Overview of Seventh Plan EE Measure Workbook Structure

Conservation Resource Advisory Committee
November 13, 2014

Measure Supply Curve Development

- **Measure Development**
  - Cost, Savings, and Life of measures in a bundle
  - Measure load shape
  - Other: O&M, Periodic Replacement

- **Run ProCost**
  - ProCost calculates TRC Levelized Cost for each measure
  - Other ProCost Inputs include price forecasts, discount rate, finance costs
  - Produces measure savings in corresponding levelized cost bins

- **Apply Market Data**
  - Number of Units: Number of homes, building SF, population
  - Applicability factors and program ramp rates

- **Product Supply Curve**
  - Supply curve for measure bundle
  - Total market savings (aMW) at corresponding levelized cost bin
Measure Workbook Names

- Naming convention:
  - Sector<>Measure Abbreviation<>7P<>Version
  - Example: Com-Streetlight-7P_V1.xlsm
- Other Linked workbooks
  - ProCost engine
    - Also, MC_and_Loadshape
  - Units Forecast
    - Contain all the units data from the Council forecast
  - “Master” files, ResMaster, ComMaster
    - Contains all measure baseline and applicability factors

7P Measure Workbook and Links

- Measure Workbook, e.g., Com-Streetlight-7P_v1.xlsm
- ProCost Engine
- Units Forecast
- “Master” files: e.g., ResMaster, ComMaster
- MC_and_Loadshape
Typical Components of Measure Workbooks

Supply Curve Results for Measure Bundle

Measure Data Input Worksheets

Includes “Units” data for measure:
- Number of homes
- Building SF
- Population
- Etc.

Plus, some informational worksheets

7PSourceSummary

- This is the best place to start

<table>
<thead>
<tr>
<th>Measure</th>
<th>LED Streetlight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
<td>Methods &amp; Sources</td>
</tr>
<tr>
<td>Measures Described</td>
<td>Reduced wattage streetlight, photocell control</td>
</tr>
<tr>
<td>Energy Savings</td>
<td>Delta watts time hours</td>
</tr>
<tr>
<td>Calculation Basis</td>
<td></td>
</tr>
<tr>
<td>Applicable Stock</td>
<td>All street and roadway lighting. Muni and State</td>
</tr>
<tr>
<td>Baseline Equipment</td>
<td>HPS or Metal Halide. Various wattages.</td>
</tr>
<tr>
<td>Baseline Saturation</td>
<td>About 15% as of 2016.</td>
</tr>
<tr>
<td>Baseline Equipment</td>
<td>Updated stock estimate from several sources including, PNL survey, 2012 Navigant study, and FERC Form 1. Added decorative, and arterial.</td>
</tr>
<tr>
<td>Hours of Operation</td>
<td>3300 hours per year</td>
</tr>
<tr>
<td>HVAC Interaction Factors</td>
<td>Updated 2014</td>
</tr>
<tr>
<td>Measures</td>
<td>None</td>
</tr>
<tr>
<td>Capital Costs</td>
<td>Recent municipal data</td>
</tr>
<tr>
<td>Periodic Replacement Costs</td>
<td>Updated from Seattle, LA, Tacoma, Portland</td>
</tr>
<tr>
<td>Savings Shapes</td>
<td>Streetlight</td>
</tr>
<tr>
<td>Measure Life</td>
<td>Estimated at 70,000 hours. 18 year life on photocell control</td>
</tr>
<tr>
<td>Achievability Ramp Rate</td>
<td>Estimated at 90. Updated from 6P. Increased from 0. Uptake on the increase.</td>
</tr>
</tbody>
</table>
Measure InputOutput

- Workbooks will link to a single version of ProCost, rather than have ProCost built into each workbook.
- Measure input and output will consist of three worksheets:
  - Measure InputOutput – this will be just measure data (input for ProCost)
  - Batch Output_All Results1
    - Primary results from ProCost.
    - Typical results you would see from an RTF ProCost run
  - Batch Output_ShapedResults1 – Shaped results
Measure Output/Results

- Worksheet: “Batch Output_All Results1”
  - Typical ProCost Results
    - Measure level results
    - Category level results (includes admin costs)
    - Supply curve results
    - Shaped Savings
- Worksheet: “Batch Output_Shaped Results1”
  - The supply curve worksheets pull data from this portion of the measure results

Savings and Cost Analysis

- The background for generating the savings and cost that end up in the Measure InputOutput worksheet
- This portion typically has multiple worksheets
- Best way to start is to follow the links from the Measure InputOutput to here.
Supply Curve Results

- Separate worksheets for New, Natural Replacement (NR), and Retrofit supply curves
- Pulls the supply curve information from the Measure InputOutput worksheet
- Then, applies the units data, applicability factors, ramp rates.
- Results is a supply curve for the measure bundle

SC Results Worksheet Structure

This portion referred to as the "Stock Model"

- Link to Units Forecast workbook
- Selection for region or state
- Forecast unit data
- Applicability, Saturation, and Turnover Rate
- Applicable Units
### SC Results Worksheet (cont.)

- **Ramp rates applied to number of units**
- **Measure savings (from Results worksheet)**
- **Levelized cost (from Results worksheet)**
- **Measure potential by year (measure savings x annual applicable units)**
- **Supply curve results – amount of potential by year and levelized cost bin.**

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<table>
<thead>
<tr>
<th>Measure savings</th>
<th>Results</th>
<th>Impact</th>
<th>Measure potential</th>
<th>Levelized cost</th>
<th>Bin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>0.12</td>
<td>0.14</td>
<td>0.2</td>
<td>500</td>
<td>0</td>
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<tr>
<td>Baseline</td>
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<td>0.16</td>
<td>0.3</td>
<td>550</td>
<td>1</td>
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<tr>
<td>Baseline</td>
<td>0.15</td>
<td>0.20</td>
<td>0.4</td>
<td>600</td>
<td>2</td>
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</tbody>
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Northwest Power and Conservation Council