BetterBuiltNW

New Homes Performance Path

Reliable results for flexible programs

Housekeeping

Submit questions via the Webex chat pane

We will address at the end of our session

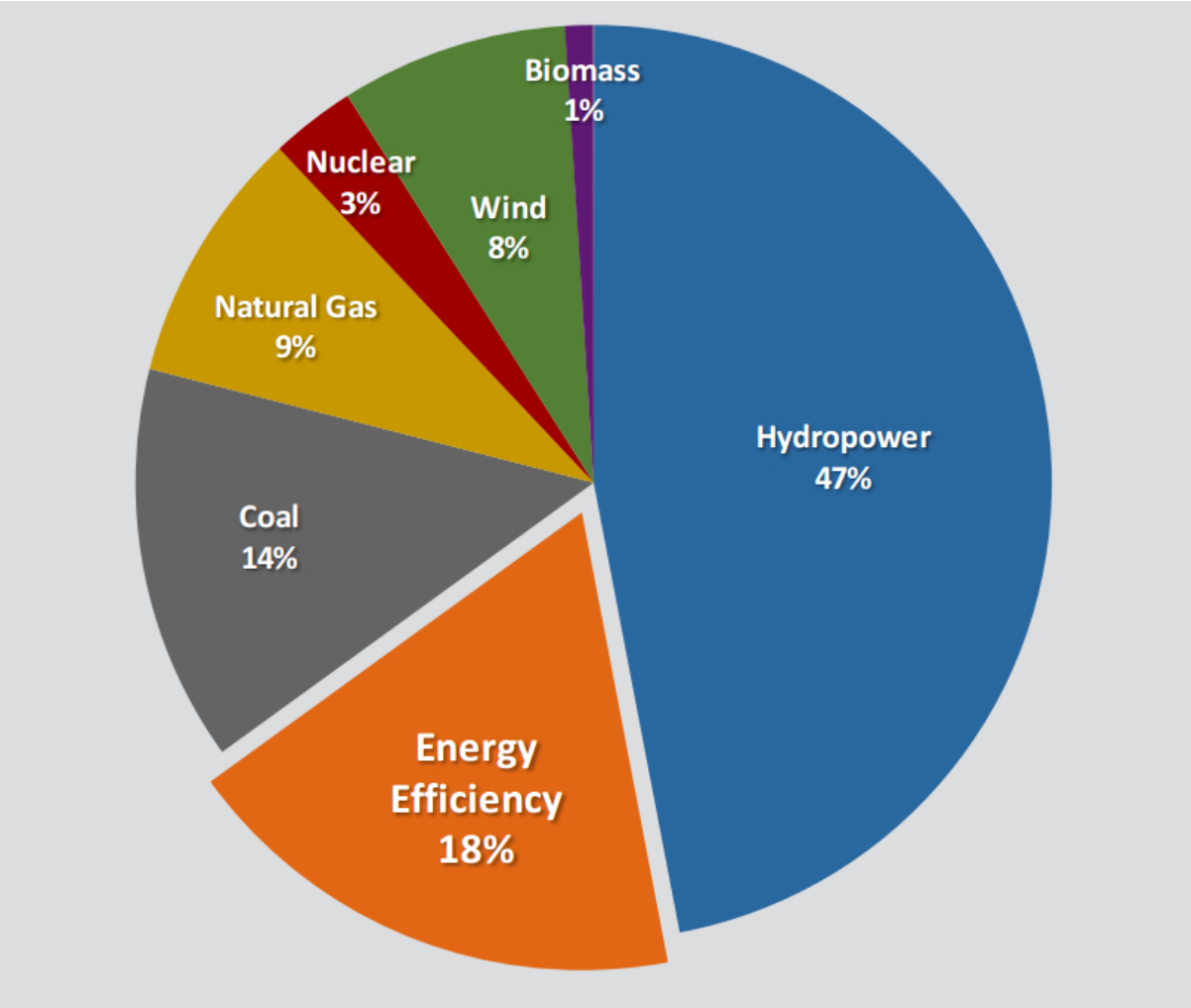
Learning Objectives

What we'll be focusing on today

1. Understand and prioritize modeling impacts
2. Benefits of standardized modeling practices
3. Applying the protocol
4. Where to go for support

Understanding Impacts

Understanding Impacts



Since 1978, the region has met over half of its load growth through efficiency resources

$4 billion saved in energy bills

6,000 aMw – enough to power 5 cities the size of Seattle

Image and data courtesy of NW Power & Conservation Council

Understanding Impacts

From page 1-1 of the RESNET® standards:

101.1 Purpose

The purpose of these standards is to ensure that accurate and consistent home energy ratings are performed by accredited home energy rating Providers through their Raters nationwide; to increase the credibility of the rating Providers with the mortgage finance industry, federal government, state governments, local governments, utility companies, and the private sector; and to promote voluntary participation in an objective, cost-effective, sustainable home energy rating process.

Understanding Impacts

Background - New Construction Standard Protocol

- Establishes a method for estimating “utility-grade” savings with REM/*Rate*™
  - Standardized modeling and QA methods
- Enables utilities to incentivize homes based on REM/*Rate*™ results, modified via AXIS database
- Allows utilities to partner with certification programs and local rater/verifiers to create new programs and incentive structures

Understanding Impacts

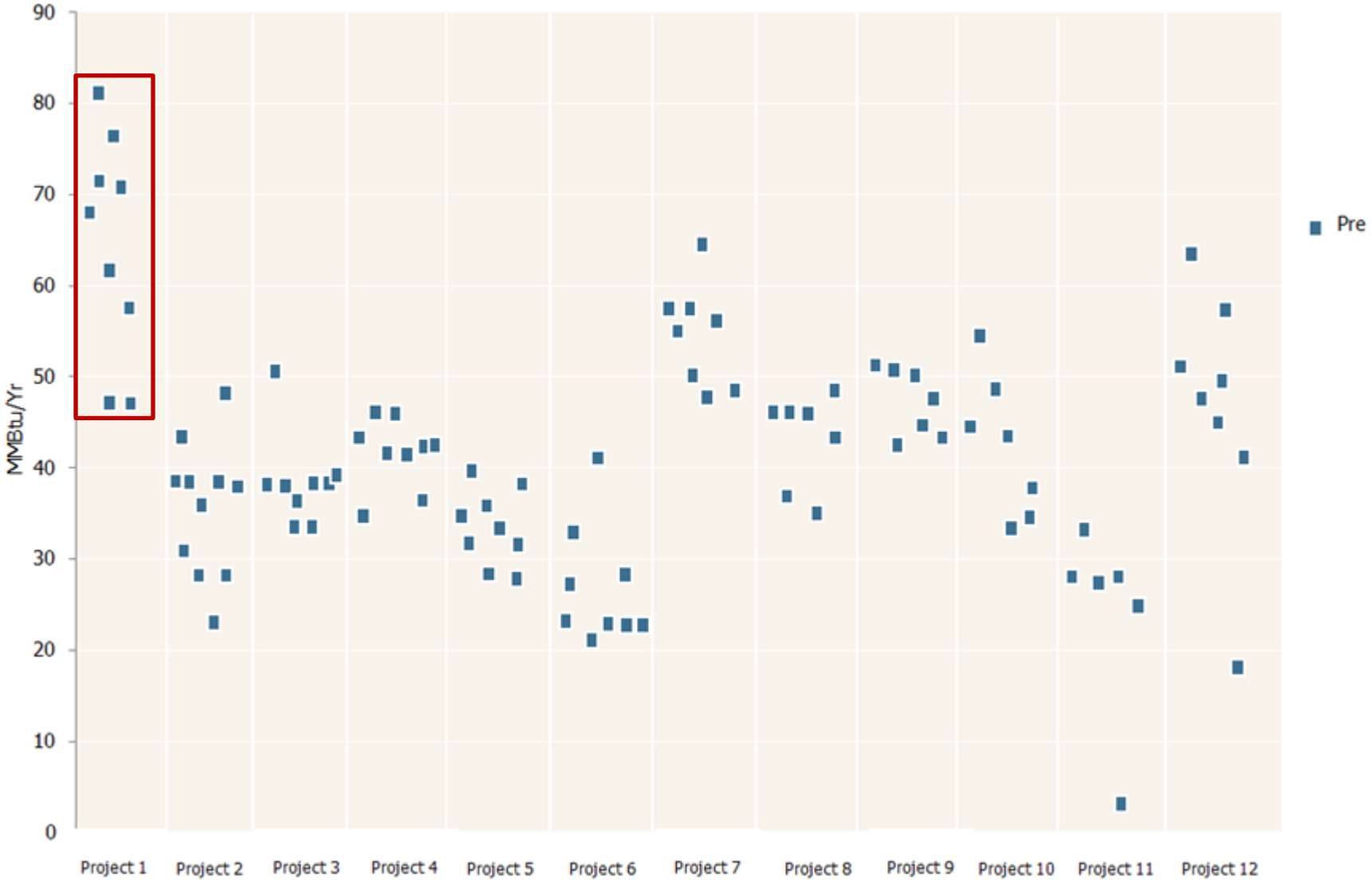
What does it take to model “utility-grade” savings in REM/*Rate*™?

NEEA Pilot Rating Project (2015)

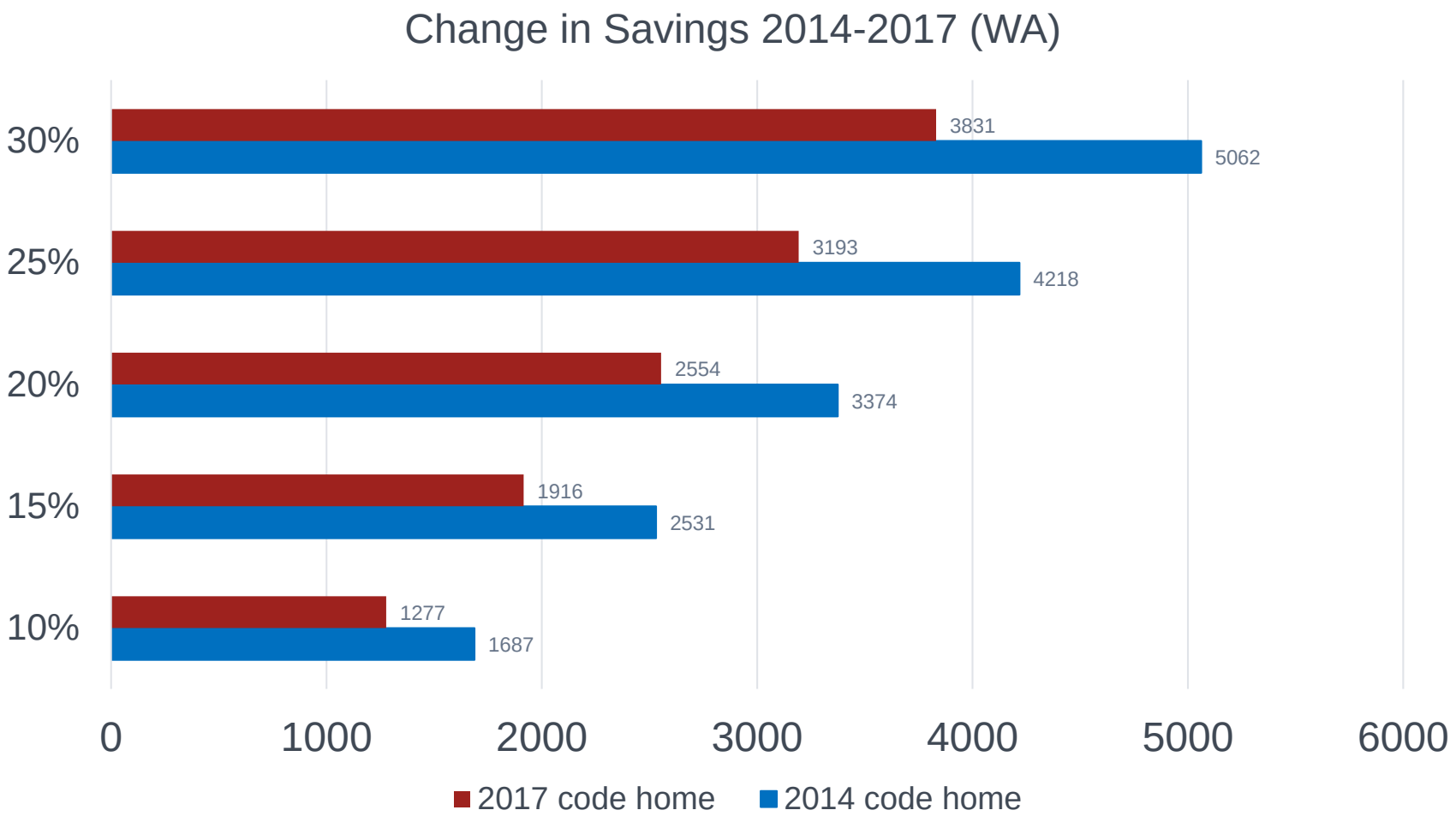
Goals:

- Quantify model variability introduced by Rater modeling practices, identify gaps in existing guidance
- Use findings to improve model consistency, accuracy, and fill gaps in existing modeling guidance

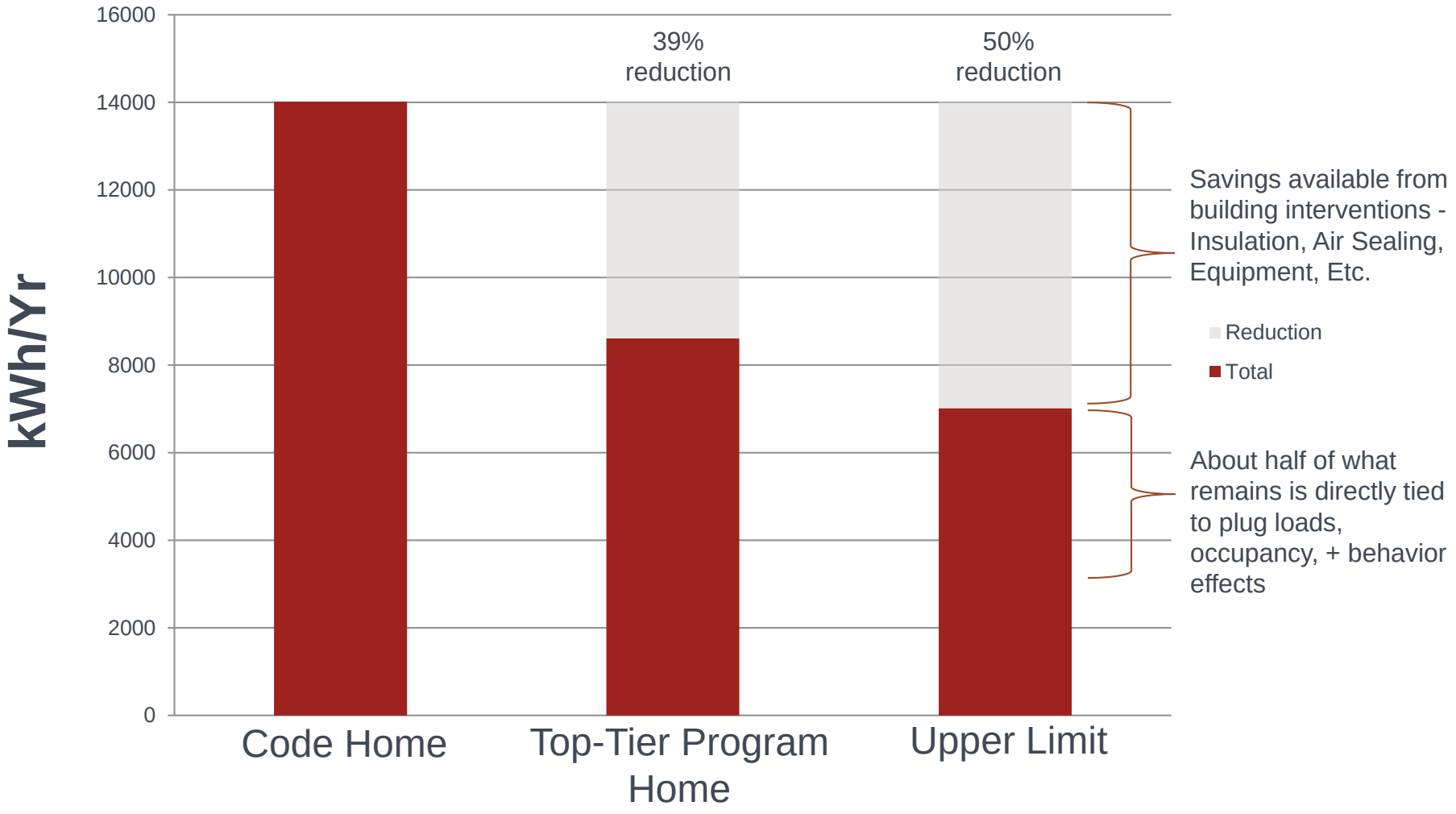
Understanding Impacts: “Ratings in the wild”



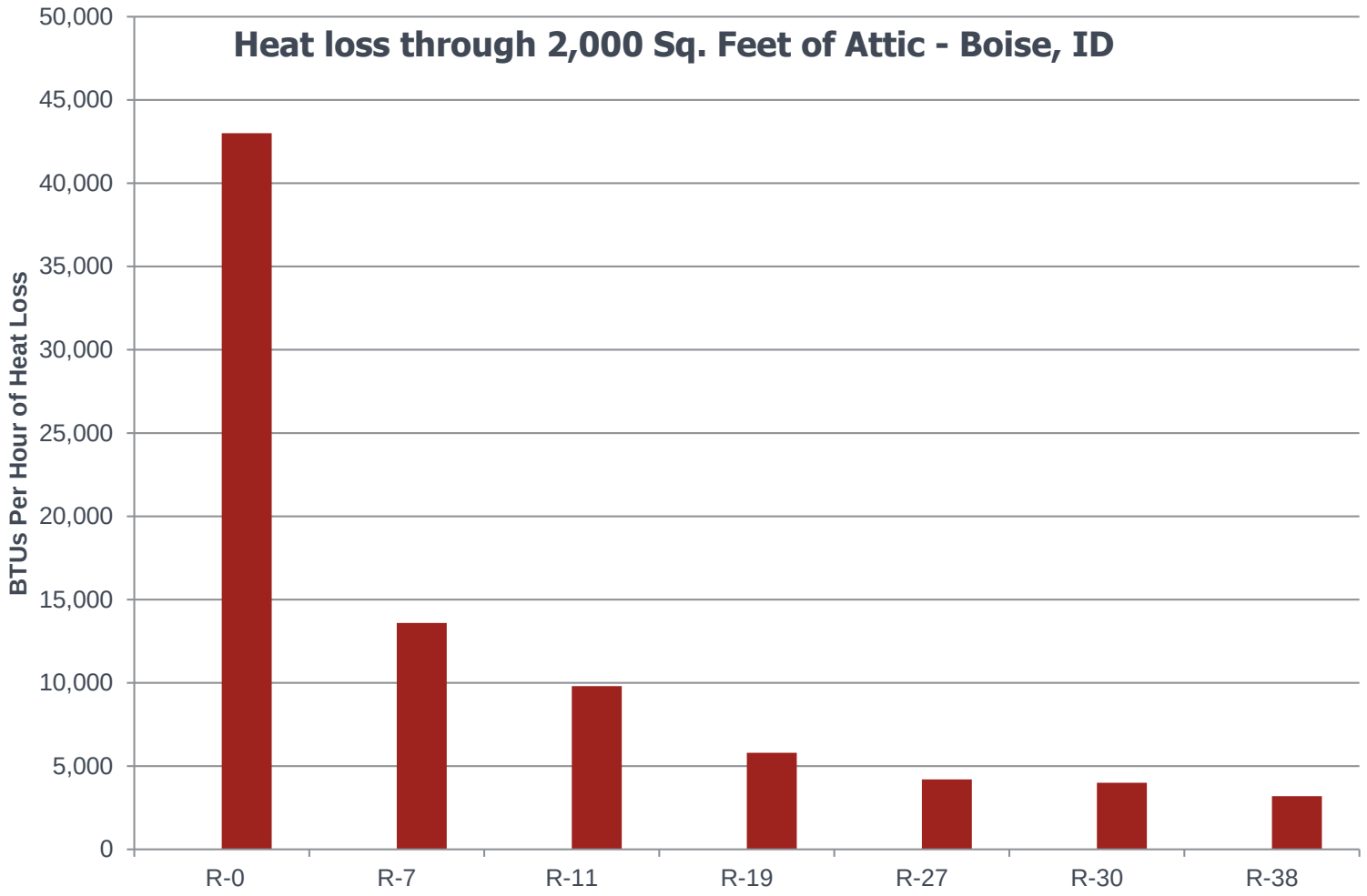
Understanding Impacts



Understanding Impacts

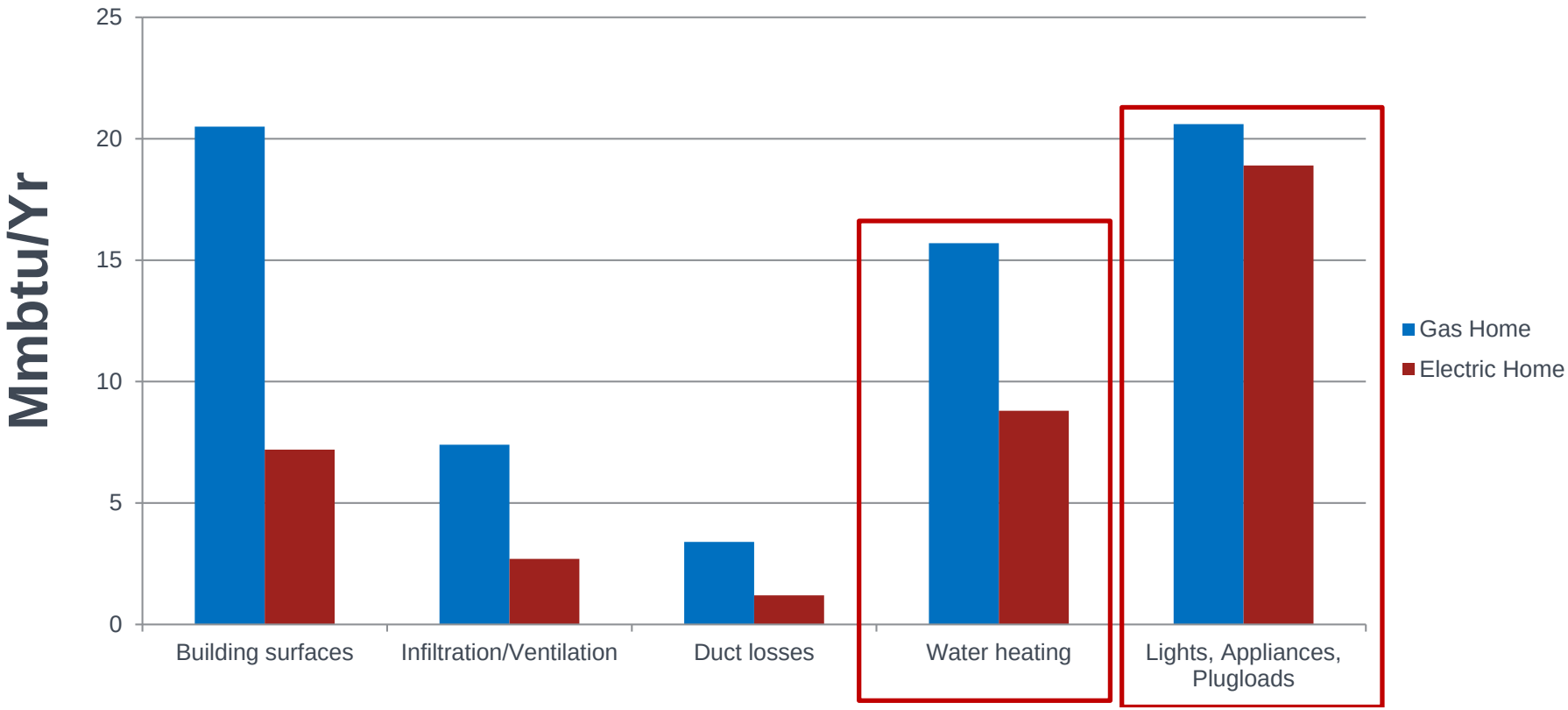


Understanding Impacts



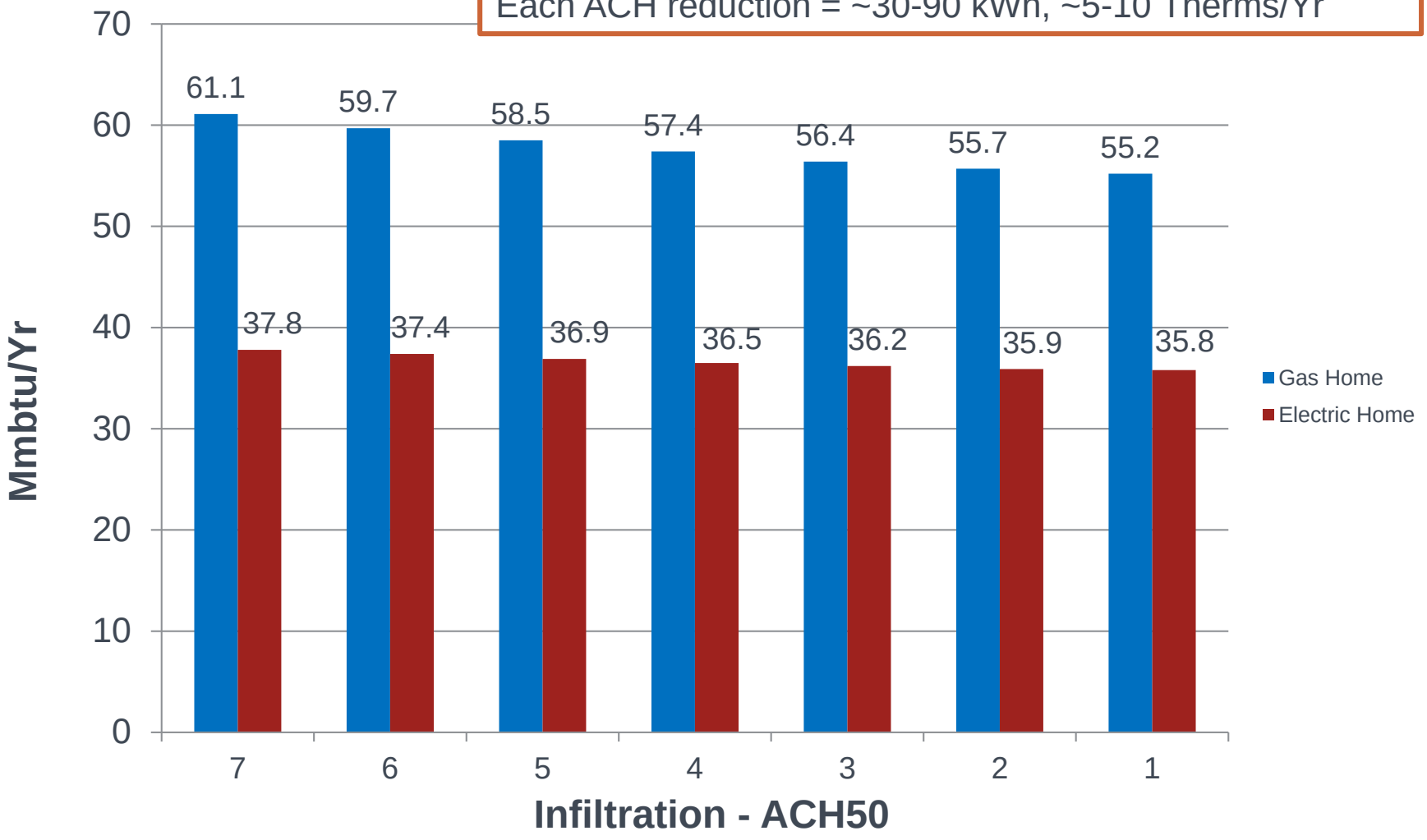
Understanding Impacts

Where do new homes use energy?

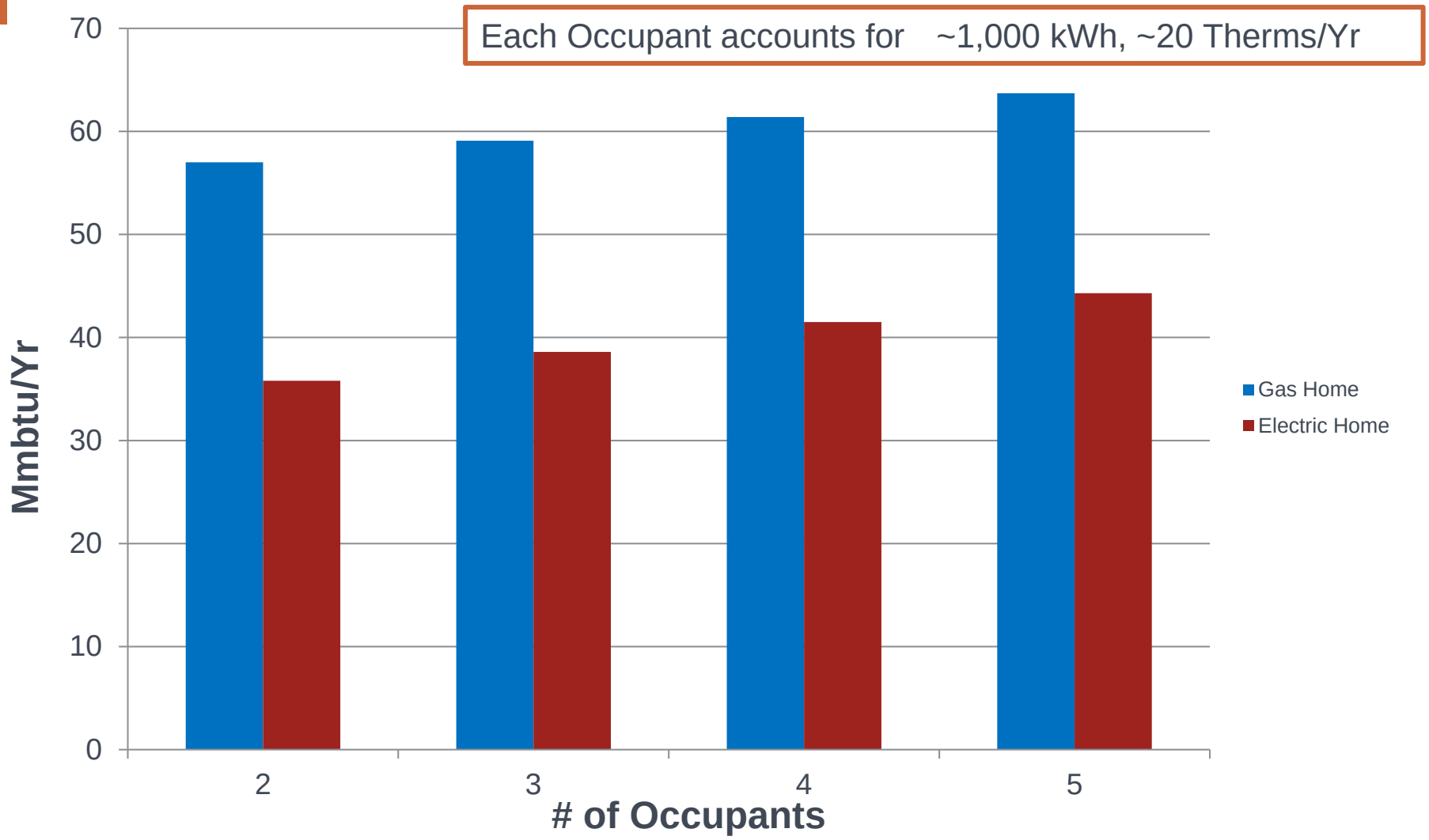


Understanding Impacts

Each ACH reduction = ~30-90 kWh, ~5-10 Therms/Yr



Understanding Impacts



Poll Question

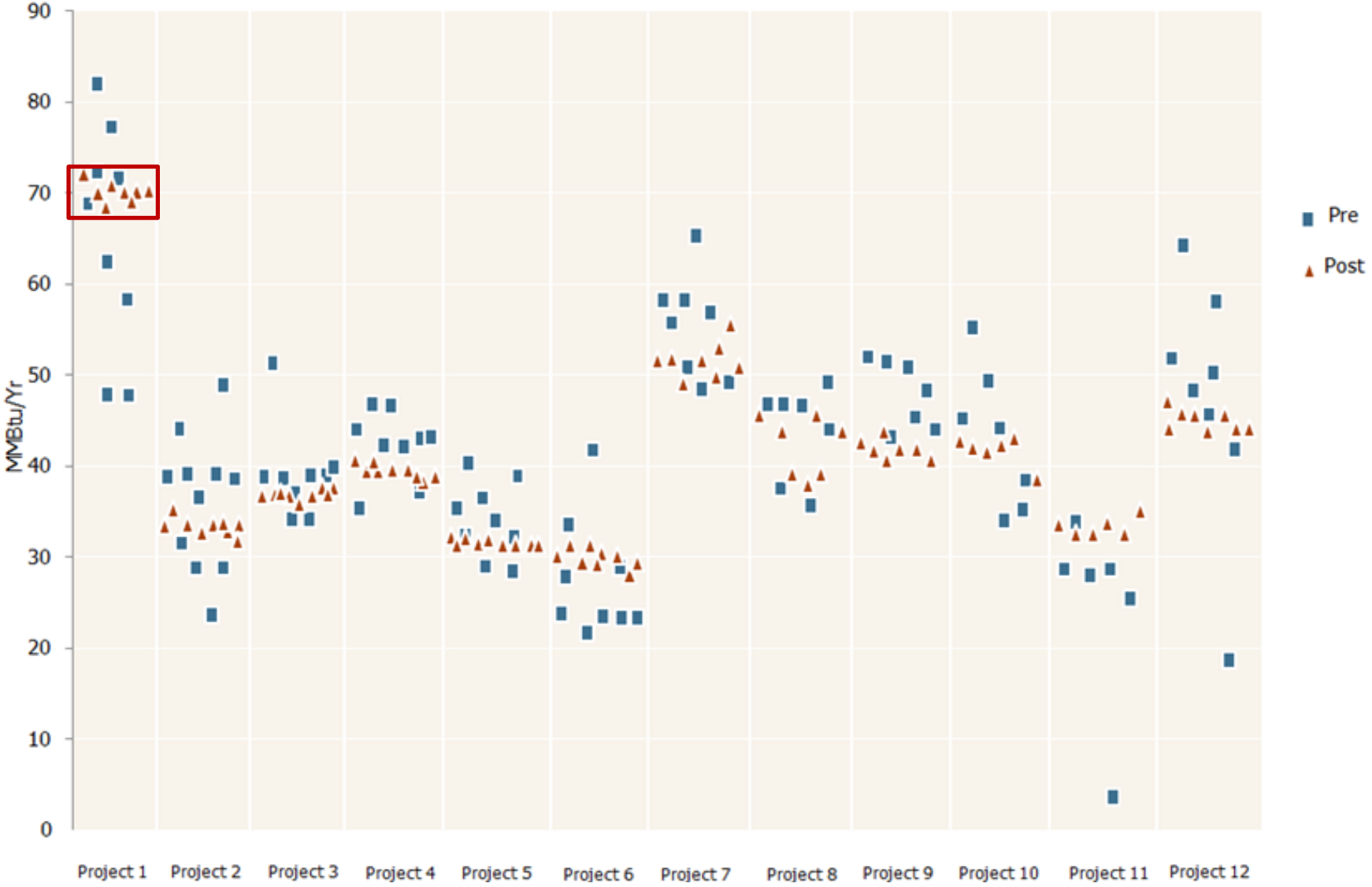
Which of the following is most impactful when modeling new homes?

The Benefits of Standardized Practices

Benefits of Standardization

- Creates consistency in ratings
- Minimizes errors and error impacts
- Closer alignment with actual energy use

Applying a Consistent Practices



Benefits of Standardization

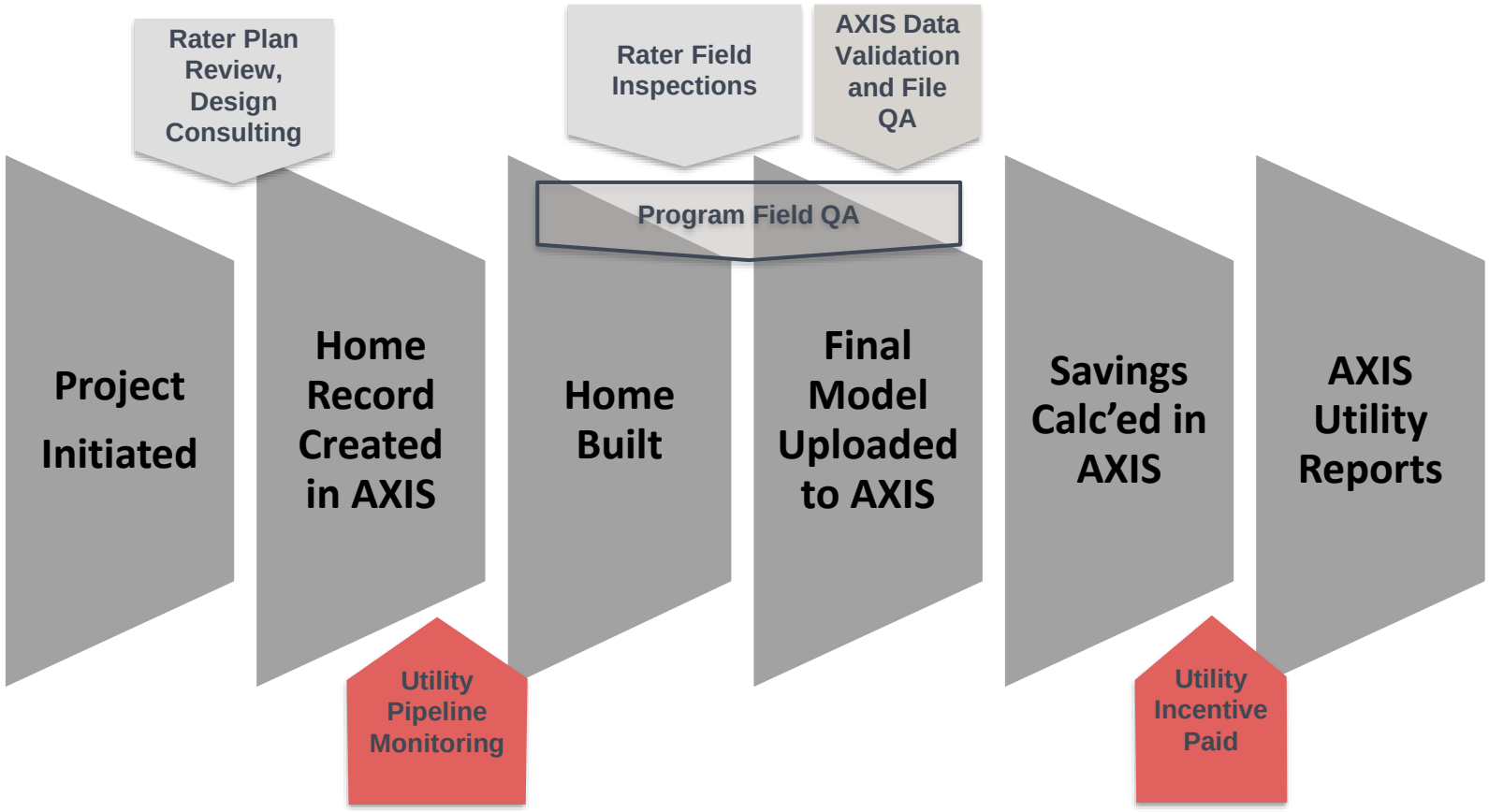
- Creates consistent practices for incentives and certifications – streamlines work processes
- Clear and consistent practices across raters/rating companies
- Data-driven program QA
  - Streamlines file review
  - Reduces administrative burden
  - Improves accuracy

Poll Question

From your perspective, which is the most valuable benefit of standardized modeling and QA practices?

Applying The Protocol

General Work Flow



Applying The Protocol

Rater/verifier Qualifications

- Must be oriented on NW modeling requirements and workflow
  - (You're doing this now.)
  - Heads up – you may also need an agreement with your local utility
- Remaining qualifications are divided according to services
  - Modeling – trained on REM/*Rate*™
    - Current HERS cert or verifiable experience modeling in other programs
  - Field verification – trained in field verification
    - Current HERS/BPI cert or verifiable experience verifying in other programs
  - Introductory training options are available for newbies. A list of trainings is available on betterbuiltnw.com

Applying The Protocol

Modeling Requirements

- Document is available on betterbuiltnw.com
- Requires REM/*Rate*™ v15.3 (national)
- Aimed at creating consistent methods for programs across the region
  - Guidance for high performance building practices and systems
  - Guidance to supplement REM/*Rate*™'s internal help menus
  - Guidance to achieve more reliable model outputs
- Designed to be more comprehensive and straight forward than NWESH modeling requirements

Applying The Protocol

- Uses REM/*Rate*™'s UDRH structure to determine % improvement over code
  - For raters participating in programs that require a baseline model, this means you no longer have to create a separate model
- Rater/verifier selects and applies the appropriate UDRH file in REM/*Rate*™
  - UDRH files are available on betterbuiltnw.com
- UDRH file selection is based on:
  - State
  - HVAC configuration (Central vs Zonal)
  - Home size (only in Washington)

Applying The Protocol

UDRH file selection

State	HVAC Configuration	Floor Area	UDRH File
Washington	Zonal	<1,500 ft^2	WA Perf Path Zonal - Small.udr
	Zonal	1,500-5,000 ft^2	WA Perf Path Zonal - Medium.udr
	Zonal	>5,000 ft^2	WA Perf Path Zonal - Large.udr
	Central	<1,500 ft^2	WA Perf Path Central - Small.udr
	Central	1,500-5,000 ft^2	WA Perf Path Central - Medium.udr
	Central	>5,000 ft^2	WA Perf Path Central - Large.udr
Oregon	Zonal	Any	OR Perf Path Zonal.udr
	Central	Any	OR Perf Path Central.udr
Idaho	Zonal	Any	ID Perf Path Zonal.udr
	Central	Any	ID Perf Path Central.udr
Montana	Zonal	Any	MT Perf Path Zonal.udr
	Central	Any	MT Perf Path Central.udr

Applying The Protocol

Modeling Requirements

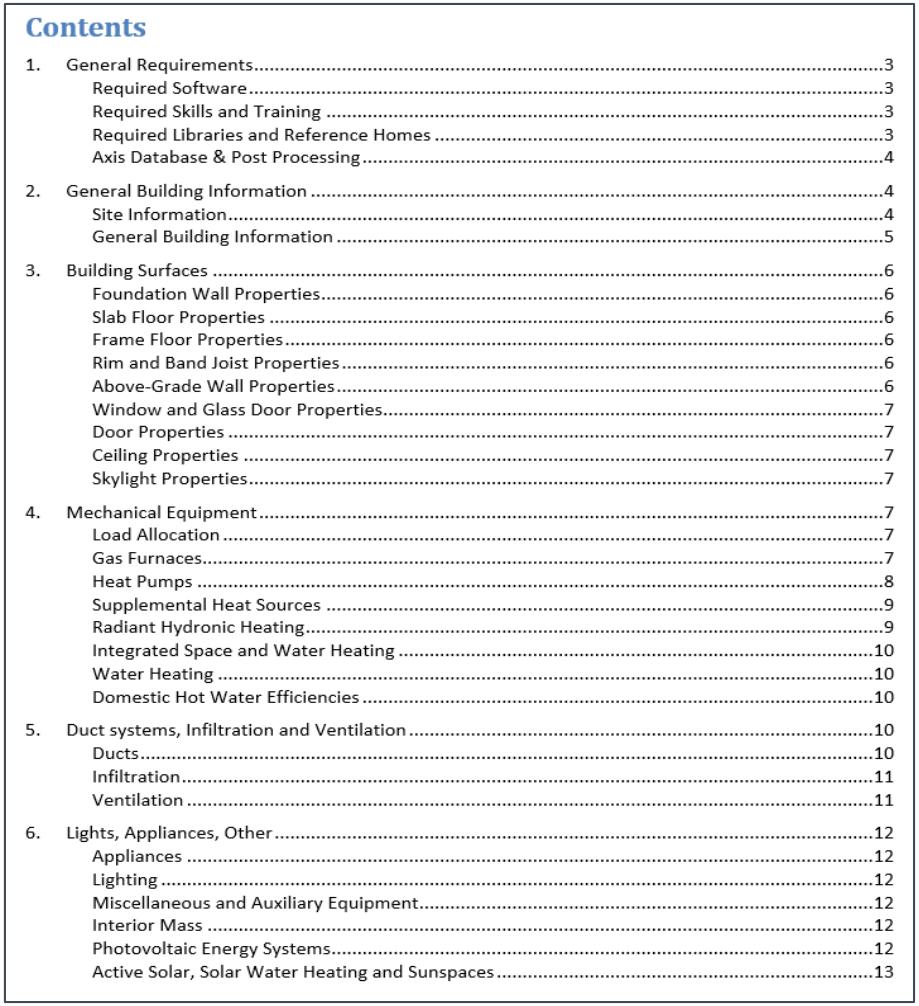
- Specific guidance on practices/systems present in NW homes
  - Thick walls
  - Foundation properties
  - Mini-split heat pumps
  - Electric resistance zone heaters
  - Fireplaces
  - Ventilation systems

Applying The Protocol

Modeling Requirements

- For field-verified components, final model inputs must align with field observations
  - Insulation values
  - Equipment specs
  - Blower door/duct blaster testing
  - Lighting counts
- AXIS database allows Rater/verifier to upload preliminary file with placeholder values to obtain savings estimates

NW Modeling Requirements



Contents

Go to:
www.betterbuiltnw.com

→ “Resources”

→ Scroll down and select “Performance Path”

NW Modeling Requirements

NW Modeling Requirements

Mini-split Heat Pumps

Includes all Ductless and Ducted mini-split heat pumps as follows:

- Enter capacity and HSPF values accurate to the unit selected. Most mini-split heat pumps do not include internal electric resistance back up heat. Unless the manufacturer's product information indicates internal back up heat, set "Electric Resistance Backup Capacity" value to zero.
- For ducted mini-splits, duct system "Sq. Feet Served" shall be entered for the whole home or zone the unit will serve and "Duct Surface Area" shall be estimated using REM/*Rate*™'s "Estimate Surface Area" option. Duct system location shall be entered accurate to the duct system to be installed in the home. Alternatively, if a duct design has been provided, the Rater may calculate duct surface area based on the design. (See "Duct systems" below)
- If no supplemental heat sources – wall heaters, zone heaters, fireplaces, electric baseboards, or electric resistance floor heat exist in the home, no further action is required.
- If supplemental wall heaters, zone heaters, fireplaces, electric baseboards, or electric resistance floor heat will be present in the home, the Rater shall enter the supplemental heat as a separate space heating system according to the sections that follow.

NW Modeling Requirements

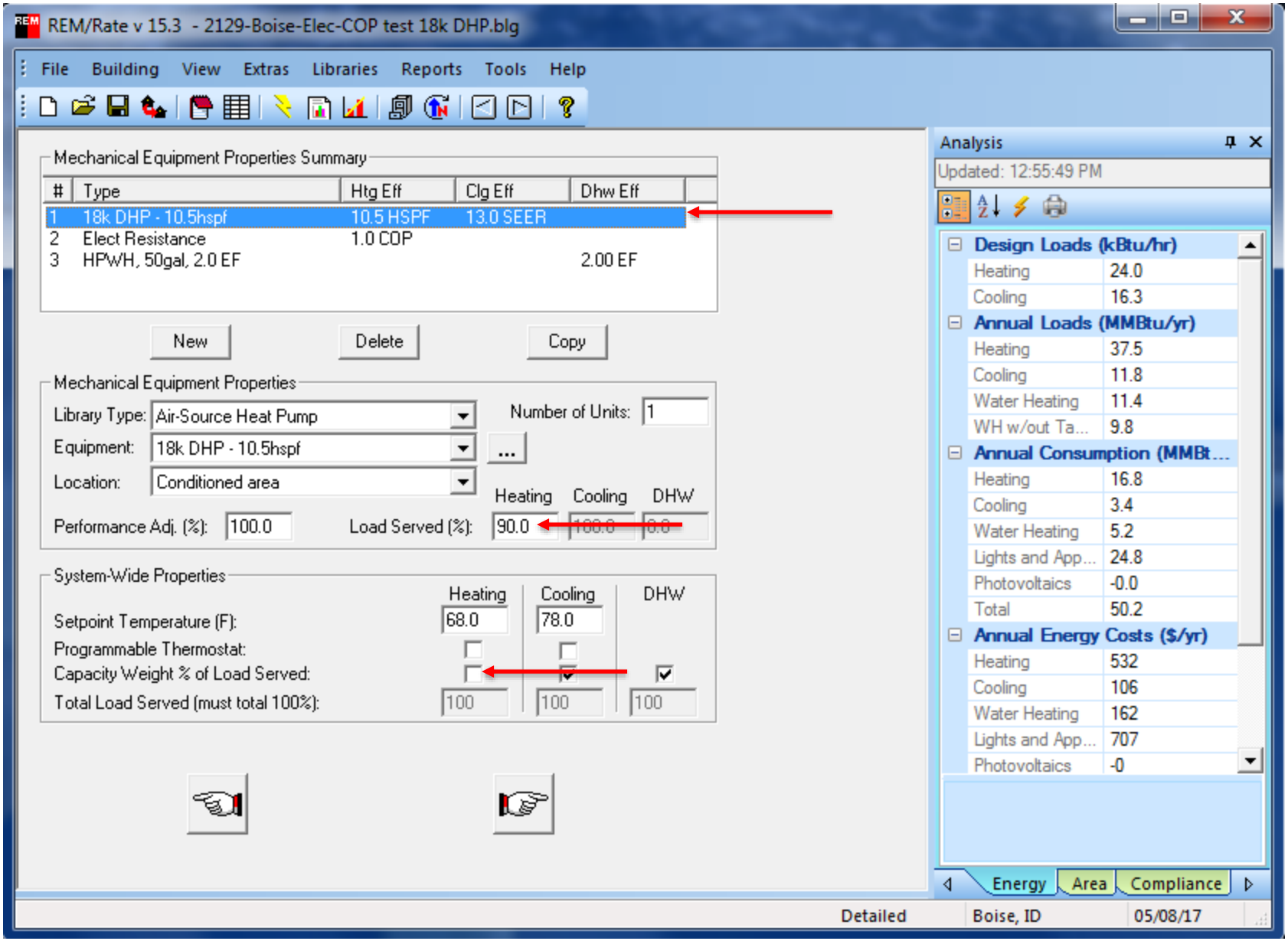
NW Modeling Requirements

Supplemental Heat Sources

Electric Resistance Zonal Heat

If supplemental electric resistance wall heaters, zone heaters, baseboard heaters, or electric resistance floor heat will be present in the home, the Rater shall enter the supplemental heat as a separate space heating system as follows:

- System type: "Electric baseboard or Radiant"
- Fuel type: "Electric"
- Rated output capacity (kBtuh) = Total capacity of supplemental heat, in kBtuh.
- Seasonal equipment efficiency = 1.0 COP
- After entering the system, Rater shall set the "Capacity Weight % of Load Served" toggles to "off" (no checkmarks in boxes) for heating and set the "Load Served (%) – Heating" value to 10% for the electric resistance heating system.
- The remaining 90% of the heat load shall be allocated to the home's other heat sources. If multiple heat sources are included in the home, the rater shall split the remaining load across those sources, according to guidance included in the other sections of this document.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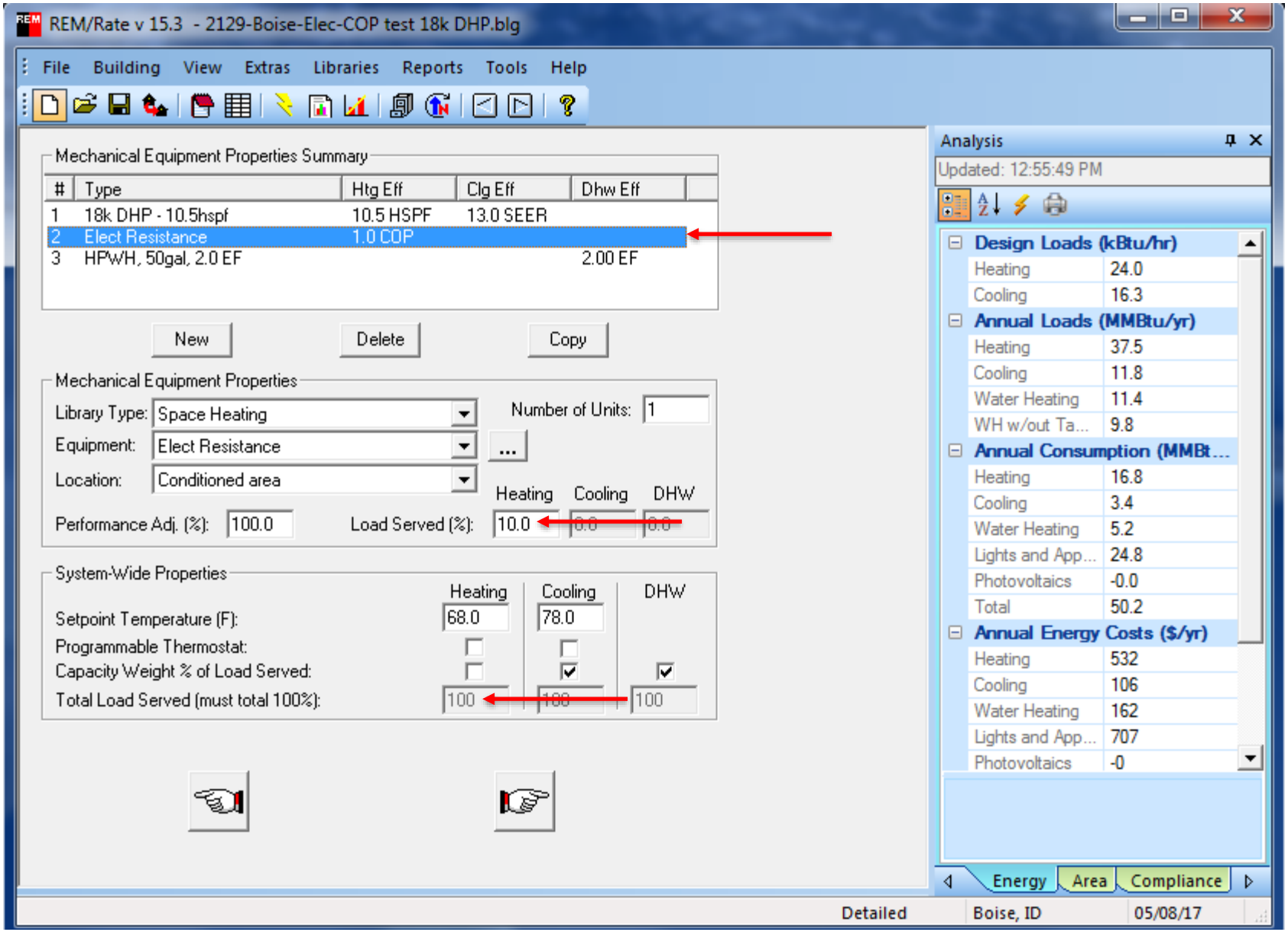
File Building View Extras Libraries Reports Tools Help
Mechanical Equipment Properties Summary
Type Htg Eff Clg Eff Dhw Eff
1 18k DHP - 10.5hspf 10.5 HSPF 13.0 SEER
2 Elect Resistance 1.0 COP
3 HPWH, 50gal, 2.0 EF 2.00 EF
New
Delete
Copy
Mechanical Equipment Properties
Library Type: Air-Source Heat Pump
Number of Units: 1
Equipment: 18k DHP - 10.5hspf
Location: Conditioned area
Heating Cooling DHW
Performance Adj. (%): 100.0
Load Served (%): 90.0
System-Wide Properties
Heating Cooling DHW
Setpoint Temperature (F): 68.0 78.0
Programmable Thermostat:
Capacity Weight % of Load Served:
Total Load Served (must total 100%): 100 100 100
Analysis
Updated: 12:55:49 PM
Design Loads (kBtu/hr)
Heating 24.0
Cooling 16.3
Annual Loads (MMBtu/yr)
Heating 37.5
Cooling 11.8
Water Heating 11.4
WH w/out Ta... 9.8
Annual Consumption (MMBt...
Heating 16.8
Cooling 3.4
Water Heating 5.2
Lights and App... 24.8
Photovoltaics -0.0
Total 50.2
Annual Energy Costs ($/yr)
Heating 532
Cooling 106
Water Heating 162
Lights and App... 707
Photovoltaics -0
Energy Area Compliance
Detailed Boise, ID 05/08/17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2 Elect Resistance 1.0 COP
3 HPWH, 50gal, 2.0 EF 2.00 EF
New
Delete
Copy
Mechanical Equipment Properties
Library Type: Space Heating
Number of Units: 1
Equipment: Elect Resistance
Location: Conditioned area
Heating Cooling DHW
Performance Adj. (%): 100.0
Load Served (%): 10.0
System-Wide Properties
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Where To Go for Support

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Thanks for Tuning In