

BPA's Utility Potential Calculator

Training Session
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AGENDA

- Overview
- UPC Presentation
- UPC Demo
- UPC Training

Background

- Understanding energy efficiency potential is increasingly more important for all utilities
 - Tiered Rates
 - 6th Plan
 - I-937 in Washington
- Comprehensive potential studies can be costly, particularly for smaller utilities
- These tools, especially the UPC, will enable smaller utilities to do CPAs

Handbook for Potential Studies in the Northwest

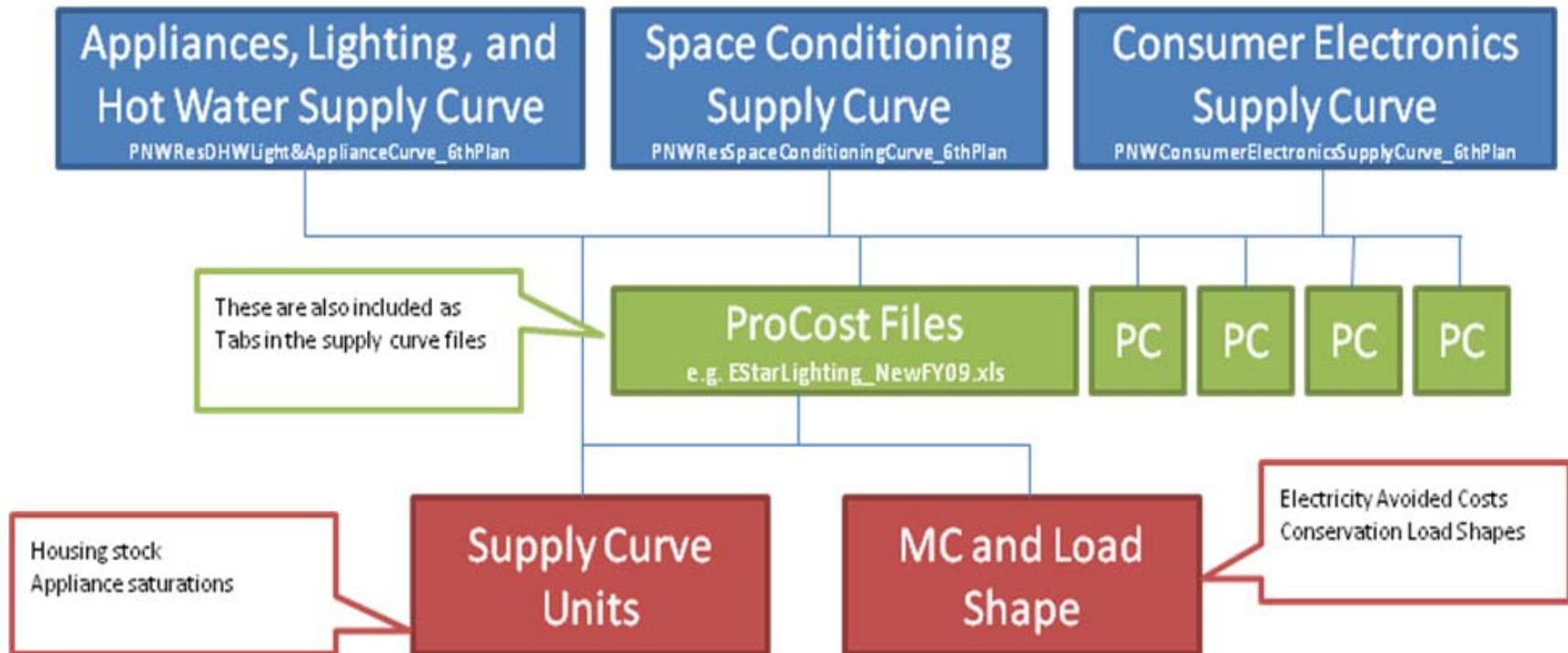
- BPA Contracted with EES to develop
 - “Handbook” with the goal of developing a reference guide for utilities:
 - Basics on potential studies and required data
 - Overview of Council’s potential models and Target Calculator
 - Brief description of *Utility Potential Calculator*
 - Components of a typical Action Plan
 - Utility Potential Calculator

Options for Estimating Potential

- Council’s Target Calculator
- Utility Potential Calculator (UPC)
- Custom Utility Potential Study
- Customize the Council Model

	<i>Utility Location</i>	<i>Residential Load</i>	<i>Commercial Load</i>	<i>Industrial Load</i>	<i>Housing Stock</i>	<i>Appliance Saturation</i>	<i>Heat Type</i>	<i>Building Vintages</i>	<i>Commercial Stock</i>	<i>Industry Types</i>	<i>Demolition/Growth Rates</i>	<i>Avoided Cost</i>	<i>Technical Measure Data</i>	<i>Ramp Rates</i>	<i>Utility Data*</i>
Target Calculator	X	X	X	X											
UPC	X	X	X	X	X	X	X	X	X	X	X				
Full Potential Study	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Council Models	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
*Including finance rates, line losses, admin cost															

Council Residential Model Structure



Utility Potential Calculator

- What is the Utility Potential Calculator (UPC)?
 - High level calculator to provide quick estimates of energy efficiency potential
 - Bridge the gap between full/comprehensive CPA and the Target Calculator
 - Enable smaller utilities to get quick and meaningful results
 - Results are customized based on utility customer characteristics
 - Based on Sixth Power Plan measures

Utility Potential Calculator

- What the UPC is not:
 - Comprehensive, bottom-up potential assessment
 - Primary research to understand customer characteristic

Data Needs

Customer Characteristics

- Residential: Total housing units, housing type, foundation, heating type, vintage and appliance saturations, cooling, heating and solar zones and growth and demolition rates.
- Commercial: square footage by sub-sector
- Industrial: load by sub-sector
- Agriculture: Total number of irrigated acres, dairy farms in service territory

These data can be changed in the UPC

Measure Characteristics

- Measure Cost
- Savings
- Life
- Achievability
- Applicability
- Avoided Cost

These data remain fixed with Council assumptions in the UPC and cannot be changed.

Demonstration...

RESIDENTIAL			RESET		
Heating Zone	Cooling Zone	Solar Zone			
I	I	I			
Residential Households	Total Population				
10,000	30,000				
Housing Stock	Service Territory %	Regional %	Housing Appliances	Saturation %	Regional %
House Type			Water Heating		
Single Family	72%	72%	Electric	64%	64%
Multi-Family	18%	18%	Natural Gas	36%	36%
Manufactured Homes	10%	10%	Appliance Saturation		
Housing Vintage			Refrigerator	112%	112%
Pre-1980	72%	72%	Freezer	57%	57%
1980 - 1993	18%	18%	Clothes Washer	87%	87%
Post 1993	10%	10%	Electric Dryer	82%	82%
Heat Fuel Type			Dishwasher	67%	67%
Natural Gas Homes	37%	37%	Electric Oven	82%	82%
Electric Homes	53%	53%			
Other Fuel Homes	10%	10%			
Electric Heat System Type					
Forced Air Furnace	34%	34%			
Heat Pump	20%	20%			
Zonal (Baseboard)	44%	44%			
Electric Other	2%	2%			
Single Family Foundation Type					
Crawlspace	64%	64%			
Full Basement	33%	33%			
Slab on Grade					

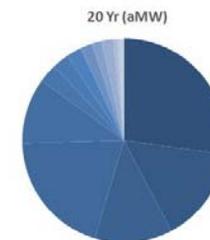
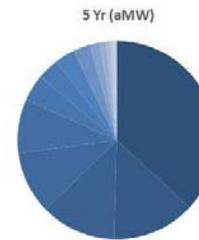
Demolition	Annual Rate	Regional Rate
Single Family	-0.23%	-0.23%
Multi-Family	-0.23%	-0.23%
Manufactured Homes	-1.07%	-1.07%

Growth Rate	Annual Rate	Regional Rate
	1%	1%

Sector Summary

Commercial

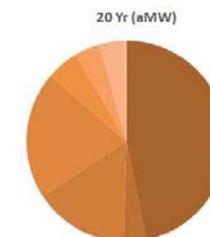
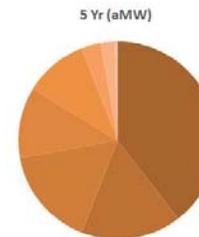
	5 Yr (aMW)	20 Yr (aMW)
Water_Wastewater	0.019	0.076
Lighting	0.007	0.043
Other	0.006	0.035
Traffic	0.005	0.068
Food Service	0.005	0.029
Ventilation	0.002	0.008
Refrigeration	0.002	0.007
PC Network/Supply	0.002	0.007
Rooftop Units	0.001	0.005
Envelope	0.001	0.004
Integrated Design	0.001	0.005
Water Heat	0.000	0.002
HVAC Controls	0.000	0.001
Ext Lighting	0.000	0.002



- Water_Wastewater
- Lighting
- Other
- Traffic
- Food Service
- Ventilation
- Refrigeration
- PC Network/Supply
- Rooftop Units
- Envelope
- Integrated Design
- Water Heat
- HVAC Controls
- Ext Lighting

Residential

	5 Yr (aMW)	20 Yr (aMW)
HP / DHP	0.224	1.583
Lighting	0.095	0.121
Water Heat	0.092	0.516
Consumer Electronics	0.065	0.695
Envelope Retro	0.059	0.176
Appliances	0.018	0.137
Envelope New	0.013	0.135
Cooling	0.002	0.013



- HP / DHP
- Lighting
- Water Heat
- Consumer Electronics
- Envelope Retro
- Appliances
- Envelope New
- Cooling

Annual Base Load in 2007	MWh	Annual Growth Rate (Regional Average)
Mechanical Pulp	0	0.46%
Kraft Pulp	0	0.66%
Paper	5,000	-0.11%
Foundries	0	-1.07%
Frozen Food	0	-0.40%
Other Food	0	0.20%
Sugar	0	-0.05%
Lumber	40,000	-1.10%
Panel	0	-1.01%
Wood	0	0.16%
Electric Fabrication	0	0.60%
Silicon	0	-1.01%
Metal Fabrication	0	0.92%
Equipment	0	-2.02%
Cold Storage	25,000	2.19%
Fruit Storage	0	2.22%
Refinery	0	-1.38%
Chemical	0	0.28%
Miscellaneous Manufacturing	0	0.50%

Reset Growth Rates

Total 70,000

Utility Training

- How to obtain a copy of the UPC:
 - From BPA Energy Efficiency Website
 - Different “versions” depending on your version of Excel
- BPA is providing 2 hours of training/consulting to each utility who obtains the UPC:
 - UPC troubleshooting
 - Data entry questions
 - Interpreting the results
 - Questions and clarifications about the tool

UPC Support and Questions

- If interested in receiving UPC support, please contact Brendan O'Donnell:
 - odonnell@eesconsulting.com
 - 425-889-2700 ext. 223

- Danielle Gidding
 - dngidding@bpa.gov
 - 503-230-7314