

April 24, 2025

HPWH Opportunities in Light Commercial Applications

Utility Energy Forum 2025



Agenda

- Northwest Water Heating Market Characterization
- Commercial Market Solutions
- Commercial Opportunities and Barriers



Learning Objectives

- Learn about the opportunities for residential-style and commercial HPWH in *light* commercial applications
- Understand how building characteristics, hot water use patterns, and existing water heater systems inform which HPWH system is the right fit for a commercial building
- Discuss the opportunities and barriers to HPWH in *light* commercial applications

Northwest Water Heating Market Characterization

Improve understanding of the opportunities
and gaps in commercial market

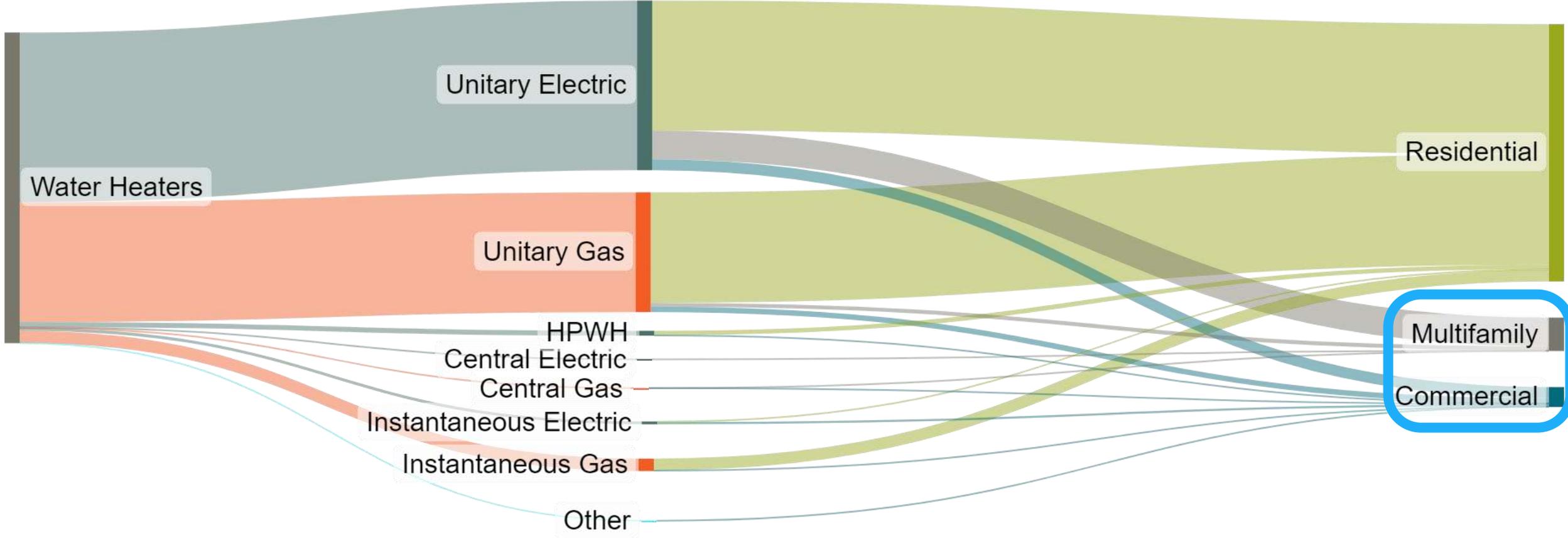


The largest quantity of water heaters in the market are in single family homes.

Number of water heater units in the Northwest

Equipment Type

Sector



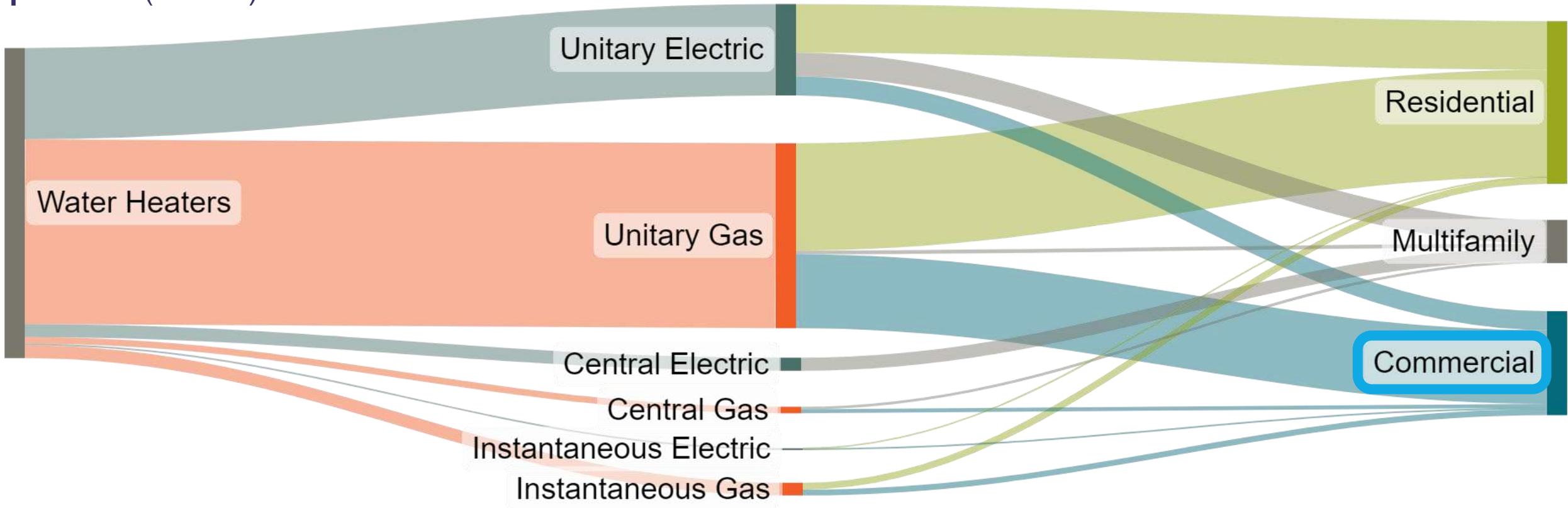


Multifamily and commercial spaces have a significant portion of the total potential energy savings.

Energy savings potential (MMBtu) in the Northwest

Equipment Type

Sector



Commercial Market Solutions

Opportunities outside of the multifamily,
central HPWH market

Central HPWHs are an ideal solution for some but not all commercial applications.

Building Type	DHW Loads	Recirculation	Large Capacity	Multiple Tanks	Good Opportunity for Central?
Multifamily (NC)	High	☑	☑	☑	Yes
Lodging	High	☑	☑	☑	Yes
Grocery	High	☒	☑/☒	☒	Better suited for unitary
Restaurants	High	☒	☒	☒	Better suited for unitary
Residential Care	High	☑	☑	☑	Yes
Hospital	Med	☑	☑	☑	Yes, but custom
School	Med	☑	☑/☒	☑	Maybe
Office	Low	☒	☒	☑/☒	No
Retail/Service	Low	☒	☒	☒	No
Warehouse	Low	☒	☒	☒	No



Commercial HPWH Terminology

Split System

Residential (Consumer)



Integrated

Commercial



Light commercial HPWH

is either a residential-style water heater less than 120 gallons used in commercial applications or an integrated (or unitary) 120-gallon commercial water heater.

Commercial Split System ("Central HPWH" or "Built-Up")



Central HPWH

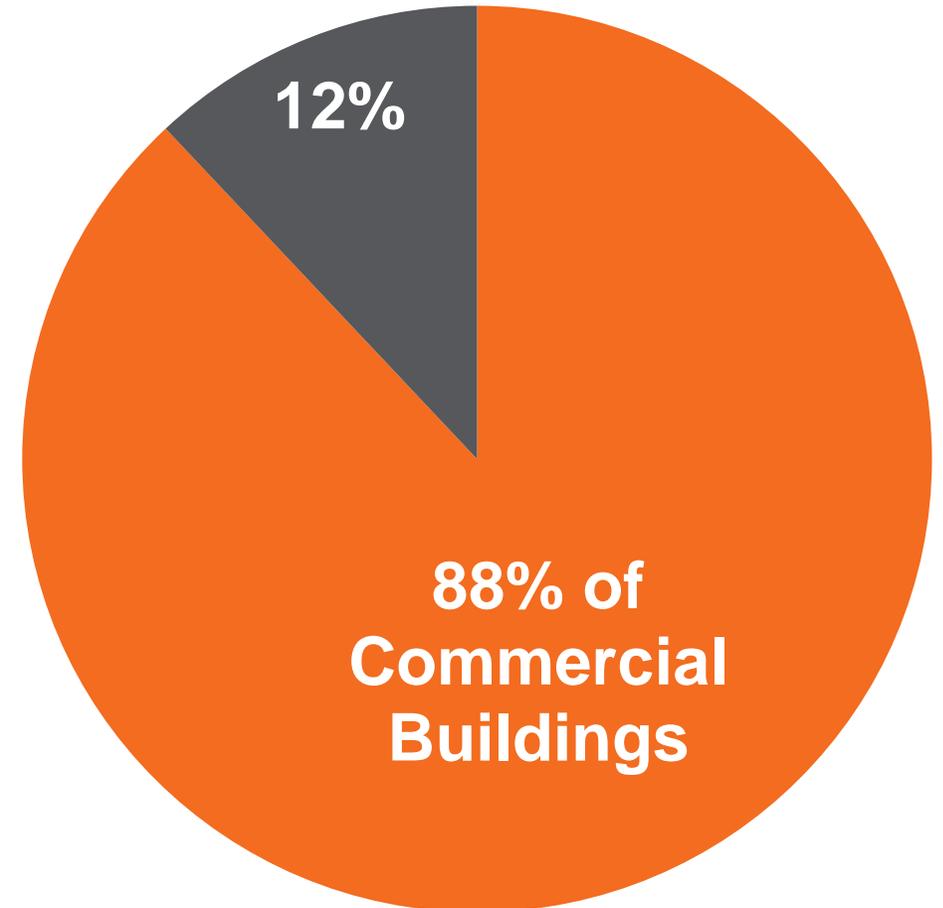
describes a commercial split system or built-up system that would typically replace a central domestic hot water boiler or water heater larger than 120 gallons.

Commercial HPWH Solutions Framework

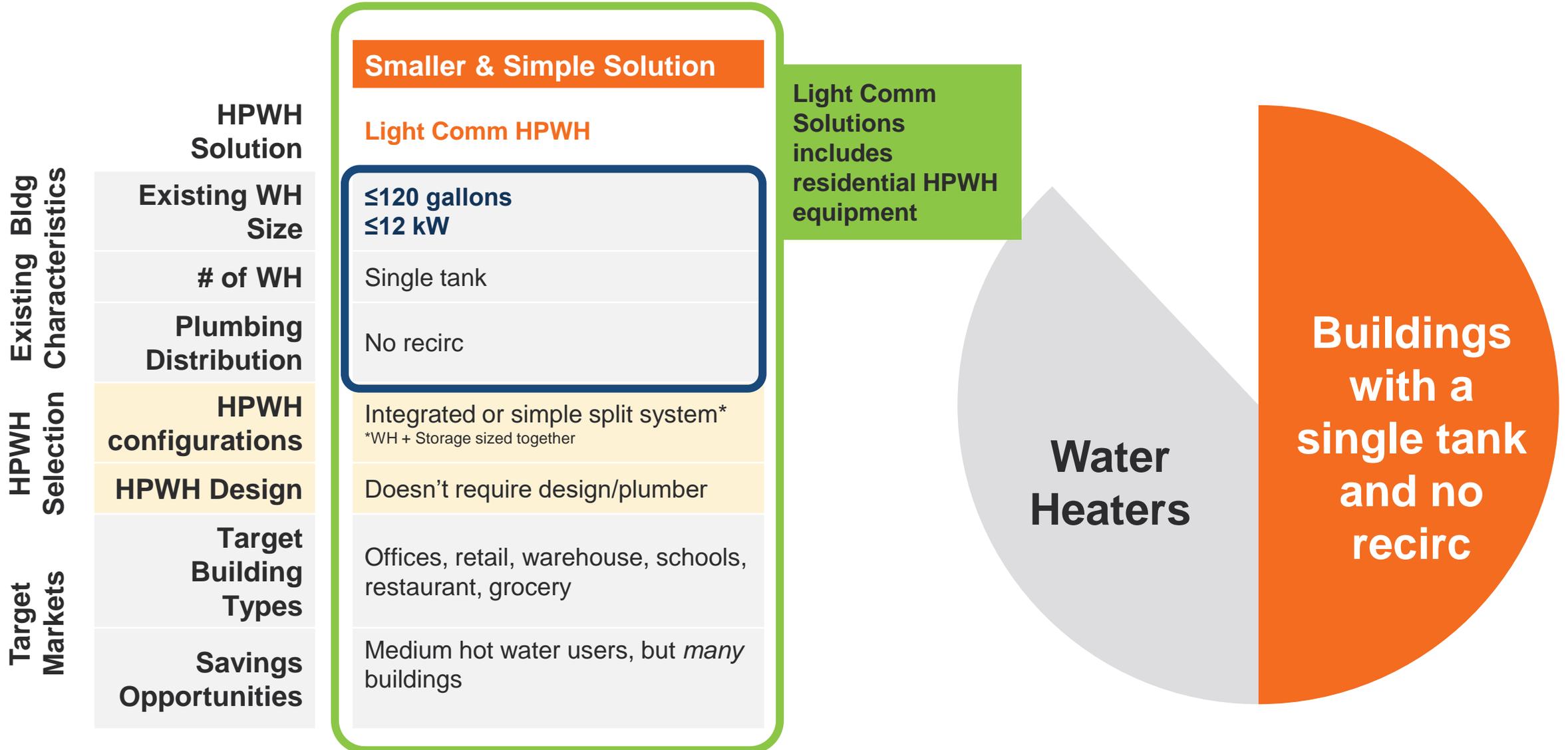
		Smaller & Simple Solution	Medium Size & Complexity	Large Size & More Complex	
Target Markets	HPWH Solution	Light Comm HPWH	Light Comm Solutions includes residential HPWH equipment	Central HPWH	
	Existing Bldg Characteristics				
	Existing WH Size	≤120 gallons ≤12 kW		>120 gallons >12 kW	
	# of ST	Single tank	Single tank or multiple tanks	Single tank or multiple tanks	
	Plumbing Distribution	No recirc	With or without Recirc	Recirc	
	HPWH Selection	HPWH configurations	Integrated or simple split system *WH + Storage sized together	Integrated or simple split system Could include a swing tank, larger storage tank	Split system, with or without swing tank, single or multi-pass
	HPWH Design	Doesn't require design/plumber	Could include some design	Are always designed systems	
Target Markets	Target Building Types	Offices, retail, warehouse, schools, restaurant, grocery	Not building-type specific	Multifamily, lodging, residential care, hospitals	
	Savings Opportunities	Medium hot water users, but <i>many</i> buildings	High hot water users but less complex systems	High hot water users	

88% of existing commercial buildings have a water heater that is ≤ 120 gallons and ≤ 12 kW

		Smaller & Simple Solution
	HPWH Solution	Light Comm HPWH
Existing Bldg Characteristics	Existing WH Size	≤ 120 gallons ≤ 12 kW
	# of WH	Single tank
	Plumbing Distribution	No recirc
HPWH Selection	HPWH configurations	Integrated or simple split system* <small>*WH + Storage sized together</small>
	HPWH Design	Doesn't require design/plumber
Target Markets	Target Building Types	Offices, retail, warehouse, schools, restaurant, grocery
	Savings Opportunities	Medium hot water users, but <i>many</i> buildings



50% of the existing commercial buildings also only have a single tank with no recirculation



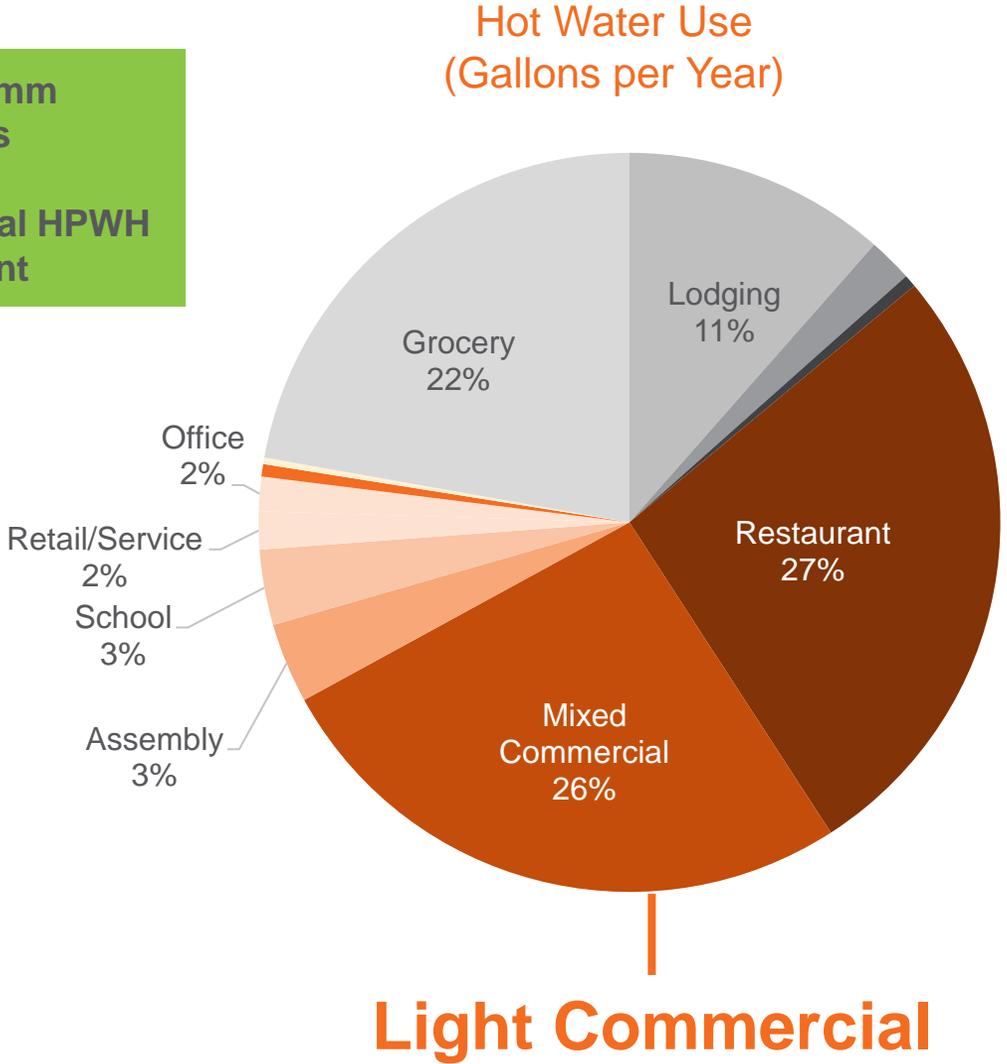
More than 60% of northwest commercial hot water usage could be met with a simple light commercial HPWH solutions

Target Markets	HPWH Solution	
	Existing Bldg Characteristics	
HPWH Selection	Existing WH Size	≤120 gallons ≤12 kW
	# of WH	Single tank
HPWH Design	Plumbing Distribution	No recirc
	HPWH configurations	Integrated or simple split system* <small>*WH + Storage sized together</small>
Target Markets	HPWH Design	Doesn't require design/plumber
	Target Building Types	Offices, retail, warehouse, schools, restaurant, grocery
	Savings Opportunities	Medium hot water users, but <i>many</i> buildings

Smaller & Simple Solution

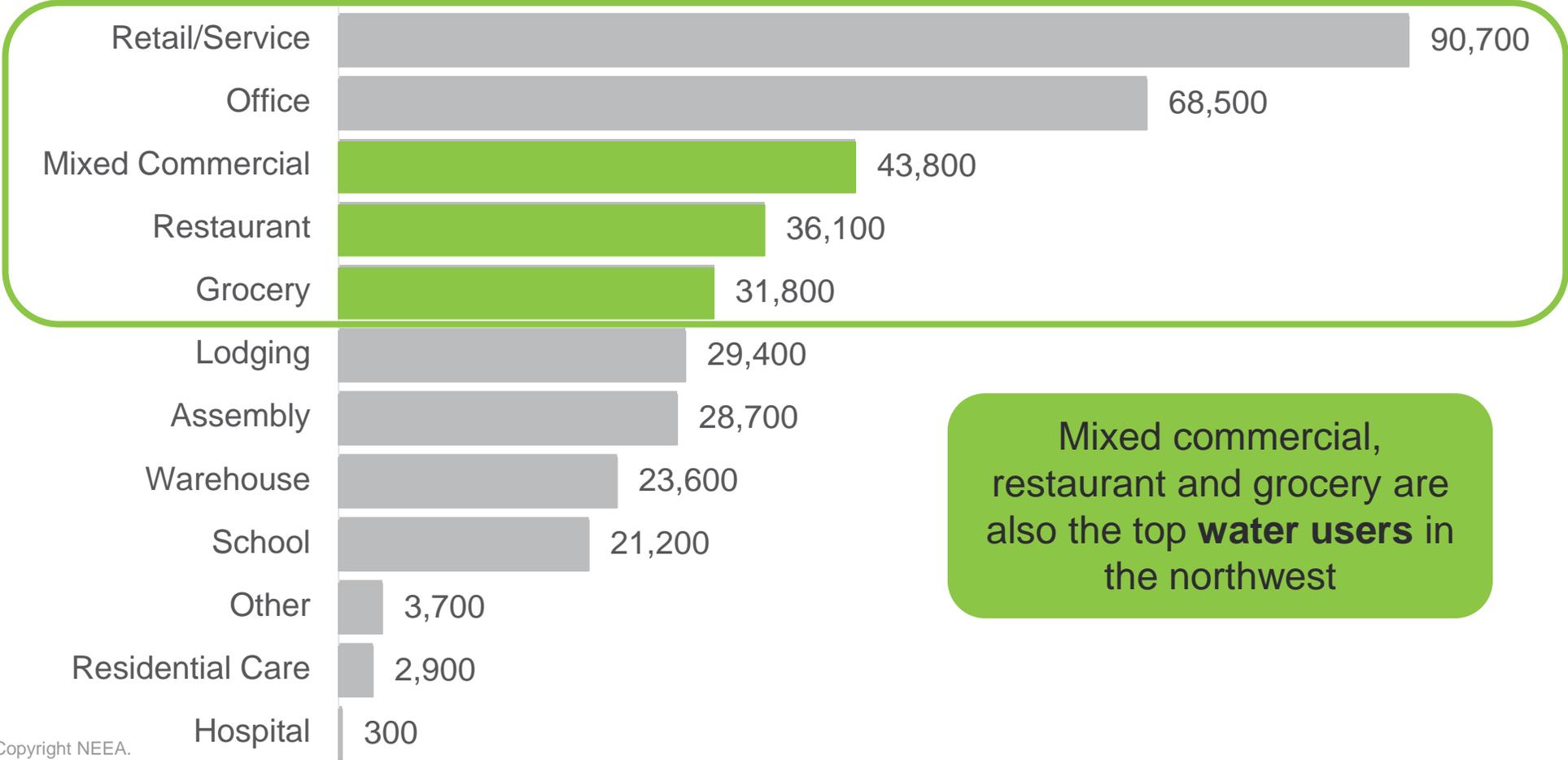
Light Comm HPWH

Light Comm Solutions includes residential HPWH equipment



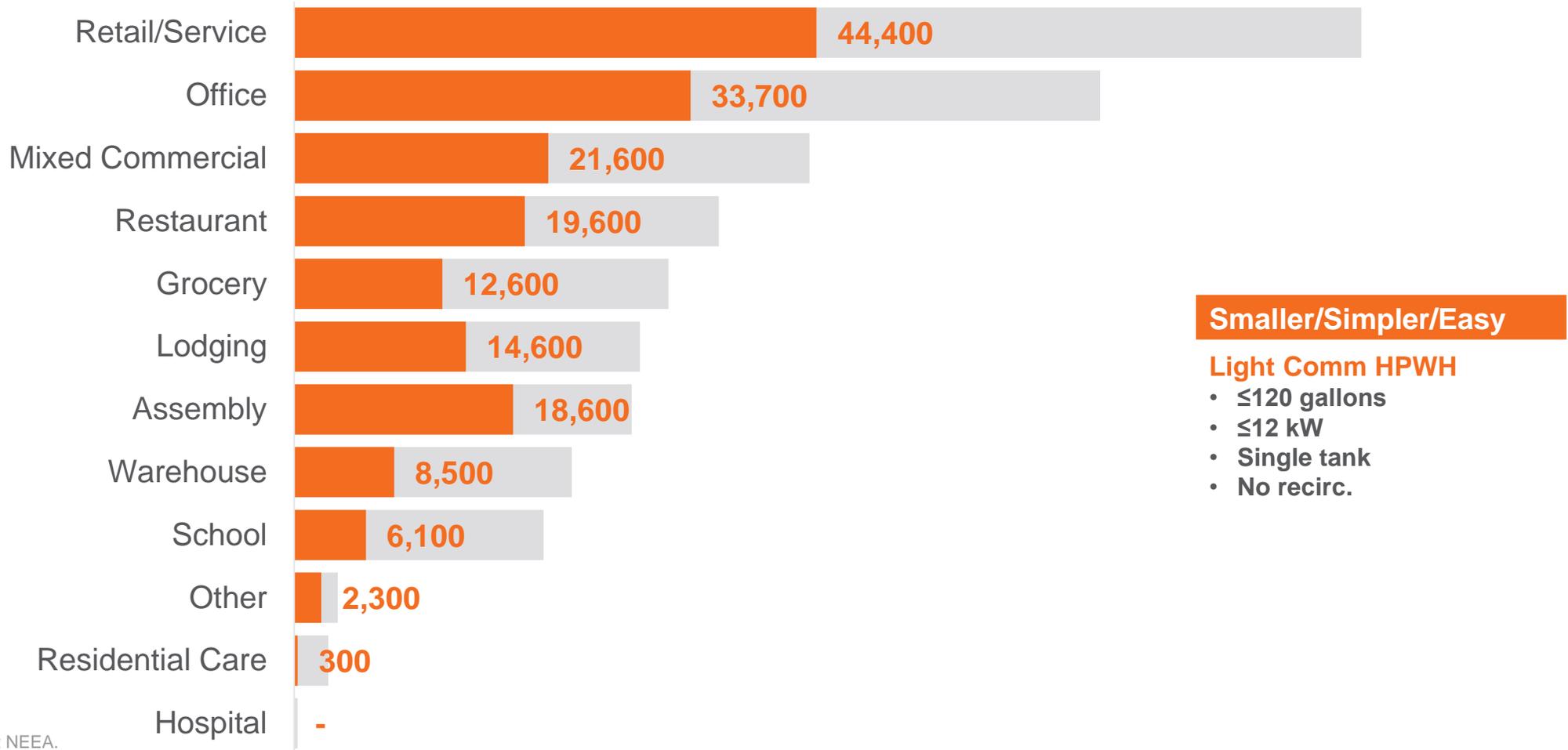


Retail/Service, Office, Mixed Commercial, Restaurant, and Grocery buildings in the northwest have the most water heaters





Retail, Office, Mixed Commercial, Restaurants, and Assembly have the most opportunity for a simple/easy solution



Commercial HPWH Barriers

Market barriers and considerations when selecting, sizing, and installing light commercial HPWH solutions



Barriers do exist for light commercial HPWH

Barriers include:

1. Building electrical service
2. Perceived that HPWH can't meet commercial loads
3. Commercial space constraints
4. System selection tools and limited installation resources
5. Cost

77% of the water heaters ≤ 120 gallons in existing northwest buildings are electric

Generally existing commercial water heating (and current design practice) is **oversized by 25% to 50%**

Majority of available resources from manufacturers.



Barriers do exist for light commercial HPWH

Barriers include:

1. Building electrical service
2. Perceived that HPWH can't meet commercial loads
3. Commercial space constraints
4. System selection tools and limited installation resources
5. Cost

**FIELD STUDIES
CASE STUDIES
MFG ENGAGEMENT**

Actions: Demonstrate light comm HPWH performance

Target Markets
HPWH Selection
Existing Bldg Characteristics

HPWH Solution	Smaller/Simpler/Easy
Existing WH Size	Light Comm HPWH ≤120 gallons ≤12 kW
# of WH	Single tank
Plumbing Distribution	No recirc
HPWH configurations	Integrated or simple split system* *WH + Storage sized together
HPWH Design	Doesn't require design/plumber
Target Building Types	Offices, retail, warehouse, schools, restaurant, grocery
Savings Opportunities	Medium hot water users, but <i>many</i> buildings



► Restaurant Field Monitoring ET22SWED046 Water Heating TSR Active 2025/11





There is a lot of opportunity for HPWHs in light commercial applications!

Light commercial HPWH barriers can be addressed.

The industry needs to:

1. Demonstrate light commercial HPWH performance
2. Create and update resources to specific to light commercial HPWH

» Questions? Discussion?

Adam Gage, NEEA
agage@neea.org

