Bonneville Power Administration

Residential Building Stock Assessment Phone Survey: Utility Potential Calculator Inputs

May 17, 2011

Carrie Cobb, BPA Project Manager
Poppy Storm, Ecotope Project Manager

Agenda

- Introduction & Study Goals
- Sample Design
- Questionnaire & Data Collection
- Development of Database & UPC Inputs
- Using UPC Inputs
- Saturation Rates Across Utilities
- Questions & Answers

Introduction & Study Goals

- Characterize residential populations in BPA customer service areas
- Leverage the RBSA survey to provide detail to specific utility areas
- Develop inputs to UPC tool useful for individual utilities

Utility Potential Calculator Background

- Developed by BPA to assist utilities in planning
- Requires information on equipment saturations and population to develop utility specific potential estimates
- Available for download at: http://www.bpa.gov/energy/n/utilities_potential.cfm

Receiving UPC inputs

Available from your EER for your territory

INSTRUCTIONS:

Step 1 – Open the UPC Calculator excel file. You will use the saturation percentages in this UPC Inputs file to populate the UPC Calculator with your utility information.

Step 2 – Complete Steps 1 through 3 in the UPC **'ResidentialInputs'** tab.

Step 3 – To complete Step 4 in the UPC **'ResidentialInputs'** tab, copy and paste the percentages from this **'ResidentialInputs_Utility'** tab into their corresponding UPC locations.

*NOTE: Do not replace the entire UPC **'ResidentialInputs'** tab with this workbook template! If you do, the **'Output'** tabs will not calculate properly.*

RESIDENTIAL

Heating Zone	Cooling Zone	Solar Zone

Residental Households		Total Population	Utility Name		Average Occupancy
					2.54

Housing Stock	Service Territory %
House Type	
Single Family	77%
Multi-Family	13%
Manufactured Homes	10%
Housing Vintage	
Pre-1980	50%
1980 - 1993	13%
Post 1993	37%
Heat Fuel Type	
Natural Gas Homes	23%
Electric Homes	65%
Other Fuel Homes	12%
Electric Heat System Type	
Forced Air Furnace	20%
Heat Pump	44%
Zonal (Baseboard)	35%
Electric Other	2%
Single Family Foundation Type	
Crawlspace	60%
Full Basement	19%
Slab on Grade	14%

Housing Appliances	Saturation %
Water Heating	
Electric	30%
Natural Gas	70%
Appliance Saturation	
Refrigerator	149%
Freezer	62%
Clothes Washer	95%
Electric Dryer	89%
Dishwasher	71%
Electric Oven	82%

Demolition	Annual Rate	Regional Rate
Single Family		
Multi-Family		
Manufactured Homes		

Growth Rate	Annual Rate	Regional Rate

ResidentialInputs_Utility

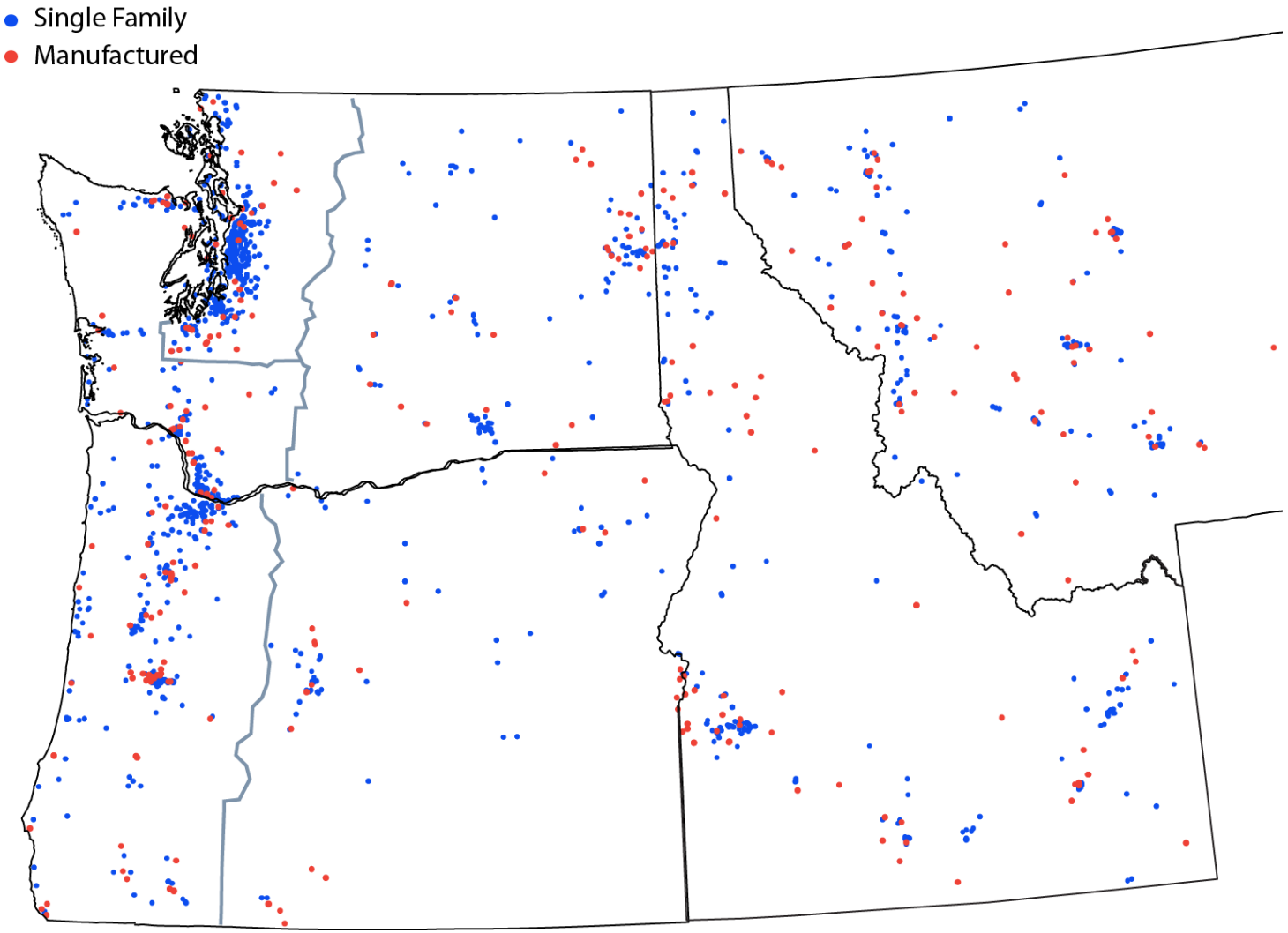
Residential Building Stock Assessment Background

- Implemented by NEEA
- Comprehensive characterization of the current Northwest housing stock
- More than 1,850 onsite audits of single-family, manufactured, and multifamily buildings
- More than 8,000 phone surveys

RBSA Phone Survey

- Random sample developed for phone survey
  - Random Digit Dial (RDD)
  - Random sample of large utility customer lists
- Targets for each housing type
- Distributed by population within state and sub-regions

RBSA On-Site Sample Distribution



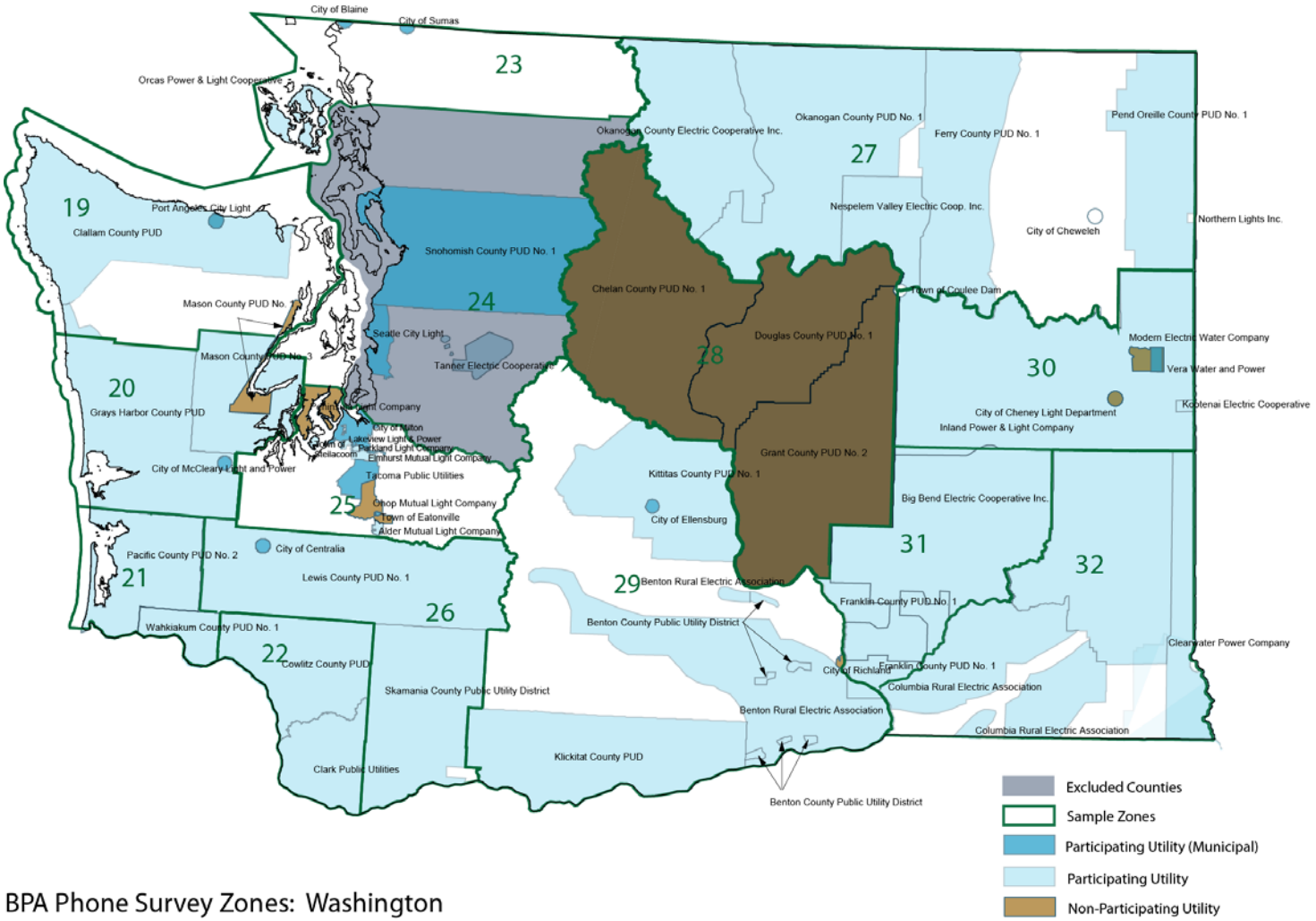
BPA Supplemental Phone Survey

- Sample 32 zones that have:
  - Similar availability of gas
  - Similar distribution of rural populations
  - Similar climate zones
- Achieve statistical validity for smaller geographic regions

Sample Design

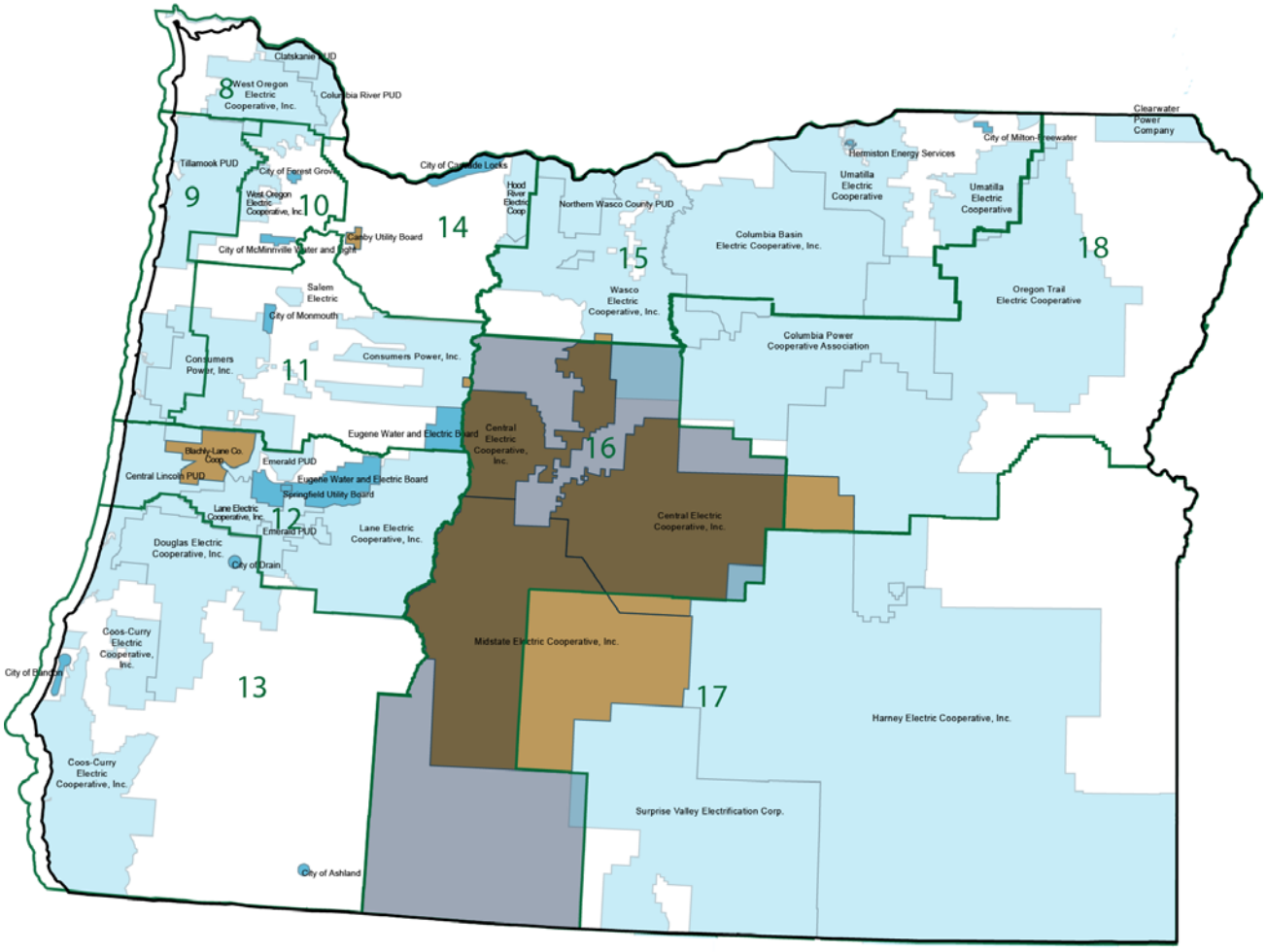
- 32 zones
  - Subsets of RBSA sampling regions
  - 2-4 utilities per zone
  - Grouped according to climate and fuel type
- 3 zones removed
  - Large publics (statistically significant already)
  - Non-BPA publics
  - Utilities not participating in the RBSA
- Approx. 2,400 homes targeted for oversample
- Approx. 4,500 homes integrated from the original RBSA phone survey

Washington Sampling Zones



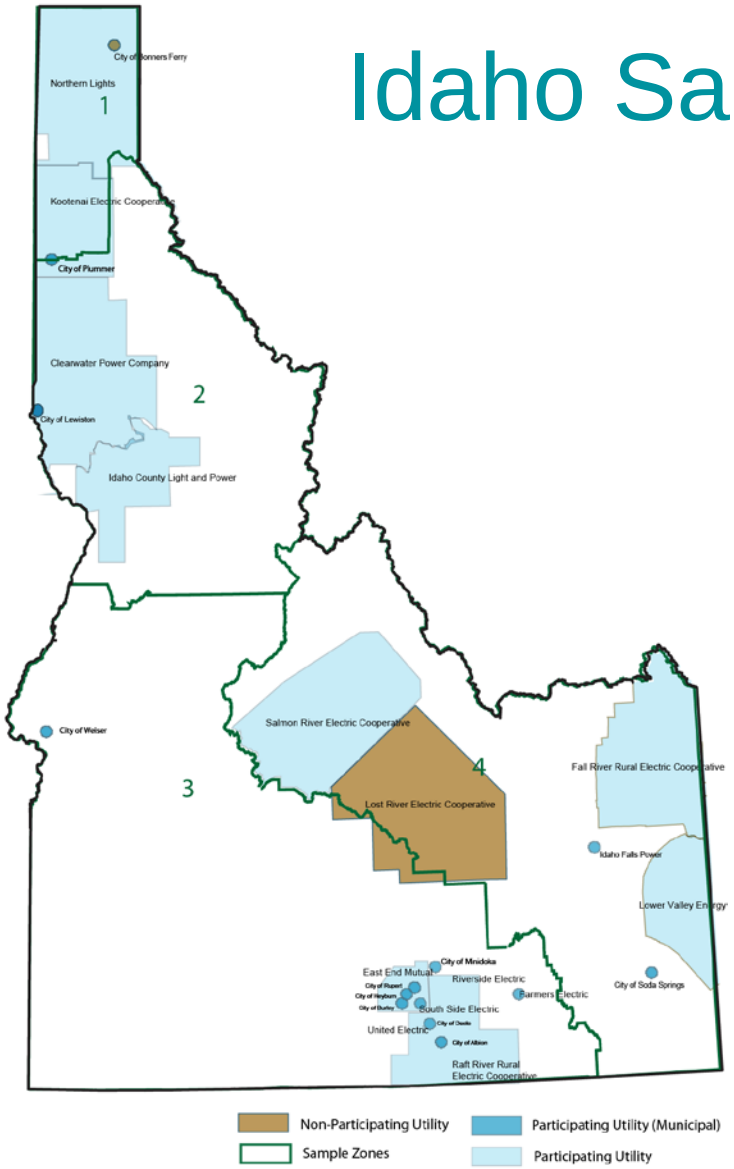
BPA Phone Survey Zones: Washington

Oregon Sampling Zones



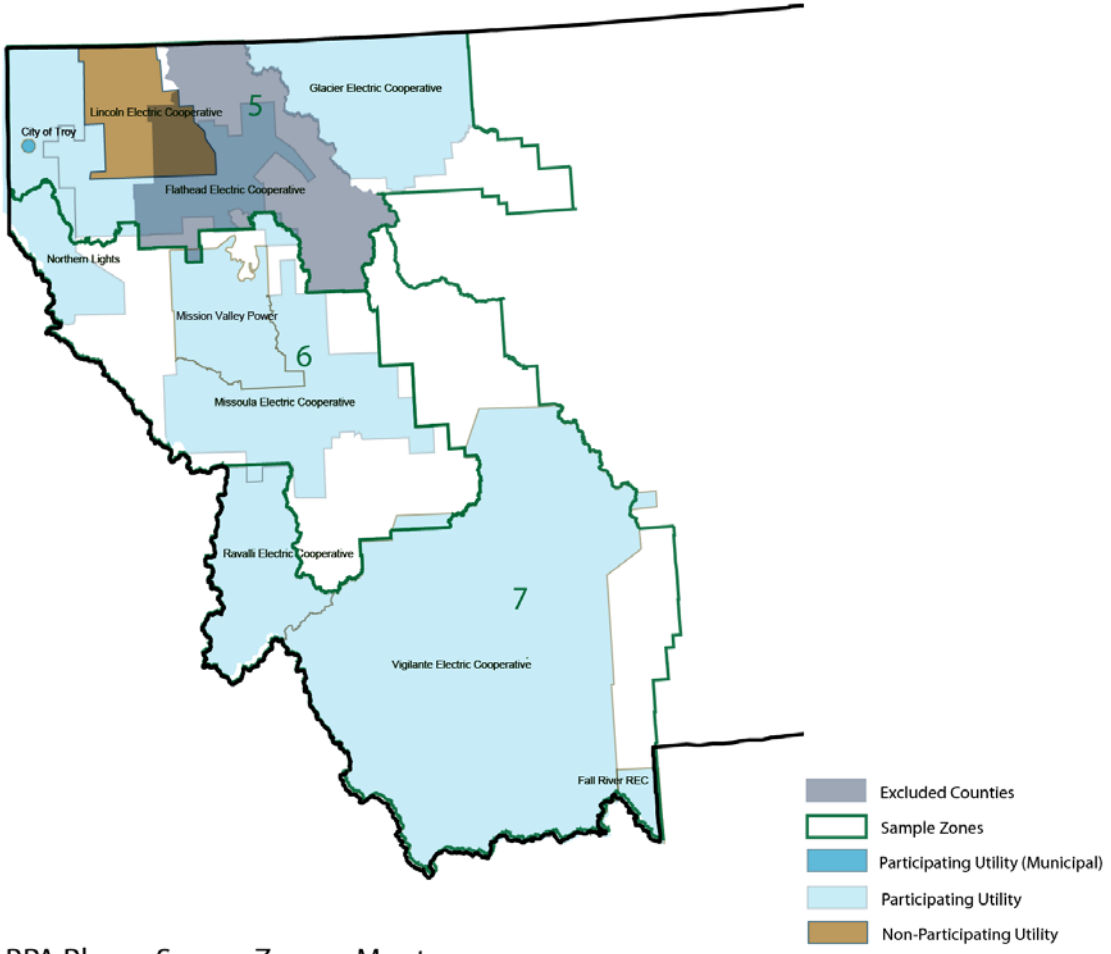
BPA Phone Survey Zones: Oregon

Idaho Sampling Zones



BPA Phone Survey Zones: Idaho

Montana Sampling Zones



BPA Phone Survey Zones: Montana

Phone Survey Questionnaire

- Screening questions to determine state, county, electrical utility and dwelling type
- Home characteristics
  - Questions designed to include UPC characteristics
- Demographics

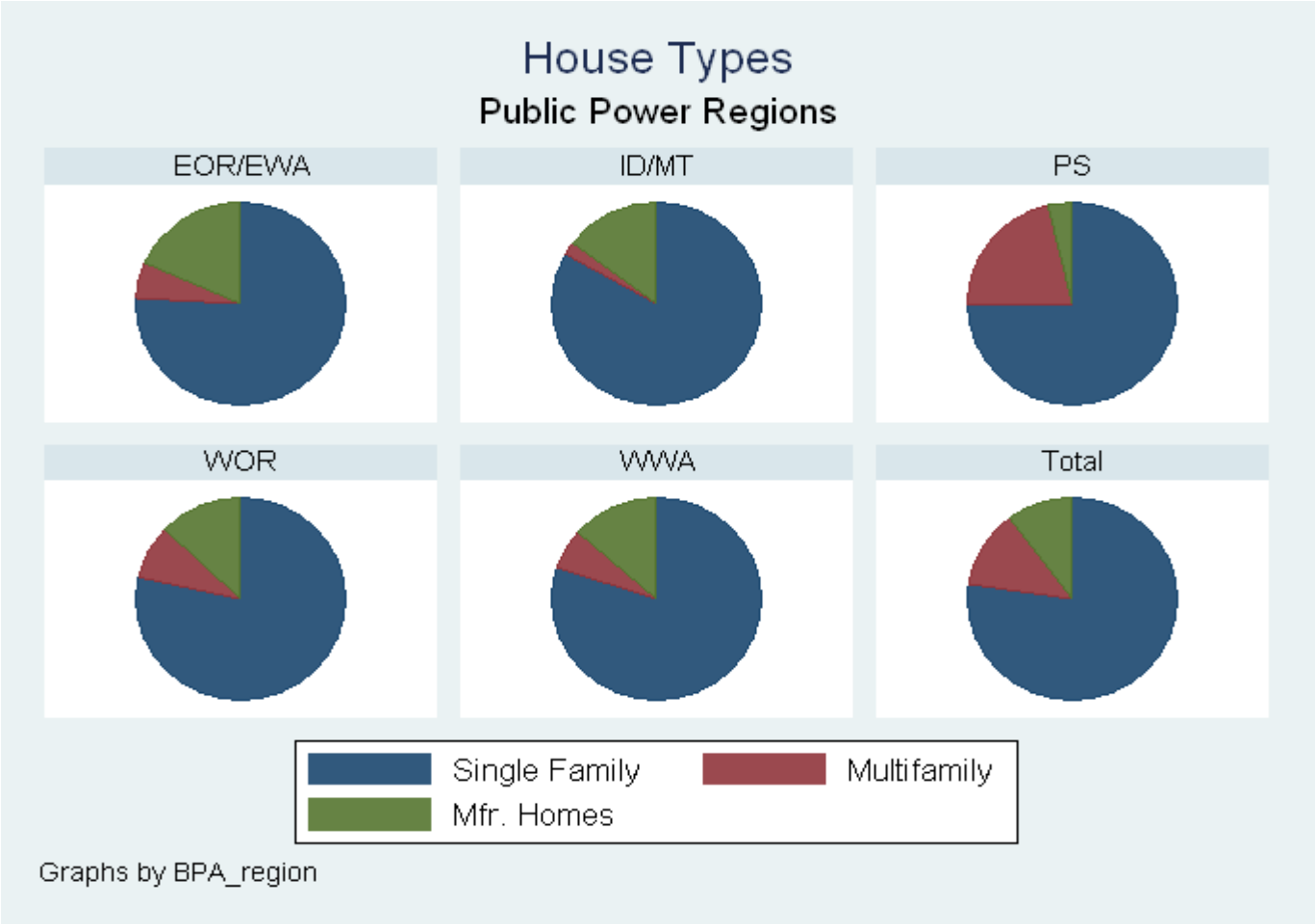
Development of Database & UPC Inputs

- Perform final QC and data cleaning
- Integrate original and oversample survey responses
- Develop saturation % for key UPC inputs:
  - Housing Type
  - Housing Vintage
  - Heat Fuel Type
  - Electric Heat System Type
  - Single Family Foundation Type
  - Water Heating
  - Appliance Saturation

Public Power Saturation Rates

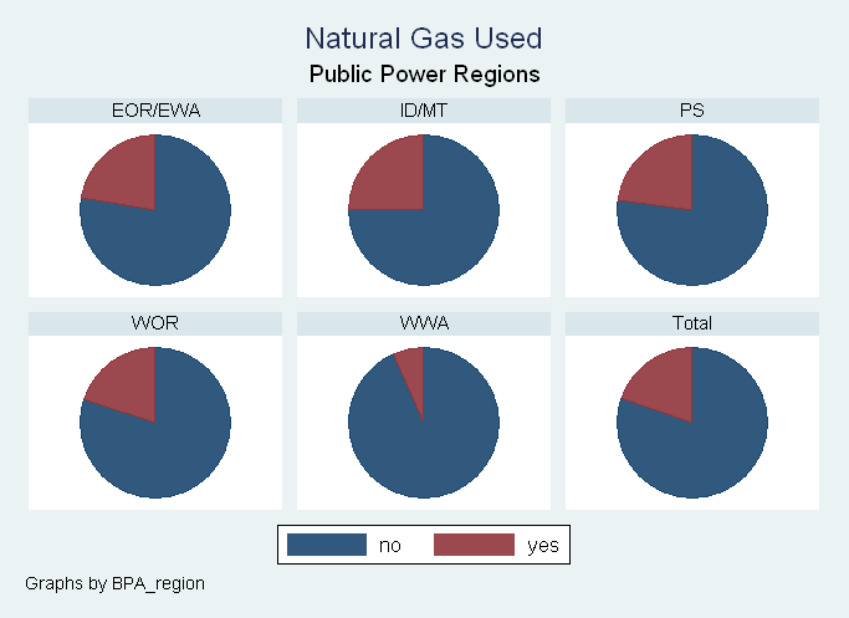
- Summaries use regional weights
  - “All Public Utilities” includes all participating public utilities
  - “Small/Med Public Utilities” includes all participating public utilities, except:
    - Seven largest public utilities
    - Three mid-Columbia public utilities

All Public Utilities Summary

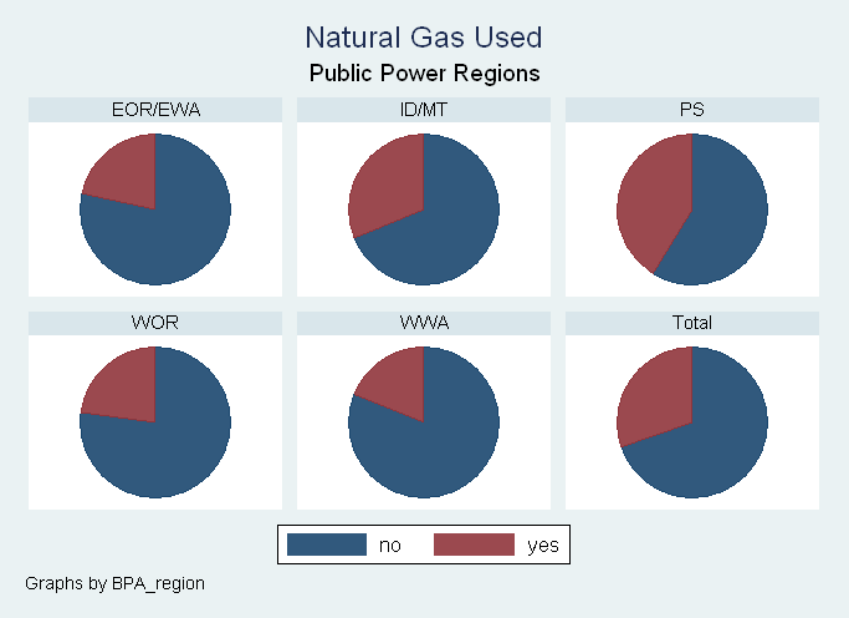


Fuel Summary

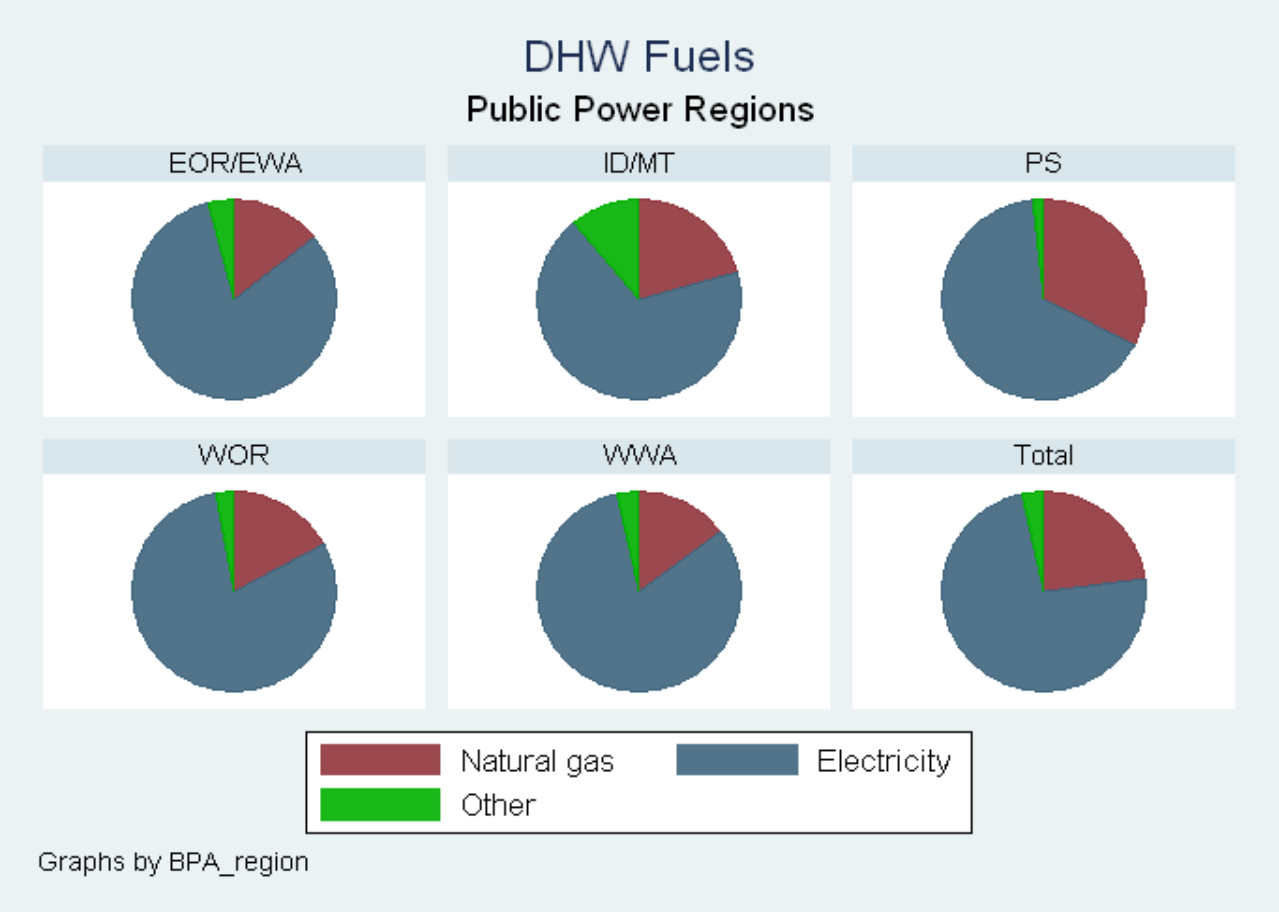
Small/Med Public Utilities



All Public Utilities

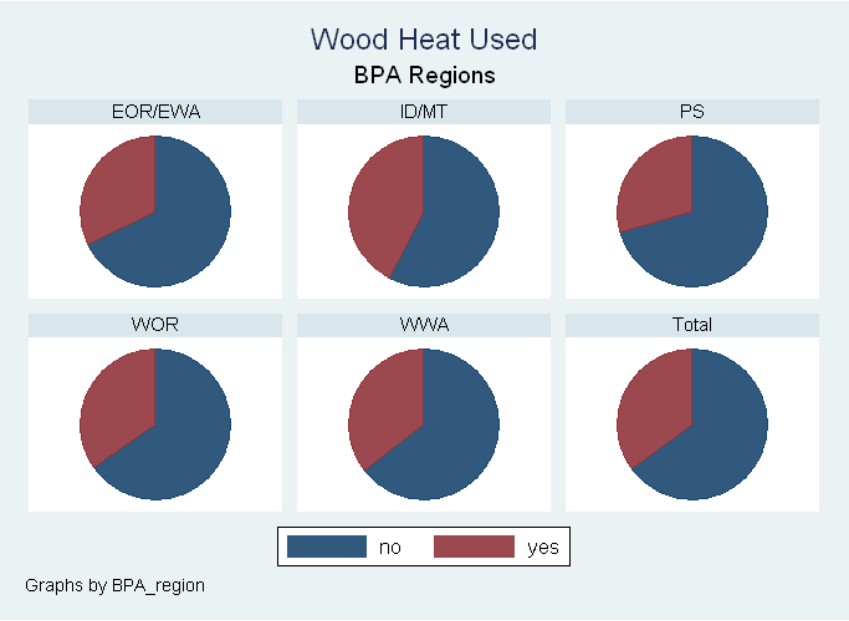


All Public Utilities: Domestic Hot Water Fuel Summary

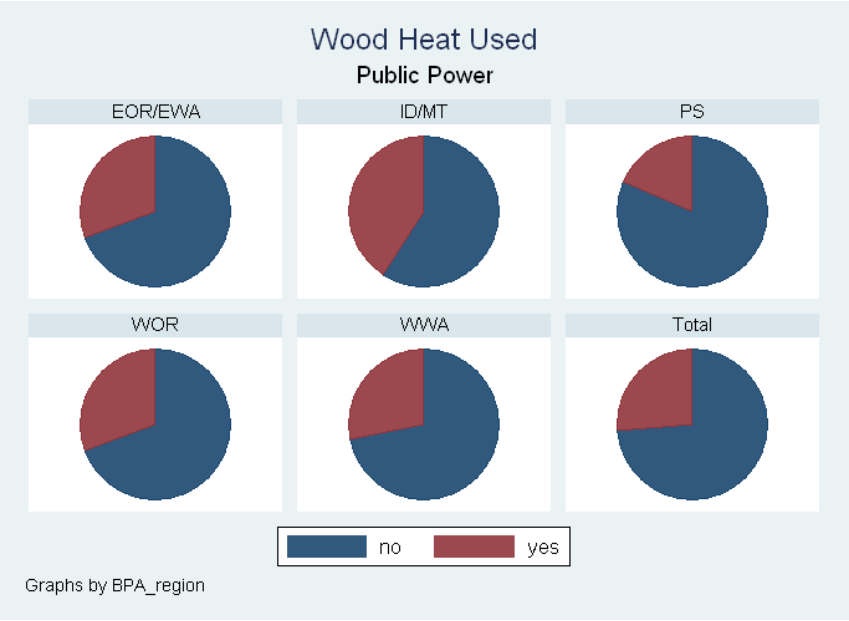


Wood Heat Summary

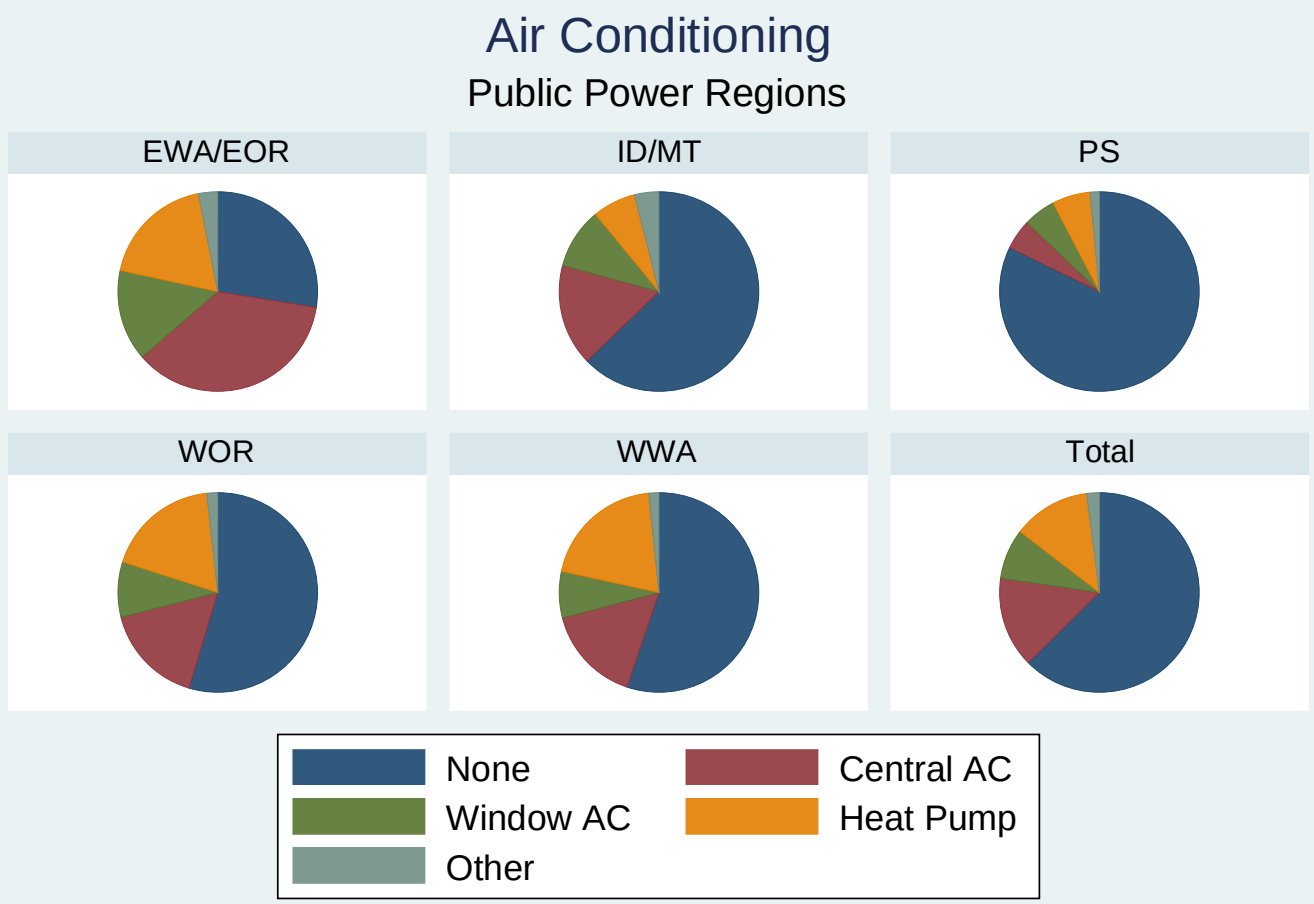
Small/Medium Public Utilities



All Public Utilities



Air Conditioning Summary



Graphs by BPA region (EOR/EWA,ID/MT,PS,WOR,WWA)

Contact Information

Bonneville Power Administration
Carrie Cobb, Energy Efficiency
503-230-4985
clcobb@bpa.gov

Ecotope
Poppy Storm, Project Manager
206.322.3753, ext 206
poppy@ecotope.com