SUMMARY GUIDE:

Estimating Peak Demand Impacts

OVERVIEW

Bonneville Power Administration's (BPA) *Estimating Peak Demand Impacts Application Guide* discusses impacts from capacity savings on utilities, defines BPA's peak demand period, and provides several methods to estimate demand savings from energy savings projects.

Peak demand impacts:

- Affect generation, transmission, and distribution capacities
- Can impact cost effectiveness of projects for customers
- Are based on reductions during specific times of day/months which see maximum system loads
- May be determined using the BPA M&V Protocol selected for the project
  - Engineering Calculations with Verification
  - End-Use Metering
  - Meter-Based Energy Modeling
- Approach used to quantify depends on the data available
- Accuracy of demand savings estimates can vary and depend on data and assumptions used
- Are not used in BPA's incentive calculations
- Are not included in BPA's project reporting requirements

WHEN TO USE

- Utilities quantifying demand impacts from energy efficiency projects and programs
- Energy efficiency projects with substantial peak demand reductions that will:
  - impact utility planning, or
  - significantly change customer costs through peak kW charges or time of use rates

WHEN NOT TO USE

- Projects with no or low expected peak demand savings
- Projects with energy only (kWh) rates

PROCEDURES

1. Use direct estimation

- Requires hourly or sub-hourly data from baseline and post-installation period

- OR-

2. Use secondary resources

- Required when hourly data is not available
- Use with with inputs and outputs of energy savings calculations

End-Use Metering

- Use measured data from baseline and post-installation period
- Weather dependent measures should be adjusted to TMY3 weather using regression analysis

Meter-Based Energy Modeling

- Hourly models of the baseline and post-installation periods are adjusted to Typical Meteorological Year (TMY3) data
- Estimate saving during each hour in the peak period and average results
- Daily models should use load shapes to estimate the distribution of energy and savings across hours (for efficiency only projects)

Engineering Calculations

- Hourly (8760) calculations can be used with coincident factor, if needed
- For bin hour analyses, identify weather conditions during peak period

DEFINITIONS

Capacity or peak demand savings

- Difference in the average baseline and post-installation demand during the peak period time and/or weather conditions
- Uses the average reduction during the peak demand window

Load shapes show the average consumption or savings across a period of time (daily, weekly, yearly)

Coincident factor is the percentage of full power draw of the targeted equipment during peak period

Energy to demand factor for a specific measure or end-use is ratio of peak demand savings to energy savings

BPA Peak Period BPA defines the peak period as cold winter weekday mornings from 6:00 AM to 10:00 AM (hours ending 7, 8, 9, and 10 local prevailing time)

TOOLS & RESOURCES

Weather Data: NREL's TMY3 Weather Data
Load shapes: RTF, EPRI
Guidelines: *Uniform Methods Project Chapter 10: Peak Demand and Time-Differentiated Energy Savings Cross-Cutting Protocol*