

Conservation Resources

**RSAC Meeting
March 12, 2015**

Agenda

- **Definitions**
- **What the Data Represent**
- **Quick Methodology Overview**
- **Amount, Cost and Pace Findings**
- **Take-Aways**

Definitions

- **Achievable potential**
 - Maximum annual pace
 - Program year
- **Levelized cost**
- **Resource type**
 - Retrofit
 - Lost opportunity
- **Energy & capacity**

What the Data Represent

- **Inputs to RPM**
 - Achievable potential, cost & pace
 - These are not conservation targets
 - Cost-effectiveness & targets determined later
- **Numbers are not final!**
 - Ready for RPM at the end of March
 - Few additional measures to be added
 - Workbooks currently undergoing external review
 - We do not expect major shifts from today's data

The Basic Formula for Savings

Achievable Savings Potential =

Number Units * kWh savings per Unit * Achievable Penetration

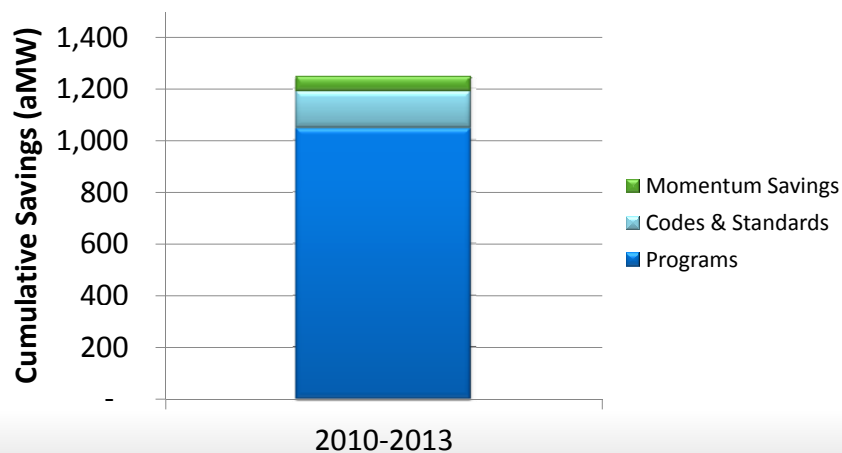
Examples:

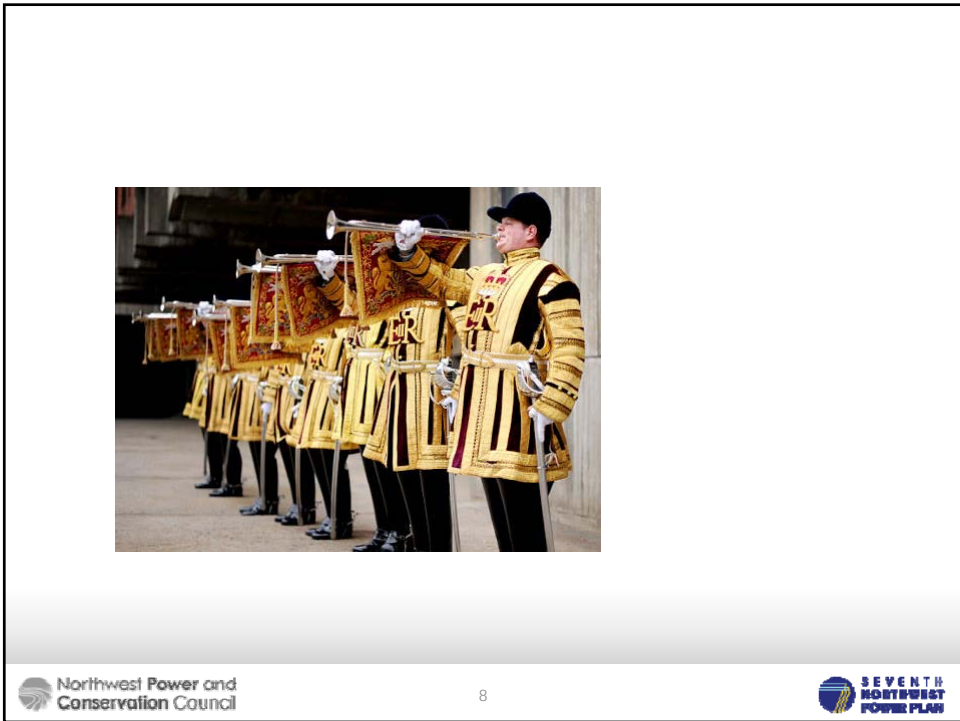
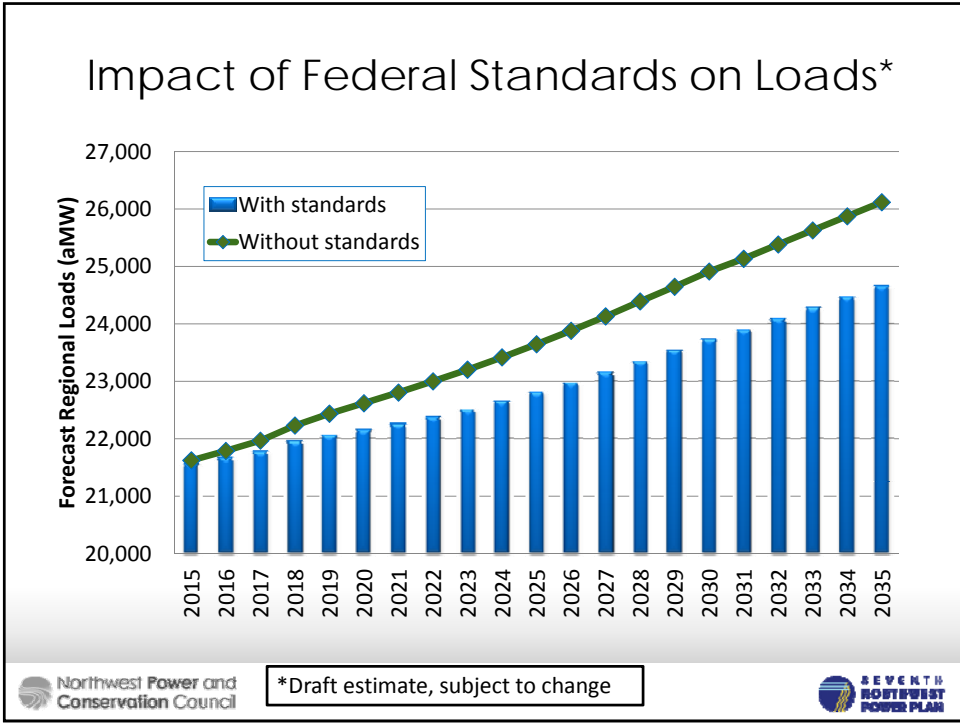
- Number Homes
- Floor Area of Retail
- Number of Refrigerators
- Acres Irrigated
- Number transformers

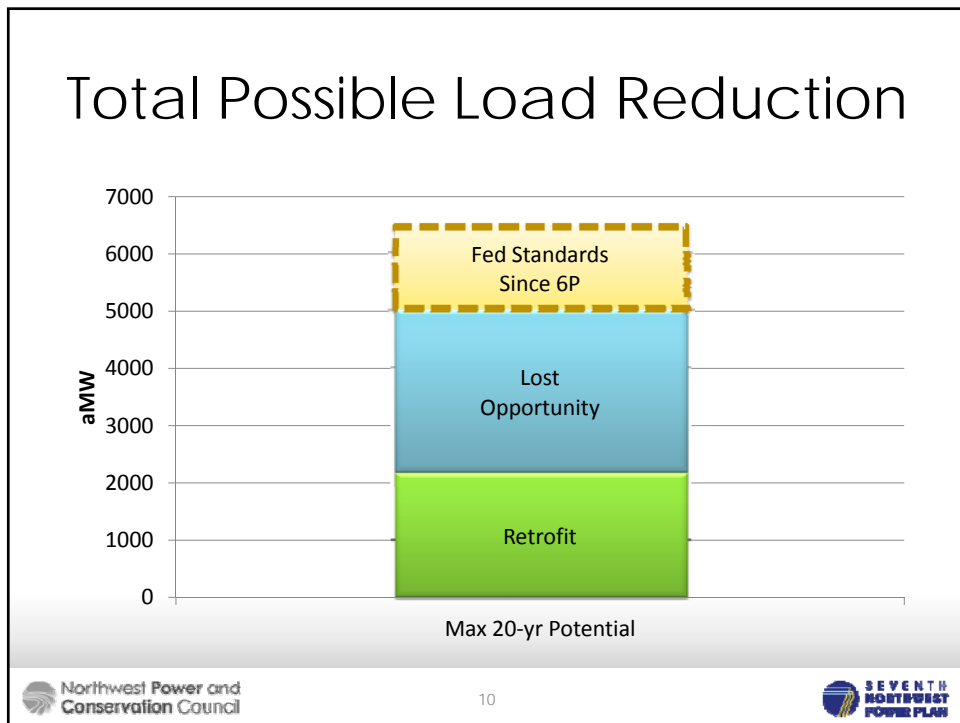
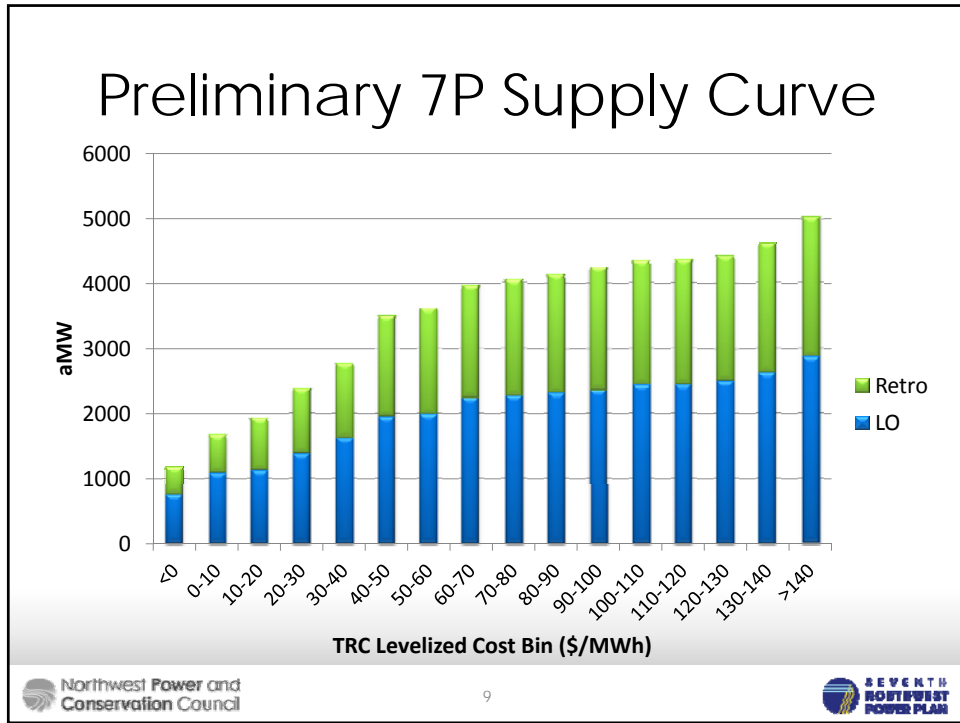
Fraction of available or remaining stock that is realistically achievable over time

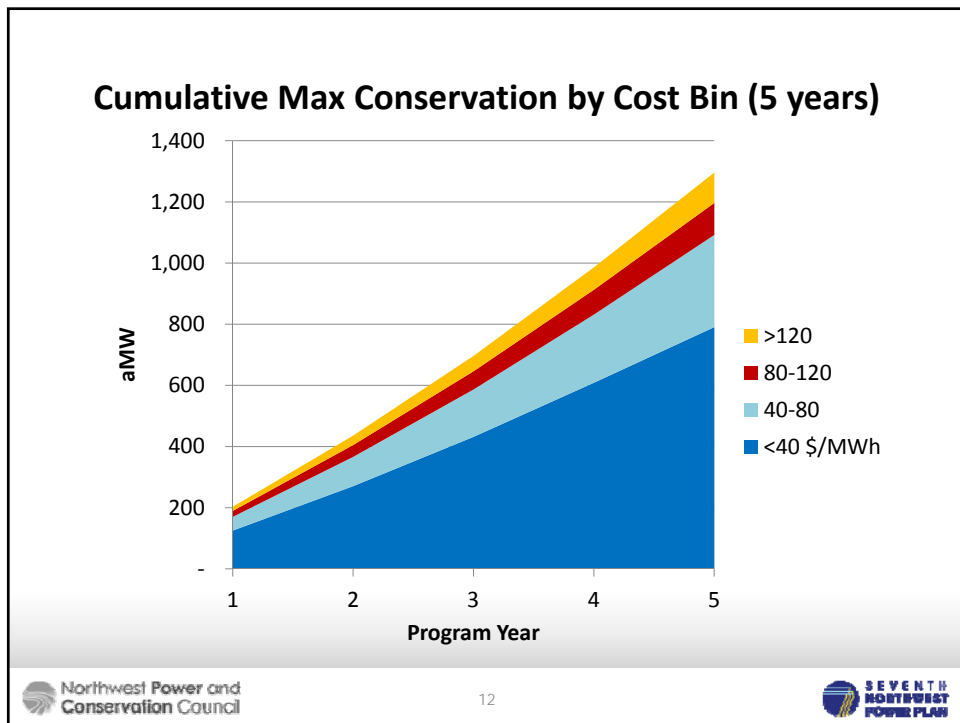
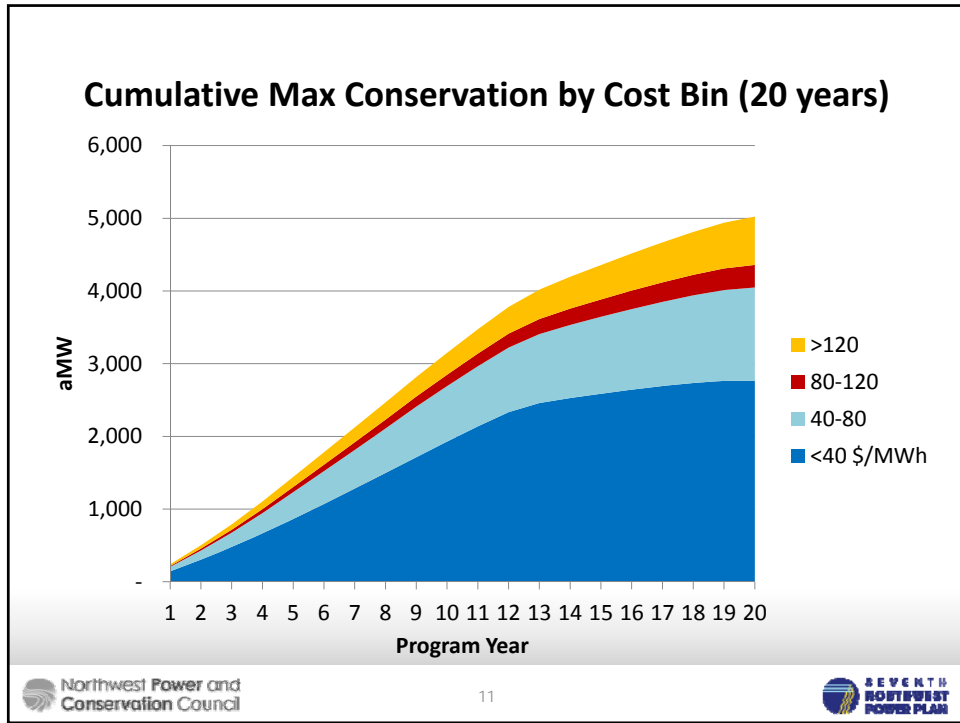
(kWh/Unit at **Baseline** Efficiency – kWh/Unit at **Improved** Efficiency)

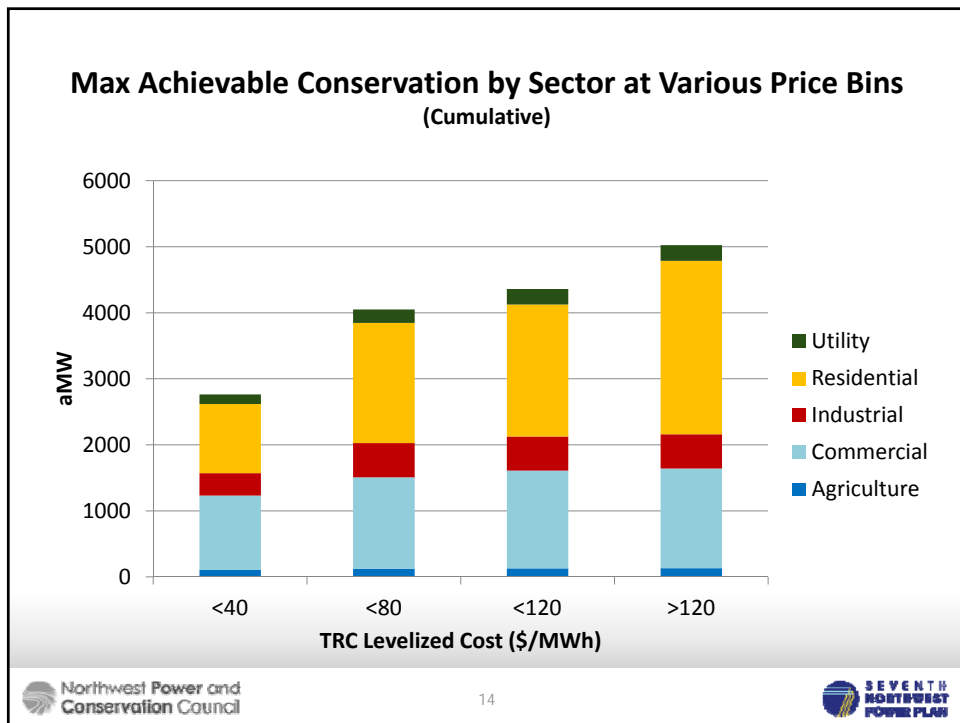
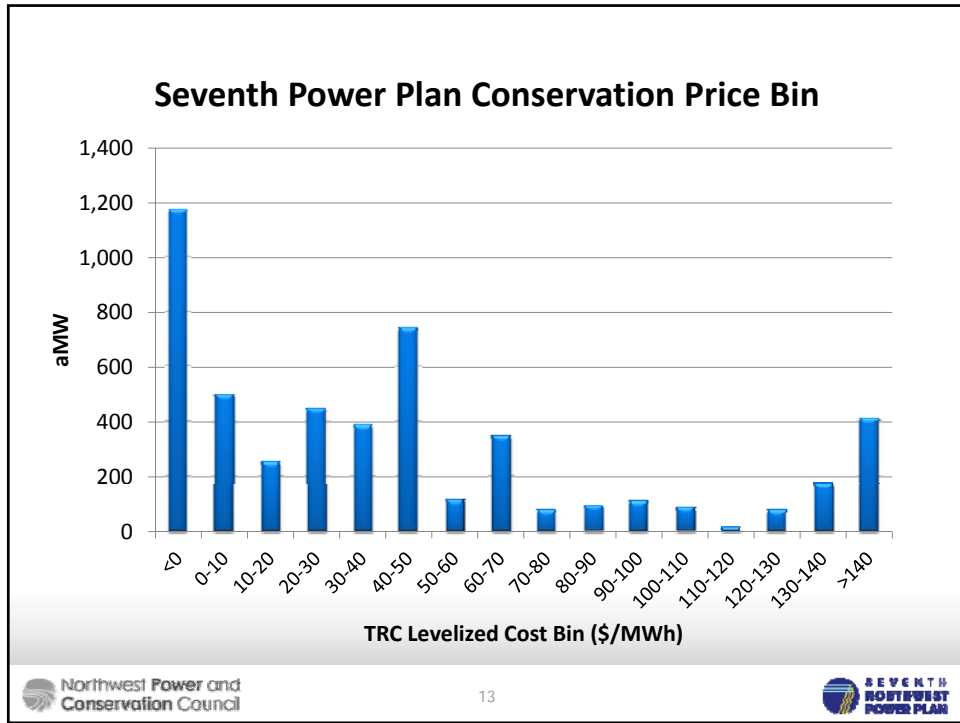
Sixth Plan Accomplishments Thru 2013

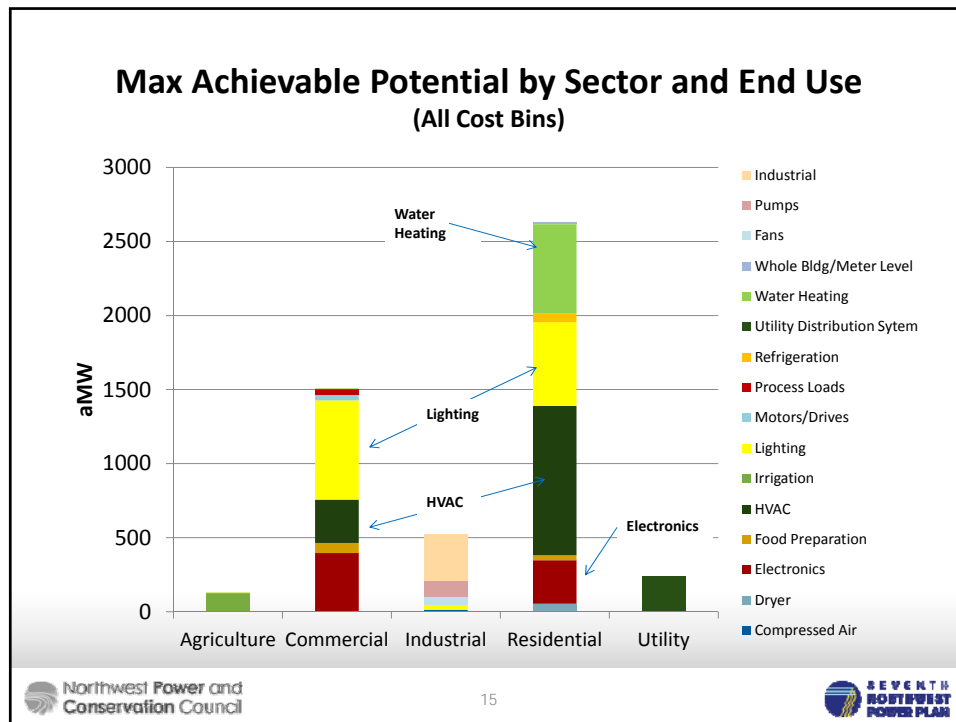








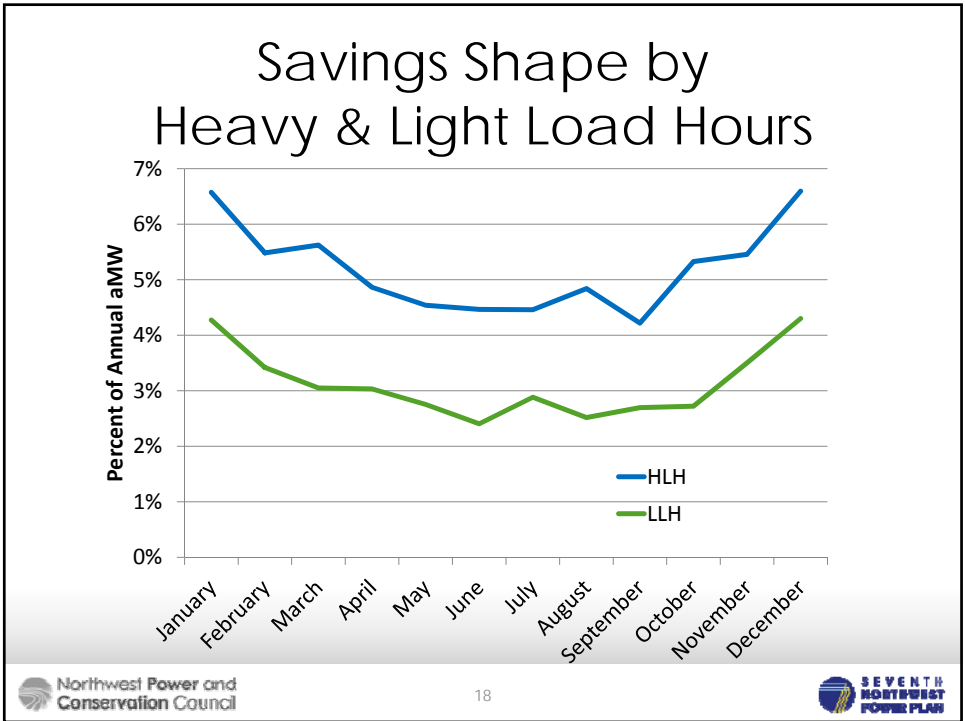
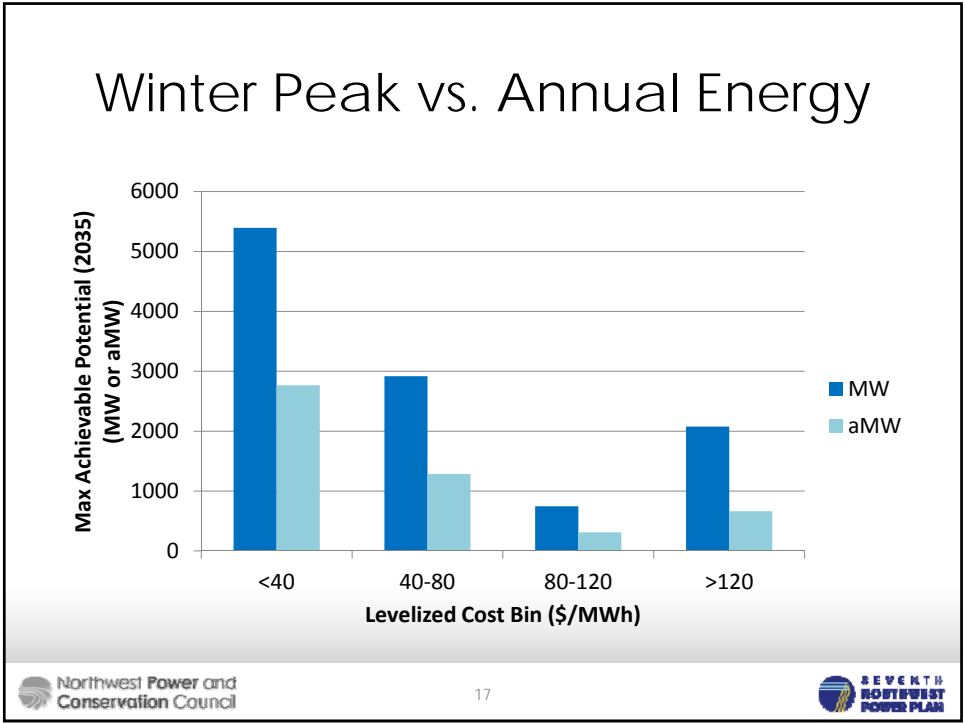


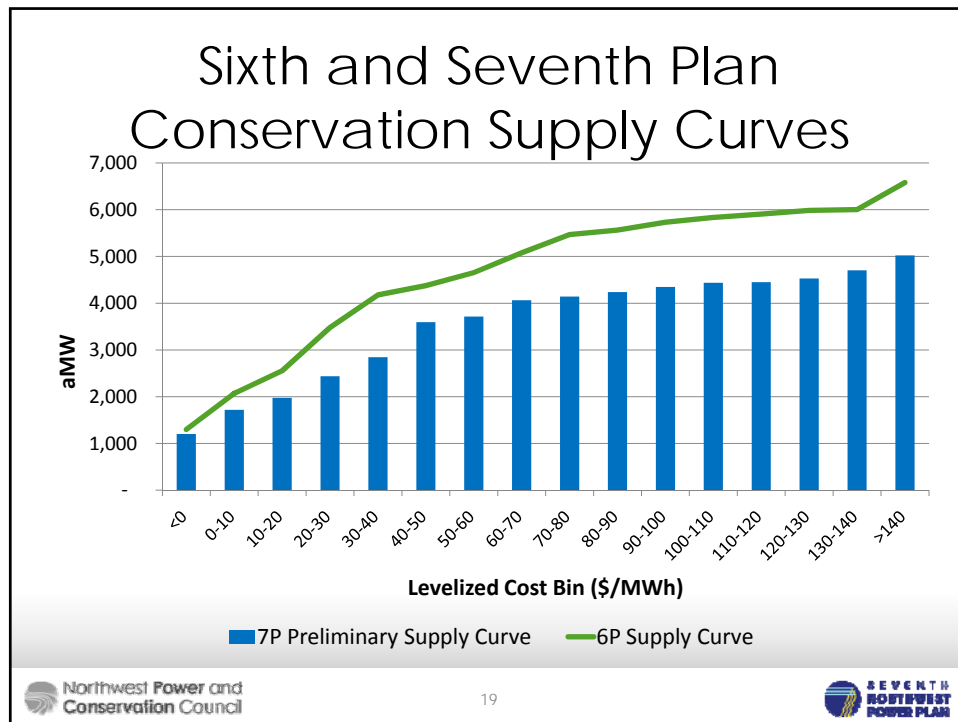


Measure List

- Over 100 measures and around 1400 measure permutations analyzed across five sectors
- Significant new measures
 - Solid state lighting
 - Variable refrigerant flow HVAC systems
 - HP clothes dryer
 - Advanced power strips
- 6P measures removed or modified
 - TVs
 - Distribution system
 - Packaged refrigeration systems
 - New residential construction shell









Some Observations

- **Over 5000 aMW identified – 20-year**
- **Similar cost profile to 6P**
- **Similar Retrofit potential to 6P**
 - Although there have been lots of accomplishments, there are also new substantive measures
- **Less Lost Opportunity potential – due to new codes & standards in place**
- **Similar measure set – a few new notables**
- **Significant impact on January single hour peak**

Northwest Power and Conservation Council 20 SEVENTH NORTHWEST POWER PLAN


Supplemental Slides

MEASURES IN THE SEVENTH PLAN CONSERVATION ASSESSMENT




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Residential Measures

Total Achievable Potential Available by Year (aMW)



Residential	2025	2035	Residential	2025	2035
HVAC	439	820	Water Heating	255	613
ResWx	242	266	Showerheads	96	121
ASHP	34	122	HPWH	51	289
Controls Commissioning & Sizing	14	50	Behavior	34	45
DHP	40	143	Solar Water Heater	32	56
DHP Ducted	66	158	Clothes Washer	23	60
Duct Sealing	30	34	Aerator	17	33
GSHP	2	19	Dishwasher	0	1
HRV	2	16	WasteWater Heat Recovery	1	8
WIFI enabled tstats	9	12	Refrigeration	7	58
Lighting	413	565	Refrigerator	6	55
Lighting	351	503	Freezer	0	3
Lighting PPA	62	62	Food Preparation	15	34
Electronics	229	302	Electric Oven	11	28
Advanced Power Strips	191	260	Microwave	4	6
Computer	31	34	Dryer	13	53
Monitor	7	8	Clothes Dryer	13	53
			Whole Bldg/Meter Level	1	7
			EV Supply Equip	1	7
			Grand Total	1,371	2,453

Commercial Measures

Total Achievable Potential Available by Year (aMW)

Commercial	2025	2035	Commercial	2025	2035
Lighting	429	682	Refrigeration	65	77
LPD Package	200	382	Grocery Refrigeration Bundle	56	63
Low Power LF Lamps	38	39	Water Cooler Controls	9	13
Lighting Controls Interior	14	38	Food Preparation	19	67
Exterior Building Lighting	116	143	Cooking Equipment	18	66
Street and Roadway Lighting	47	60	Pre-Rinse Spray Valve	1	1
Parking Lighting	9	9	Process Loads	41	49
Bi-Level Stairwell Lighting	4	11	Municipal Sewage Treatment	29	35
Electronics	263	392	Municipal Water Supply	12	14
Data Centers	185	261	Motors/Drives	16	39
Smart Plug Power Strips	41	47	ECM-VAV	12	34
Desktop	25	56	MotorsRewind	4	5
Monitor	11	24	Compressed Air	2	4
Laptop	1	4	Compressed Air	2	4
HVAC	166	371	Water Heating	4	5
Advanced Rooftop Controller	72	119	Showerheads	4	4
Commercial EM	37	77	WHTanks	1	2
DCV Parking Garage	11	13	Grand Total	1,004	1,687
Demand Control Ventilation	15	29			
Secondary Glazing Systems	14	40			
VRF	15	88			
Premium Fume Hood	1	4			



Agriculture Measures

Total Achievable Potential Available by Year (aMW)

Agriculture	2025	2035
Irrigation	87	125
Irrigation Hardware	47	54
Irrigation Pressure	9	26
Irrigation Water Mgmt	23	23
Irrigation Efficiency	7	22
Lighting	3	4
Dairy	0	0
Lighting	3	3
Motors/Drives	3	3
Dairy	0	0
Irrigation Motor	3	3
Refrigeration	1	1
Dairy	1	1
Grand Total	93	133



Industrial Measures

Total Achievable Potential Available by Year (aMW)



Industrial	2025	2035
Pumps	92	108
Fans	45	54
Energy Project Management	80	95
Integrated Plant Energy Management	43	86
Lighting	30	34
Plant Energy Management	40	45
Food Processing	15	17
Food Storage	13	14
Compressed Air	11	12
Material Handling	16	19
Hi-Tech	8	10
Pulp	6	13
Paper	3	6
Wood	6	7
Metals	0	1
Grand Total	407	519

Utility System Measures

Total Achievable Potential Available by Year (aMW)



Utility	2025	2035
Utility Distribution System	155	236
LDC voltage control method	60	92
Light system improvements	35	53
Major system improvements	38	58
EOL voltage control method	20	30
SCL implement EOL w/ major system improvements	1	2
Grand Total	155	236