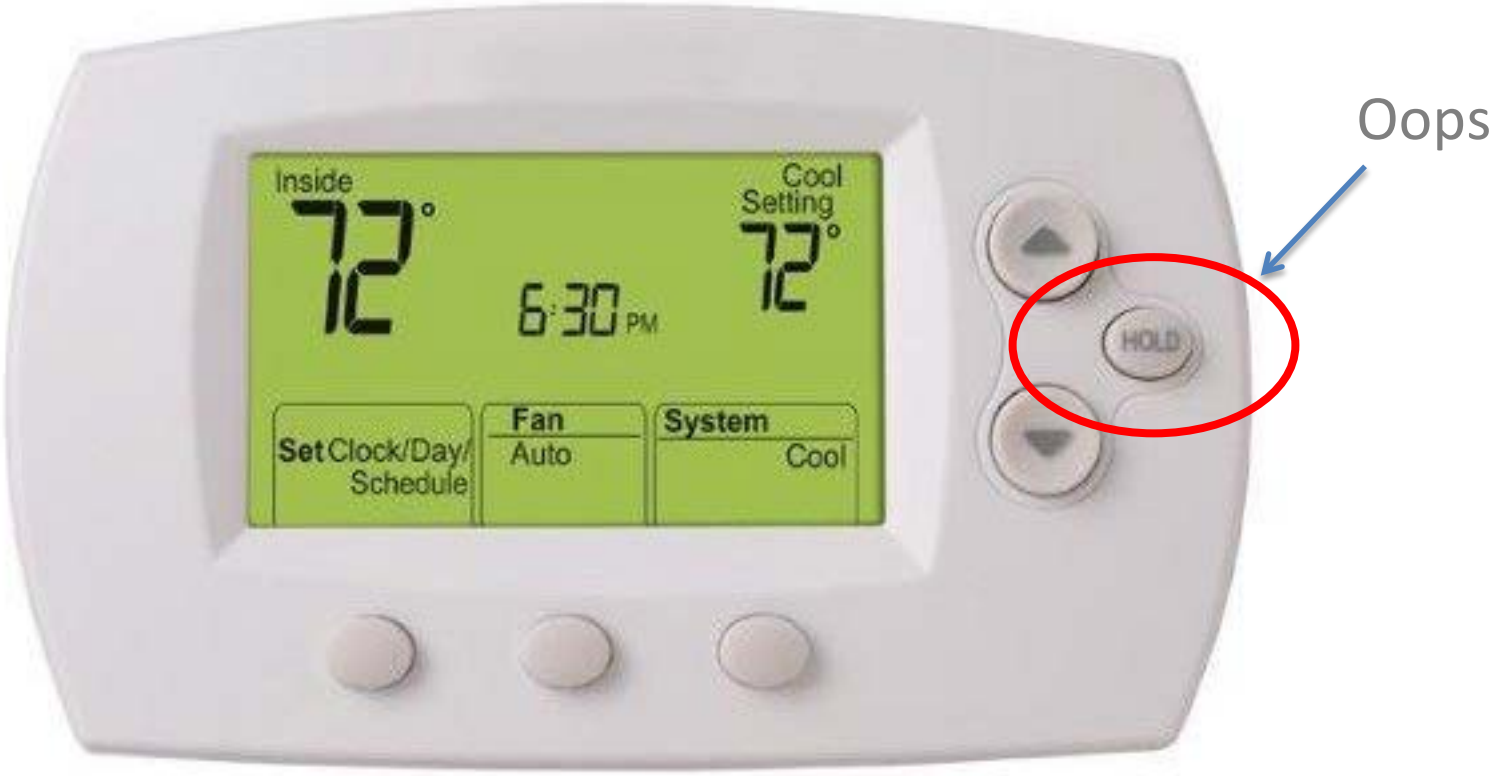


Off switch


TU
EVE
69°
FILTER
HOLD
67°
HEAT
UP
DOWN
SET
SATURDAY
PROGRAM
SET
SUNDAY
PROGRAM
SET
WEEKDAY
PROGRAM
FILTER
SET
DAY/TIME
RUN
RESET
HOLD
NEXT
FAN
AUTO
ON
HEAT
OFF
COOL

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?

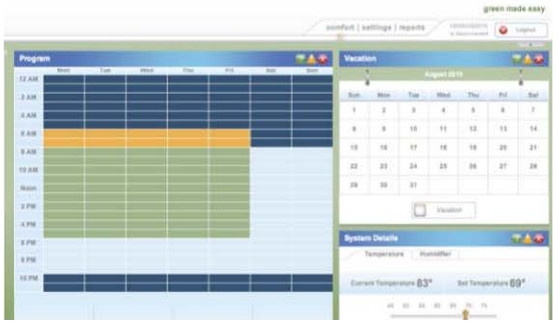
50-100 million of these stranded in people's homes

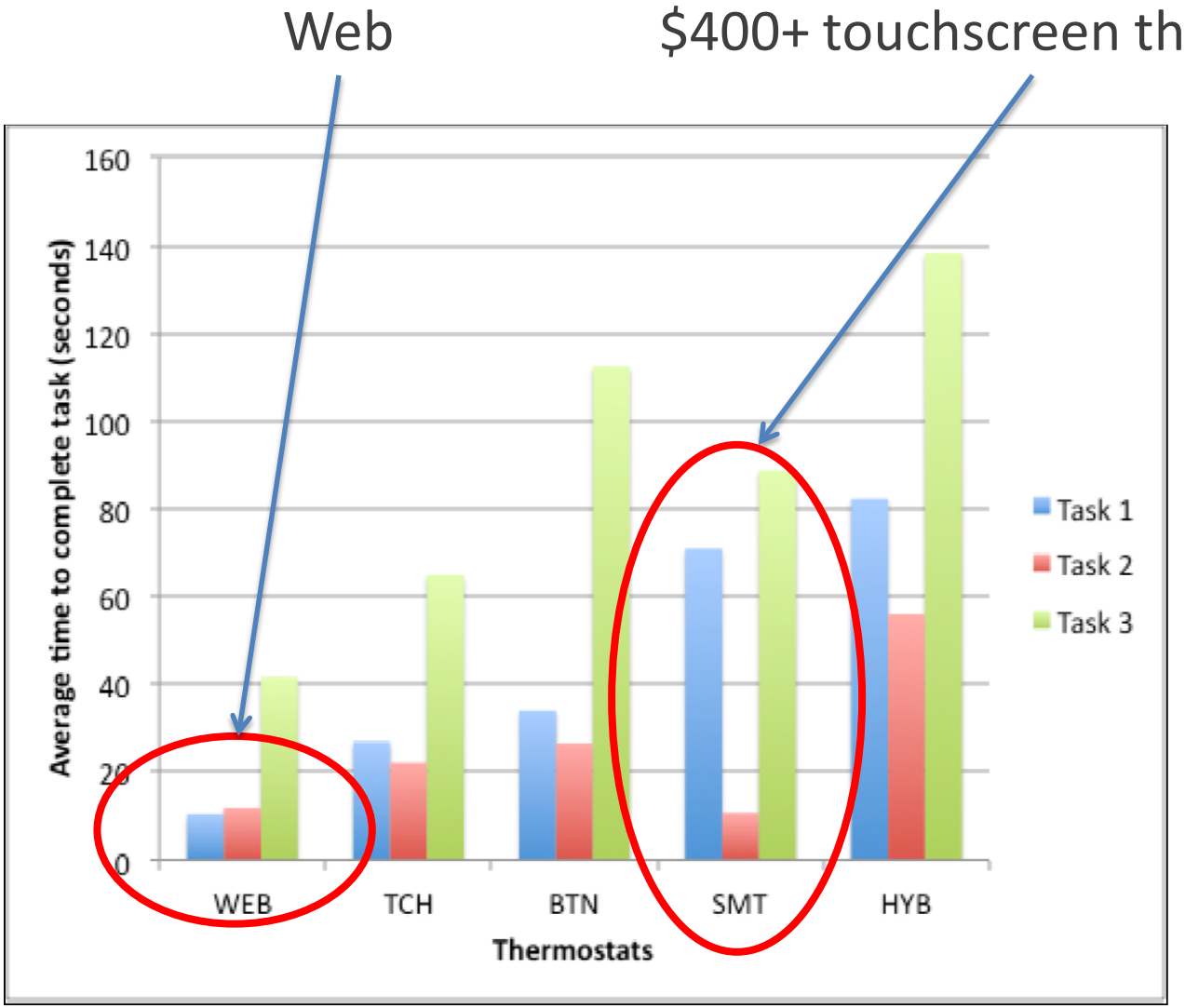
no data

Your Price: $665.00

no thanks

LBNL tested these thermostats…





Time to complete various programming tasks

Source: LBNL, 2009 and 2011

ALRIGHT. SO NOW WHAT?

Surely, these can help…

$99.88 /EA-Each

That's more like it

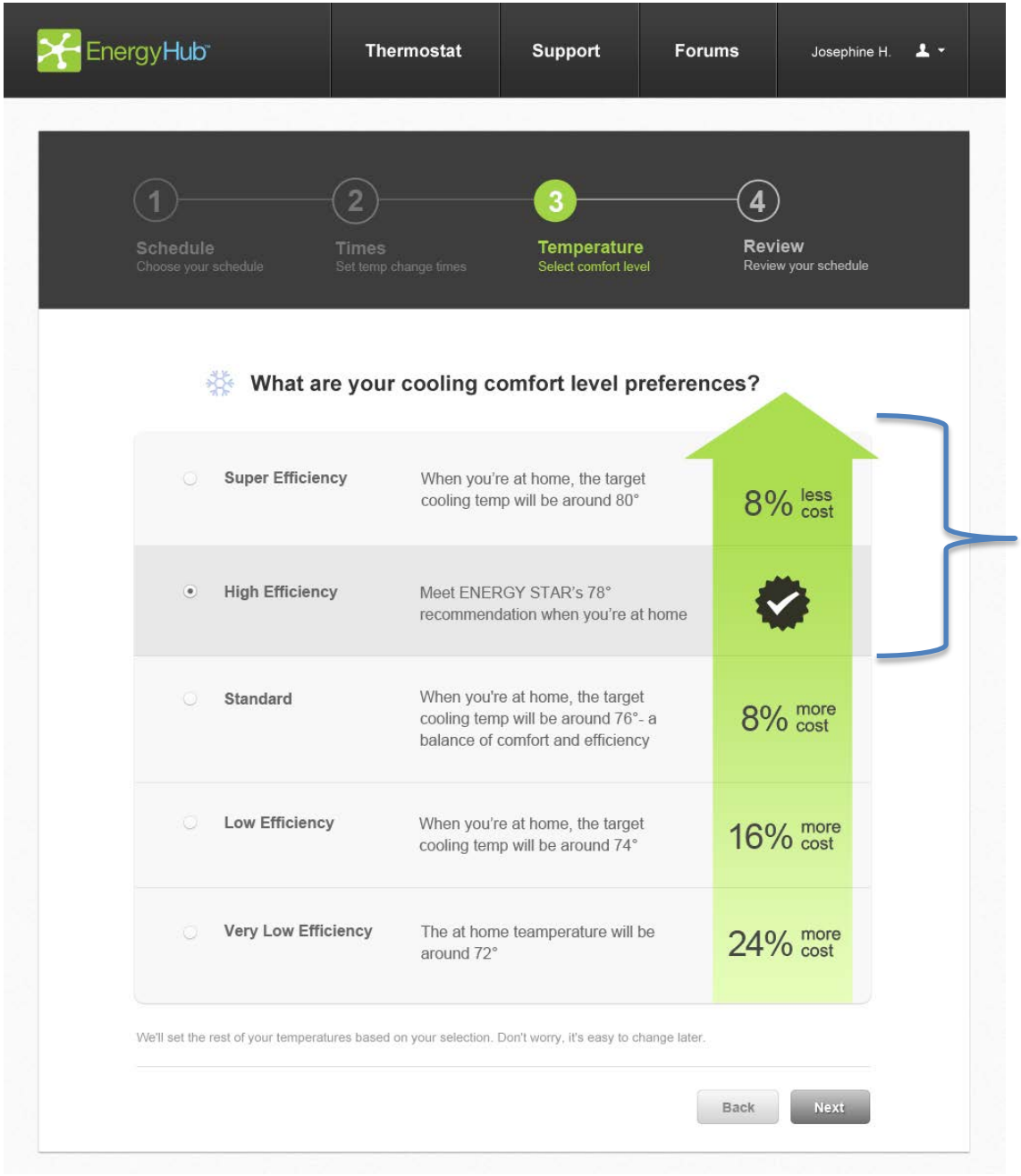
SO WE MADE SOMETHING SMART

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:

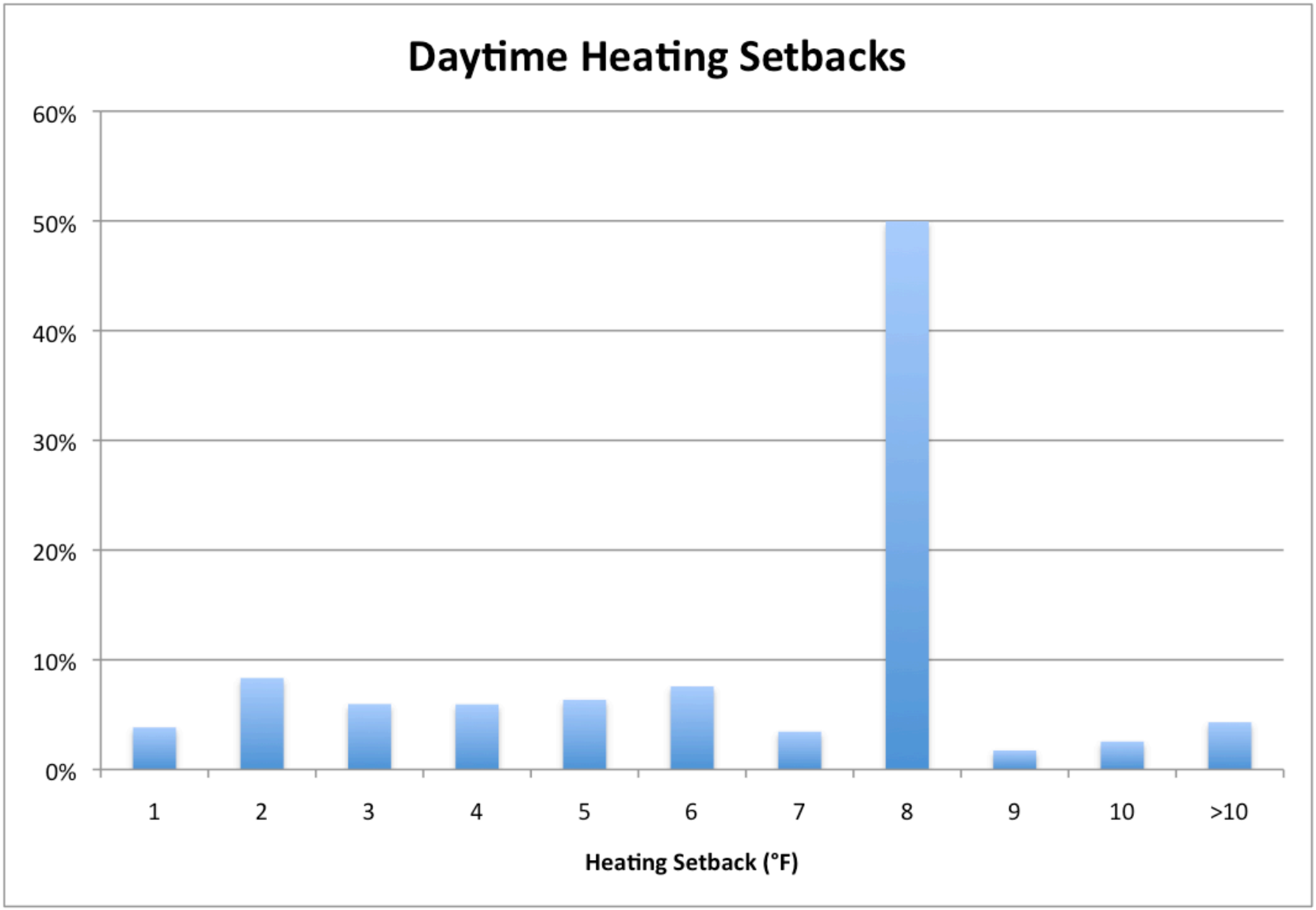
56%

of standard, programmable thermostats (**self-reported,** EIA)

vs.

72%

of Mercury-powered communicating thermostats


Daytime Heating Setbacks
60%
50%
40%
30%
20%
10%
0%
1
2
3
4
5
6
7
8
9
10
>10
Heating Setback (°F)

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

EnergyHub™

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