Demand Side Management

Energy Efficiency and Load Control

November, 2013
What is Demand Side Management (DSM): 

- The reduction or shifting of energy consumption through efficiency improvements or load shifting on the customer side of the electrical meter.
- DSM is often referred to as the least cost resource because the cost of developing defined quantities of energy that can be reallocated or shifted is significantly lower than the cost of constructing new capacity.
How Do DSM Programs Work:

- Energy Efficiency (EE) programs accumulate savings year-over-year that can, in aggregate, offset future load growth and reduce peak system demand.
  - Requires a volume of scale, many measures
  - Measures have varying lifetimes or persistence, tracking is required
  - A mid-long term strategy, requires long ramp time

**Daily Measure Load Shape: CFL**

**Annual Measure Load Shapes:**

Residential Portfolio
Demand Side Management

How Do DSM Programs Work:

- DSM Load Control (DLC) programs coordinate reduced customer power consumption during specific events of peak system demand.
  - Curtailing manufacturing processes that are interruptible during times of peak energy demand

Sample Single Day DLC Capacity Impact
Benefits of Demand Side Management

Why do TEP and UES implement DSM programs:

• DSM programs support the goal of meeting future demands through diverse and cost effective methods.
• DSM programs support existing operations as a resource to reduce peak system demand.
• DSM programs support requirements to mitigate and reduce environmental impacts.
• DSM programs are required in order to comply with the Arizona Energy Efficiency Standards passed by the Arizona Corporation Commission in 2010.
Non-Energy Benefits of Demand Side Management

Non-Energy Benefits:

- Improved customer service and products
- Increased customer comfort and quality of life
- Supports reducing customer disconnects due to non-payment
- Reduces quality of service defects
- Reduces air pollution and water use
- Job creation and retention (0.38-0.59 jobs per GWh saved)
- Risk mitigation strategy
AZ Energy Efficiency Standard

- Arizona Public utilities are required to achieve annual energy savings of at least 22%—measured in kWh—by 2020.
- Annual savings targets are set at a percentage of retail energy sales from each prior calendar year.
EE and DLC Driven Capacity Reductions

Energy Efficiency
- 500 GWh (2014)
- 1100 GWh (2016)
- 1600 GWh (2018)
- 1700 GMh (2020)
- 1800 GWh (2022)

Load Control
- 15 MW (2014)
- 35 MW (2016)
- 45 MW (2018)
- 50 MW (2020)
DSM Cost Effectiveness Requirements

Cost Effectiveness Requirements:

- The Societal Cost Test (SCT) is used to determine the cost effectiveness of DSM program and measures.
- For every $1 spent on programming, the benefits accrued to all customers must exceed $1.
- The costs of DSM programming must be less than the alternative supply options.

Compliance Filing Requirements:

- Utilities file annual DSM program plans and results for review and approval by the A.C.C.
DSM Opportunities: Residential

- Cooling: 32%
- Lighting: 21%
- Plug loads: 13%
- Freezers (stand alone): 7%
- Refrigerators: 6%
- Clothes Washers: 7%
- Clothes Dryers: 6%
- Dishwashers: 3%
- Televisions: 5%

- HVAC, Duct Sealing, Air Sealing & Insulation Rebates
- CFL Upstream Buy Down Program
- Behavioral: Home Energy Reports, Energy Workshops
- Refrigerator Recycling *
- Low Income Weatherization Multi-Family Retrofit *

* Indicates UNS Electric only
DSM Opportunities: C & I

Office, 32%
Manufacturing, 12%
Retail Non-Food, 10%
Restaurant, 8%
School, 9%
Retail Food, 6%
Medical Care, 4%
Hotel, 3%
Warehouse, 2%
Other Commercial, 14%

Small Business Direct Install
C & I Comprehensive
School Facilities*
Retro-Commissioning *
Direct Load Control

* Indicates UNS Electric only
Questions?