

Commercial Sector: Preliminary 7P Potential Estimates for Selected Measures

Conservation Resource Advisory Committee
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Measures Covered Today

- Embedded data centers (proposed approach – separate presentation)
- Streetlight
- Wastewater treatment
- Water supply
- Pre-rinse spray valves
- Commercial cooking

Street and Roadway Lighting

Parameter	Sixth Plan	Seventh Plan (draft)
Unit Savings at busbar (kWh)	190 to 280	340 to 3200
Levelized Cost (\$/MWh)	3 to 250 73 weighted average	(-100) to 16 (-39) weighted average
Levelized Cost (\$/MWh) Without maintenance savings	NA	(-5) to 34 18 weighted average
Baseline EE Saturation	<1%	13% by end 2015*
Number of Units (20 years)	1.5 million	1.3 million
Achievable Technical Potential (aMW over 20 years)	44 aMW	55 aMW

* Current penetration estimate being updated

Street and Roadway Lighting

- **Costs falling dramatically**
- **Maintenance savings still large**
- **Lots of activity**
 - **Seattle finished, Portland to finish 2016**
- **Updated stock estimate**
- **High-mast applications now viable**
- **Did not estimate control options savings**

Measure: LED Streetlight		
Item	Methods & Sources	7P Updates
Measures Described	Reduced wattage streetlight, photocell control or astrological clock	
Energy Savings Calculation Basis	Delta watts time hours	
Applicable Stock	All street and roadway lighting. Muni and State	Updated stock estimate from several sources including, PNL survey, 2012 Navigant study, and FERC Form 1. Added decorative, and arterial (high mast).
Baseline Equipment	HPS or Metal Halide. Various wattages.	
Baseline Saturation	About 13% as of end of 2015.	Forecast by end of 2015. From survey of municipalities, PNL & Navigant 2012. Portland, Seattle and other finished by 2016. See sheet SatPen
Hours of Operation	4300 hours per year	Updated 2014
HVAC Interaction Factors	None	
Measures	Primarily LED. Some induction.	Expanded to higher wattage and high mast applications
Capital Costs	Recent municipal data	Updated from Seattle, LA, Tacoma, Portland
Periodic Replacement Costs	Two methods used, 1) Utility rate schedule 2) Data from local utilities	
Savings Shapes	Streetlight	Rebuilt measure shape based on astrological data, three cites and KEMA shape tool from Joe Lopes
Measure Life	Estimated at 70,000 hours. 16 year life on photocell control.	Updated 2014. Use Navigant standards model with forecast to 2017. Modest increase in forecast lifetime.
Achievability Ramp Rate	LO Fast for New, LO Medium NR due to large volume of NR	Increased from 6P. Uptake on the increase.


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Wastewater Treatment

Parameter	Sixth Plan	Seventh Plan (draft)
Average Savings at busbar (kWh per MGD flow)	201,000	163,000
Levelized Cost (\$/MWh)	24	18
Baseline EE Saturation	Built into baseline	26%
Number of Units (20 years)	1750 MGD	1680 MGD
Achievable Technical Potential (aMW over 20 years)	36	29

Wastewater Treatment

- **Measures include:**
 - VFDs
 - Upgrade to premium efficiency motors
 - Aeration blower control via automated dissolved oxygen monitoring
 - Fine bubble diffusers
 - Optimize pumping and blower configurations and operation/controls
 - Upgrade to more efficient pumps and blowers
 - Use hydraulic digester mixing & optimize mixing time
- **Updated number of facilities, total MGD flow**
- **Achieved approximately 10 aMW 2010-2014 (estimated)**
- **More utility data still coming in; will update results**

Water Supply

Parameter	Sixth Plan	Seventh Plan (draft)
Average Savings at busbar (kWh per MGD flow)	59,598	37,739
Levelized Cost (\$/MWh)	61	20
Baseline EE Saturation	10%	35%
Number of Units (20 years)	2459 MGD	2621 MGD
Achievable Technical Potential (aMW over 20 years)	13.8	10.5

Water Supply

- **81% of PNW served by community water systems**
 - 52% is Surface Water
 - 48% is Ground Water
- **New cost data from recent project experience**
- **Sources include EPA Clean Watersheds Needs Survey and American Water Works Association (AWWA)**
- **Measure savings adjusted for recent achievements**
- **Achievements average approximately 1 aMW per year.**

Commercial Cooking

Parameter	Sixth Plan	Seventh Plan (draft)
Average Savings at busbar (kWh/unit)	Fryer - 0 HFHC - 1,194 Steamer - 1,666 Combi Oven - 12,823 Convection - 1,191	2,449 643 41,641 15,281 1,669
Levelized Cost (\$/MWh)	16	-24
Baseline Saturation	10%	39% (ENERGYSTAR)
Number of Units (20 years)	133,961	96,000
Achievable Technical Potential (aMW over 20 years)	32	137

Commercial Cooking

- **Five measures: Fryers, HFHC, Steamers, Combi Oven, Convection Oven**
- **Recent RTF update resulted in significantly higher per measure savings for steamers and combi ovens.**
- **Negative avoided cost due to water savings (Steamer, Combi)**
- **Will be updated with final CBSA data (number of units)**

Pre-Rinse Spray Valves

Parameter	Sixth Plan	Seventh Plan (draft)
Average Savings at busbar (kWh)	979 (electric only)	94 - 151
Levelized Cost (\$/MWh)	-59	-216
Baseline Saturation	0%	26%
Number of Units (20 years)	16,000 (electric only)	54,600
Achievable Technical Potential (aMW over 20 years)	1.8	1.5

Pre-Rinse Spray Valves

- Measure is for Any fuel type (higher savings for electric only). 6P measure was for electric only
- Significant non-electric savings
- Will update with final CBSA and saturation data