

**Program 170 End –Use  
Energy Efficiency &  
Demand Response  
*Project Set 170A  
Analytics Portfolio***





# Load Research 170.005: Load Shape Library

## Objective

Develop, demonstrate and update a load data framework with a database and web portal to enable access to best available whole premise and end use load shape data.

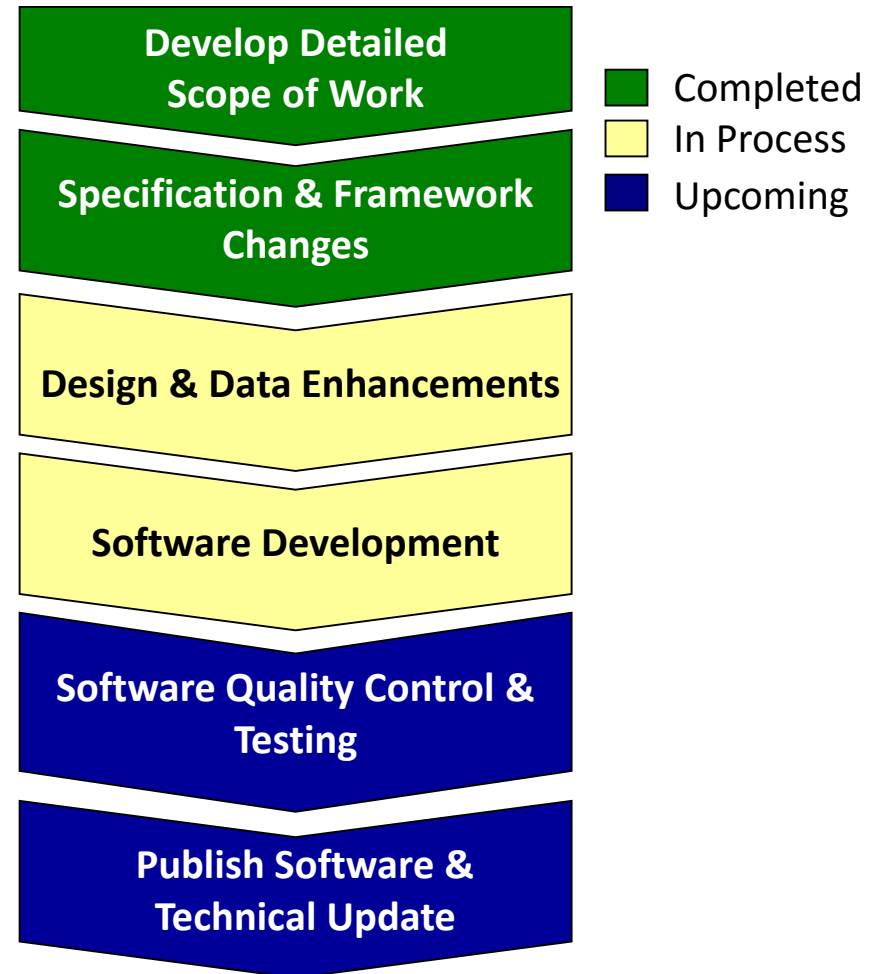
## Deliverable

**Load Shape Library version 5.0**  
**Public, open access software**  
Product ID # 3002010559

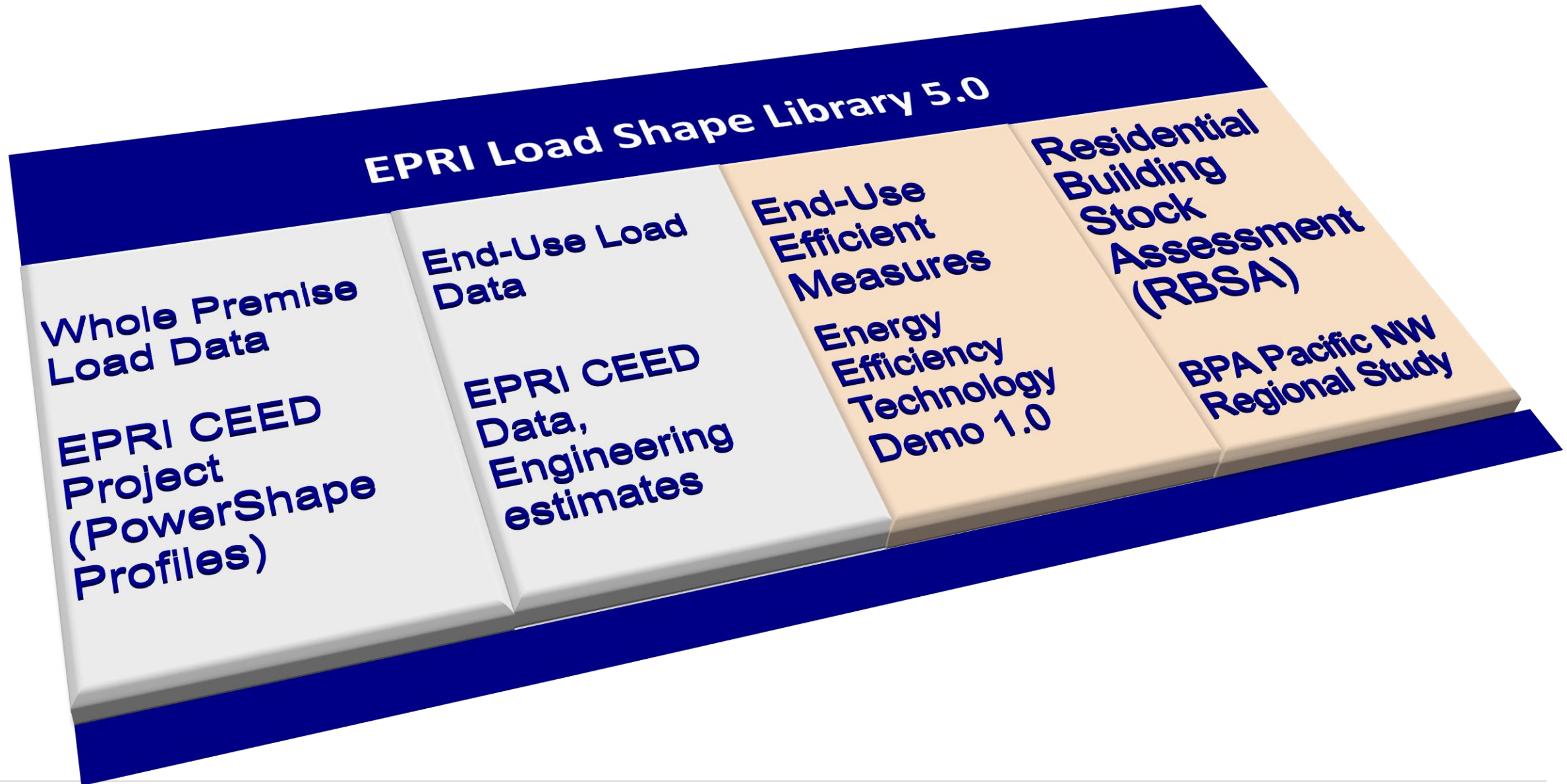
## Big Picture

*Load shape data assists load forecasters, system planners, energy efficiency program managers and rate design analysts to facilitate integration of supply and demand options.*

## Tasks and Milestones



# Load Shape Library: The Big Picture



# Load Shape Library: Data Content

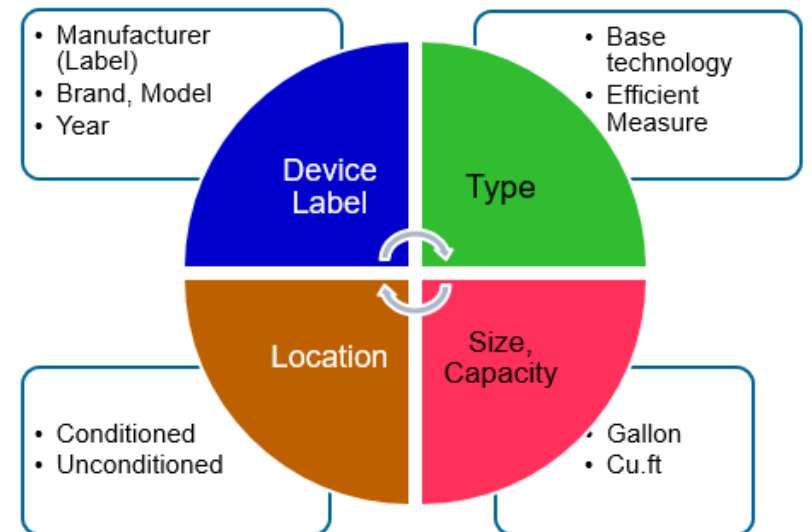
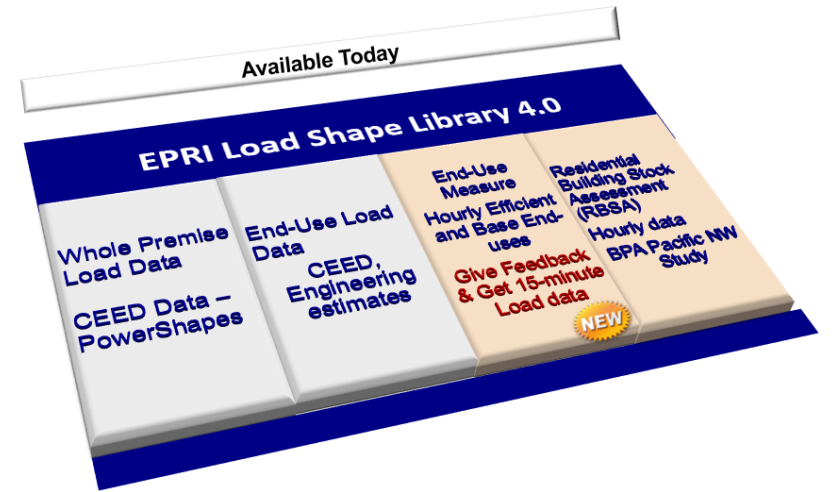
## Summary

- Whole premise and end-use energy demand
- Bonneville Power Administration (BPA) Residential Building Stock Assessment (RBSA) – residential demand by end-use
- End-use efficient technology measure data (HP Water heaters, efficient appliances)
- User feedback survey

## Value

Load shapes by climate zone, city/state, technology type, size of load, manufacturer type, user-defined electric vs. non-electric parameters

- Best-available end-use data



# End-Use Database: EPRI CEED Data, Model Estimates



2008 NERC Regional Distinctions

Sectors and End Uses

Unitized end use load shapes

## Day and Seasonal Definitions

Peak season: May - September

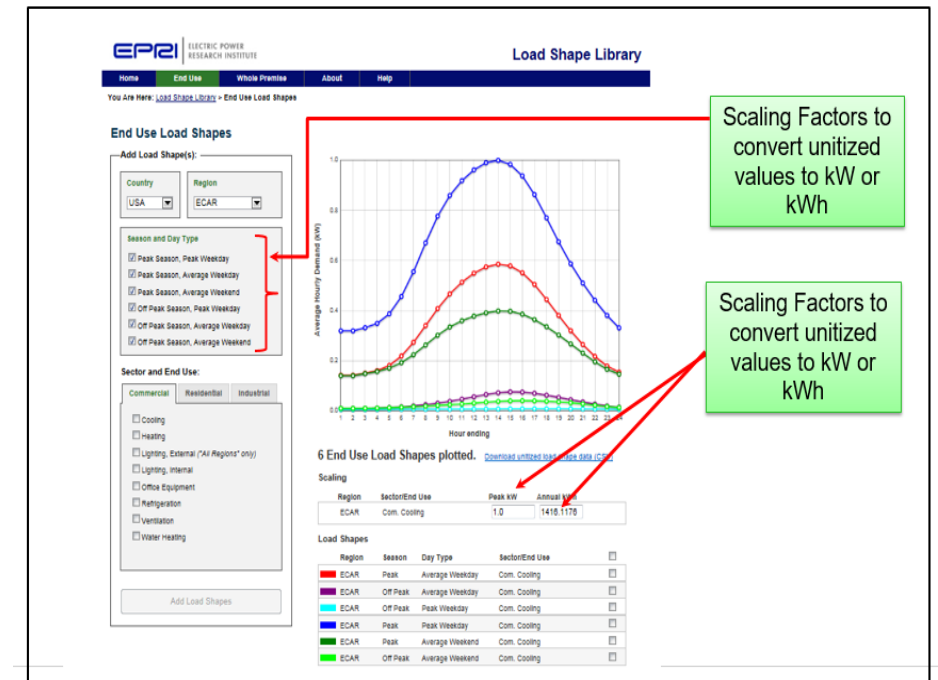
Off-peak season: October -April

Peak weekday (peak season): Five hottest non-holiday weekdays one in each month of the peak season

Peak weekday (off-peak season): Seven coldest or hottest non-holiday, weekdays (depending on region), one in each month of the off-peak season

Average weekday/weekend (peak season): all other weekdays/ weekends in peak season

Average weekday/weekend (off-peak season): all other weekdays/ weekends off-peak season



# Whole Premise Database: (EPRI CEED PowerShape™, Model + Limited Field Validated)

**Whole Premise Load Shapes**

Country: USA, City, State: Los Angeles, CA

Heating Type: Electric, Fossil Fuel

Building Type: Commercial, Residential

2 plots.

City	Month	Heating Type	Building Type
Los Angeles, CA	August, 2001	Electric	Retail, Large
Los Angeles, CA	August, 2001	Electric	Office, Large

**Whole Premise Load Shapes**

Country: USA, City, State: Austin, TX

Heating Type: Electric, Fossil Fuel

Date Range: From: 1/1/2001, To: 12/31/2001

Building Type: Commercial, Residential

3 plots.

City	Start Date	End Date	Heating Type	Building Type
Austin, TX	1/1/2001	12/31/2001	Electric	Com. Hotel
TX	1/1/2001	12/31/2001	Electric	Com. Retail, Large
TX	1/1/2001	12/31/2001	Fossil Fuel	Com. Office, Small, Bank

Load shape: Austin, TX, 1/1/2001 to 12/31/2001, Fossil Fuel, Com. Warehouse

Date definitions to allow day and season selections such as weekday, peak day, summer, winter, shoulder etc.

# Technology Measures & RBSA Databases

Welcome | EPRI | ELECTRIC POWER RESEARCH INSTITUTE

Home | End Use | Whole Premise | **Technology Measures** | Pacific Northwest RBSA | About | Help

You Are Here: [Load Shape Library 3.0](#) > Technology Measures Load Shapes

### Technology Measures Load Shapes

Add Load Shape(s):

Country: USA

City, State: Cantonment, FL

Utility: Choose a Utility ...

Climate Zone: Choose a Climate Zone

Technology Type:

Water Heater, Unconditioned | Water Heater, Conditioned | Appliances

Up to 50 Gallon

Conventional Water Heaters

Manufacturer A Heat Pump Water Heaters

Day Type and Date Range:

Weekdays, Weekends

Weekday | Weekend | Weekdays and Weekends

Date Range:

Date Range1: [ ]

Date Range2: [ ]

### Residential Building Stock Assessment (RBSA) Load Shapes

Add Load Shape(s):

City, State: Choose a City, State ...

Utility: Choose a Utility ...

Climate Zone: ALL

Fuel Type at Premise: Choose a Fuel Type at Premise ...

Technology Type:

Premise Total & Main End Uses | Appliances | Electronics, Lighting & Other

Home Audio

Cable Box & DVR

Computer

Computer & Accessories

Lighting and Other

Day Type and Date Range:

Weekdays, Weekends

Weekday | Weekend | Weekdays and Weekends

Date Range:

Date Range1: [ ]

Date Range2: [ ]

### Technology Measures

Load Shape Plots

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You Are Here: [Load Shape Library 4.0](#) > Residential Building Stock Assessment (RBSA) Load Shapes

Enter Feedback for More Granular Data

Provide feedback for 15-minute interval data.

\* 1. Which of the following categories best describes the industry you currently work in?

Utility |  Government

Utility Contractor/Consultant |  Regulator

Non-Utility Contractor/Consultant |  Aggregator

Product/Solution Provider |  Market Operator

Academic |  Utility R&D

Other (please specify): [ ]

\* 2. What is the application you plan to use the Load Shape Library data for?

EE & DR Operations |  Program Design Analytics

M&V |  Customer Usage Analysis

EE & DR Planning |  Load Research

Close

Analysis Parameters

Granularity: Daily | Hourly

Date Range: [ ]

Date Range1: [ ]

Date Range2: [ ]

Legend: Premise Total, Premise kWh, Electricity, Average Energy kWh, [Site Count: 103]



# How to Access the Load Shape Library ?

## Access

### 1. Direct Access

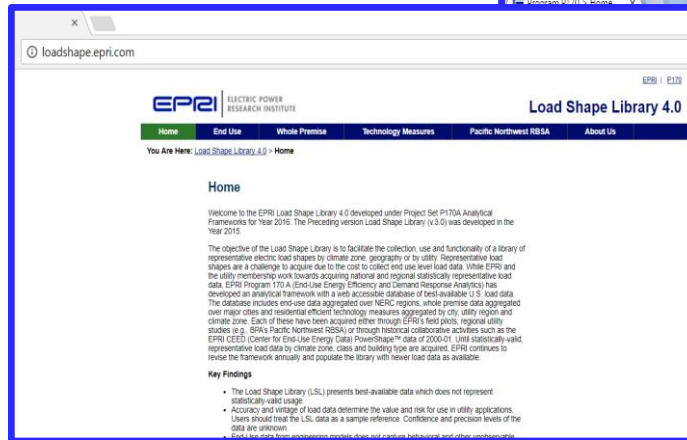
Public Website URL

<http://loadshape.epri.com>

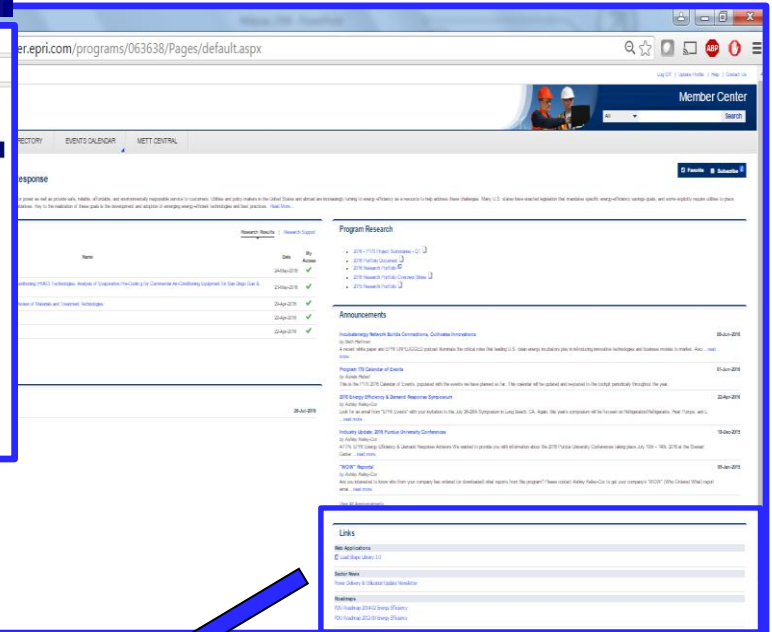
### 2. From Program 170 Cockpit

- Bottom right hand corner of the page, look for “Links”
- Under “Links”, find “Web Applications”
- Click on the “Load Shape Library 4.0” link
- “Version 4.0” will be replaced with 5.0 by December 2017.

## Load Shape Library Website



## EPRI Program 170 Cockpit



## Links

### Web Applications

 Load Shape Library 4.0

# References

- Load Shape Library: Version 5.0. EPRI, Palo Alto, CA: 2017. 3002010559.
- Residential Building Stock Assessment: Metering Study. NEEA, 2014 <https://neea.org/docs/default-source/reports/residential-building-stock-assessment--metering-study.pdf?sfvrsn=6>
- Energy Efficiency Demonstration V1.0, EPRI, Palo Alto, CA: 2012. 1025437
- Translating Energy Efficiency into CO2 Emissions Reduction: A Modeling Approach, EPRI, Palo Alto, CA:2011.1023185
- U.S. EIA National Energy Modeling System (NEMS), DOE/EIA-0581.2009 <https://www.eia.gov/outlooks/aeo/nems/overview/index.html>
- Modeling CO2 Emissions Impact of Energy Efficiency: Proof of Concept. EPRI, Palo Alto, CA:2008.1016085
- Load Data Analysis and PowerShape Training: Strategic Load Research and Advanced Topics in Load Profiling for Settlements, EPRI, Palo Alto, CA:2000. 1001304
- PowerShape Market Profiles, EPRICSG, Palo Alto, CA: 1999. TR-111998



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