

IS "SMART" THE NEW "GREEN"?

Unraveling a New, Dynamic
and Complex Market

November 7, 2018



Bonneville
POWER ADMINISTRATION



WHY DO WE CARE ABOUT THERMOSTATS?

1

Gain insights
into an evolving
and growing
market

2

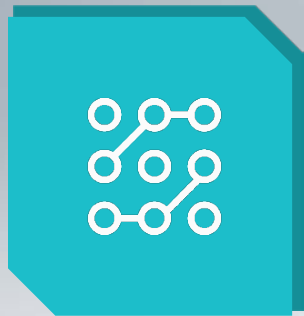
Determine
how savings will
be incorporated into
the momentum
savings model



RESEARCH OBJECTIVES

Define

technologies
in market



Learn

what others
found



Understand

market
dynamics



Assess

compatibility
issues





RESEARCH ACTIVITIES



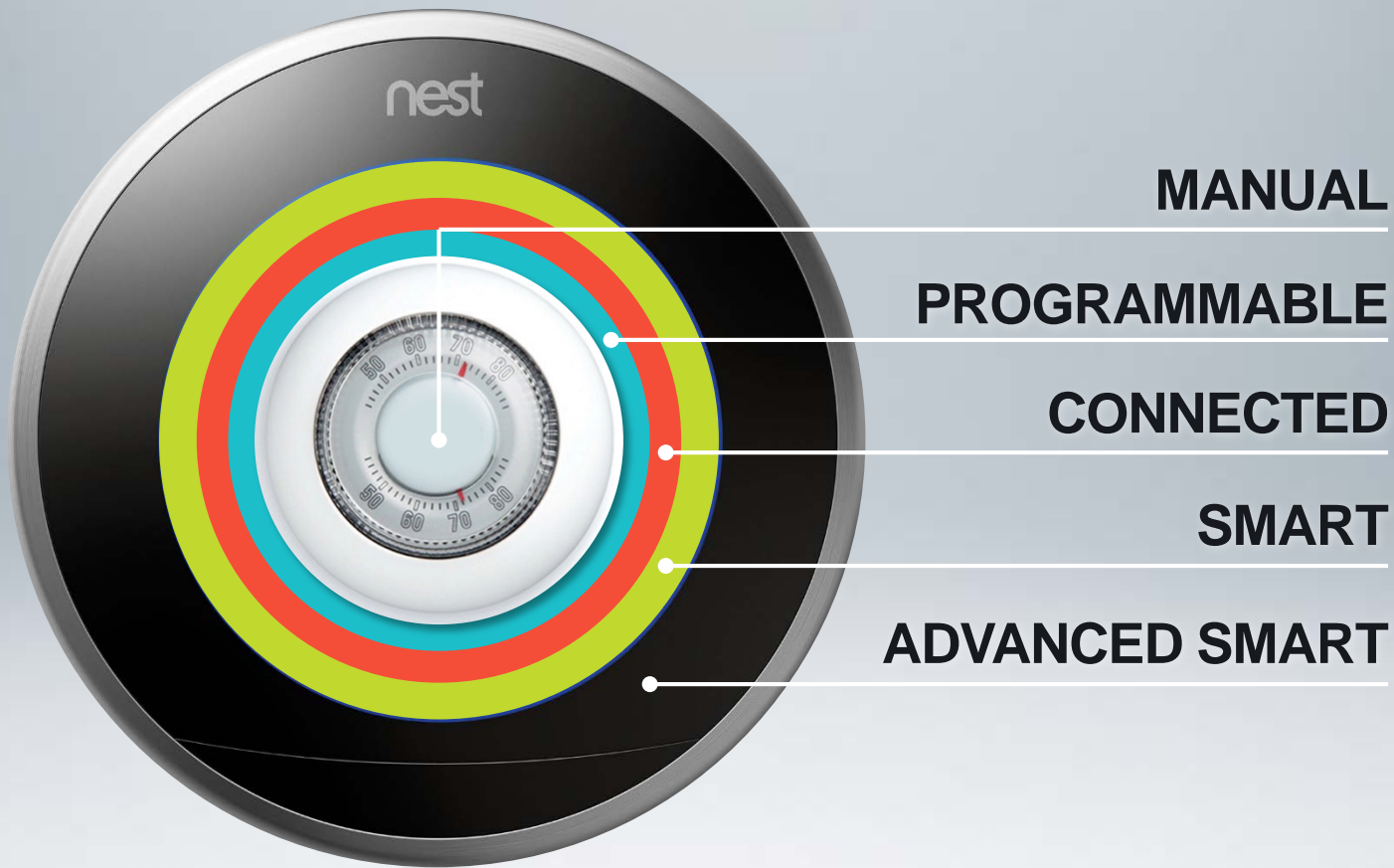
Market Actor Interviews



Literature Review



WHAT IS A "SMART THERMOSTAT"?



MAPPING FEATURES TO DEFINITIONS

Connected



- Scheduled setbacks
- Adjust remotely / has an app

Smart



Connected+

- Proximity sensing (Geofencing)

Advanced Smart

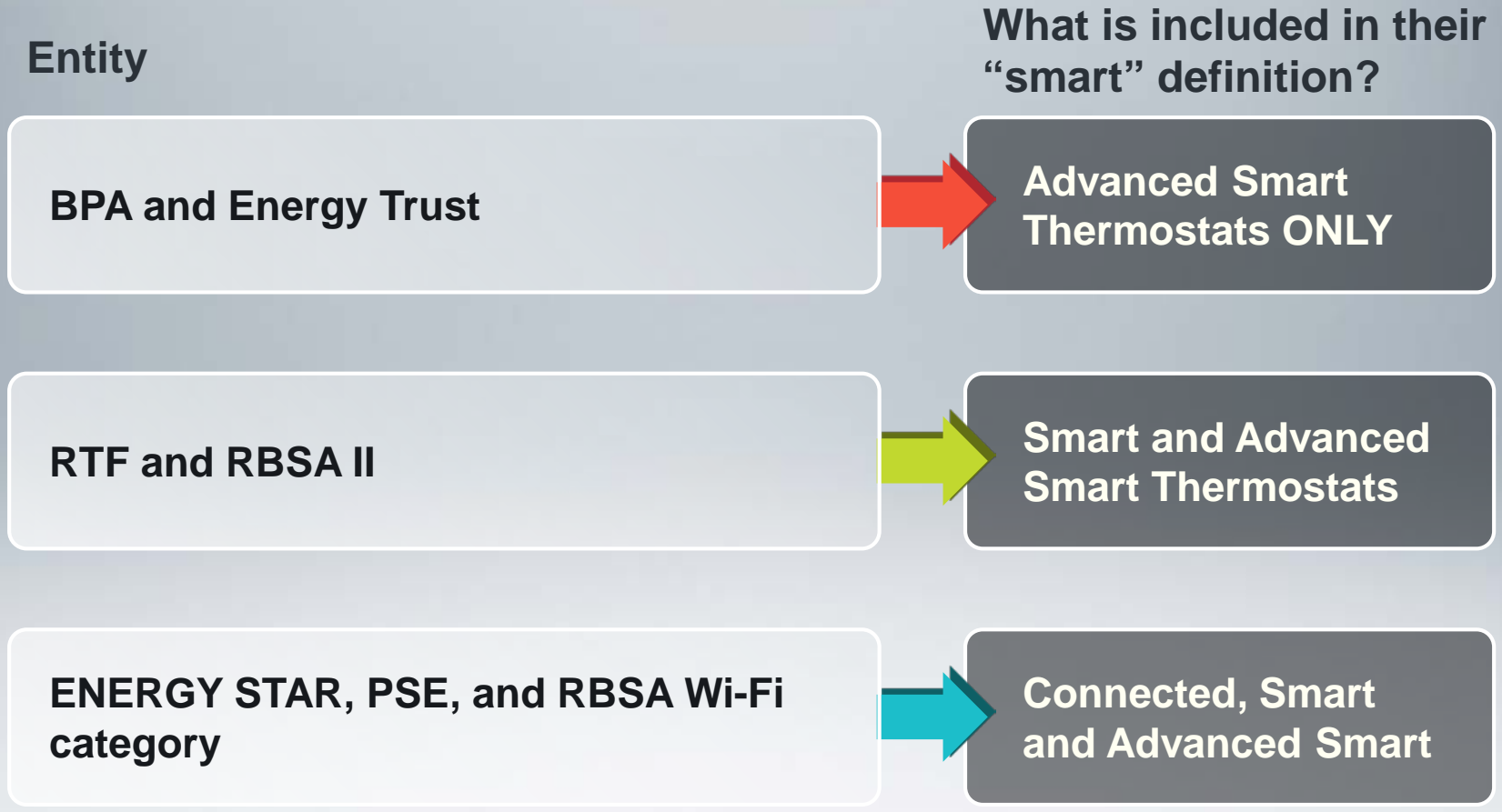


Smart+

- Onboard occupancy sensing
- Heat pump optimization
- Learning algorithms

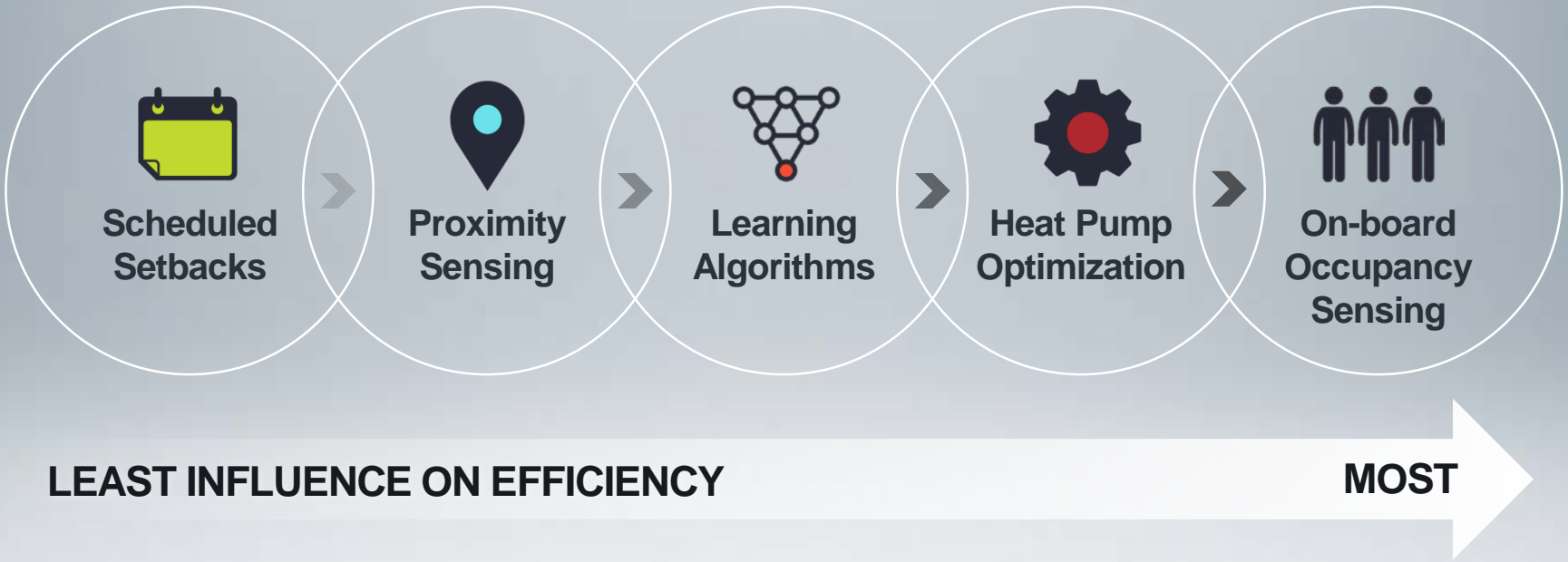


REGIONAL DEFINITIONS OF “SMART” ARE INCONSISTENT





WHAT FEATURES SAVE ENERGY?





ENERGY SAVINGS CAN EXIST... FOR ADVANCED SMART THERMOSTATS



Nest-only studies



Nest & other

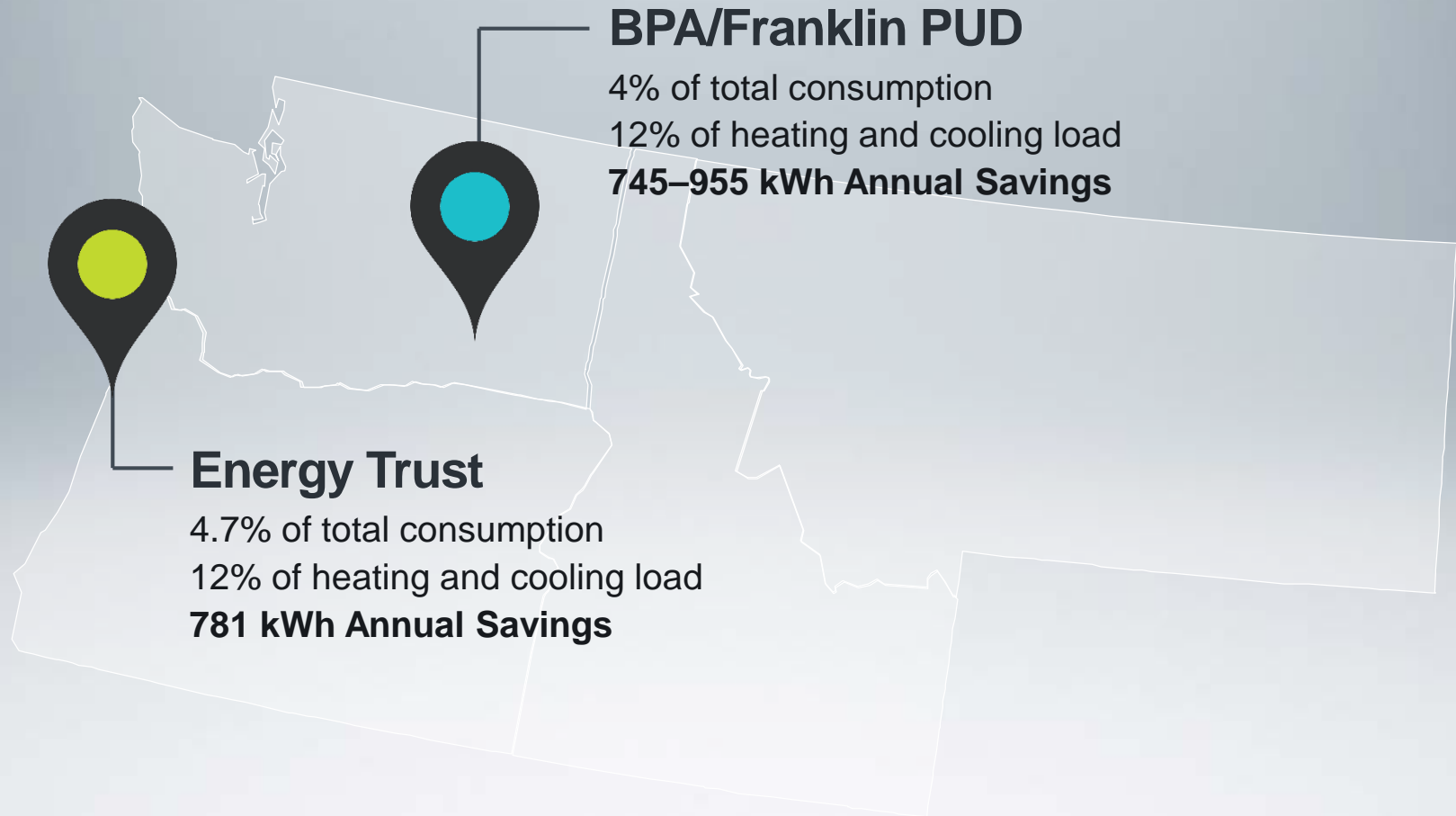


Nest & ecobee



ecobee-only

RESEARCH FINDINGS IN THE PACIFIC NW ARE FAIRLY CONSISTENT



ADVANCED SMART THERMOSTATS DON'T NECESSARILY ALWAYS SAVE ENERGY



**Algorithms need
time to learn**



**Default settings
may not maximize
energy savings**

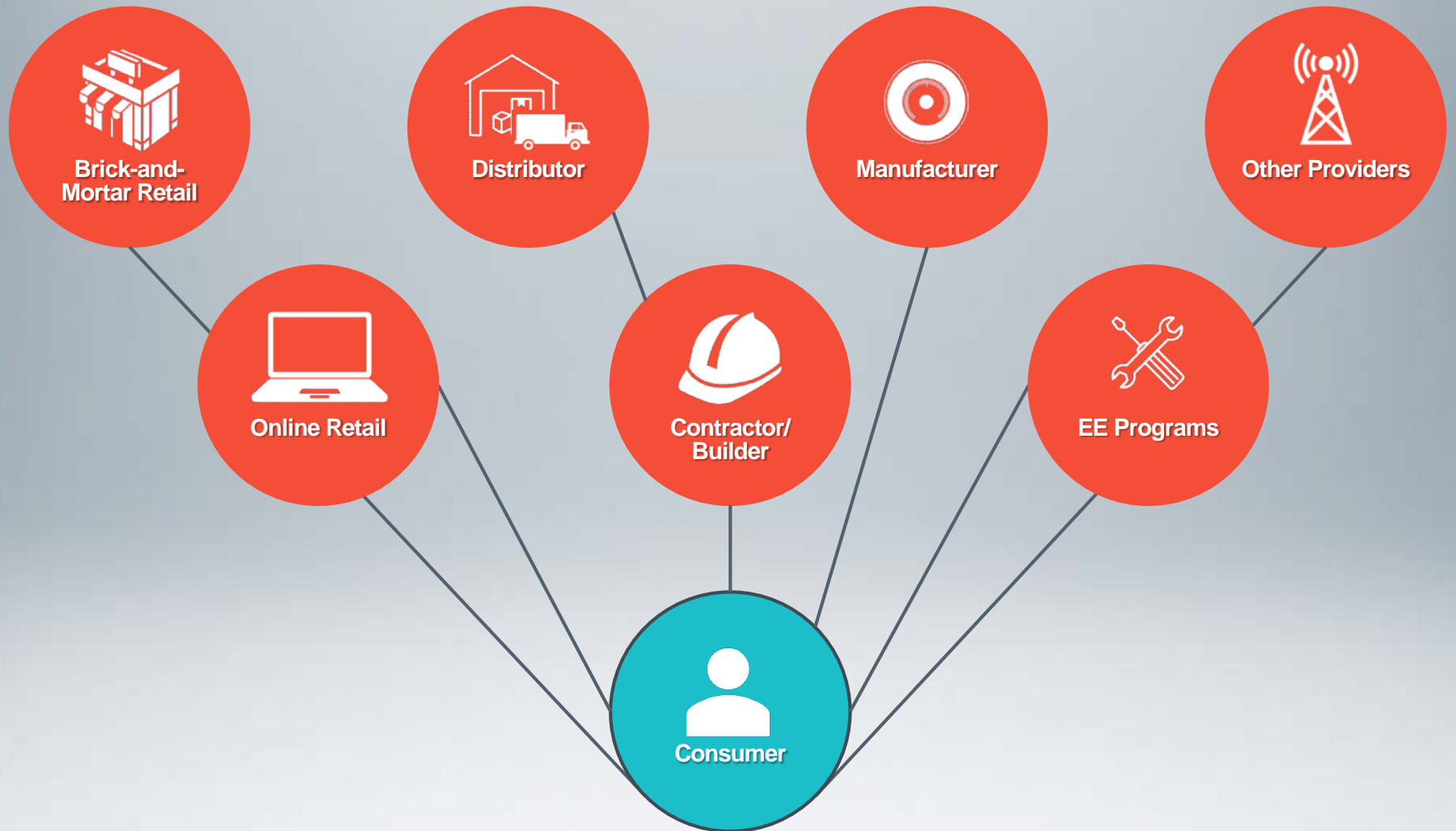


**Users may
change default
settings**



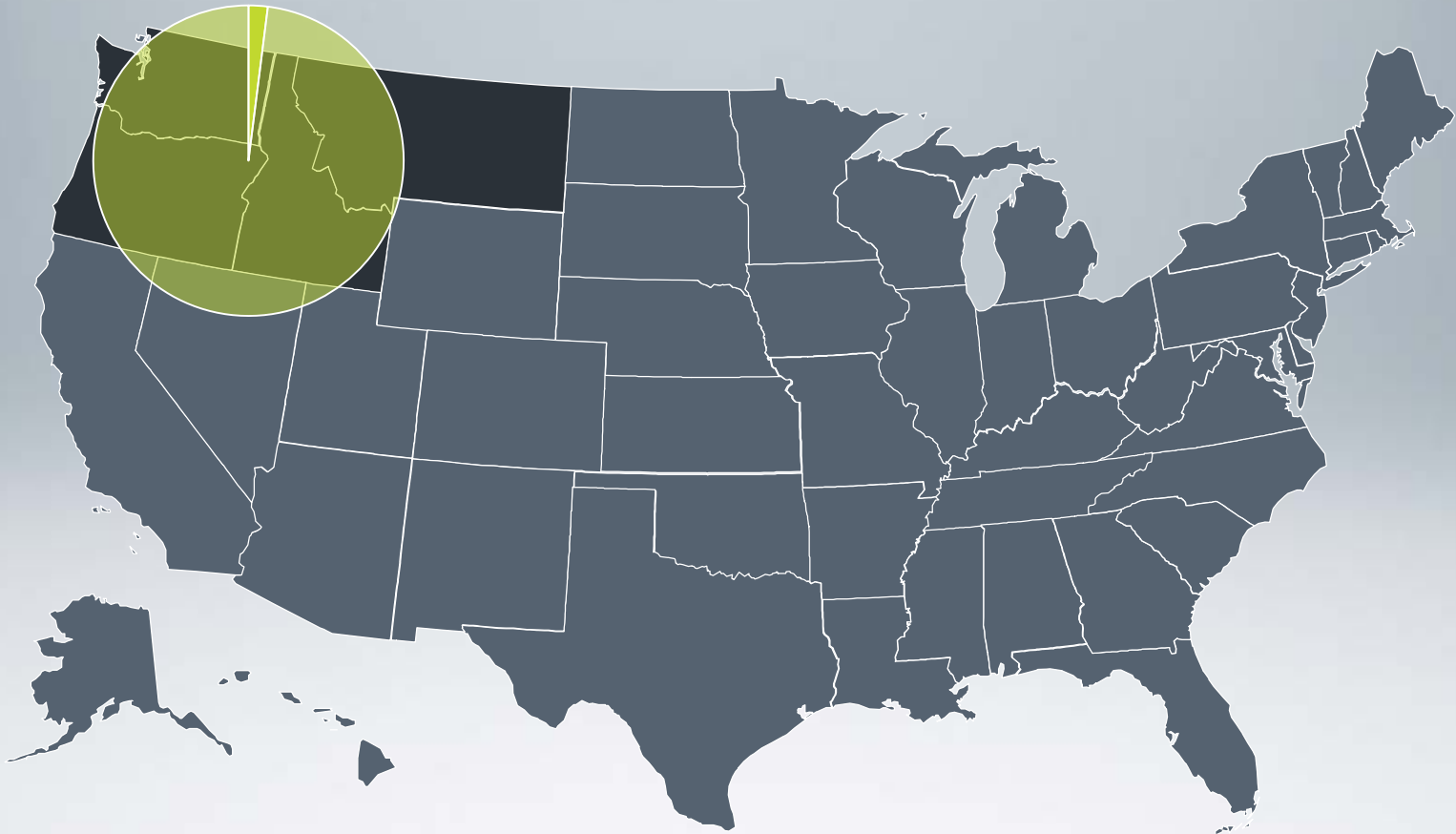
**Incorrect
installation can
increase energy use**

NEW COMPLEXITY IN SUPPLY CHAIN

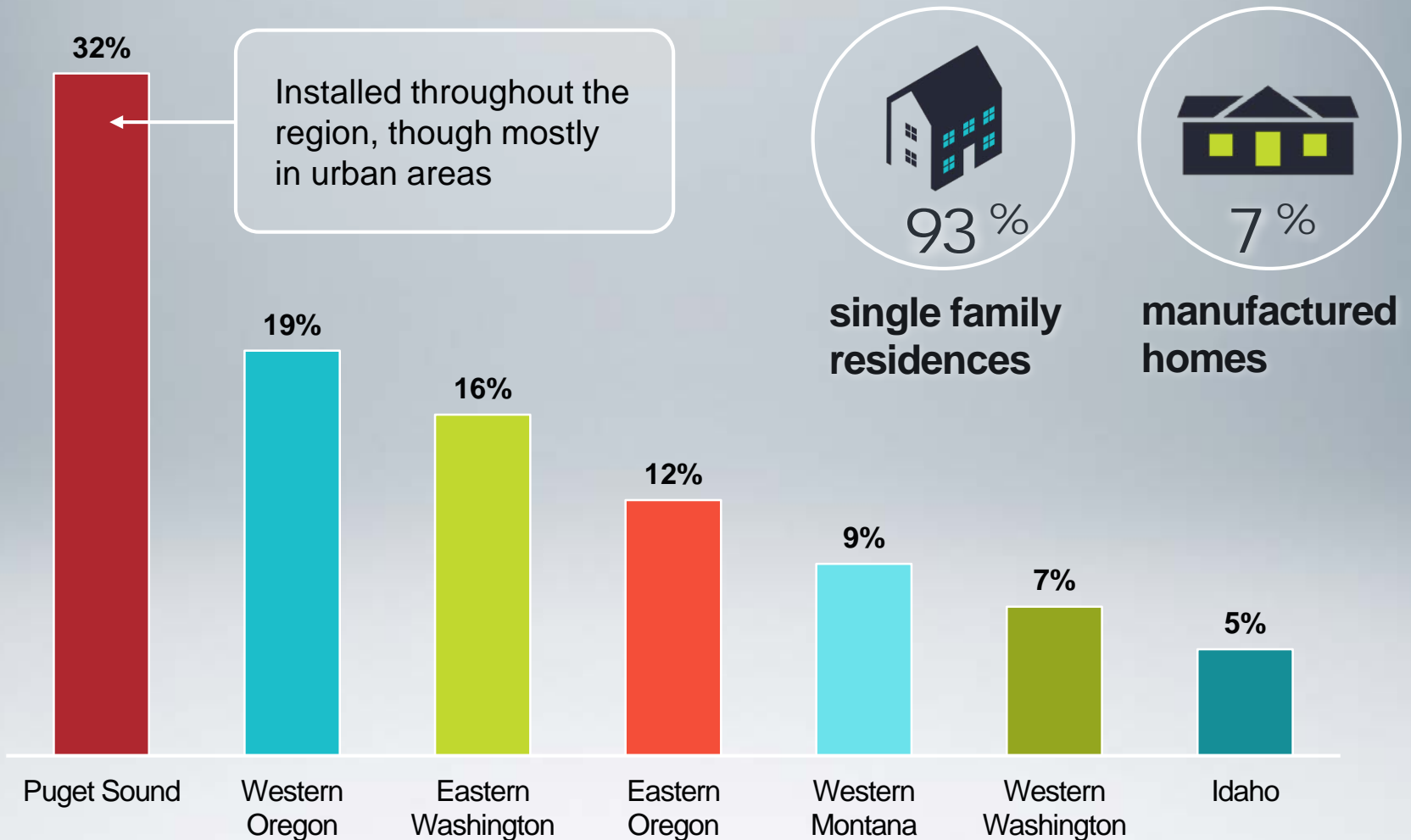


COUNTING IS CHALLENGING

Analysis of RBSA II data suggests regional saturation of advanced smart thermostats was about 2% in 2016.



WHERE ARE THEY INSTALLED?





WITH WHAT SYSTEMS ARE THEY PAIRED?



Cooling

54% paired with central air conditioners

46% paired with air source heat pumps



Heating

54% paired with gas furnaces

35% paired with air source heat pumps

6% paired with propane furnaces

4% paired with electric furnaces

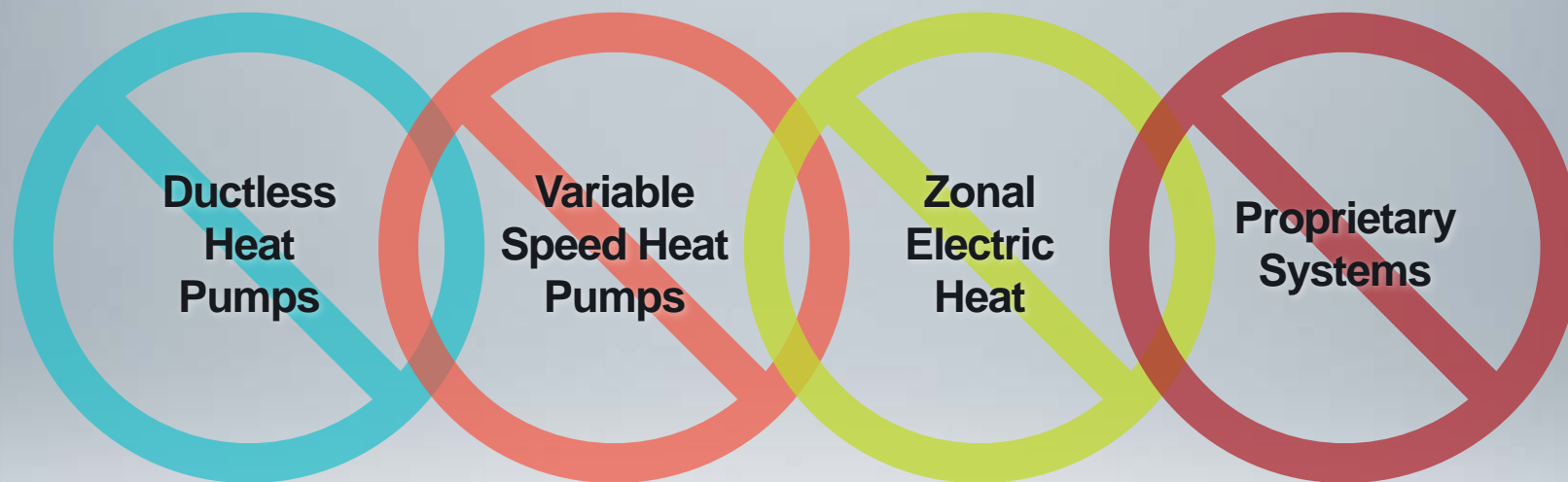
1% paired with boilers

EXPLOSIVE GROWTH IS EXPECTED





THEY DON'T CURRENTLY WORK WITH EVERYTHING





RECOMMENDATIONS

Coalesce

Around
Definitions



Strategy

for Tracking
Market Change
and Savings



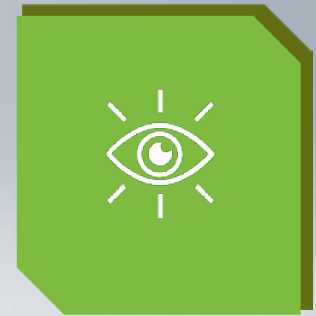
Research

and Data on
Growth and
Performance



Awareness

of New
Products



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Get a copy of the detailed memo:

<https://www.bpa.gov/EE/Utility/research-archive/Pages/hvac-market-research.aspx>

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