

# Residential Sector Update & Future-casting

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Oregon Utility Roundtable  
Eugene, WA  
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# Overview

- 6<sup>th</sup> Plan Accomplishments
- 7<sup>th</sup> Plan projections – program perspective
- Oct 2015 updates / new measures
- New measures in the pipeline
- Wx support assessment results, next steps
- HVAC opportunities coming
- Update on Low Income Workgroup (LIEE)

# 6<sup>th</sup> Plan FY2010-2014

## FY2010-2014 – 18 New Measures Delivered!

### ■ FY2010

- Ductless Heat Pumps (SF Zonal)
- Ductless Heat Pumps (MH and MF, retracted by RTF April 2011)
- Montana House
- CRC funds for Low income weatherization

### ■ FY2011

- Ductless Heat Pumps (EFAF)
- PTCS Heat Pump Conversions
- Built Green Homes eligible as ESTAR
- Measures for ESTAR gas-heated homes

### ■ FY2012

- Pipe Insulation (renewed measures)
- Heat Pump Water Heaters (SF)

### ■ FY2013

- Variable Speed Heat Pumps eligible
- Insulation measures for Multifamily
- LED bulbs and downlight retrofit fixture
- Class 22 windows

### ■ FY2014

- Advanced Power Strips
- Exterior Insulated Doors
- High Performance Manufactured Homes
- Expanded definition of “electrically heated”

### ■ FY2015 (to date)

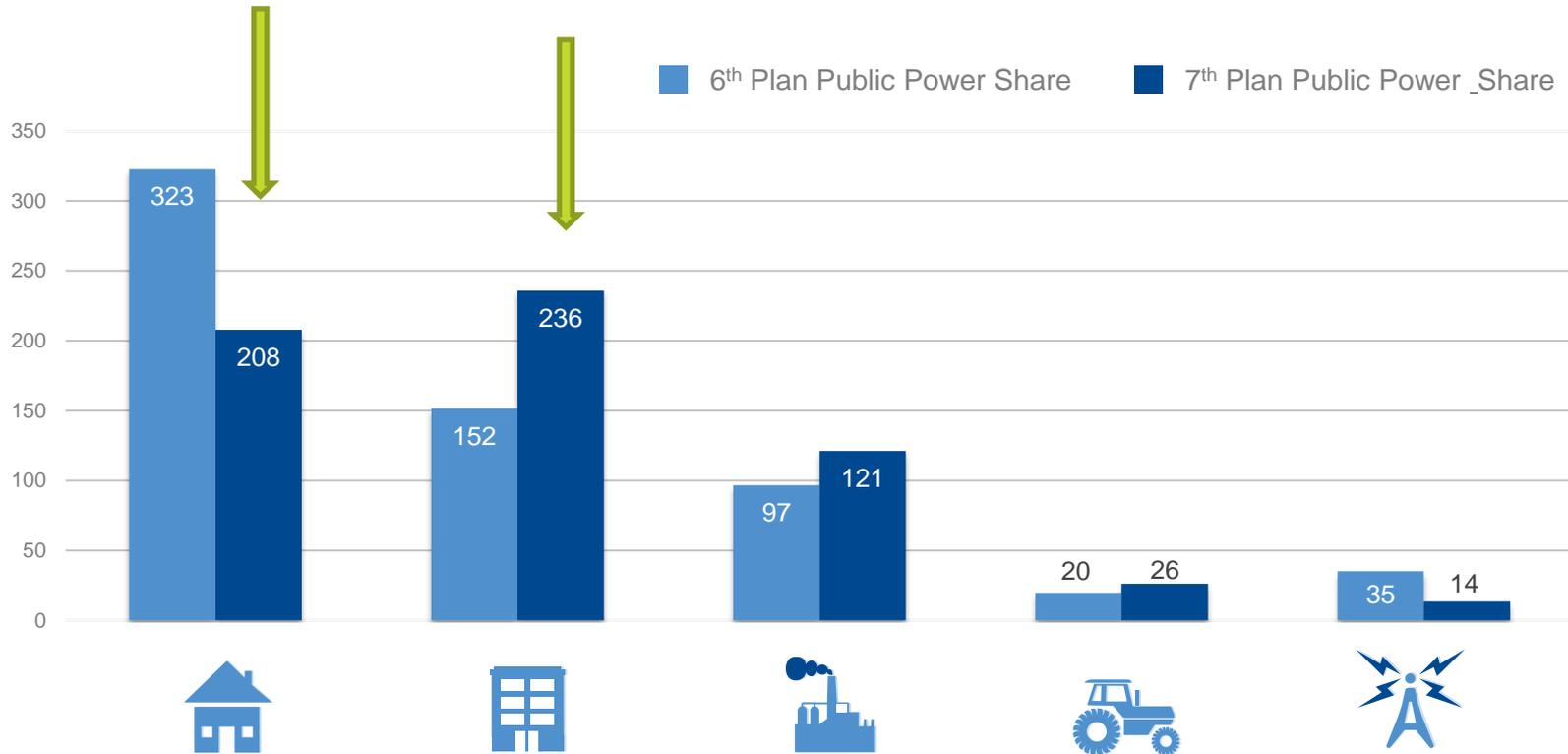
- Retail Sales Allocation tool
- Retail measures for Appliances
- Ductless Heat Pumps (MH zonal)
- Prescriptive Duct Sealing & Air Sealing
- Expanded Low Income measures

# Existing measure support

*From FY2010 – 2014 the Residential team managed through more than 50 measure reconfigurations. . . including . . . .*

- 12 updates to lighting measures
- 15 updates to appliance measures
- 24 updates to HVAC/Wx/New Construction

# PUBLIC POWER ECONOMIC POTENTIAL COMPARISON To 6<sup>TH</sup> Plan Targets



# PUBLIC POWER RESIDENTIAL 7<sup>th</sup> Plan Potential

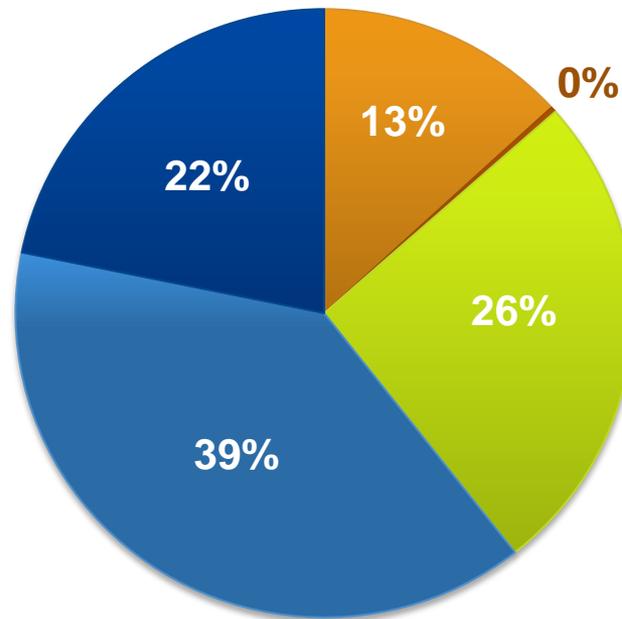


**208** aMW

6-YEAR  
ECONOMIC POTENTIAL  
*75% of Technical Potential (276 aMW)*

**706** aMW

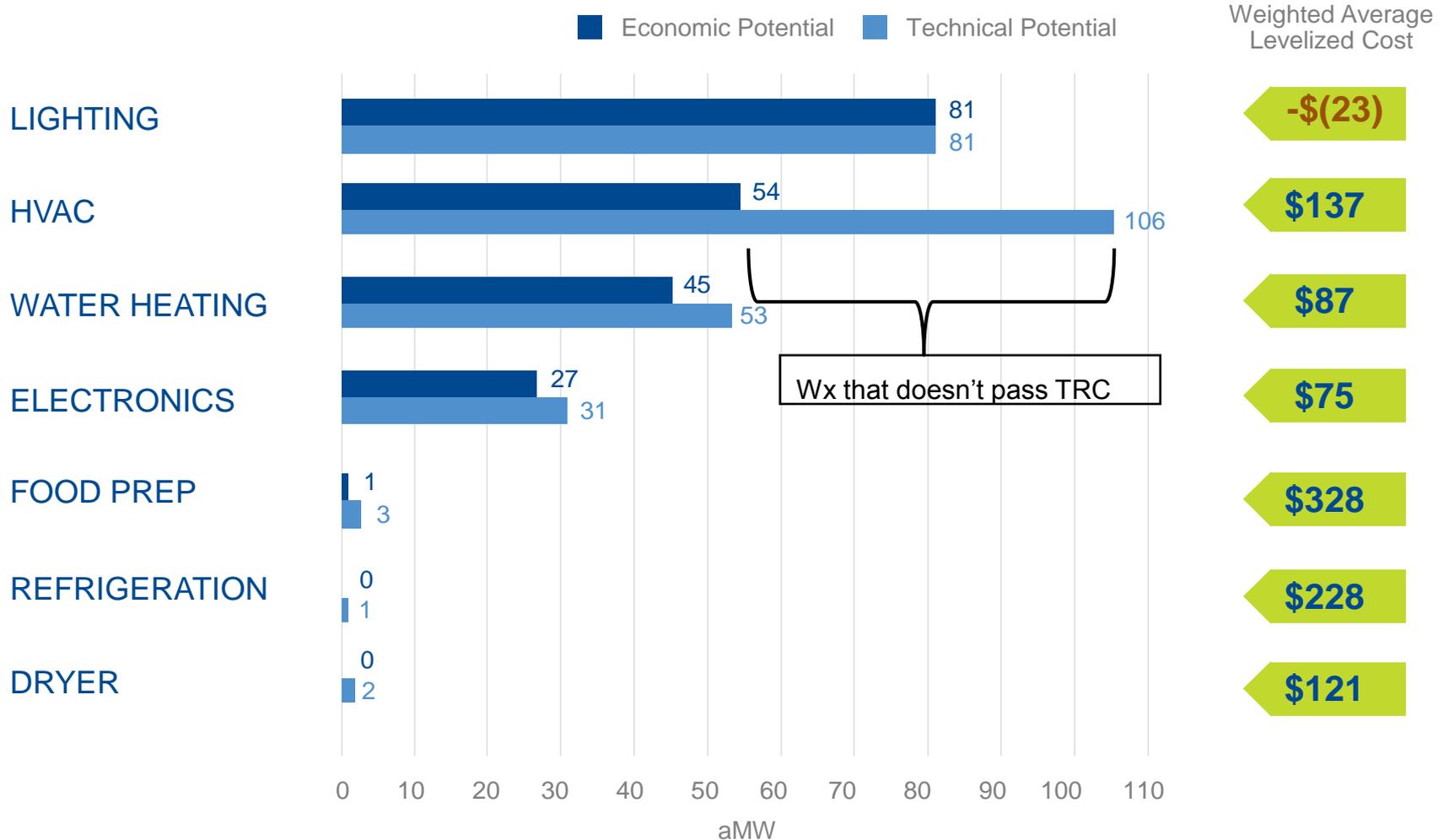
TOTAL  
ECONOMIC POTENTIAL  
*71% of Technical Potential (999 aMW)*



- Electronics
- Food Preparation
- HVAC
- Lighting
- Water Heating

6-YEAR  
Economic Potential

# PUBLIC POWER 6-YEAR POTENTIAL RESIDENTIAL End Uses



# Oct 2015 IM - Changes

- Removed ducting requirement for Tier 2 Heat Pump Water Heaters(HPWH)
- New BPA HPWH Qualified Product list
- Re-organized HVAC section to prepare for HVAC expansion
- Single Family definition expanded to include Townhouses

# Oct 2015 IM – new measures

- T-8 Linear Fluorescent Fixtures – Retail
- LED Fixtures – Retail
- Energy Star Clothes Dryers (electric)
- HPWH for Manufactured Homes
- SF Wx measures by HVAC type – optional
- Class 22 windows for multifamily (also low income)

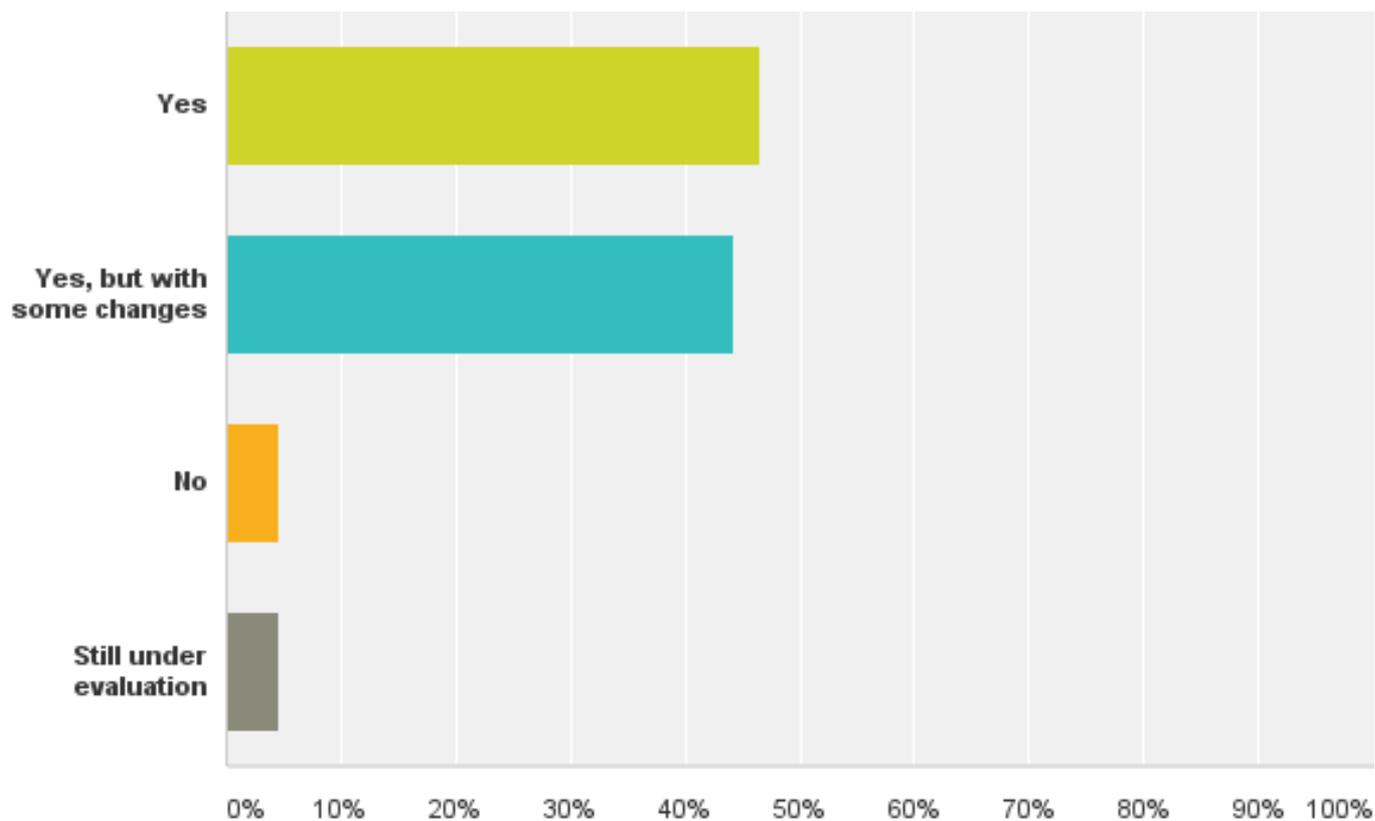
# New measures in the pipeline

*\*In process, not guaranteed by April 2016*

- Efficient Storm Windows
- HPWH – Tier 3 (default settings)
- High Efficiency Clothes Dryers – Tiers 2-6
- Thermostatic Shower valves
- DHP for New Construction

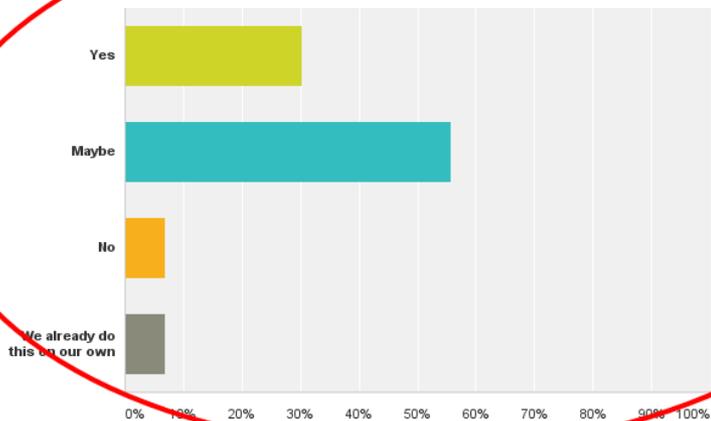
# Wx support assessment - SF

Q1: Does your utility plan to offer Single Family weatherization? (43 responses)

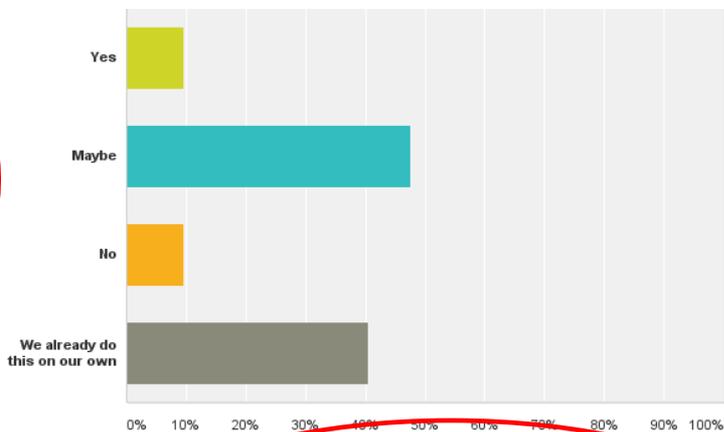


# Wx support assessment

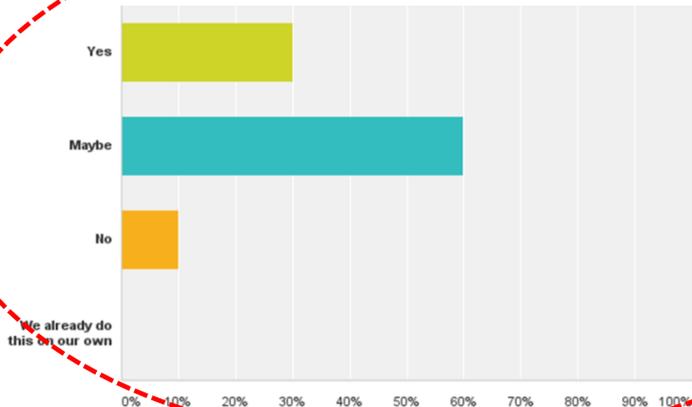
Community Education materials



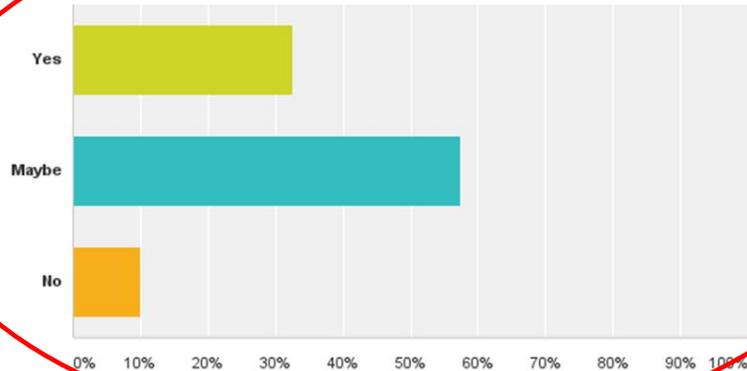
Wx In A Box



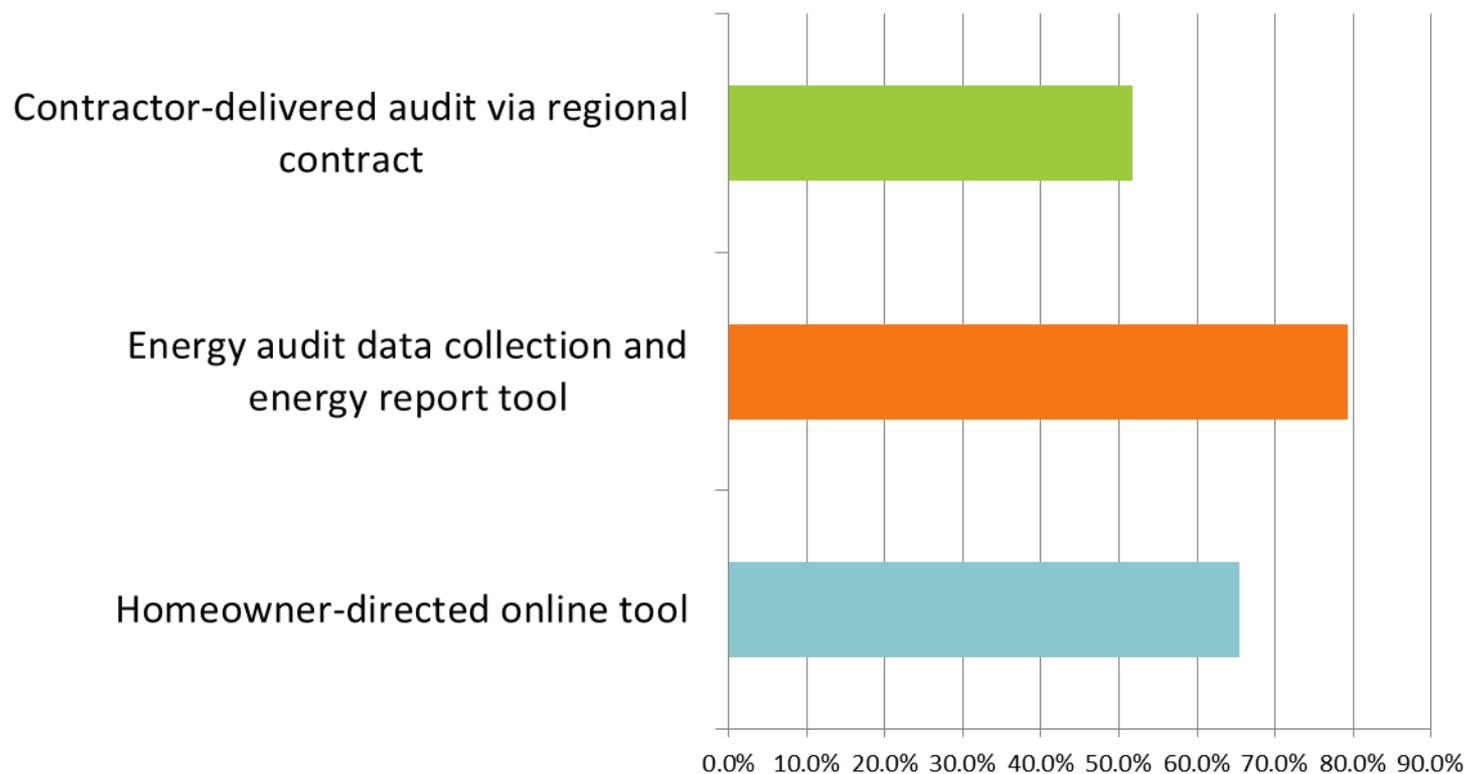
DIY materials



Measures by HVAC detail



# Results of Energy Audit Question



# Audit tool/support: Next Steps

- Assemble group of interested utility staff
- Determine features desired from potential products and services
- Select best options within our constraints
- Decide if BPA should support a tool

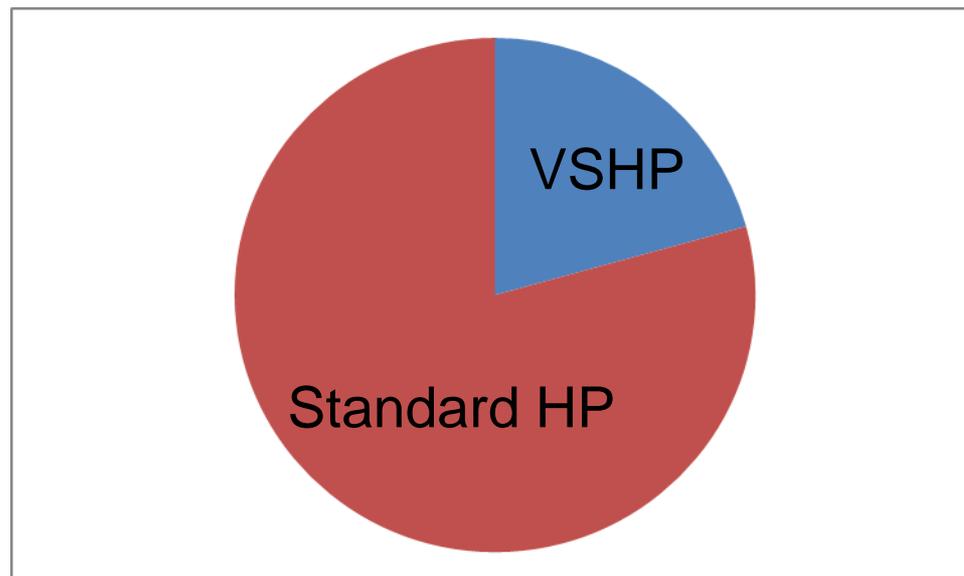
# HVAC opportunities coming

- PTCS site registry data is showing an increase in the percentage of Variable Speed Heat Pumps
- This represents an expanding opportunity
- More on the horizon with CO2 Heat Pumps



# PTCS VSHP activity

- 13.2% VSHPs, in the last 2 years
- 17.3% VSHPs, in the last 1 year
- 20.2% VSHPs, in the last 6 months



# The energy savings

ASHP and VSHP kWh/yr. (savings)

Heating zone	Cooling Zone	Technology	Upgrade Savings @ Busbar (kWh/yr)	Conversion savings @ Busbar (kWh/yr)
HZ1	All CZ	ASHP	1,440	5,785
HZ1	CZ1	VSHP	2,324	7,246
HZ1	CZ2	VSHP	2,411	6,927
HZ1	CZ3	VSHP	2,525	6,505

# VSHPs by efficiency (HSPF)

PTCS HPs in last 2 Yrs	HSPF							Grand Total
	< 9.0	9	9.5	10	11	12	13	
<b>Grand Total</b>	<b>362</b>	<b>4115</b>	<b>879</b>	<b>615</b>	<b>79</b>	<b>147</b>	<b>19</b>	<b>6216</b>

Variable Speed HPs	HSPF					Grand Total
	9.5	10	11	12	13	
<b>CARRIER</b>		55	79	147	19	300
<b>LENNOX</b>	38	138				176
<b>TRANE</b>	21	356				377
<b>Grand Total</b>	<b>59</b>	<b>549</b>	<b>79</b>	<b>147</b>	<b>19</b>	<b>853</b>

- 10 – 11 HSPF Range

- Carrier Minimum Range
- Lennox & Trane Maximum Range
- RTF VSHP requires 10 HSPF minimum & inverter driven

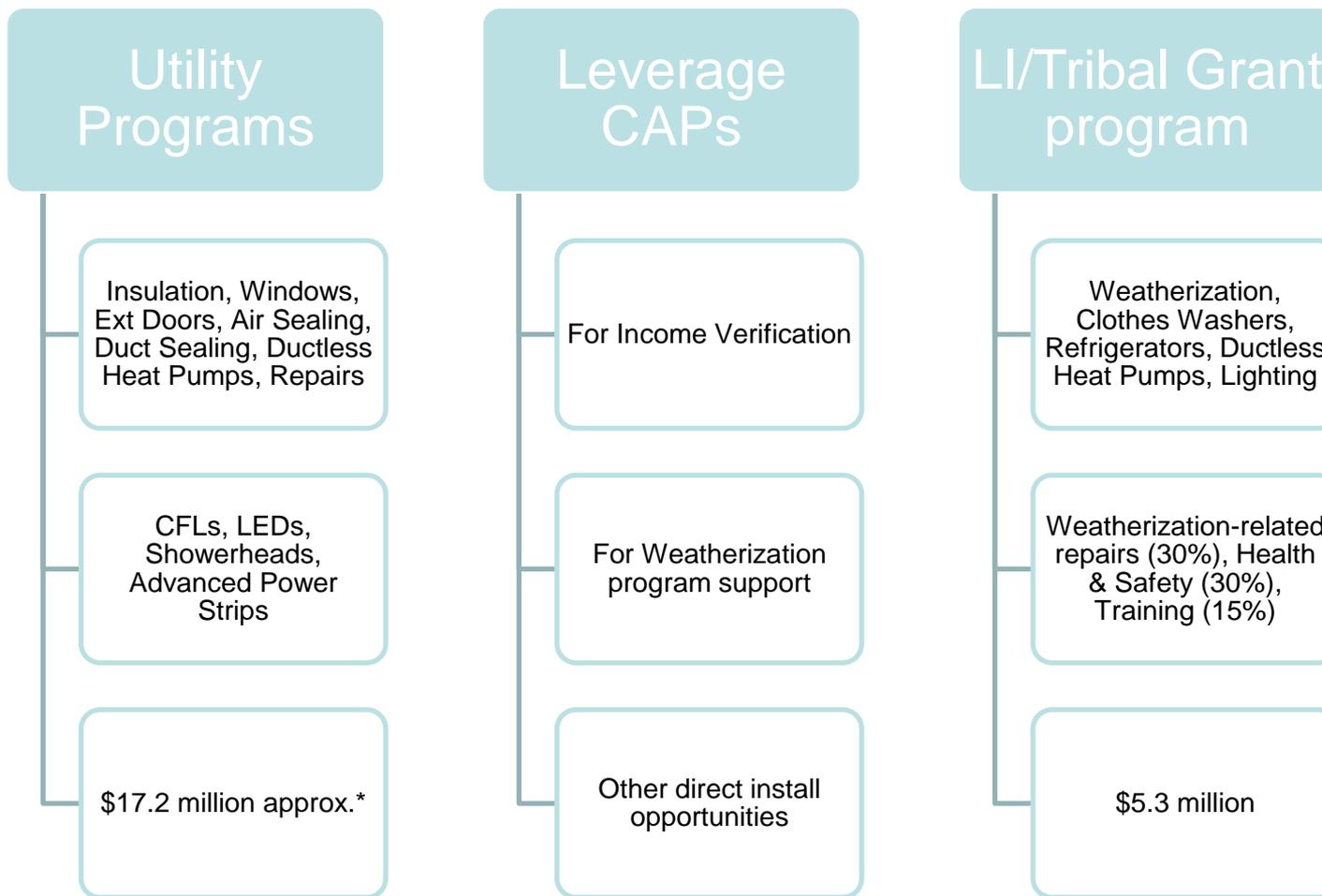
# HVAC program evolution

- Options for how we move forward . . .
- Think about the effects of rebate \$\$
- If you could re-invent the PTCS program?
- Something entirely new?
- How should we engage utilities?

# NW Energy Coalition letter

1. *BPA should continue its low-income program*
2. *BPA should determine the proportion of low-income*
3. *BPA should adjust the overall BPA low-income weatherization budget*
4. *BPA should report progress, quarterly*
5. *Continue to support the Low-Income Work*
6. *Establish a moderate-income program*

# Current utility and grant programs



\*estimate based on 25% of 2014 Residential budget spend

# Moderate Income Comparison

Energy-efficiency upgrade	Energy Trust (ETO) Savings Within Reach program requirements	Maximum ETO incentive	BPA payment for corresponding measure*
<b>Attic insulation</b>	Existing must be R-12 or less, insulate to R-38.	\$0.50 per sq. ft.	R-7 or less: \$0.65 per sq. ft.
			R-7 to R-11: \$0.25 per sq. ft.
<b>Wall insulation</b>	Existing must be R-4 or less, insulate to R-11, or fill cavity.	\$0.50 per sq. ft.	\$0.65 per sq. ft.
<b>Floor insulation</b>	Existing must be R-0, insulate to R-30, or fill cavity.	\$0.40 per sq. ft.	\$0.30 per sq. ft.
<b>Heat pump</b> upgrade with a minimum efficiency HSPF 9.0	Upgrade from an existing heat pump or replacing non-electric heat (example: propane, wood or oil).	\$550	\$500
<b>Heat pump</b> upgrade with a minimum efficiency HSPF 9.5	Upgrade from an existing heat pump or replacing non-electric heat (example: propane, wood or oil).	\$800	\$500
<b>Heat pump</b> upgrade with a minimum efficiency HSPF 9.0	Upgrade from electric furnace, baseboard, wall heater or ceiling heat.	\$750	\$1,400
<b>Heat pump</b> upgrade with a minimum efficiency HSPF 9.5	Upgrade from electric furnace, baseboard, wall heater or ceiling heat.	\$1,000	\$1,400
<b>Ductless heat pump</b>	Must replace electric resistance heat or electric furnace as primary heat source.	\$1,000	\$800 replacing zonal heat
			\$1200 replacing electric furnace

\* Note: The payment listed is for the BPA measure most closely correlated to the Energy Trust measure. BPA maintains many other measures with a variety of insulation starting and ending R-values, allowing more homes to qualify for programs.

# BPA Measures Not Offered by ETO

<b>Energy-efficiency upgrade</b>	<b>Energy Trust Savings Within Reach program requirements</b>	<b>Maximum ETO incentive</b>	<b>BPA payment</b>
<b>Insulated Exterior Door</b>	N/A	N/A	\$40.00
<b>Whole House Air Sealing</b>	N/A	N/A	\$0.20 per CFM50
<b>Prescriptive Air Sealing</b>	N/A	N/A	\$0.08 per sq. ft.
<b>PTCS Duct Sealing</b>	N/A	N/A	\$250
<b>Prescriptive Duct Sealing</b>	N/A	N/A	\$250

# Low Income reporting gaps

- BPA utility data under-reporting Low Income
  - Projects reported under Standard Income measures:
    - Lighting, showerheads via direct install
    - Duct sealing
    - Ductless Heat Pumps prior to 2014
    - Utility self-funded measures
  - Unreported measures
  - CAP activity not captured
  - Other efforts we don't see

# Meaningful benchmarking

- Tracking percentage of total region is too variable
  - Economic factors are dynamic
  - Status of housing stock is dynamic
  - We don't have good historical data
  
- We can do better benchmarking annually
  - Utility program Low Income reported measures
  - CAP program activity
  - Grant program activity
  - Demographic analysis and trends by state (Census, RBSA)

# Programmatic Strategies – Identify Barriers

- Continue to allow utilities to set budget goals for Low Income weatherization
- CAP assessment (in progress)
- Utility assessment (coming soon)
- Continue Low Income Workgroup (LIEE workgroup)
- Utility Roundtables
- Outreach to focus support
  - New measure ideas (exterior doors)
  - Program support for SRR utilities

# Residential Team

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*Sector strategy, budget and contract oversight,  
currently also Wx & HVAC*

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*Vacant Program Manager position*

*HVAC: DHP, PTCS HPs and DS*

*Hire date tbd*

*Vacant Program Manager position*

*Existing Homes Wx/ New Construction*

*Hire date tbd*

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