DEEMED SAVINGS TECHNICAL ASSUMPTIONS

Program: Multifamily Buildings Pilot - CO

**Description:**
Multifamily buildings that are electric and natural gas customers can receive an energy assessment and direct-install measures they are eligible for based on the assessment at no-cost. Those customers will also be eligible to participate in larger, capital-intensive projects that will offer them rebates for custom, prescriptive, and whole-building measures like those in EEB.

**Program References:**
- Refer to Product "CO School Education Kits" formulas for (Customer kW, Customer kWh, Customer PCkW, etc.) for the "Replace incandescent lamps with CFLs" measure.
- Refer to Product "CO School Education Kits" formulas for (Customer kW, Customer kWh, Customer PCkW, etc.) for the "Replace incandescent lamps with LEDs" measure.
- Refer to Product "CO School Education Kits" formulas for (Customer kW, Customer kWh, Customer PCkW, etc.) for the "Provide Efficient Showerhead" measure.
- Refer to Product "CO School Education Kits" formulas for (Customer kW, Customer kWh, Customer PCkW, etc.) for the "Provide Kitchen Faucet Aerator" measure.
- Refer to Product "CO School Education Kits" formulas for (Customer kW, Customer kWh, Customer PCkW, etc.) for the "Provide Bath Faucet Aerator" measure.
- Refer to Product "Business New Construction" formulas for (Customer kW, Customer kWh, Customer PCkW, etc.) for the "Average EEB Project" measure.

**Equations:**
- Water Heater Blanket Electrical Energy Savings (Customer kWh)
  \[ \text{Customer kWh} = (\text{HLF before} - \text{HLF with blanket}) \times \text{Hr. Operation} / \text{HE}_\text{Elec} / 3412 \]
- Water Heater Blanket Electrical Demand Savings (Customer kW)
  \[ \text{Customer kW} = (\text{HLF before} - \text{HLF with blanket}) \times \text{Hr. Operation} / \text{HE}_\text{Elec} / 3412 / \text{Hr Operation} \]
- Water Heater Blanket Gas Savings (Customer Dth)
  \[ \text{Customer Dth} = (\text{HLF before} - \text{HLF with blanket}) \times \text{Hr. Operation} / \text{HE}_\text{Gas} / 1,000,000 \]

**Electrical Energy Savings (Gross Generator kWh)**
\[ = \text{Customer kWh} \times (1 - \text{TLDI}) \]

**Electrical Demand Savings (Gross Generator kW)**
\[ = \text{Customer kW} \times (1 - \text{TLDI}) \]

**Electrical Energy Savings (Net Generator kWh)**
\[ = \text{Gross Generator kWh} \times \text{NTG} \times \text{Install Rate} \]

**Electrical Demand Savings (Net Generator kW)**
\[ = \text{Gross Generator kW} \times \text{NTG} \times \text{Install Rate} \]

**Variable ID**
- HE_Elec
- HE_Gas
- HE_Hr
- HLF
- HLF with blanket

**Value**
- 0.9172
- 0.80
- 8760
- 441 Btu/hr
- 352.8 Btu/hr

**Description**
- Heat generation efficiency for electric water heater based on steady-state water heater efficiency.
- Heat generation efficiency for gas water heater based on steady-state water heater efficiency.
- Annual water heater "on" time.
- Heat loss from a 50 gallon water heater with an 1" fiberglass insulation at 140 degrees.
- Heat loss from a 50 gallon water heater with a 1" fiberglass insulation at 140 degrees plus an additional 2" fiberglass blanket.

**Assumptions:**
* CFL and LED costs are estimated values based on historical program costs, but the pilot will determine new incremental costs and those values will be used in final calculations.
### DEEMED SAVINGS TECHNICAL ASSUMPTIONS

<table>
<thead>
<tr>
<th>Provided by Customer:</th>
<th>Verified during M&amp;V:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of DI measures distributed</td>
<td>Yes</td>
</tr>
<tr>
<td>Were all identified CFLs and LEDs installed</td>
<td>Yes</td>
</tr>
<tr>
<td>Was showerhead installed</td>
<td>Yes</td>
</tr>
<tr>
<td>Was Kitchen aerator installed</td>
<td>Yes</td>
</tr>
<tr>
<td>Was Bath aerator installed</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### References:
3. Xcel Energy Home Lighting and Recycling Program Assumptions
4. "The effects of variation in body temperature on the preferred water temperature and flow rate during showering" Authors: Tadakatsu Ohnaka, Yutaka Tochihara, Yumiko Watanabe. Affiliations: a) Department of Physiological Hygiene, The
5. Handbook of Water Use and Conservation, Denver Water Conservation
7. DOE HW Appliance calculator
8. Lighting Baseline Watts per Agreement with Minnesota Division of Energy Resources. Based on a EPA Next Generation Lighting Program: Opportunities to Advance Efficient Lighting for a Cleaner Environment- Table 3.
9. DEER Database for Energy Efficient Resources 2011 update to EUL data

### Changes from Last Filing
1. New Pilot