Demand Response Characteristics Assumptions for use in RPM

CRAC Meeting
March 24, 2015

Council’s Analytical Process Flow

Load Forecast Model

Baseline Load Forecast (without efficiency)

Regional

Generating Resource Potential Assessment

How do we integrate Demand Response??
Distinguishing New DR Resources

Main Drivers in RPM for New DR Acquisition
- Summer and Winter Peaking Capability
  - RPM determines Need
- Cost
  - RPM determines Cost-Effectiveness

Development of Demand Response Inputs for RPM
- Leveraged Navigant Demand Response Potential study (commissioned by Council) and stakeholder responses to the study for cost and regional potential
- Developed “Supply Curves” for DR resources that address peak demand
  - Demand response resources can used for other purposes (i.e., flexibility and balancing) but these are not modeled in the RPM
### Demand Response Programs Included in Potential Study

#### Summer Peaking
- **Irrigation Pumping** - DLC and AutoDR (Agricultural/Industrial)
- **Space Cooling** – DLC and AutoDR (Residential and Commercial)

#### Winter Peaking
- **Space Heating** – DLC and AutoDR (Residential and Commercial)

#### Year-Round Peaking
- **Water Heating** - DLC and AutoDR (Residential)
- **Curtailable/Interruptible Tariffs** - DLC and AutoDR (Agricultural/Industrial)
- **Lighting Controls** – AutoDR only (Commercial)
- **Load Aggregators** – AutoDR only (Agricultural/Industrial)

### Demand Response Acquisition Logic Used in the RPM

**How will the RPM determine whether to acquire DR?**
- DR resources will be acquired using logic similar to that used for acquiring a supply-side resource in the RPM

**When will the RPM likely acquire DR?**
- When it is economic and least cost
  
  **But more likely...**
  - When there is insufficient peak capacity to meet system peak demand, i.e., to maintain resource adequacy
What's In Each Bin?

**Bin 1**
The RPM can purchase up to **1689 MW (Summer Peak)** and **1595 MW (Winter Peak)** at **-$5.20** (in 2012$/kW-yr) over the course of the study.

*Over 76% of the bin is made up of*
- Curtailable/Interruptible Tariff: **-$13**
- Curtailable/Interruptible Tariff (ADR): **-$3**

*Less than 24% is made up of*
- Refrigerated Warehouses: **$3**
- Space Cooling, Medium - Switch: **$4**
- Space Cooling, Small - Switch: **$11**
### Bin 1 Cumulative MW

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<tr>
<td>Curtailable/Interruptible Tariff</td>
<td>26</td>
<td>131</td>
<td>238</td>
<td>348</td>
<td>462</td>
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<td>13</td>
<td>15</td>
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### What’s In Each Bin?

#### Bin 2

The RPM can purchase up to 
**1299 MW (Summer Peak)** and 
**1312 MW (Winter Peak)** at 
$44.53 (in 2012$/kW-yr) over the course of the study.

Over 54% of the bin is made up of 
Residential Water Heating: **$49**
Space Heating- Switch: **$28**

Less than 46% is made up of 
Space Cooling, Medium (ADR): **$55**
Irrigation Pumping (ADR): **$85**
Load Aggregator (ADR): **$29**
Space Cooling, CAC Switch: **$47**
Irrigation Pumping - Switch: **$76**
Lighting Controls (ADR): **$55**
Space Cooling, RAC Switch: **$61**
Bin 2 Cumulative MW

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<td>Water Heating - Switch</td>
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<td>4</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>11</td>
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What’s In Each Bin?

**Bin 3**

The RPM can purchase up to **827 MW (Summer Peak)** and **489 MW (Winter Peak)** at **$151.81** (in 2012$/kW-yr) over the course of the study.

*Over 60% of the bin is made up of*

- **Space Heating – PCT**: $153
- **Space Cooling, CAC PCT – Switch**: $153
- **Space Cooling, RAC PCT- Switch**: $153
- **Water Heating (ADR)**: $153
- **Space Cooling, Small – PCT**: $89

Bin 3 in 2021
Bin 3 Cumulative MW

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<td>Water Heating - WH Controls</td>
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<td>23</td>
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<td>44</td>
<td>87</td>
<td>138</td>
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<td>236</td>
<td>278</td>
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<tr>
<td>Space Cooling - RAC PCT</td>
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<td>39</td>
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<td>89</td>
<td>106</td>
<td>125</td>
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<td>Space Heating – PCT</td>
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<td>238</td>
<td>378</td>
<td>540</td>
<td>644</td>
<td>759</td>
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Are the DR Resources Selected by the RPM “the Plan”?

- The RPM DR resource acquisition results will guide parts of the narrative in the Plan.

- The RPM DR resource acquisition results are NOT necessarily the same as the resource strategy recommendations for the Plan.
Questions?