



Next Step Home Baseline Estimation Study

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Study Background

Northwest ENERGY STAR Homes

- Covers ID, MT, OR, and WA
- Homes are 15% more efficient than code
- Over 25,000 homes certified

Next Step Homes

- Next major NEEA Initiative to transform market
- Homes will be 30% more efficient than code



Photo courtesy of NEEA



Objectives

Establish the Next Step Home Baseline

- Estimate percentage of new homes that meet the NSH specification in 2014 – *with no assistance from NEEA or partners (NW utilities, BPA, Energy Trust of Oregon)*
- Estimate future market adoption – *with no assistance or code changes*



Next Step Home Specification

1. Advanced wall construction;
 - Max. u-value = 0.035 in Heating Zone 1
 - Max. u-value = 0.030 in Heating Zones 2 & 3
2. An ultra-tight shell (2.0 ACH₅₀) and heat recovery ventilation (HRV);
3. Ducts inside the building shell (if applicable);

Photos courtesy of NEEA





Specification - continued

4. Efficient heating equipment, such as
 - a. Gas Furnace – 94% AFUE
 - b. Heat Pump – 9.0 HSPF, 12.0/11.5 EER
 - c. Ductless heat pumps
 - d. Radiant floor heating
5. Heat pump water heater or gas water heater with 0.81 efficiency; and
6. U.25 windows

Photos courtesy of NEEA





Estimation Steps

1. Interviews with efficient homes program managers (n=7)
 - E.g., NW ENERGY STAR, Built Green, Earth Advantage, Passive House, LEED
2. Home builders phone survey (n=185)
 - Current construction practices
 - Expectations of NSH future market shares
 - Likelihood of installing specific measures



Findings – Programs Interviews

About 130 homes built in 2013 estimated to meet or approximate NSH specification

- Less than 1% of NW market
- 43 Built Green homes in King and Snohomish Counties (WA)
- 38 LEED in Idaho



Findings – Programs Interviews

Expected NSH Future Adoption

Time Period	Market Share (Low)	Market Share (High)	Market Share (Avg)	Market Share (Median)
2024	1%	40%	12%	6%
2034	5%	80%	30%	13%



Findings – Programs Interviews

Reported NSH adoption barriers:

- Low consumer awareness of EE homes and demand
- Higher first costs will limit supply and demand – especially if more spec building in rebounding market
- Builders inexperienced with HRV systems



Findings – Programs Interviews

- Large national companies moving into WA and acquiring smaller companies – may be less attuned to “efficiency culture”
- Changing equipment and technologies – will builders opt for other measures?
- Trend towards performance-based codes – could drive builders towards other programs, certifications



Findings – Builders Survey

NSH measures installation rates – 2013 new homes

Measure	State				Average
	ID (n=38)	MT (n=36)	OR (n=46)	WA (n=65)	
94% gas furnace	64%	63%	92%	81%	75%
Ducts in conditional spaces	35%	91%	34%	56%	54%
0.81 EF gas water heater	15%	26%	92%	41%	44%
Advanced walls	46%	66%	49%	13%	44%
U.25 windows	33%	54%	31%	43%	40%
Ultra tight shell with HRV	6%	18%	26%	12%	16%
High efficiency heat pump	7%	6%	13%	16%	11%
Radiant floor heating	9%	5%	6%	3%	6%
Ductless heat pumps	1%	0%	3%	2%	2%
Heat pump water heater	1%	1%	0%	2%	1%



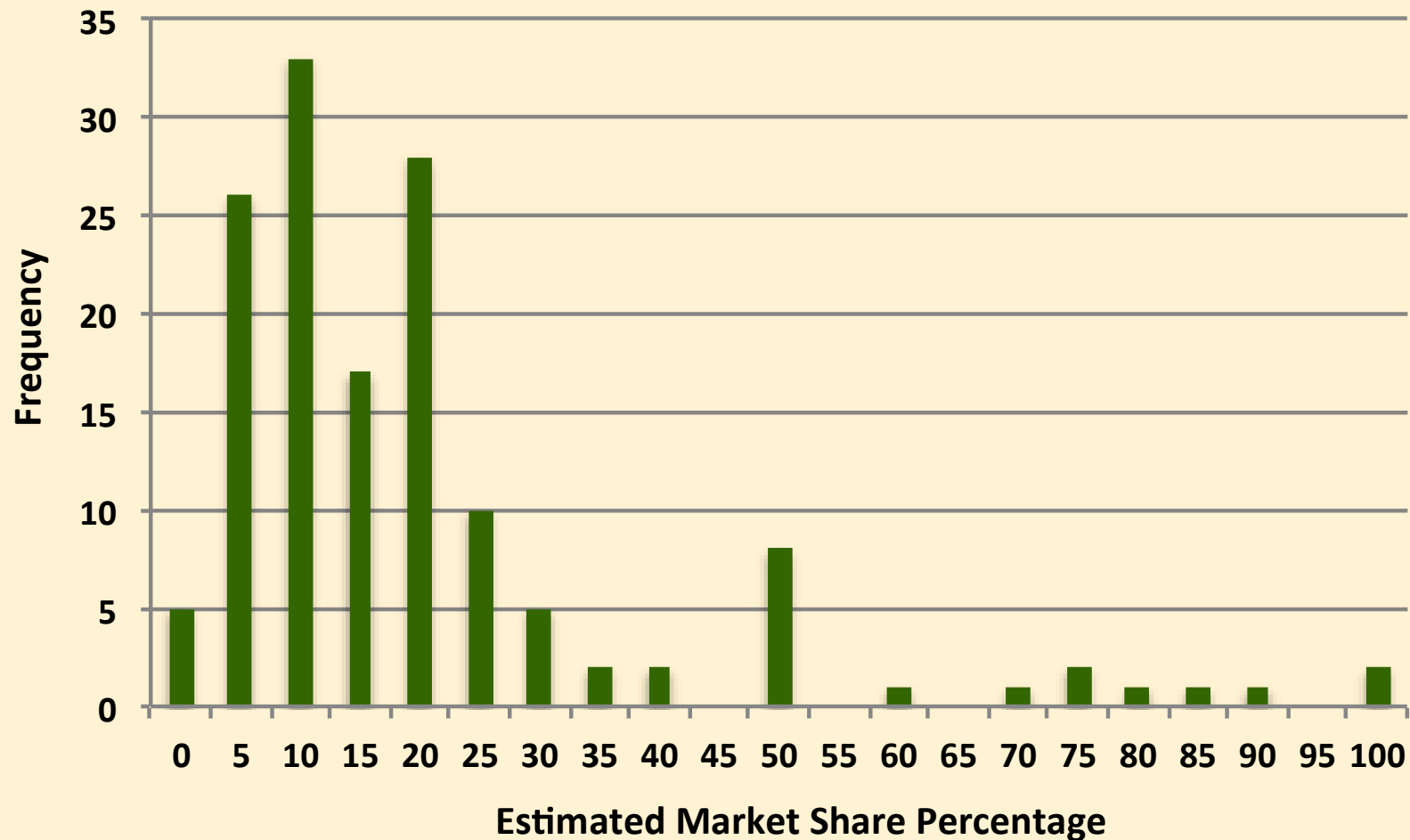
Findings – Builders Survey

- 1. If NEEA and the Northwest utilities (and Energy Trust of Oregon) do not provide financial incentives or technical assistance to builders, and state codes do not change significantly, what do you think the market share for these homes will be in 20 years in **[STATE]**?*
- 1. What do you think the market share for these homes will be in 10 years?*



Findings – Builders Survey

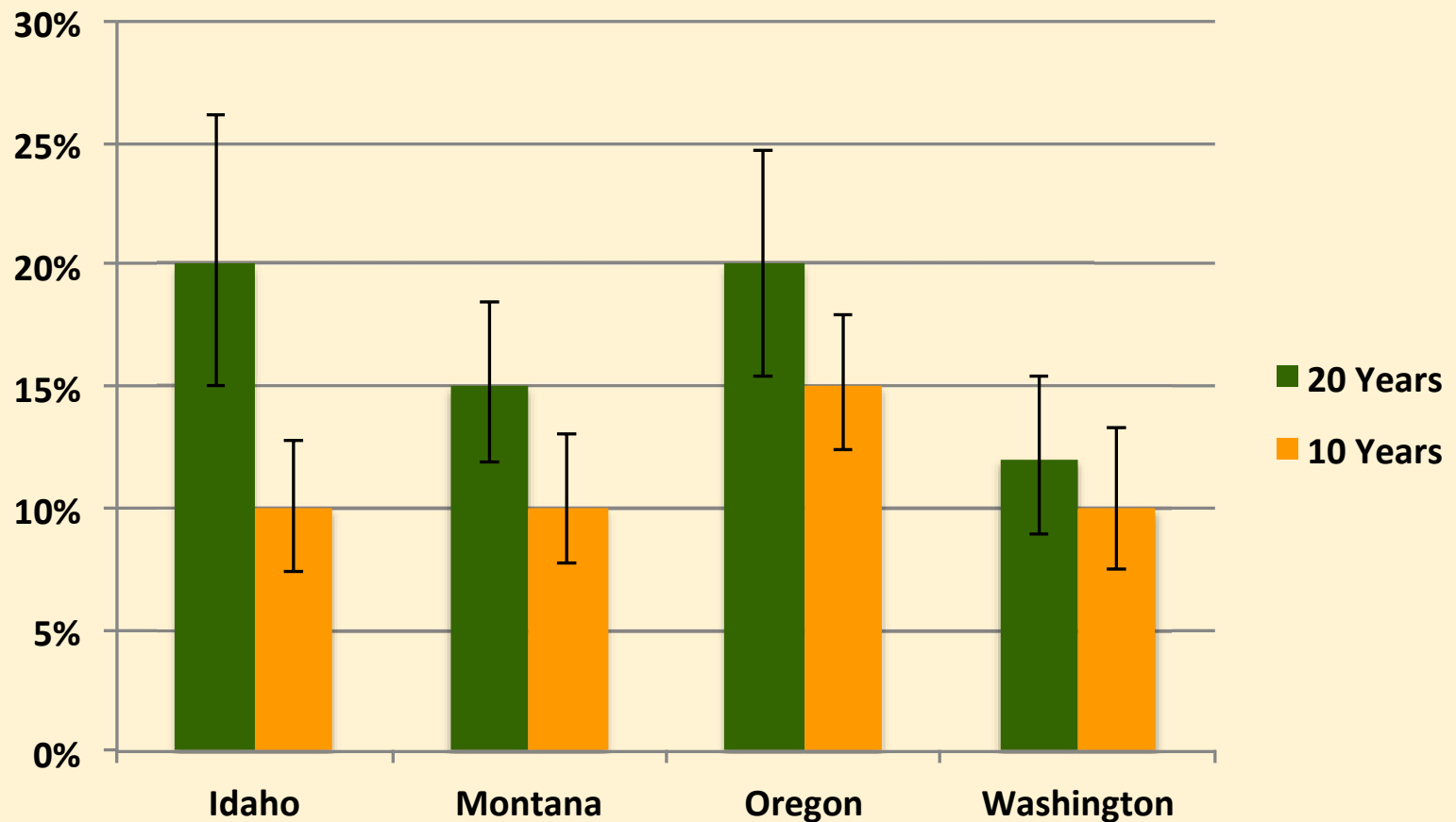
Estimated Market Share of Next Step Homes – 20 Years





Findings – Builders Survey

Expected NSH Market Shares – Median Values





Findings – Builders Survey

1. *Thinking about the single-family market in [STATE], if NEEA, BPA and the Northwest utilities (and Energy Trust) do not provide financial incentives or technical assistance to builders, and state codes do not change significantly, do you think the market share for these homes will be greater than [random # from 10% to 20%] 20 years from now?*
- 2a. *(If Q1 = Yes) Do you think the market share for these homes will be greater than [random # from Q1 + 5%]?*
- 2b. *(If Q1 = No) Do you think the market share for these homes will be greater than [random # from Q1 - 5%]?*



Findings – Builders Survey

Open-End and Bounded Questions Comparison – 20 Years

State	Median Open-Ended	90% CI (Open Ended)		Median Bounded
		Lower	Upper	
ID	20%	15.0%	26.1%	20.0%
MT	15%	11.9%	18.5%	16.5%
OR	20%	15.4%	24.7%	18.5%
WA	12%	8.9%	15.4%	13.5%
Total	15%	13.0%	17.1%	16.5%



Findings – Builders Survey

Likelihood of installing NSH measures in next 10 years

(1 = not at all likely, 10 = extremely likely)

Measure	State				Average
	ID (n=38)	MT (n=36)	OR (n=46)	WA (n=65)	
94% gas furnace	8.68	8.99	8.12	7.70	8.15
U.25 windows	7.84	6.82	7.13	6.27	6.85
Ducts in conditioned spaces	6.68	8.29	6.50	6.50	6.76
0.81 EF gas water heater	6.67	5.93	7.31	5.58	6.31
High efficiency heat pump	5.64	4.02	6.59	6.49	6.05
Advanced walls	5.54	5.44	6.79	4.58	5.46
Ultra tight shell with HRV	5.76	5.29	6.53	4.65	5.44
Ductless heat pumps	3.93	2.95	5.46	4.63	4.51
Heat pump water heater	3.62	3.37	4.34	4.36	4.10
Radiant heat flooring	3.72	5.08	3.88	3.63	3.90



Findings – Builders Survey

Reported NSH adoption barriers:

- High first costs - many buyers priced out
- Low consumer understanding of EE measures
- Low energy prices = low demand for EE homes
- Concerns about tight homes, inadequate ventilation
- Increasing costs for mechanical systems
- Difficulties procuring U.25 windows



Questions?

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