

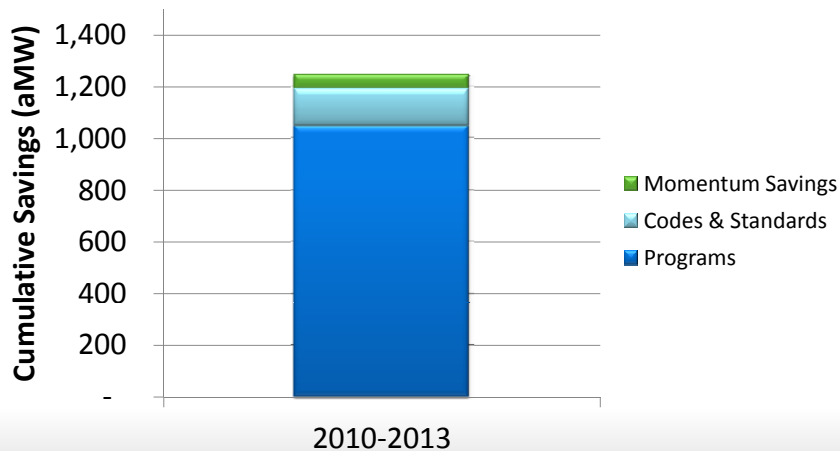
Conservation Resources Supply Curve

CRAC Meeting
March 24, 2015

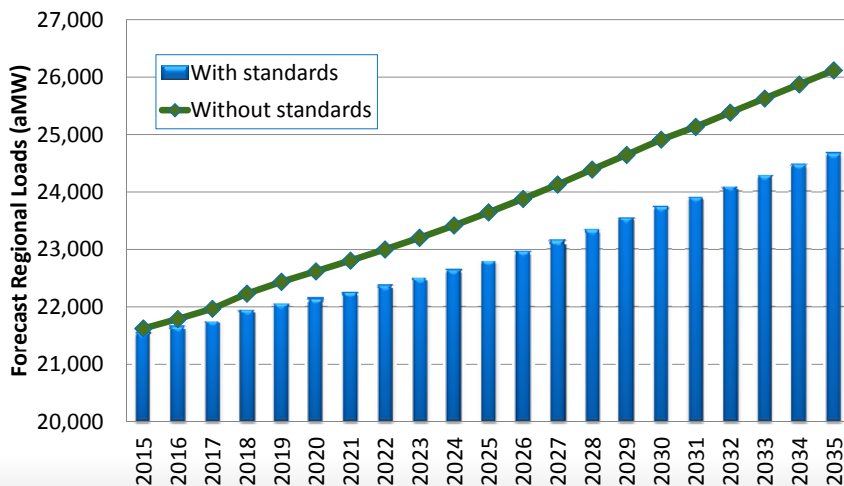
What the Data Represent

- **Inputs to RPM**
 - Achievable potential, cost & pace
 - These are not conservation targets
 - Cost-effectiveness & targets determined later
- **Numbers are *almost* final!**
 - Ready for RPM on March 27
 - We are reviewing Industrial loads
 - May add another small-saver measure or two
 - We do not expect major shifts from today's data

Sixth Plan Accomplishments Thru 2013

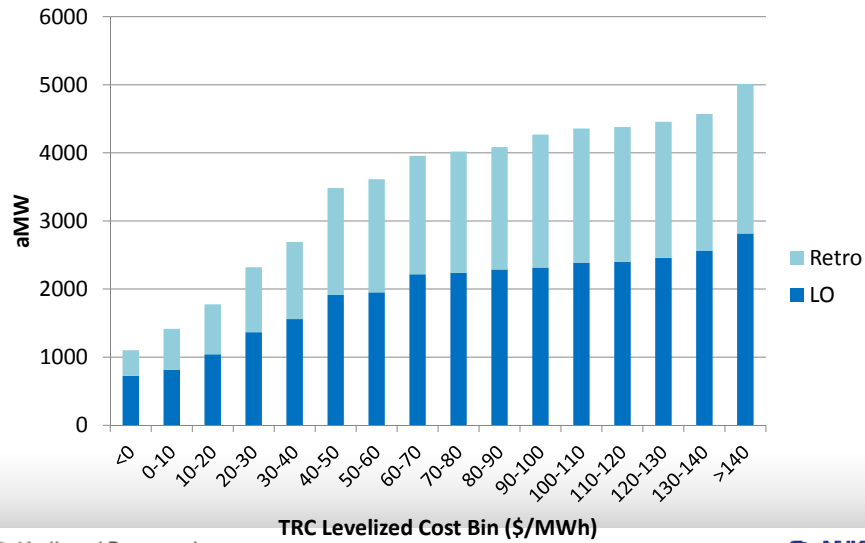


Impact of Federal Standards on Loads*

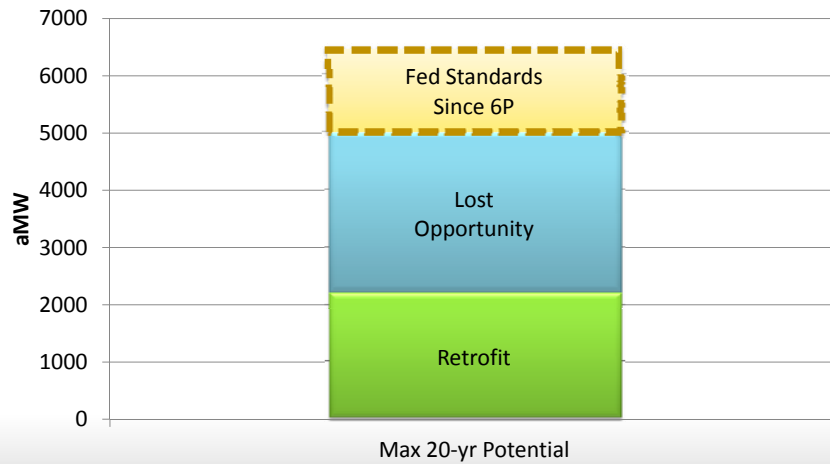




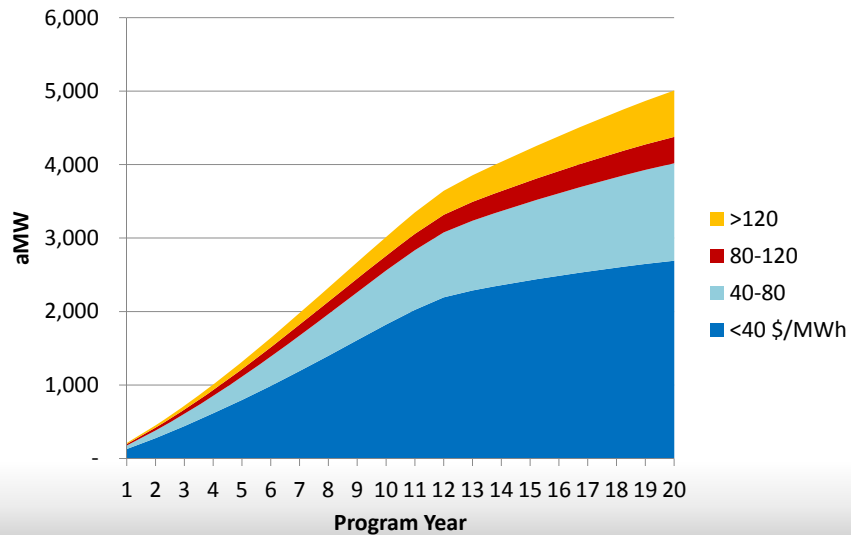
Preliminary 7P Supply Curve

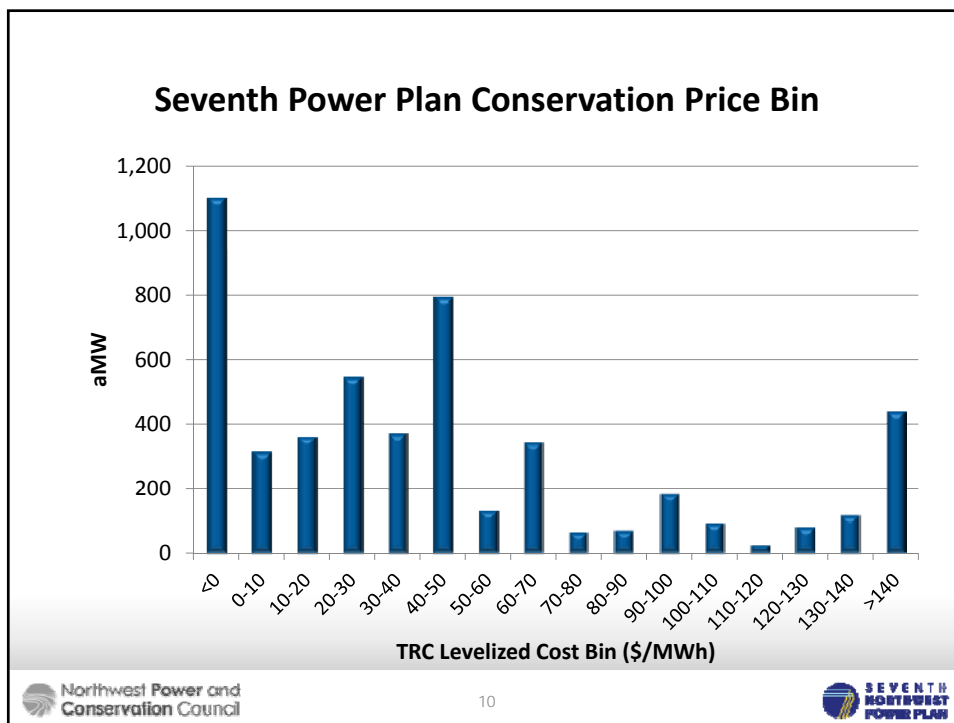
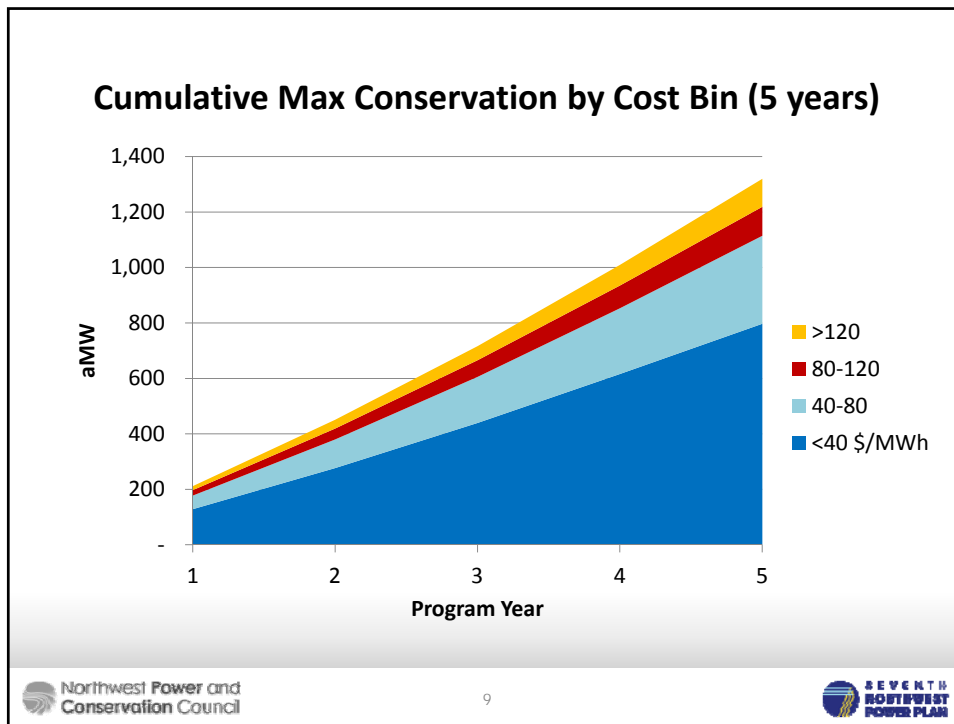


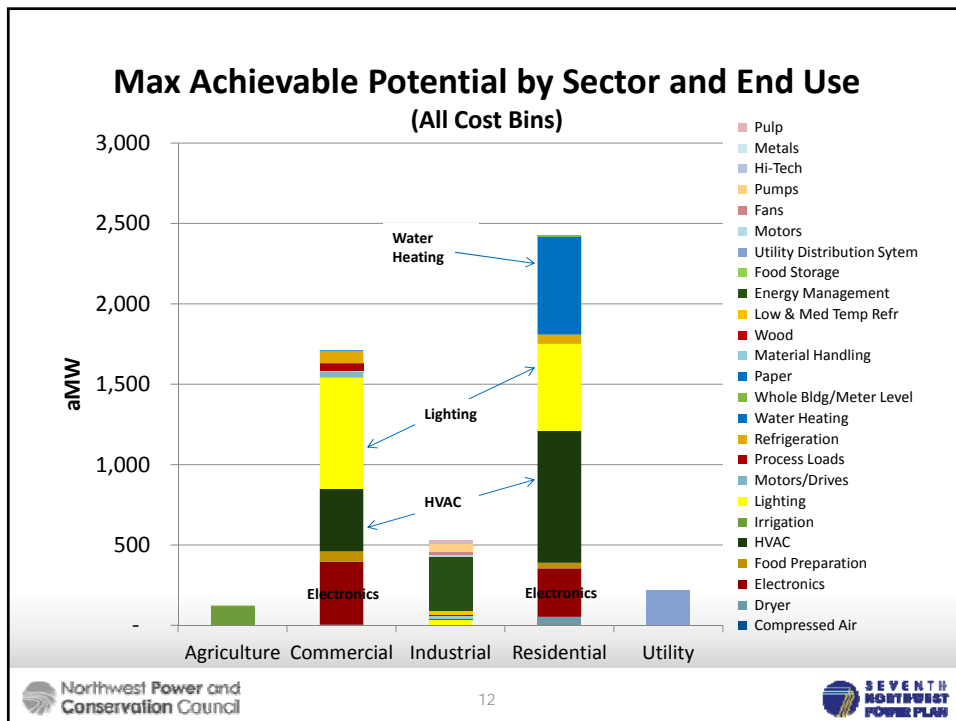
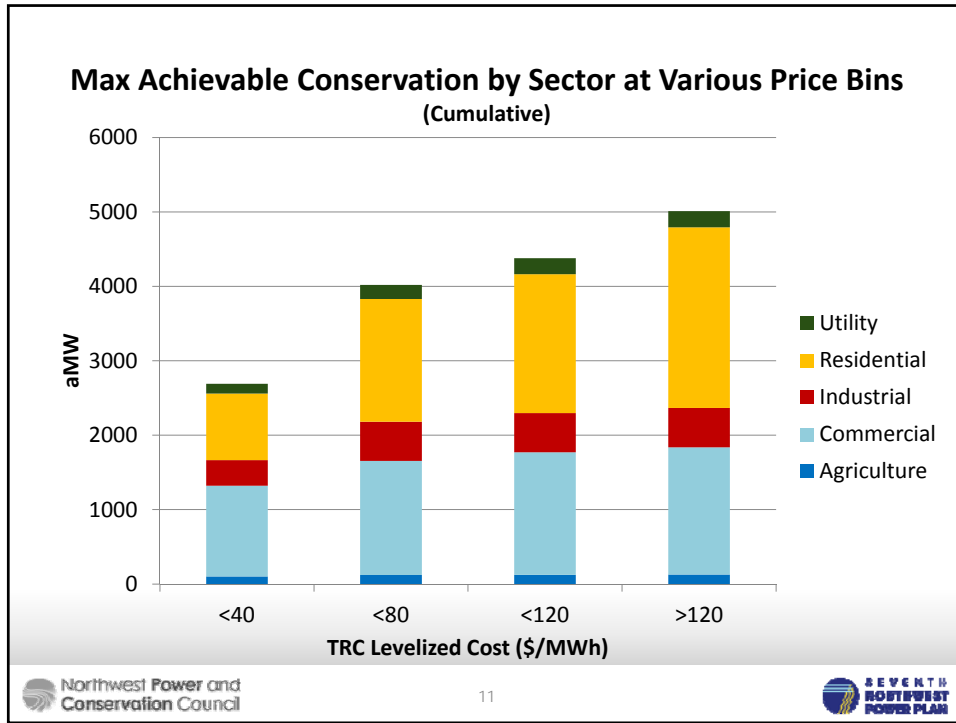
Total Possible Load Reduction



Cumulative Max Conservation by Cost Bin (20 years)





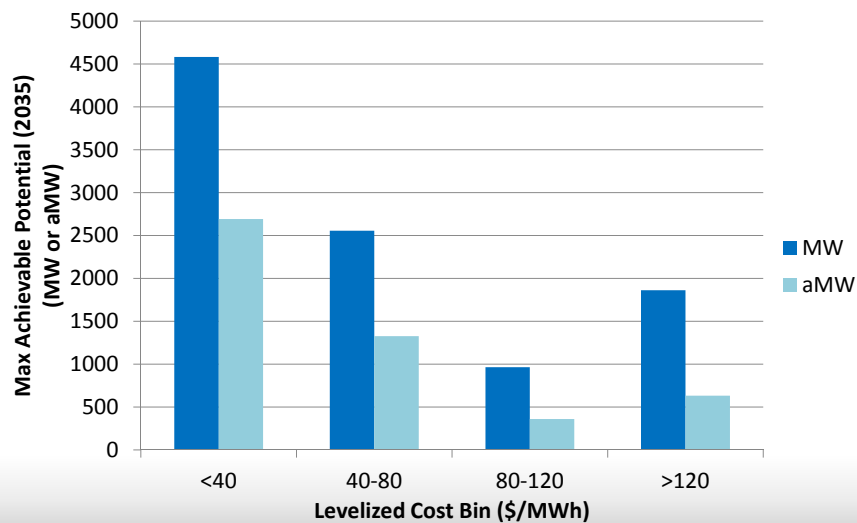


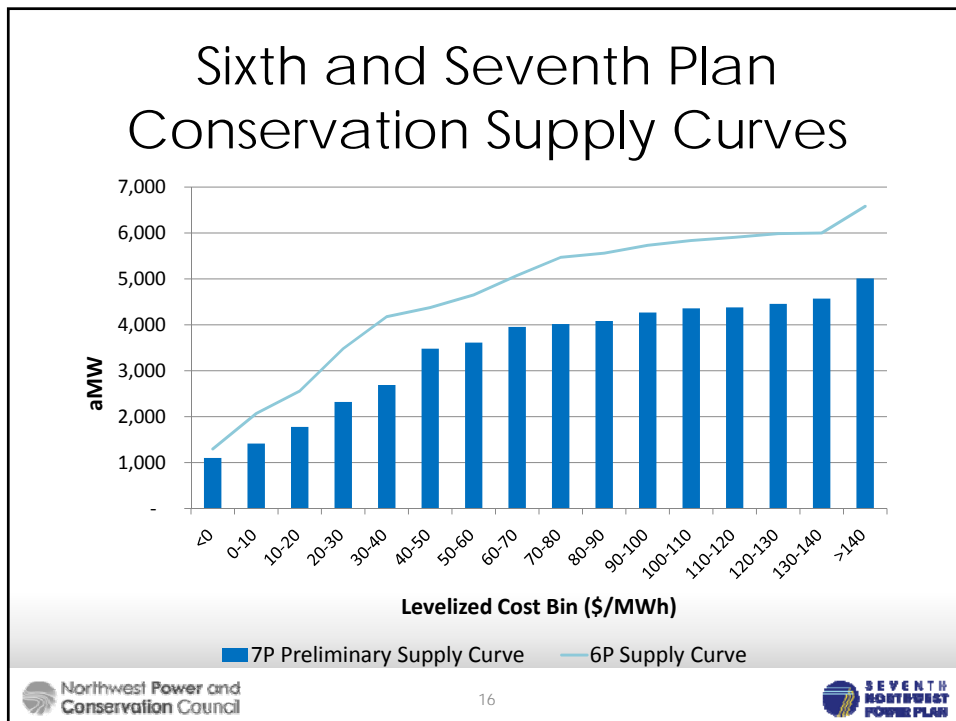
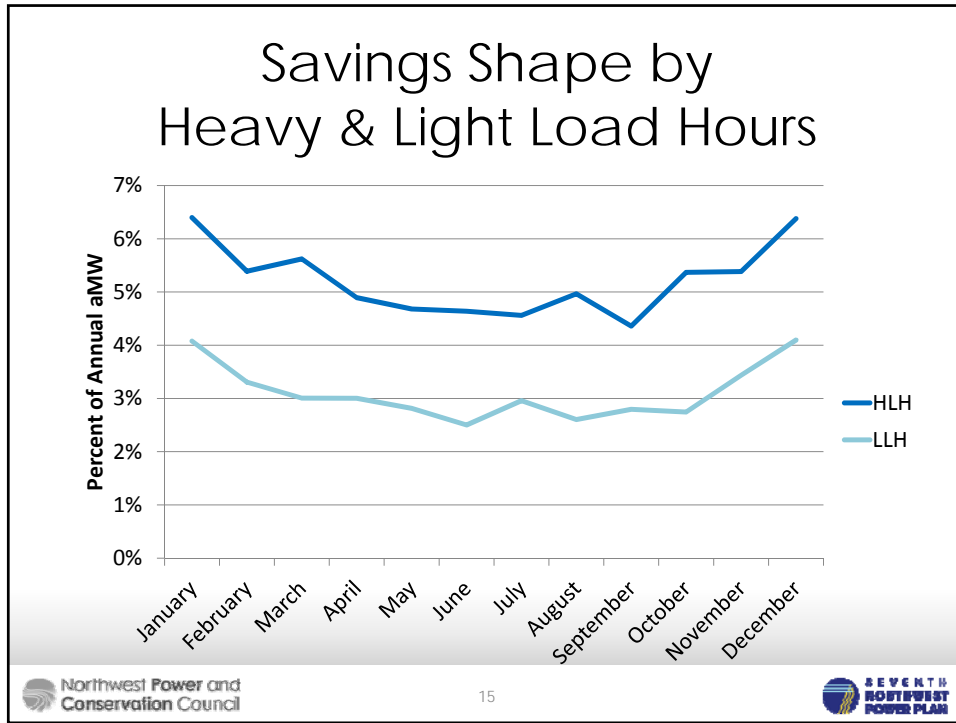
Measure List

- 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



Winter Peak vs. Annual Energy





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

Supplemental Slides

MEASURES IN THE SEVENTH PLAN CONSERVATION ASSESSMENT

Residential Measures

Total Achievable Potential Available by Year (aMW)



Residential	2025	2035
HVAC	439	820
ResWx	242	266
ASHP	34	122
Controls Commissioning and Sizing	14	50
DHP	40	143
DHP Ducted	66	158
Duct Sealing	30	34
GSHP	2	19
WiFi enabled tstats	9	12
Heat Recovery Ventilation	2	16
Lighting	393	541
Lighting	334	483
Lighting PPA	59	59
Water Heating	255	612
Showerheads	96	121
HPWH	51	289
Behavior	34	45
Solar Water Heater	32	56
Clothes Washer	23	60
Aerator	17	32
Dishwasher	0	1
WasteWater Heat Recovery	1	8

Residential	2025	2035
Electronics	229	301
Advanced Power Strips	191	260
Computer	30	33
Monitor	7	8
Refrigeration	7	58
Refrigerator	6	55
Freezer	0	3
Food Preparation	15	34
Electric Oven	11	28
Microwave	4	6
Dryer	13	53
Clothes Dryer	13	53
Whole Bldg/Meter Level	1	7
EV Supply Equip	1	7
Grand Total	1,351	2,428



Commercial Measures

Total Achievable Potential Available by Year (aMW)

Commercial	2025	2035
Lighting	445	691
LPD Package	208	391
Low Power LF Lamps	40	40
Lighting Controls Interior	14	37
Exterior Building Lighting	118	142
Street and Roadway Lighting	53	61
Parking Lighting	8	8
Bi-Level Stairwell Lighting	4	11
Electronics	263	392
Data Centers	185	261
Smart Plug Power Strips	41	47
Desktop	25	56
Monitor	11	24
Laptop	1	4
HVAC	234	390
Advanced Rooftop Controller	72	119
Commercial EM	64	73
DCV Parking Garage	11	13
Demand Control Ventilation	20	21
Secondary Glazing Systems	14	40
VRF	26	92
Premium Fume Hood	1	4
Economizer	25	26

Commercial	2025	2035
Refrigeration	64	76
Grocery Refrigeration Bundle	55	63
Water Cooler Controls	9	13
Food Preparation	19	64
Cooking Equipment	18	63
Pre-Rinse Spray Valve	1	1
Process Loads	41	49
Municipal Sewage Treatment	29	35
Municipal Water Supply	12	14
Motors/Drives	16	39
ECM-VAV	12	34
MotorsRewind	4	5
Compressed Air	2	4
Compressed Air	2	4
Water Heating	5	6
Showerheads	4	4
WHTanks	1	2
Grand Total	1,088	1,711



Agriculture Measures

Total Achievable Potential Available by Year (aMW)

Agriculture	2025	2035
Irrigation	84	120
Irrigation Hardware	46	53
Irrigation Pressure	8	24
Irrigation Water Mgmt	23	23
Irrigation Efficiency	6	19
Lighting	3	3
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	90	127



Industrial Measures

Total Achievable Potential Available by Year (aMW)

Industrial	2025	2035
Pumps	92	108
Fans	45	54
Energy Project Management	79	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
Motors	7	9
Grand Total	415	528



Utility System Measures

Total Achievable Potential Available by Year (aMW)



Utility	2025	2035
Utility Distribution System	76	218
LDC voltage control method	29	83
Light system improvements	17	50
Major system improvements	19	55
EOL voltage control method	10	28
SCL implement EOL w/ major system improvements	1	2
Grand Total	76	218