



2025 Commercial Building Stock Assessment (CBSA) Findings

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Agenda



- Study Overview
- Findings
- Lessons Learned
- Resources
- Q&A



Overview



Vision Statement

Support the region's energy efficiency, resource planning, and utility objectives through a regionally representative, statistically rigorous, and comprehensive assessment of commercial and multi-family buildings.

Use Cases



Measure
Development



Market Sizing



Power Planning



Integrated
Resource
Planning



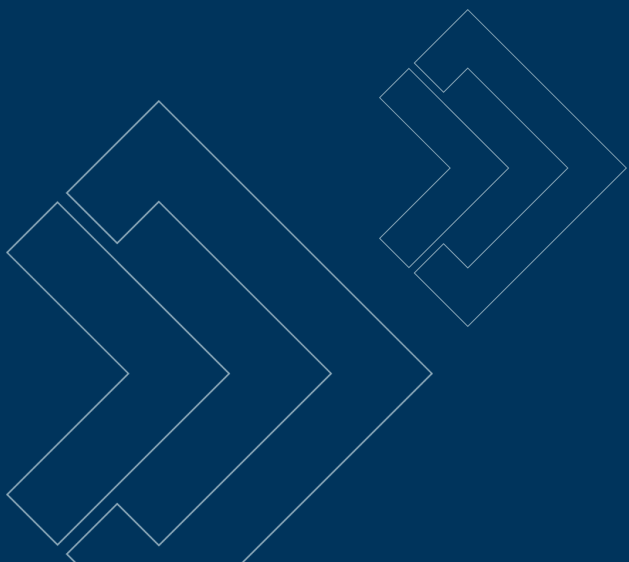
Conservation
Potential
Assessments



Program Strategy



Savings Models
and Forecasts





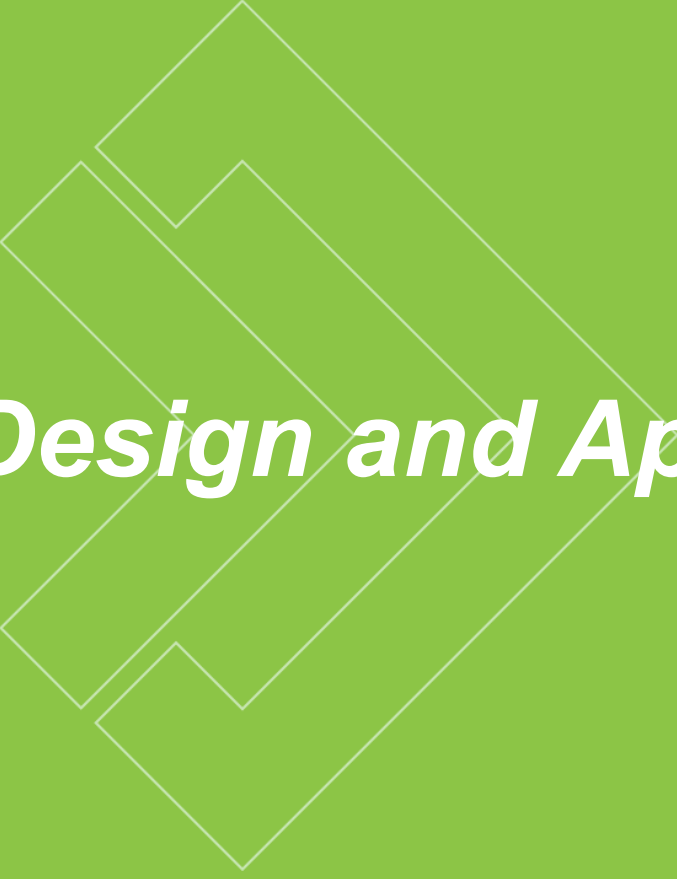
CBSA Workgroup

Purpose: The Commercial Building Stock Assessment (CBSA) Work Group will provide NEEA with decision support and coordination on key components of the study's design and implementation.

- Avista
- Bonneville Power Administration
- Cascade Natural Gas
- Clark PUD
- Energy Trust of Oregon
- Idaho Power
- Northwest Natural Gas
- Northwest Power and Conservation Council
- Portland General Electric
- Puget Sound Energy
- Regional Technical Forum
- Seattle City Light
- Snohomish County PUD

Implementation Firms





Study Design and Approach



Eligible Building Types

- **Commercial:**
 - Buildings used for a purpose other than residential, industrial/manufacturing, or agricultural.
- **Multi-family:**
 - Buildings with five or more residential units, and four or more floors.
- **Exclusions:**
 - Buildings < 1,000 sqft
 - Buildings on a military base
 - Buildings with very high security (EG correctional facility, psychiatric hospital)

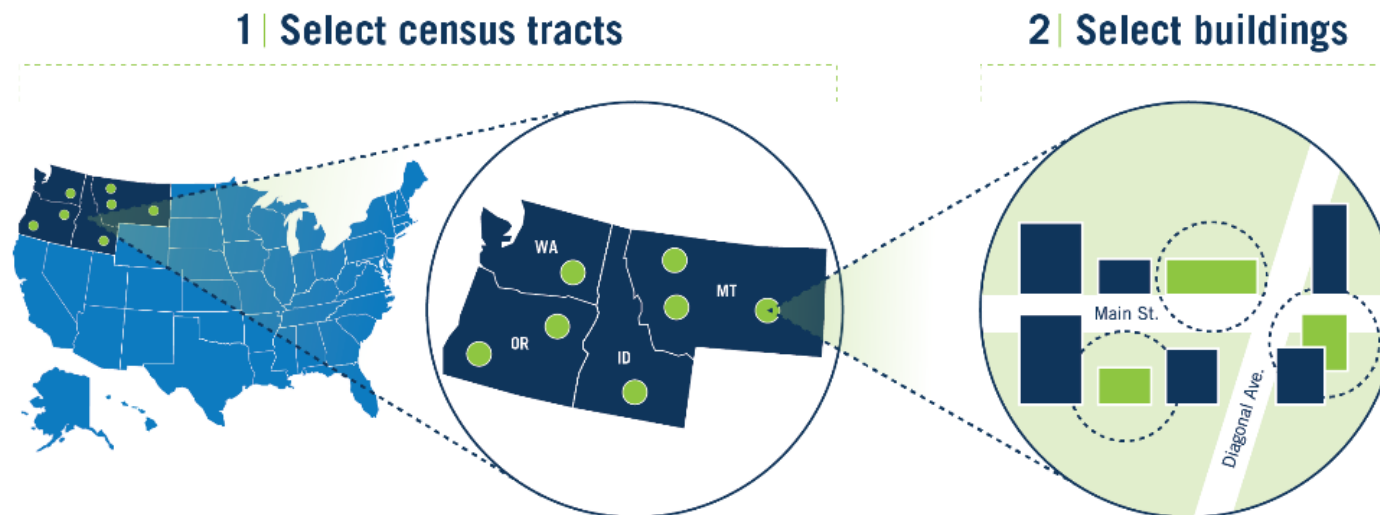
Data Collection

Two Components

- Building and Equipment Characteristics
 - Web survey
 - Site visit
- Billing Data
 - Signed billing data release form
 - Utility request for consumption data



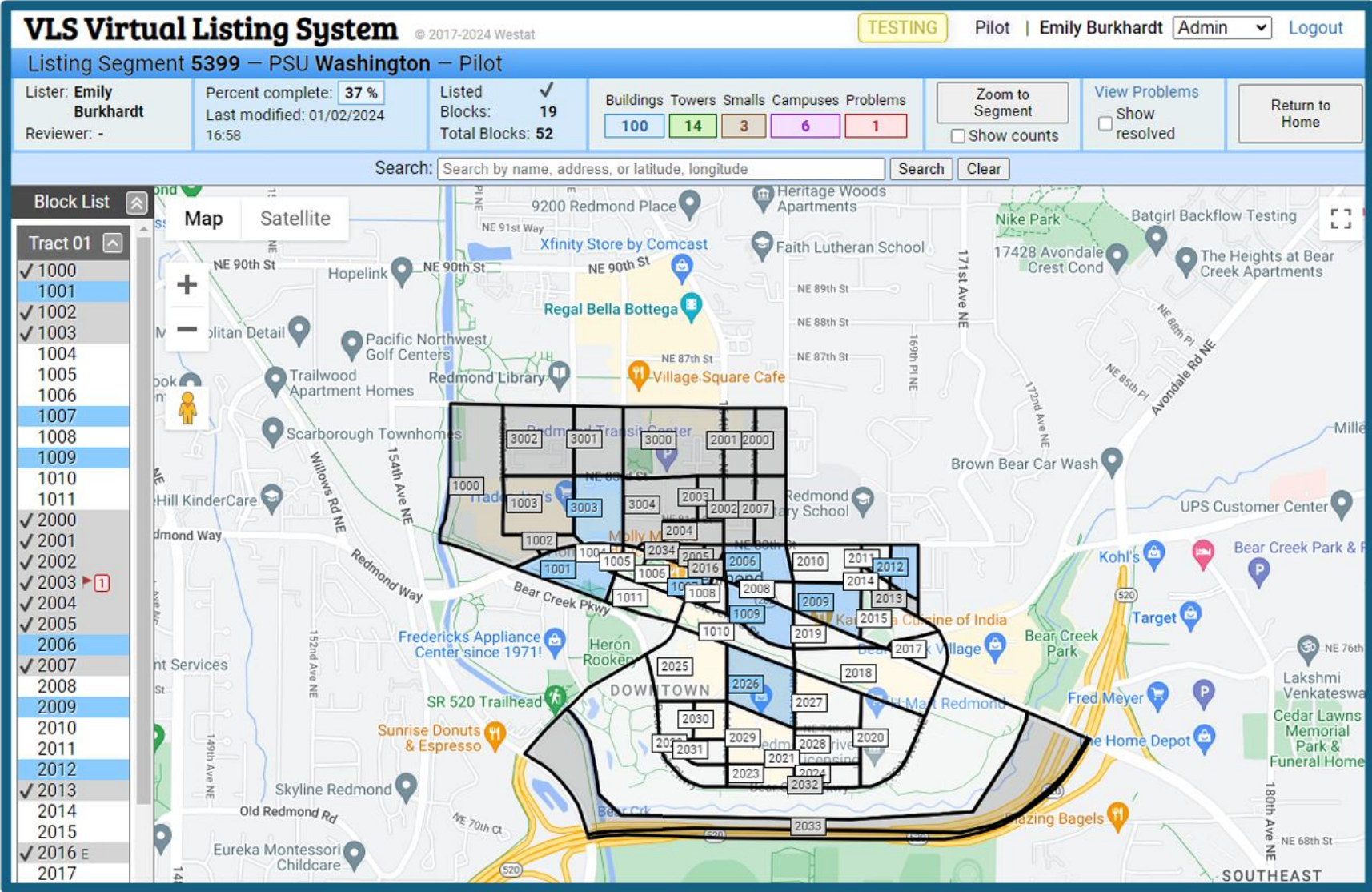
Two Phase Area Probability Sample Design



- **Phase 1**: Randomly selected 90 census tracts in the Northwest.
- **Phase 2**: Randomly selected 5,654 buildings within 90 selected tracts.

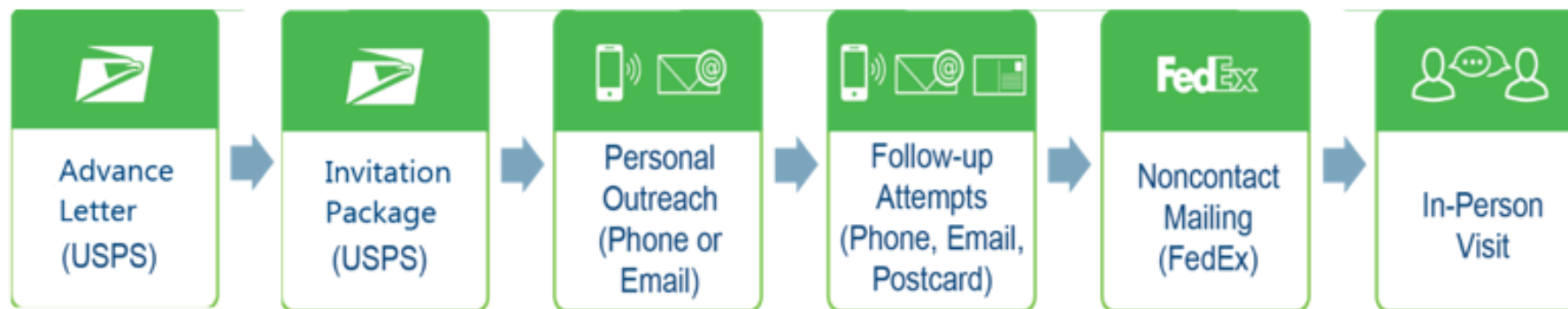
Original goal of 950 site visits, later revised down to 568 due to recruiting costs.

Developing the Building Frame



Building Recruitment

- Online research for building respondent leads and contact information
- Experienced, trained remote and in-person recruiters
- Customized outreach materials
- Monetary incentives based on building size
- Multi-step contact protocol: mail, phone, email, in-person attempts





Response Rates

Starting sample size = 5,682 buildings



- Web surveys
 - Completes = 676
 - Response rate = 11.9%



- Site visits
 - Completes = 568
 - Response rate = 10.0%

2025 vs 2019 Study Participation

Building Types

- More warehouses and offices
- Fewer medical buildings, restaurants, and retail

Geography

- More buildings east of the Cascades

Vintage

- More buildings built after 2009
- More buildings built before 1980



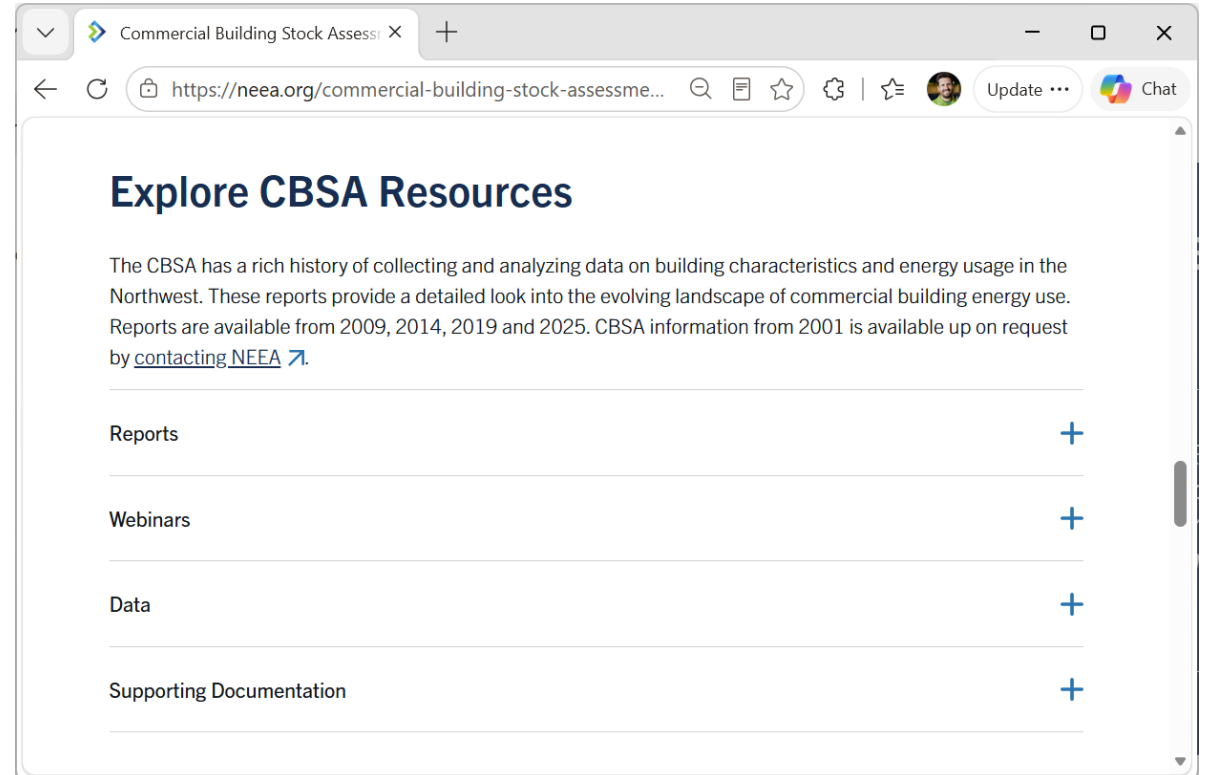
Utility Billing Data Collection Results

Building by energy type	Total	Received	Data Incomplete	In 2025 Dataset	2025 Fill Rate	2019 Fill Rate
Electricity	580	496	21	475	82%	53%
Natural gas	408	318	41	277	70%	55%



Data Products and Publications

- Final Report
- Data Deliverables
 - Datasets
 - Data Dictionary
 - User Guide
- neea.org/cbsa





Findings



Comparing 2019 to 2025 Results

2025 CBSA included
building types that
were excluded in the
2019 CBSA

Changes between
studies can be due to a
combination of
methods changes,
error, and real-world
changes

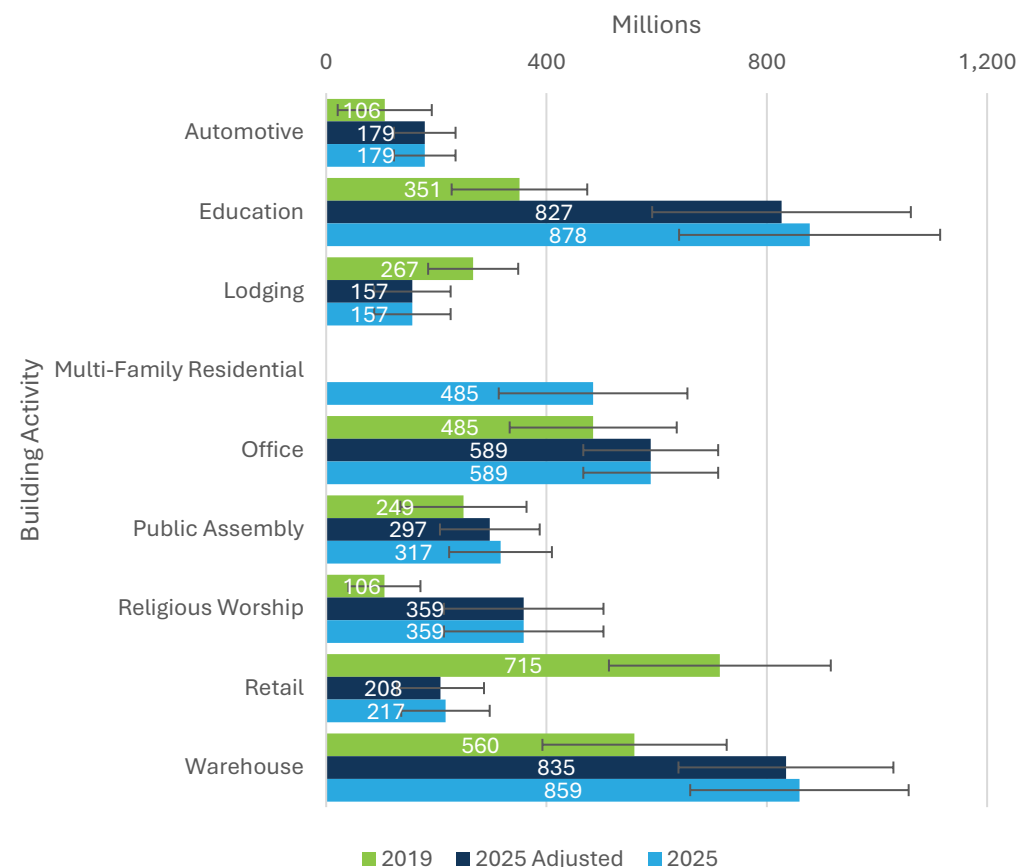
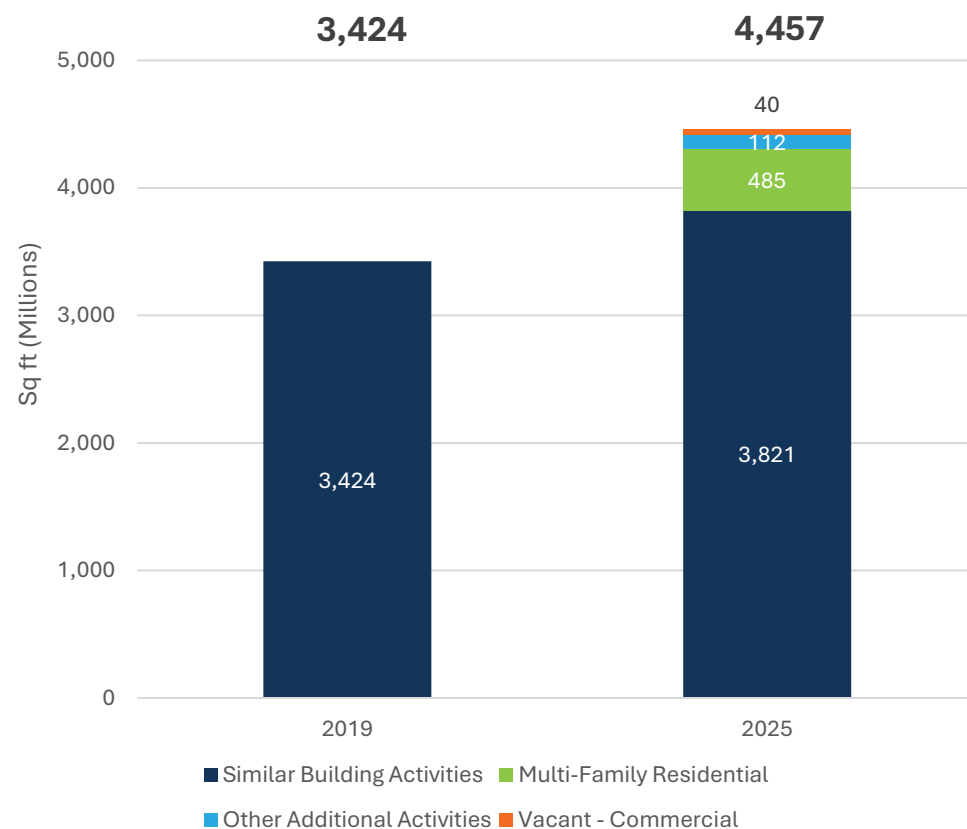
No 2014 results



Building Stock Characteristics



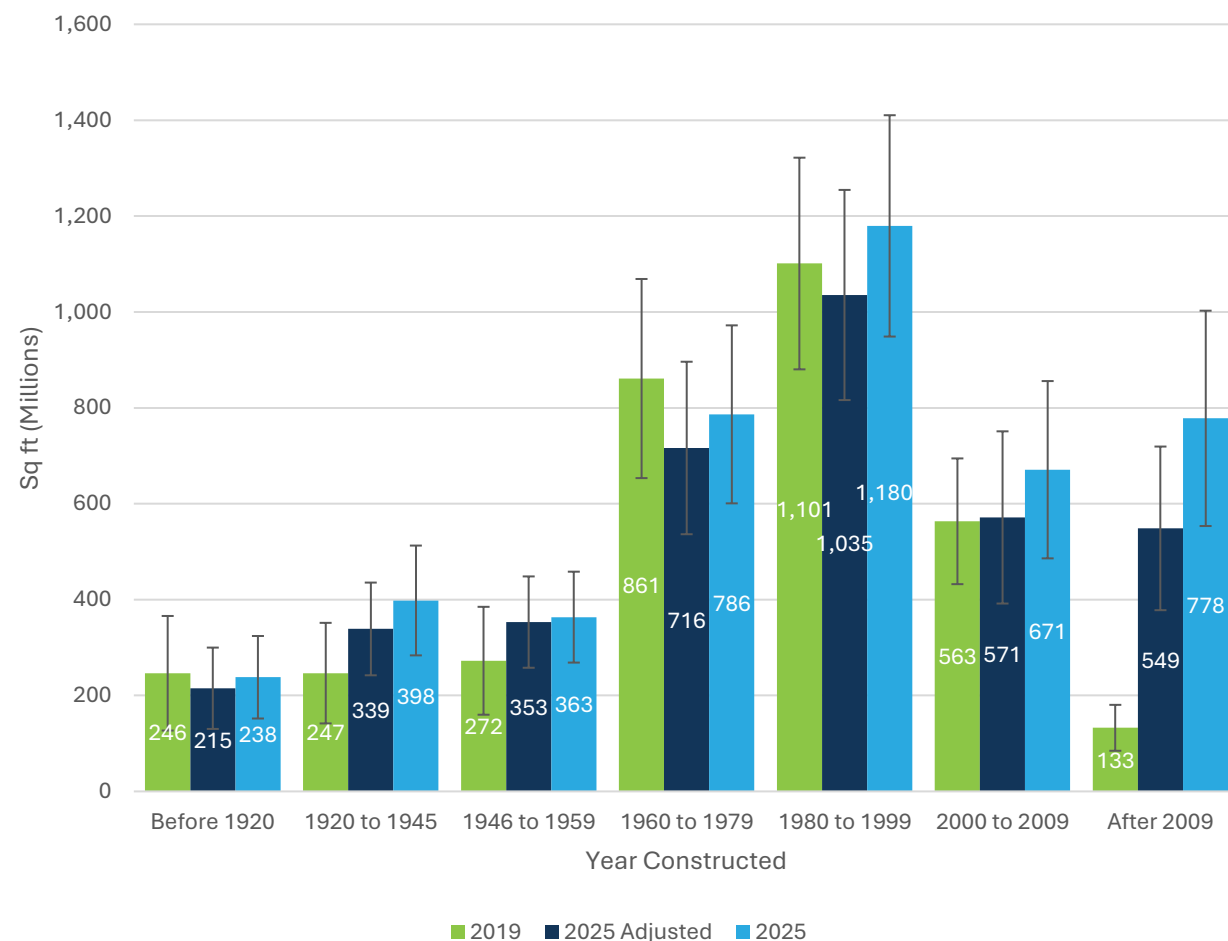
Total Commercial Floor Space



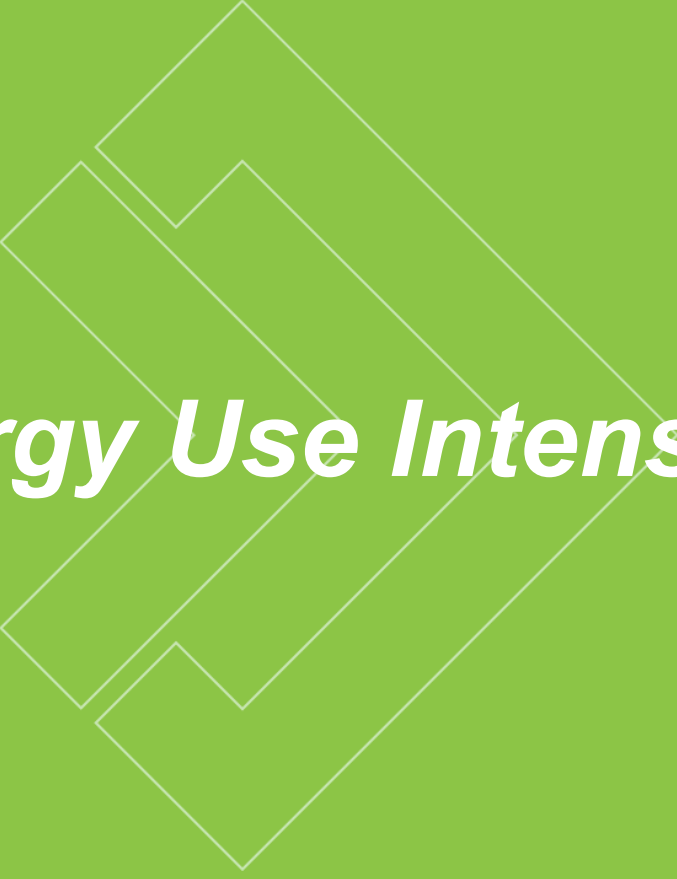
- Increase in estimated floor space in 2025 driven by new eligibility criteria, especially the addition of Multi-Family Residential
- 2025 has increase for Education and Religious Worship activities, and decrease for Retail



Total Commercial Floor Space: Building Age



- Buildings constructed after 1959 represent most of estimated sq ft
- Most building vintages contribute similarly to sq ft in 2019 and 2025, but increase in newer buildings (after 2009)

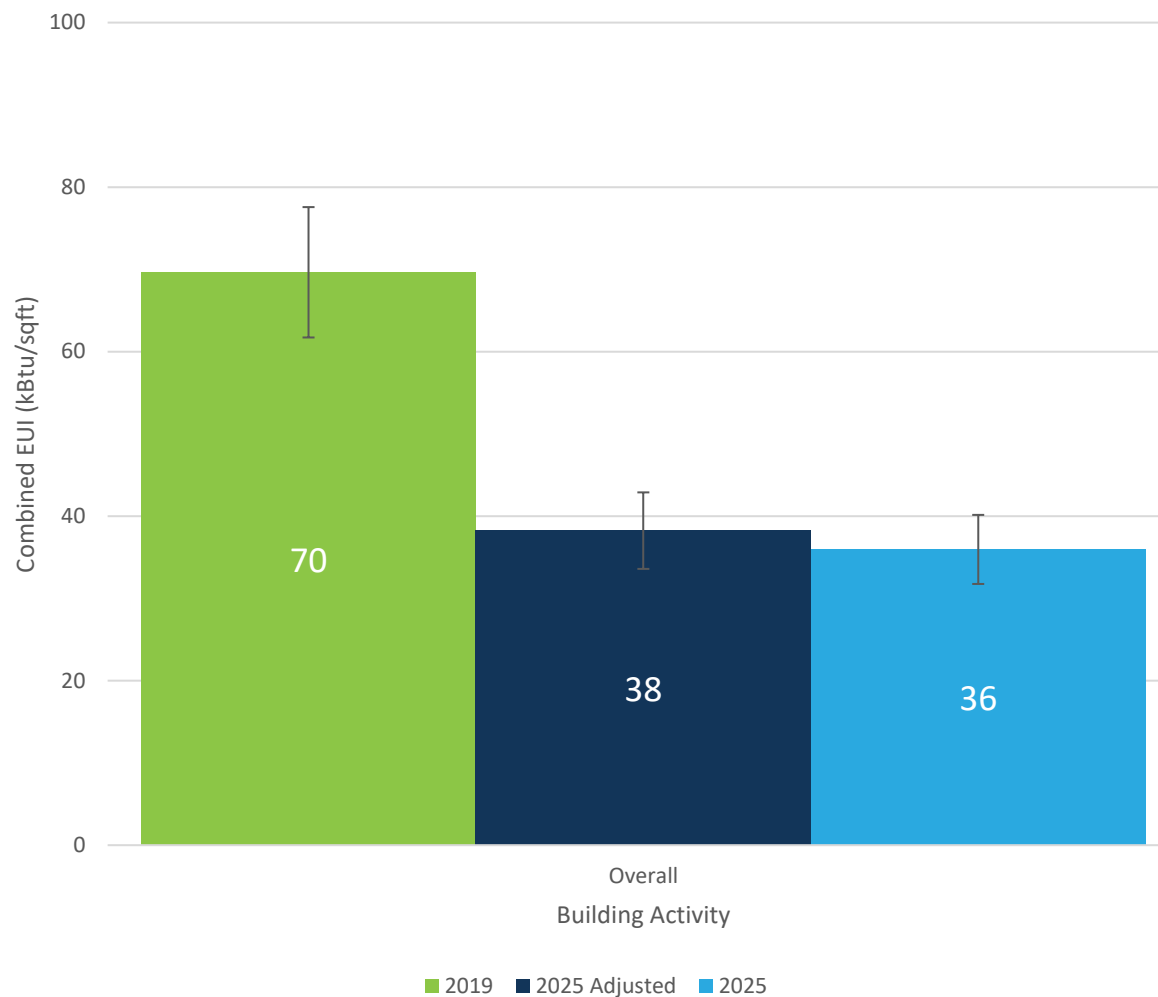


Energy Use Intensities



Average Combined EUI

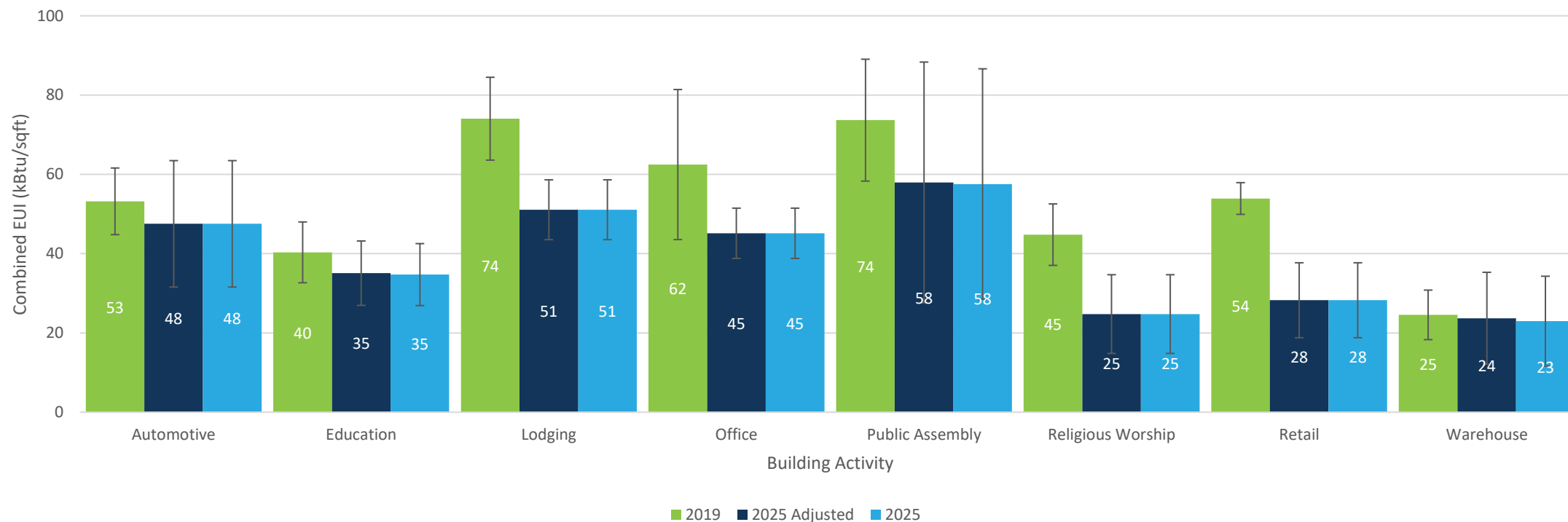
- Overall: Why the significant drop?
 - Change in proportion of participating buildings by primary activity
 - In particular, 2025 had more warehouses and fewer restaurants and hospitals than 2019





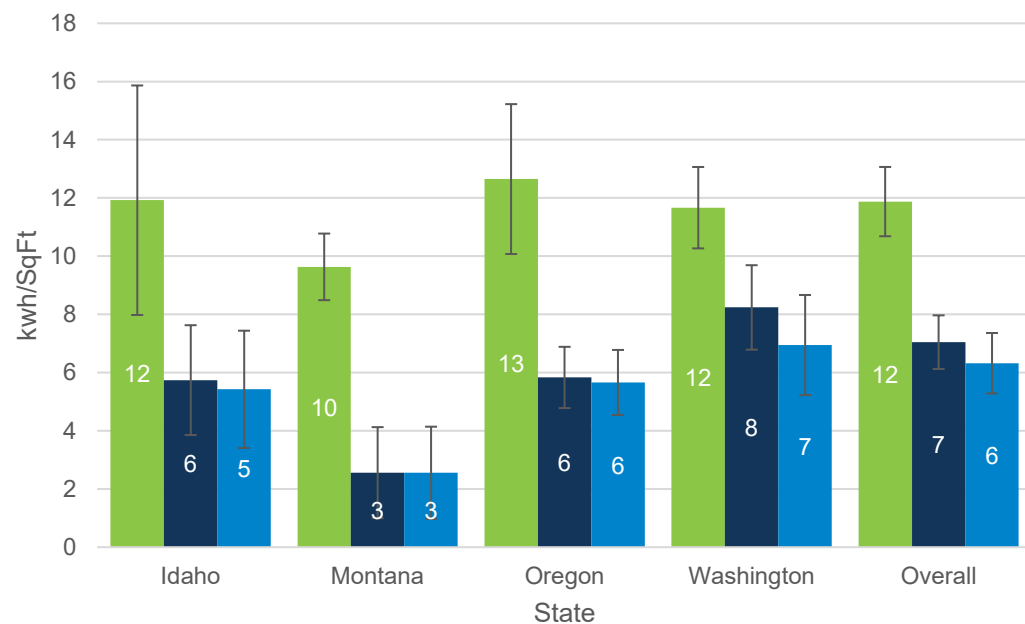
Average Combined EUI by Primary Building Activity

- But while the only statistically significant decreases among primary building activities were in Lodging & Religious Worship, EUI is trending downward from 2019 to 2025 across all activity types



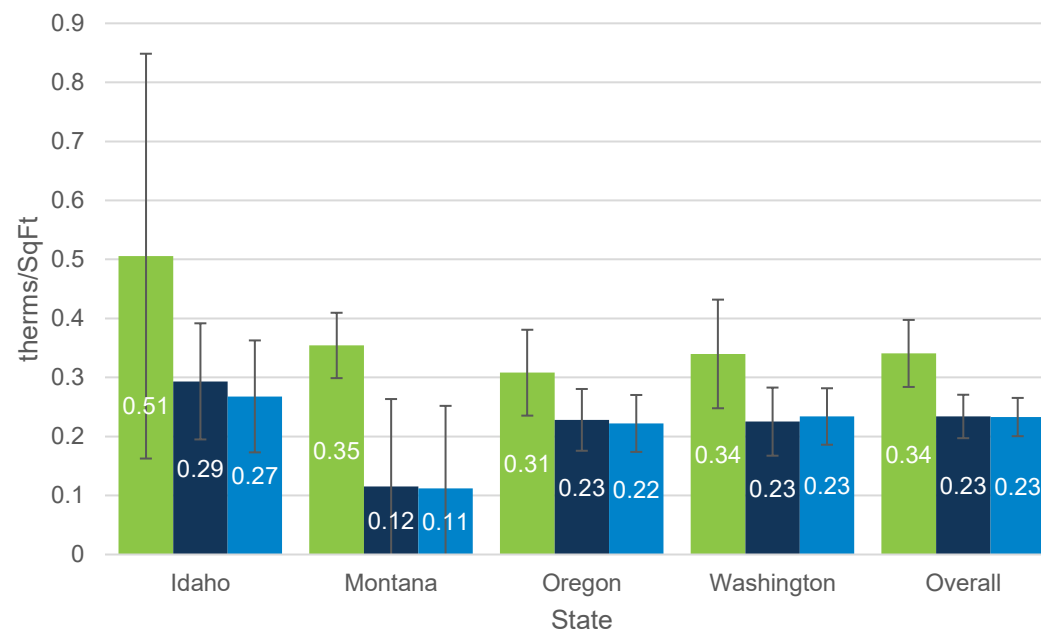
Average EUI by State

- For electric, significant decreases in every state and overall
- For gas, significant decrease only in MT and overall



■ 2019 ■ 2025 Adjusted ■ 2025

Electric



■ 2019 ■ 2025 Adjusted ■ 2025

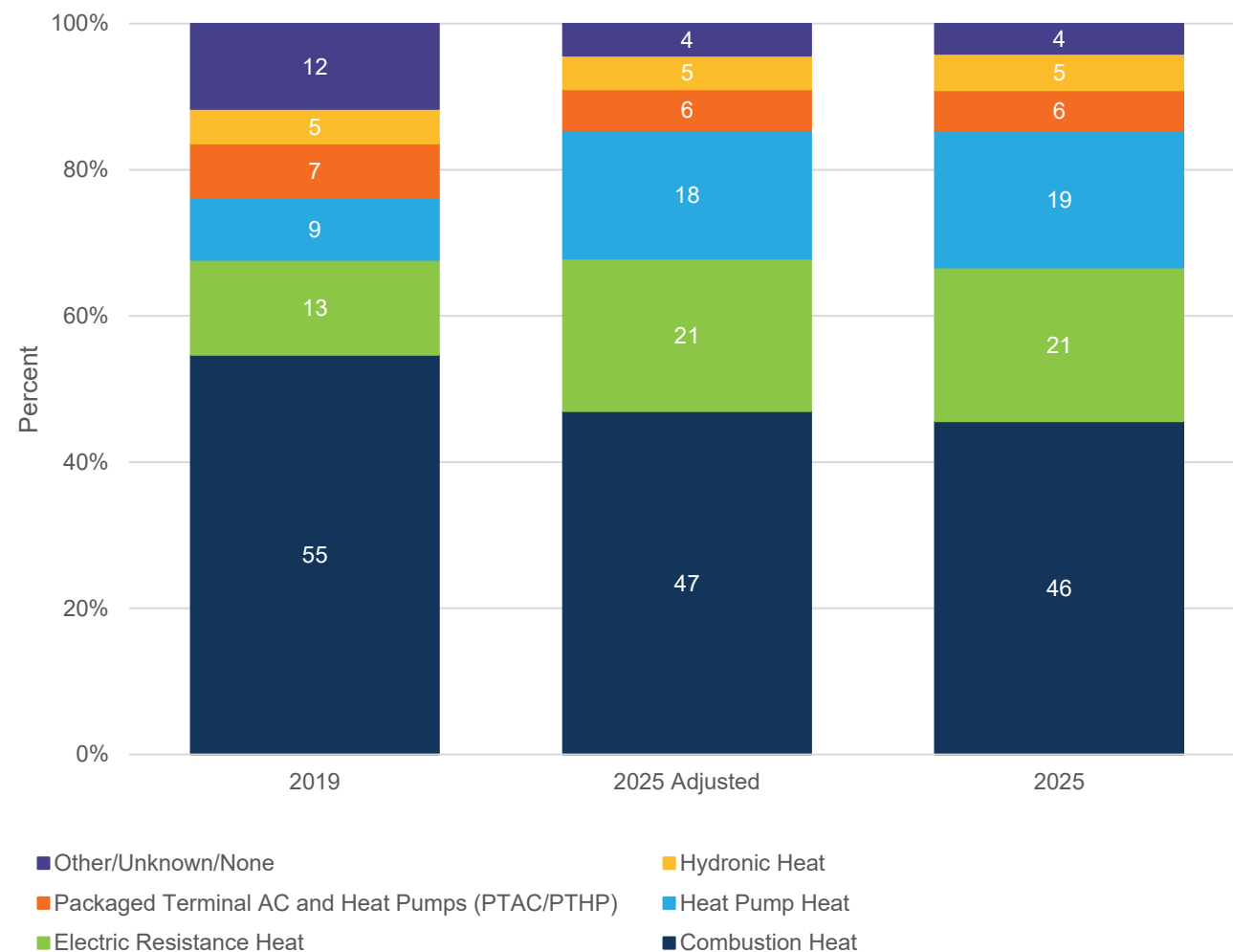
Gas



Heating and Cooling

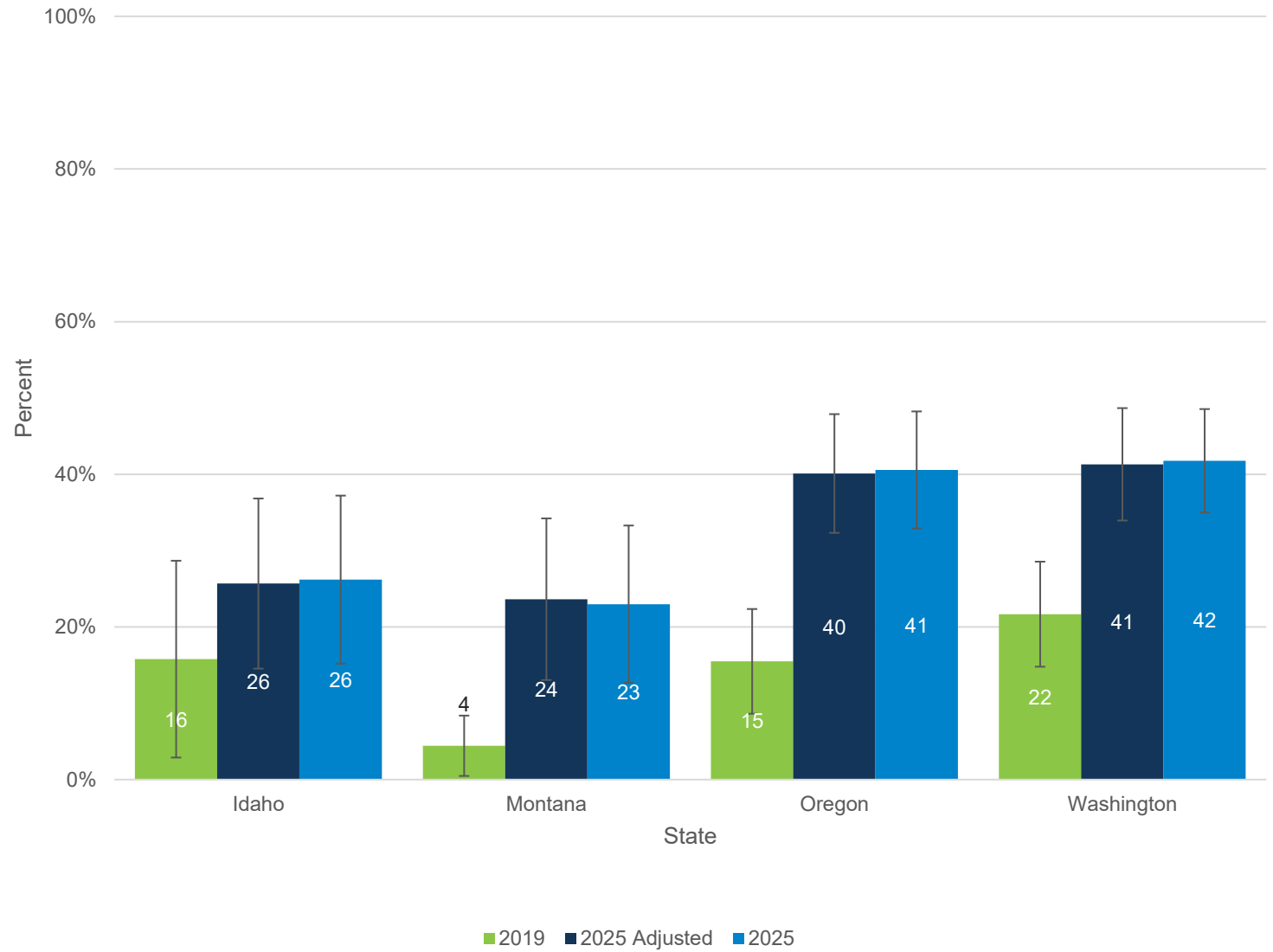


Heating Systems by System Type



- Combustion heating comprised the largest proportion of heating systems
- But fewer systems relied on combustion heating in 2025 than in 2019
- Electric resistance and heat pump heat use increased in 2025

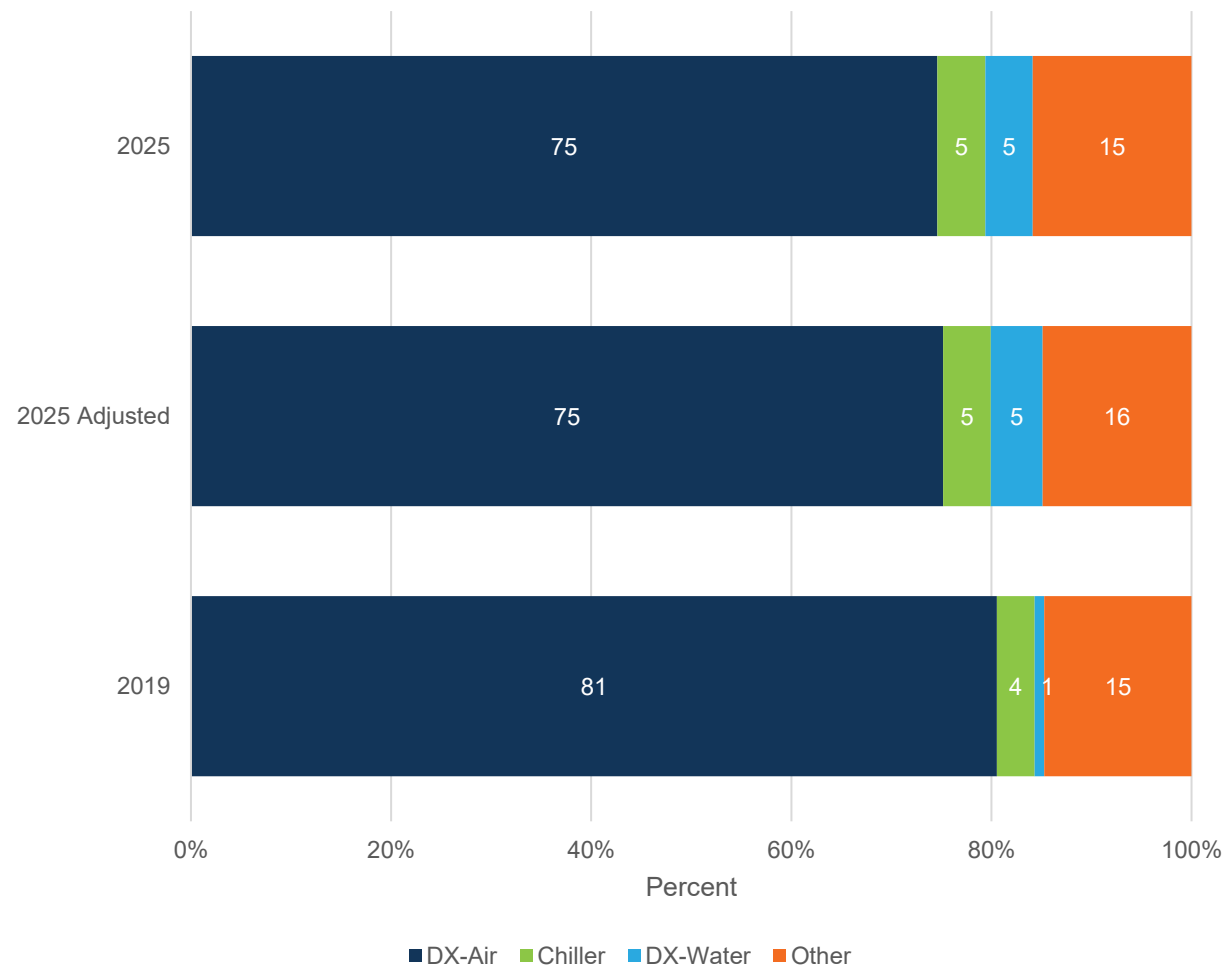
Building Heat Pump Heating by State





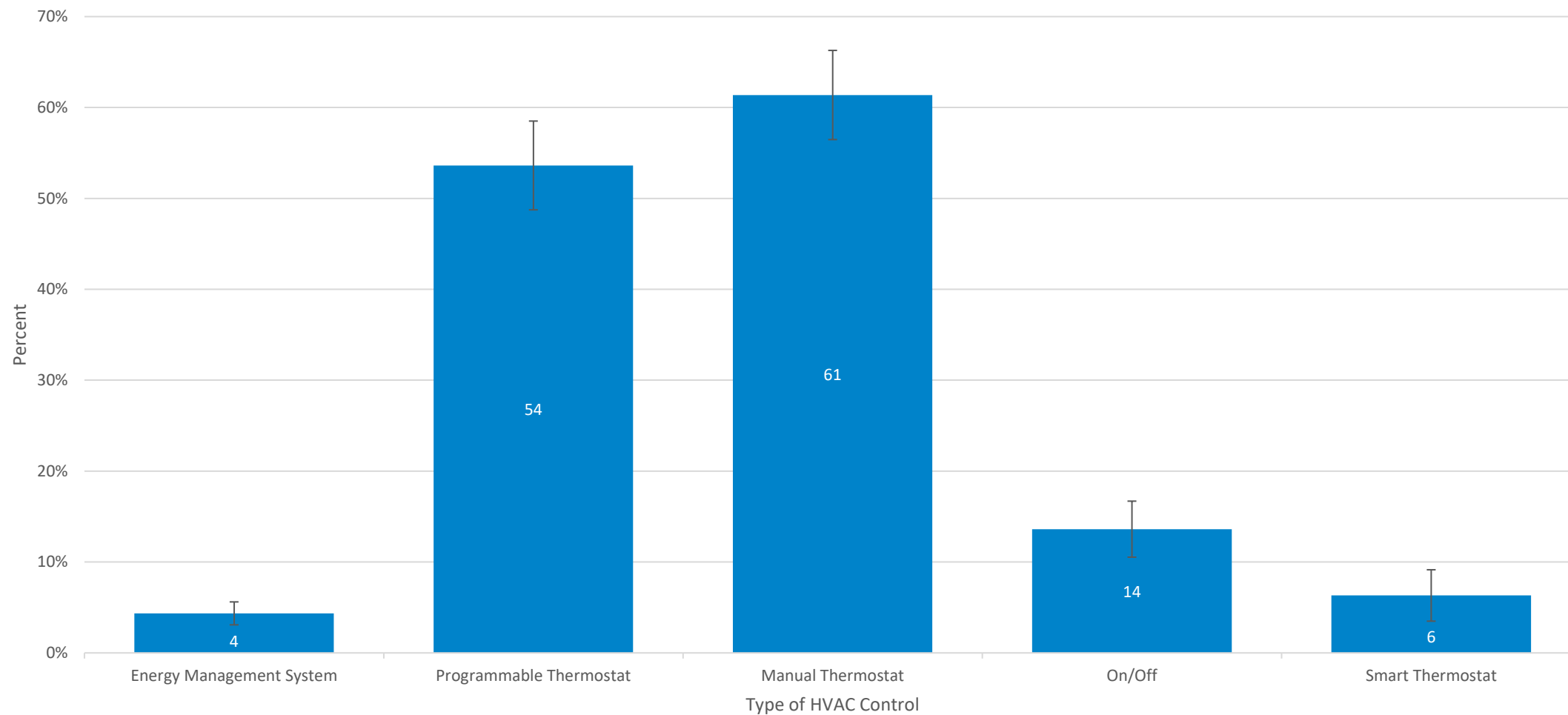
Cooling Systems by Cooling System Type

- In 2025 most common system: air-cooled direct expansion (DX-air)
- Decrease in % of DX-air from 2019 to 2025
- Increase in % of DX-water from 2019 to 2025



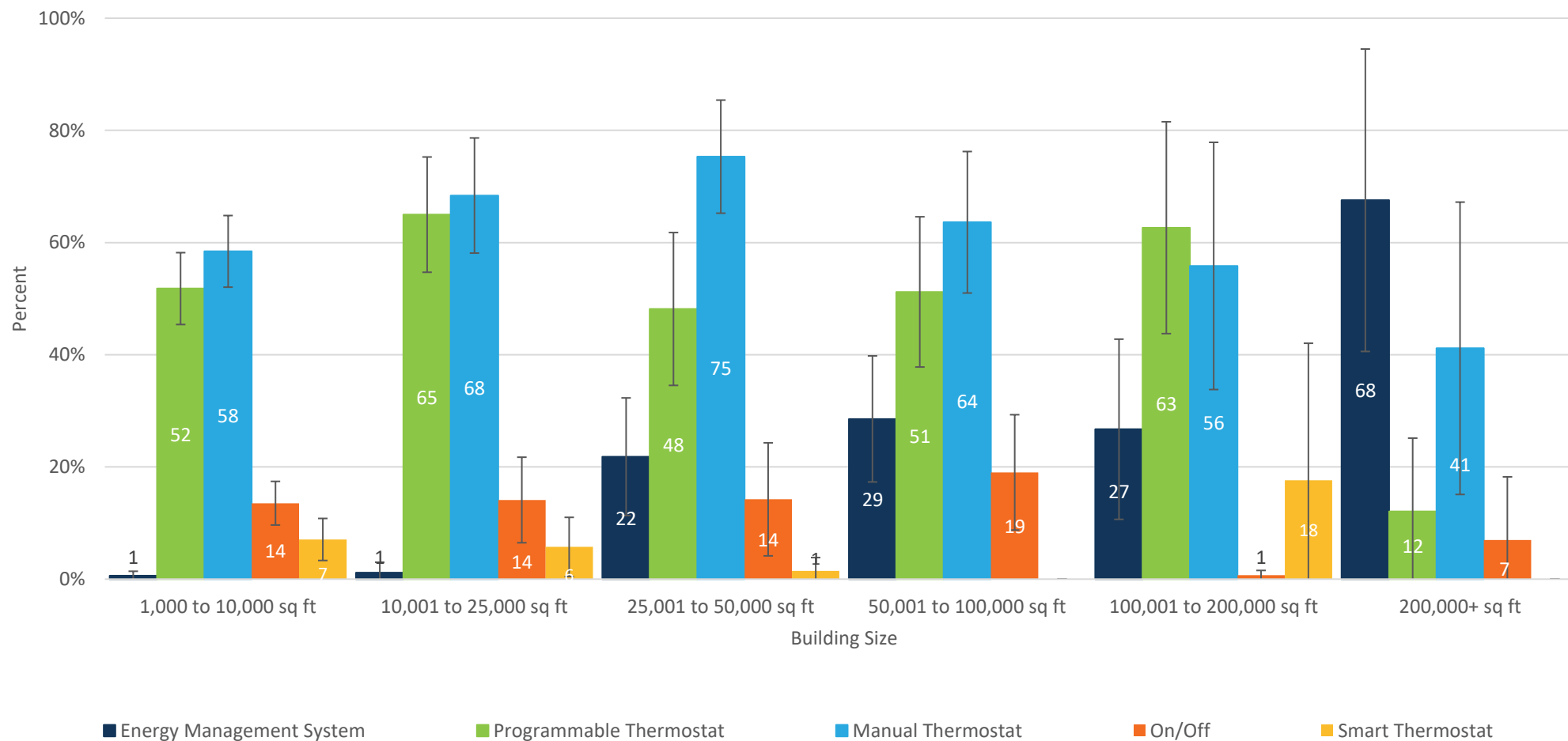


Building HVAC System Control Types





Building HVAC System Control Types by Building Size

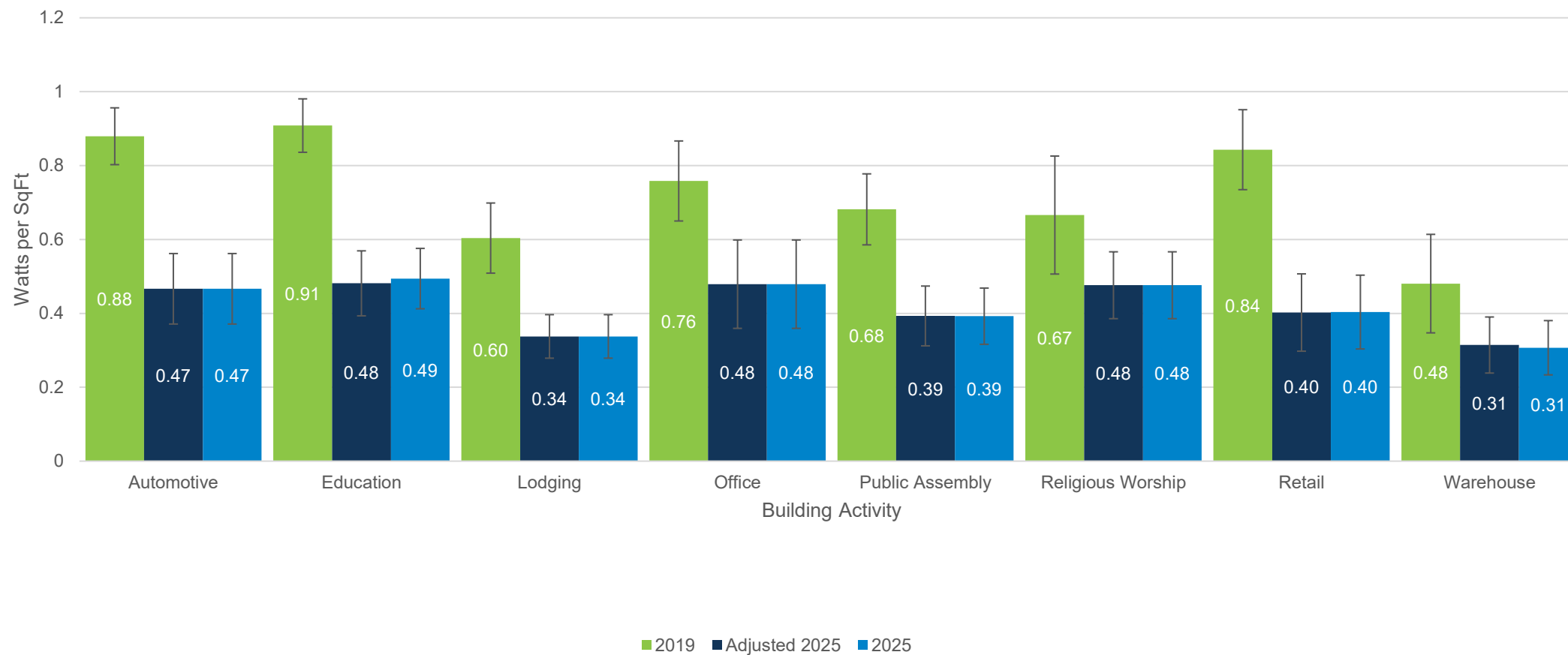




Lighting

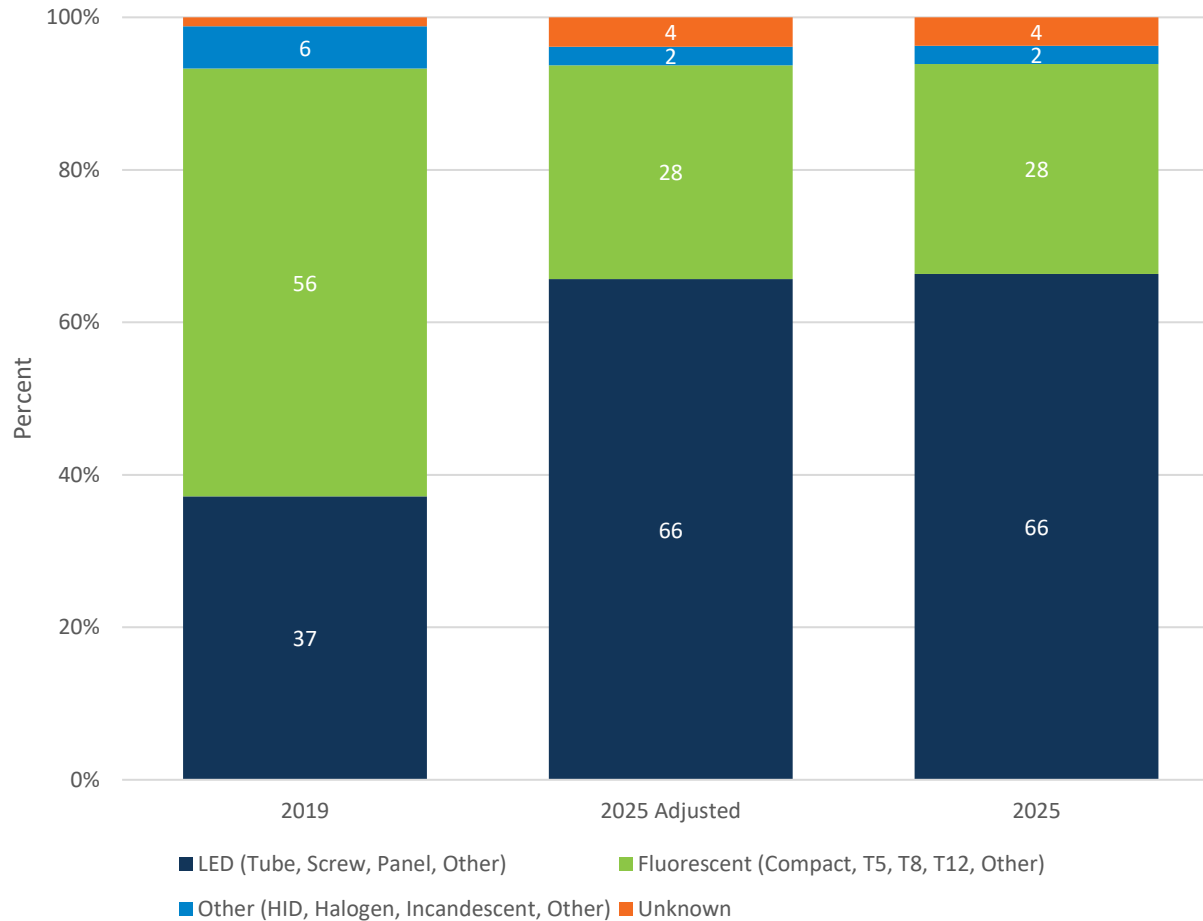


Indoor LPD by Building Activity





Percent of Lighting Fixtures by Lamp Technology

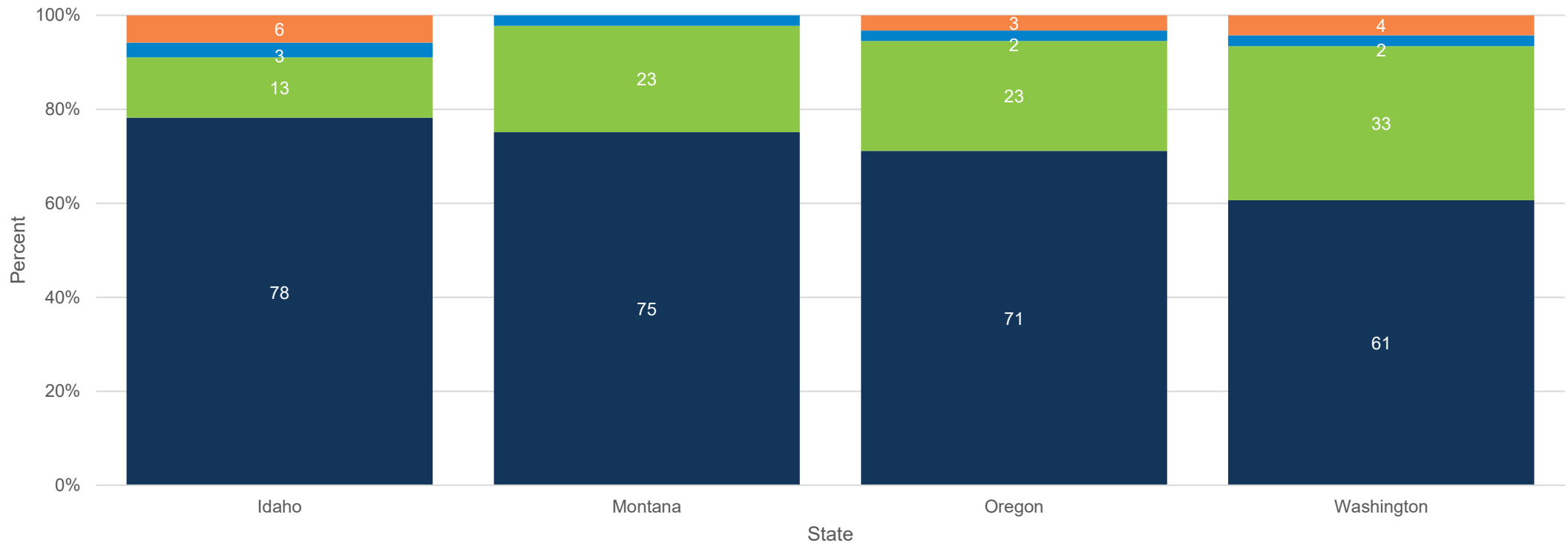


In 2025:

- 66% of fixtures used LEDs
- 30% increase from 2019
- Fluorescent use declined:
 - 28% in 2025
 - 56% in 2019



Percent of Lighting Fixtures by Lamp Technology and State



■ LED (Tube, Screw, Panel, Other)

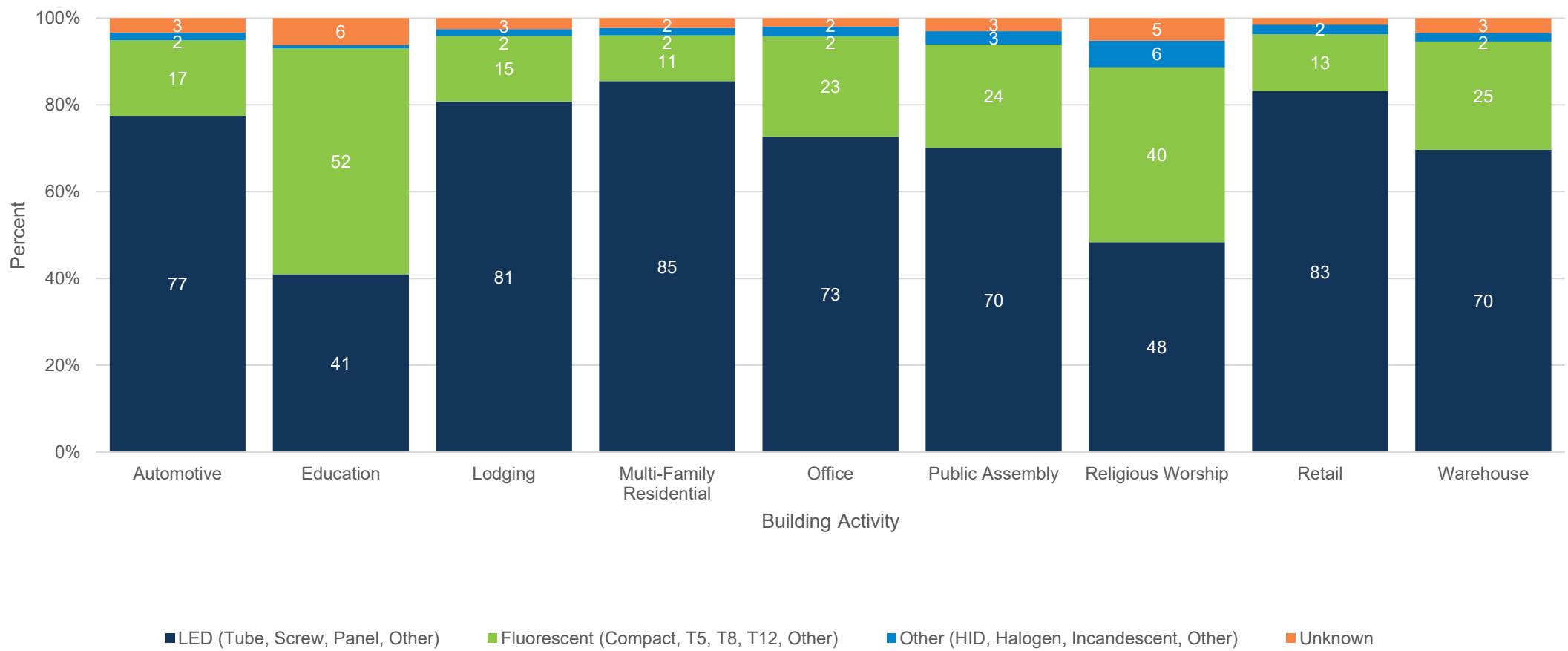
■ Fluorescent (Compact, T5, T8, T12, Other)

■ Other (HID, Halogen, Incandescent, Other)

■ Unknown



Percent of Lighting Fixtures by Lamp Technology and Building Activity

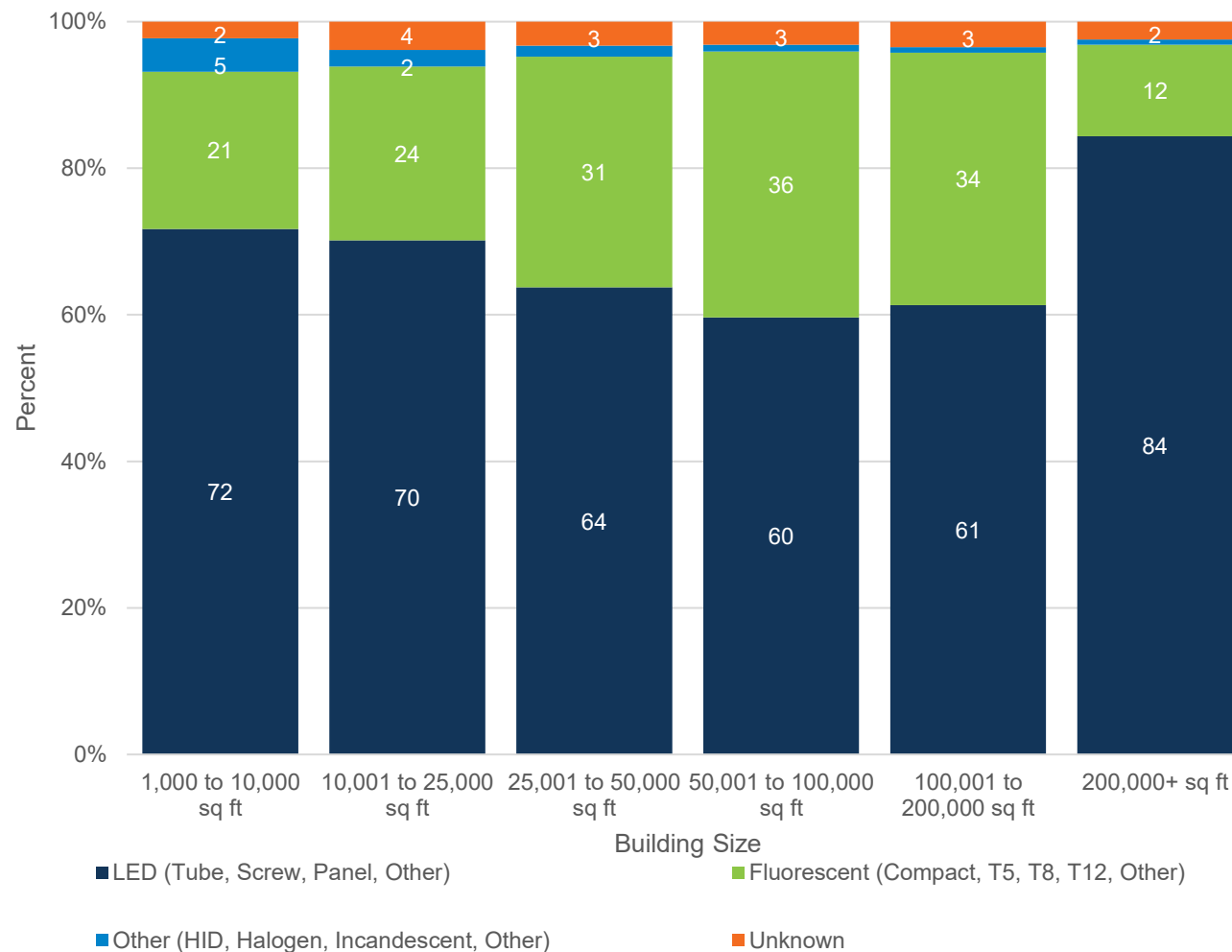




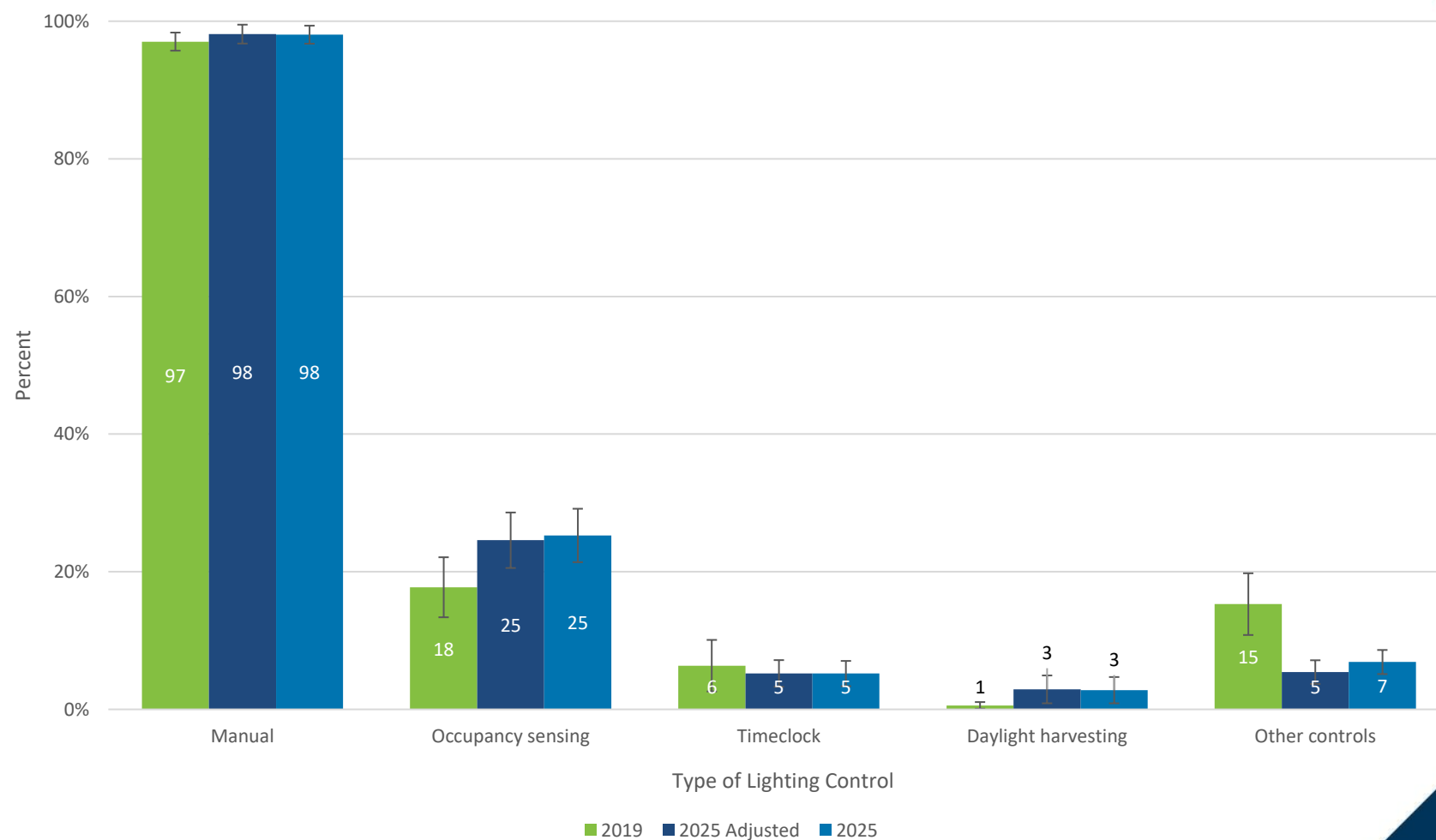
Percent of Lighting Fixtures by Lamp Technology and Building Size

In 2025:

- 84% of fixtures were LED
- 12% of fixtures were fluorescent
- Smaller buildings use less LED and more fluorescent than overall building averages



» *Lighting Control Types*

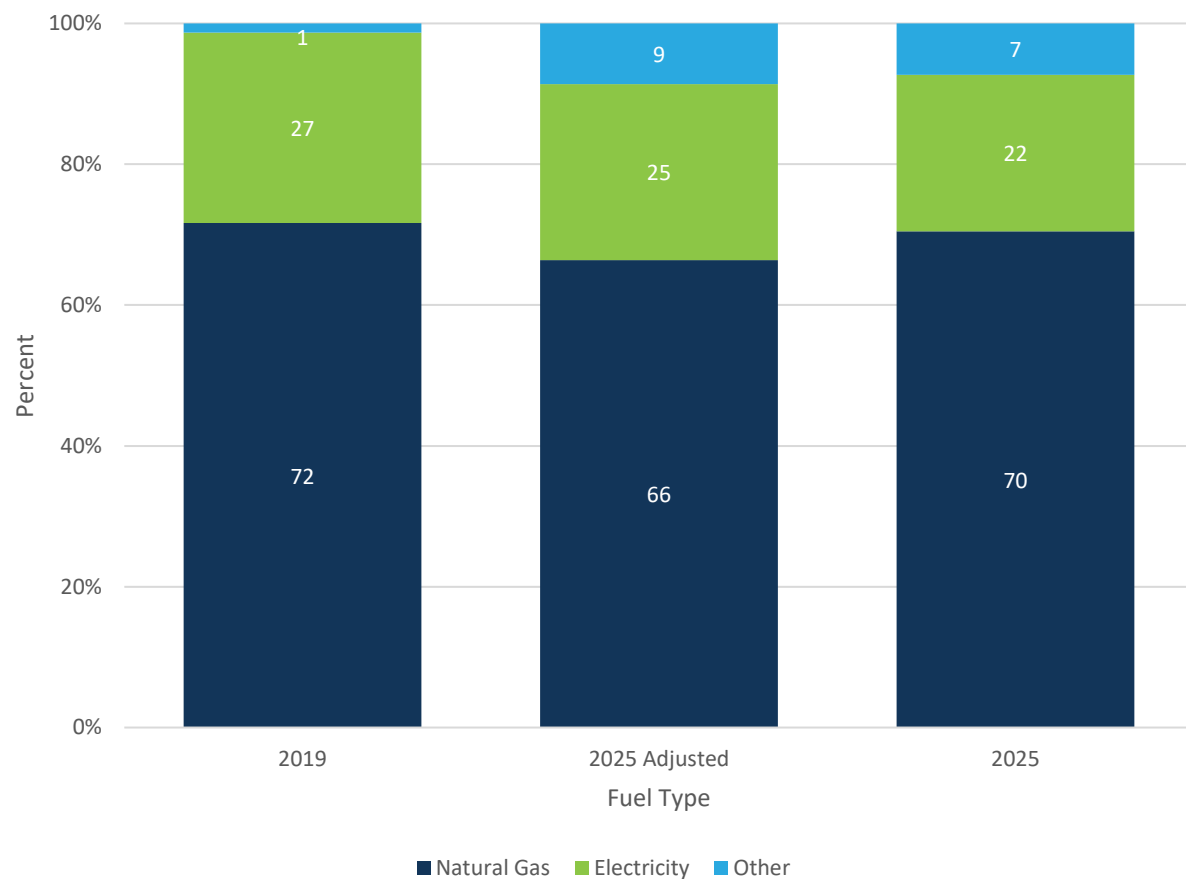




Water Heating



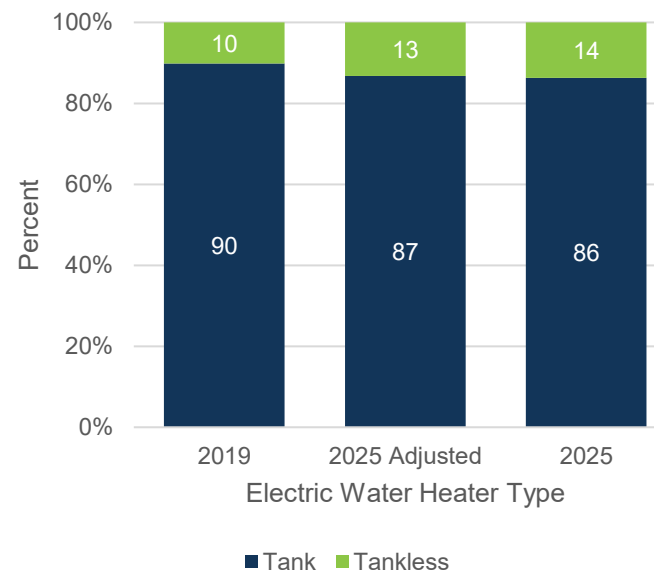
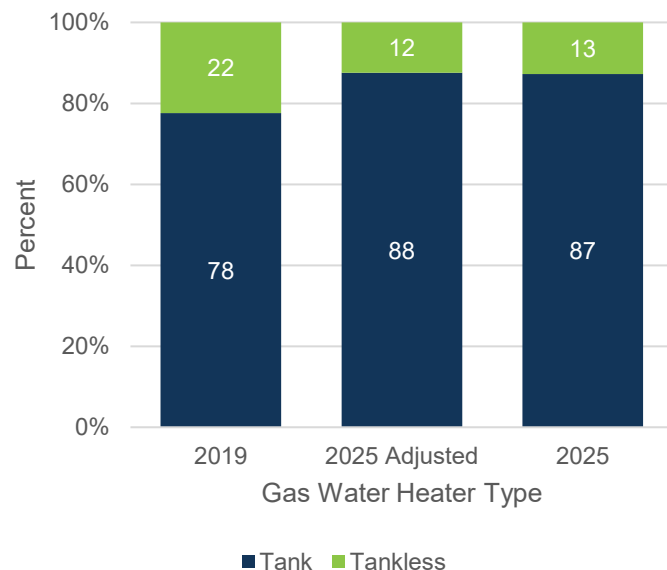
Water Heater Capacity by Fuel Type



- Slight increase in “other” fuel use
- Otherwise, water heater stats remain consistent between cycles



Water Heater Capacity by Fuel Type



- The percentage of water heaters with tanks continues to overshadow the percentage of tankless systems, for both gas and electric water heaters
- There are still very few heat pump water heaters reported, despite increased adoption of heat pump HVAC systems

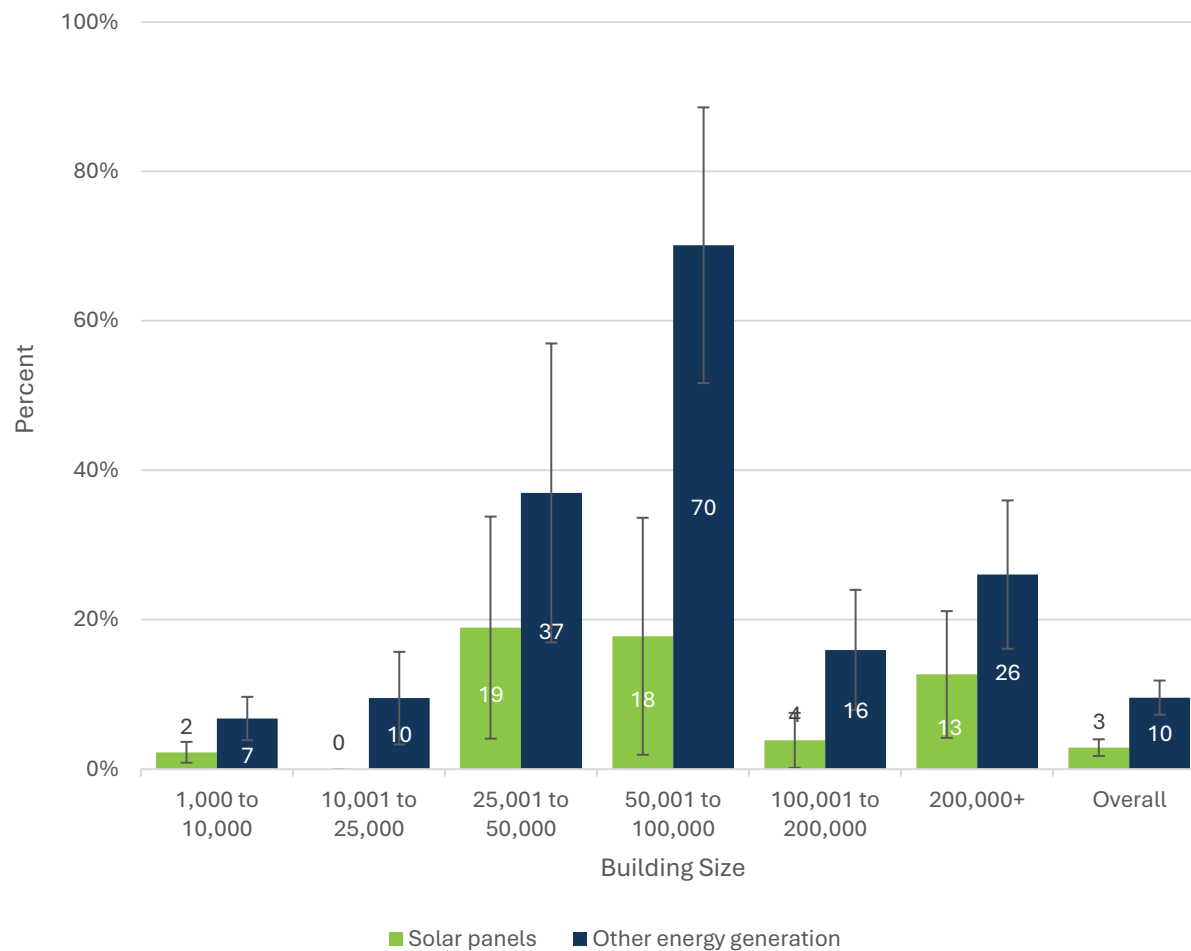


Other Uses and Characteristics

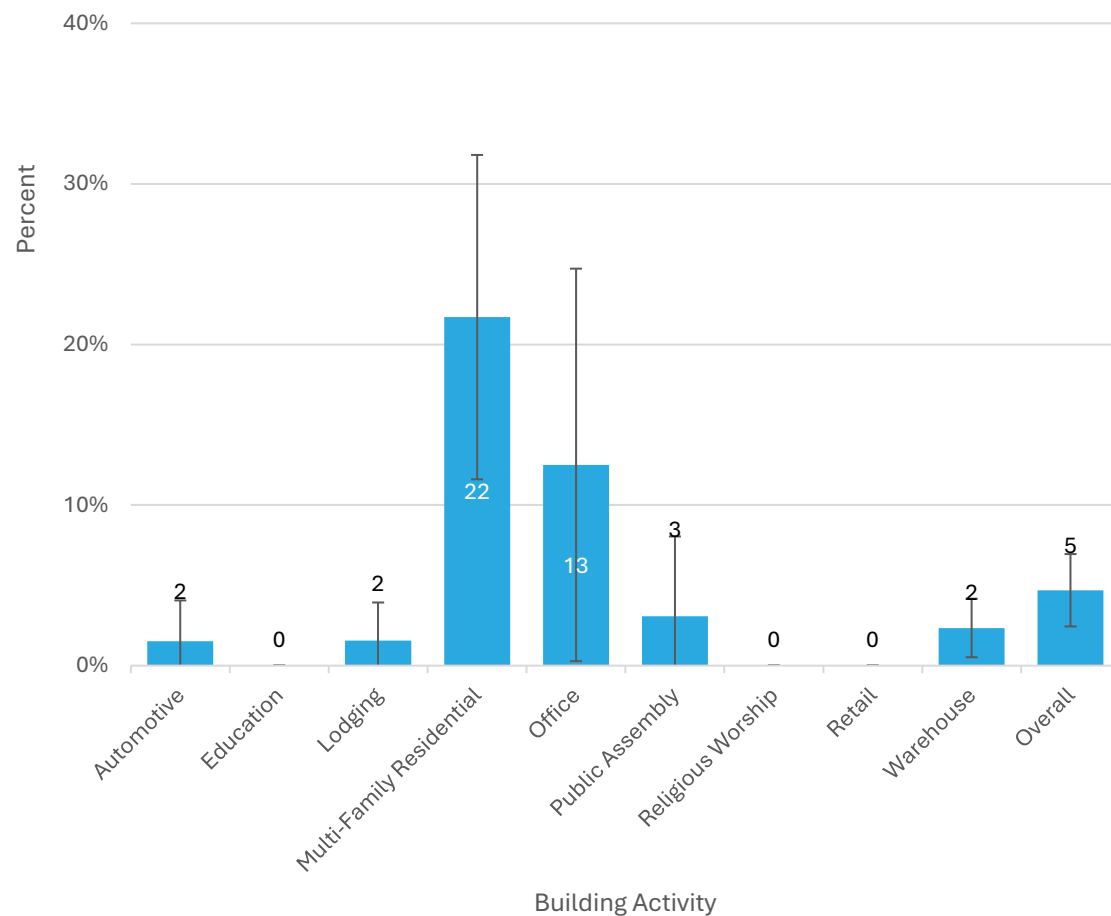


On-site Energy Generation

- “Other energy generation” is predominantly backup generators
- Other energy generation more common than solar energy at all building sizes
- Both more common in larger buildings (25,001+ sq ft)



EV Charging Availability



- 5 percent of buildings overall offered EV charging
 - Slight increase from 3 percent of buildings in 2019
- Most common in Multi-Family Residential (22%)



Lessons Learned



Lessons Learned

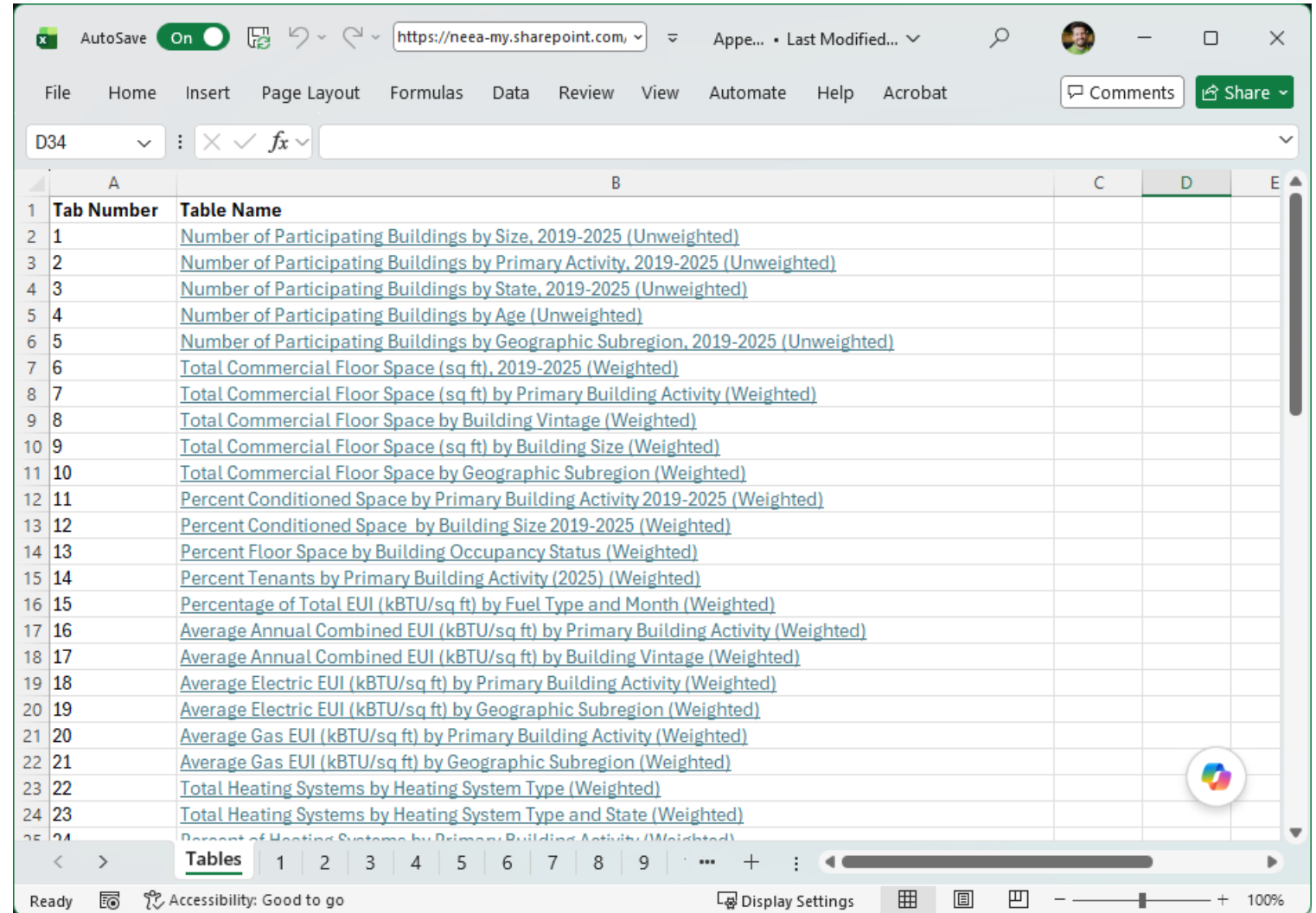
- Virtual listing works. ~80% accuracy in terms of building activity type, ~90% accuracy in terms of size, and it identified an additional 20% of buildings not present in third party building data.
- In-person recruiting supports response rates around 10%.
- Large buildings remain particularly challenging to recruit.



Resources

Report Data

Appendix A spreadsheet provides data behind all report figures



Tab Number	Table Name
1	Number of Participating Buildings by Size, 2019-2025 (Unweighted)
2	Number of Participating Buildings by Primary Activity, 2019-2025 (Unweighted)
3	Number of Participating Buildings by State, 2019-2025 (Unweighted)
4	Number of Participating Buildings by Age (Unweighted)
5	Number of Participating Buildings by Geographic Subregion, 2019-2025 (Unweighted)
6	Total Commercial Floor Space (sq ft), 2019-2025 (Weighted)
7	Total Commercial Floor Space (sq ft) by Primary Building Activity (Weighted)
8	Total Commercial Floor Space by Building Vintage (Weighted)
9	Total Commercial Floor Space (sq ft) by Building Size (Weighted)
10	Total Commercial Floor Space by Geographic Subregion (Weighted)
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12	Percent Conditioned Space by Building Size 2019-2025 (Weighted)
13	Percent Floor Space by Building Occupancy Status (Weighted)
14	Percent Tenants by Primary Building Activity (2025) (Weighted)
15	Percentage of Total EUI (kBtu/sq ft) by Fuel Type and Month (Weighted)
16	Average Annual Combined EUI (kBtu/sq ft) by Primary Building Activity (Weighted)
17	Average Annual Combined EUI (kBtu/sq ft) by Building Vintage (Weighted)
18	Average Electric EUI (kBtu/sq ft) by Primary Building Activity (Weighted)
19	Average Electric EUI (kBtu/sq ft) by Geographic Subregion (Weighted)
20	Average Gas EUI (kBtu/sq ft) by Primary Building Activity (Weighted)
21	Average Gas EUI (kBtu/sq ft) by Geographic Subregion (Weighted)
22	Total Heating Systems by Heating System Type (Weighted)
23	Total Heating Systems by Heating System Type and State (Weighted)
24	Percent of Heating Systems by Primary Building Activity (Weighted)

User Guide

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Thank You!



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