Northwest Power and Conservation Council and Northeast Energy Efficiency Partnership's

End-Use Data Assessment Project

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End-Use Load Data Project: Phase 1

- Project Objectives: To assess the existing end-use and load shape data available for typical loads in the Pacific Northwest and East regions
  - Research and inventory the existing load shape data available
  - Determine what load shape data is necessary to meet needs
  - Identify weaknesses in the existing data
  - Evaluate the transferability and applicability of existing load shape data
  - Provide a road map for meeting future short term and long term end-use metering needs

KEMA

Methodology for Data Collection

- A web survey of 102 industry contacts
- Studies compiled for the 2006 California Load Shape Update Initiative
- Follow up interviews to identify and collect dataset characteristics of studies

Data Collection

- In total, over 110 studies were identified as part of this effort.
- Most studies fell into one of three categories:
  - **Compilation Studies**
  - **Load Research Studies**
  - **Evaluation Studies**

Usability and Transferability of Datasets

- **Issues Related to Usability:**
  - **Accessibility**
  - **Statistical significance/Sample size**
  - **Vintage of Data**
  - **Time Resolution/Granularity of Data**
  - **Geographic Location of Data**

Usability and Transferability of Datasets

- **Transferability of Load Shapes between Regions**

Analysis Group	Schedule Variability	Weather Variability	Transferability Rating
Appliances - Kitchen	Medium	Low	High
Appliances - Laundry	Medium	Low	High
Appliances -Refrigerators	Low	Medium	High
Domestic Hot Water	Low	Medium	Medium
HVAC – Cooling	Medium	High	Low
HVAC – Fan Energy	Medium	High	Low
HVAC - Heating	Medium	High	Low
HVAC - Ventilation	Medium	Medium	Low
HVAC - Other	Medium	High	Low
Lighting - Exterior	Medium	Low	High
Lighting - Interior	Low	Low	High
Plug Load	Low	Low	High
Pool Pump	Low	Medium	Medium

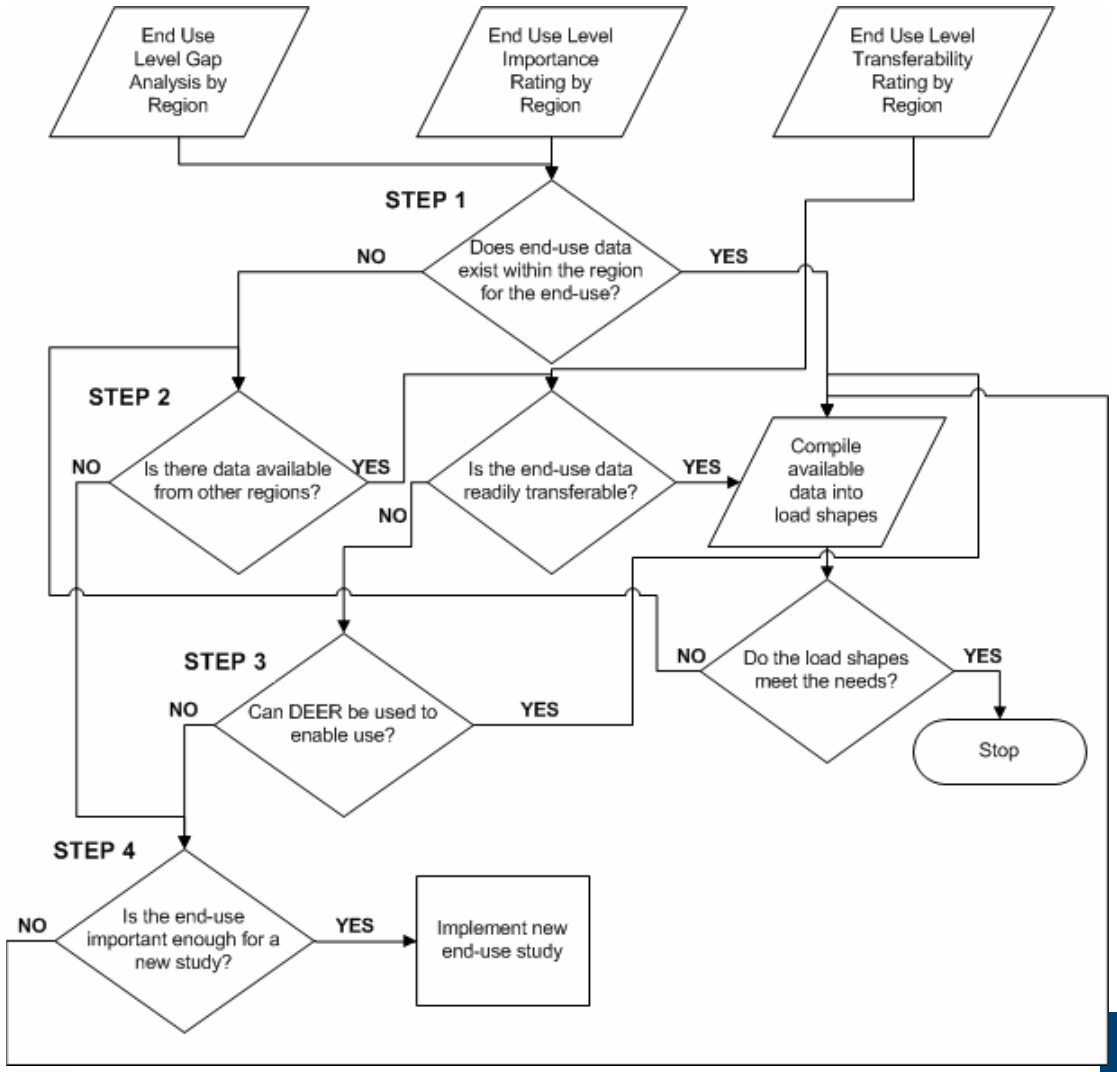
Identification of Potentially Useful Studies

Sponsoring Entity	Study Name	Study End Date	Analysis Groups Evaluated	Usability Rating
NEEA	Ductless Heat Pump Pilot Evaluation	Not Completed	HVAC-Cooling, HVAC- Fan, HVAC-Heat HVAC-Other, Water Heating	C
NEEA	Northwest Energy Star Homes Impact Evaluation	Not Completed	Lighting	C
BC Hydro	Load Monitoring Project (LMP)	1994 -2009	Appliance-Kitchen, Appliance Laundry Appliance Refrigerator, Water Heating	B
PacifiCorp	System Wide Potential for Demand Side & Other Resources (Residential)	2007	Appliance-Kitchen,Laundry & Refrigerator, Water Heating HVAC - Cooling, Heating & Fan, Plug Load, Lighting	C
PacifiCorp	System Wide Potential for Demand Side & Other Resources (Non-Res)	2007	Industrial - Process, Refrigeration, Water Heating HVAC - Cooling, Heating, Fan &Ventilation Only, Lighting	C
BC Hydro	Power Smart Residential End Use Study	Planning Stages	Appliance-Kitchen, Appliance Laundry Appliance Refrigerator, Water Heating	C
Seatle Cty Light	Space Heat Thermostat Metering Study	2006	HVAC - Heating	B

Gap Analysis

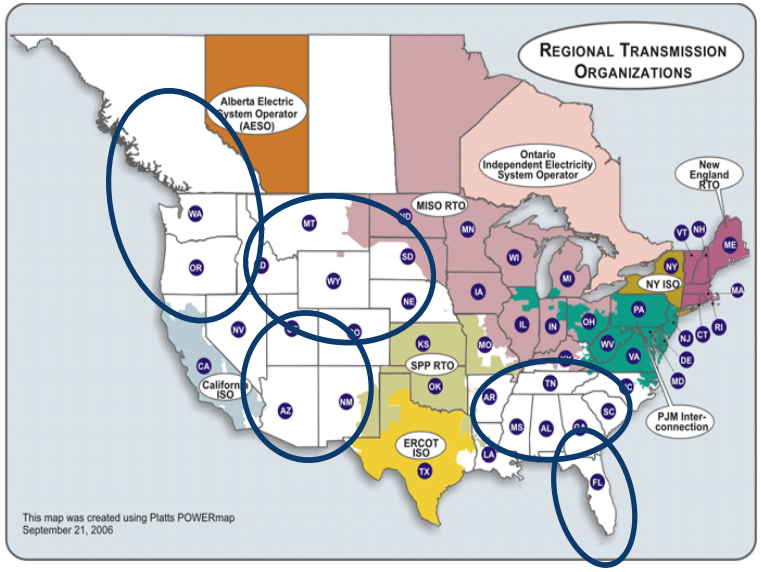
Region	Sector	Summary of Gap Analysis
Pacific Northwest region	Residential	The residential customer sector has good coverage in this region as long as the BC Hydro Power Smart Residential End-use metering study is implemented with the large sample sizes that were indicated in the customer survey. If this study is not implemented the sample sizes are significantly reduced than the coverage for these analysis groups gets thin rather quickly.
	Non-Residential	There was only one non-residential study identified in this region, and it was the PacifiCorp study that had no sample size information. Therefore based on the available information **all non-residential analysis groups have a high need for end-use data.**

Prioritization of Near-term Activities



Roadmap for Future Regional End-Use Data Efforts

- Customer Class Considerations
- Evaluating Options for Future End-use Metering
- AMI
- Regional Transmission Areas



Summary of Recommendations

- Near-term Recommendations
  - ***Develop detailed protocols for end-use data collection***
  - ***Coordinate with metering studies currently in progress***
  - ***Implement new metering studies targeted at specific end-use analysis groups***

Summary of Recommendations

- Mid-Term Recommendations
  - ***Plan for other study types (non-metering studies)***
  - ***Conduct survey of regional utilities and AMI initiatives***
  - ***Explore high resolution conditional demand analysis***

Summary of Recommendations

- Long-Term Recommendations
  - ***Utilize AMI data and disaggregation to examine true transferability***
  - ***Implement multi-region end-use data repository***