



Demand-Side Management (DSM) Measurement & Verification

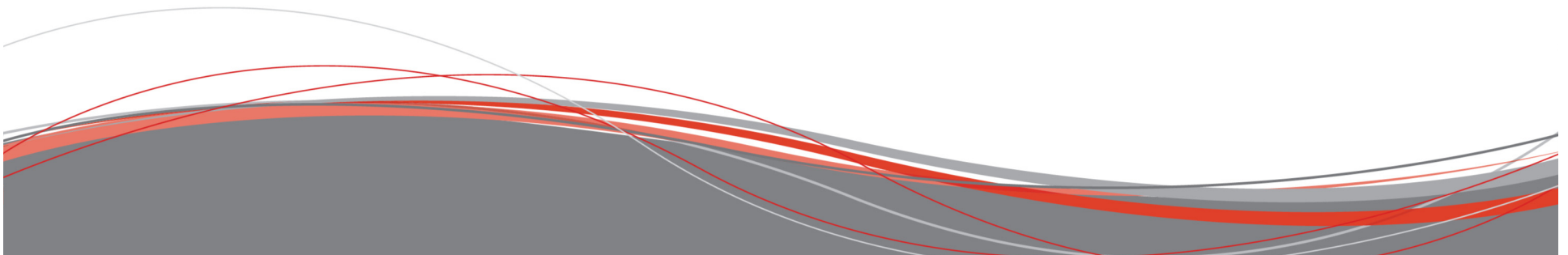
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Agenda

- Objectives of DSM M&V
- PSCo DSM M&V in Colorado
- SPS DSM M&V in New Mexico
- Possible DSM M&V Options in South Dakota

Objectives of DSM M&V

■ Measurement

- ◆ What are the annual energy and demand savings?
- ◆ Efficiency improvement of equipment – easy to calculate
- ◆ Utilization of equipment – difficult to measure/predict
- ◆ Deemed Savings used for prescriptive measures
 - Based on national engineering and impact studies
 - Algorithms predicting usage based on participant characteristics
 - ◆ Business Type
 - ◆ Size of Equipment
 - ◆ Type of work that Equipment performs (process, cooling, etc.)
 - ◆ Size of House
 - Adjustments made for weather, regional differences
- ◆ Short-term metering used for custom or large measures

Objectives of DSM M&V

■ Verification

- ◆ Is equipment installed
- ◆ Are equipment characteristics captured correctly
- ◆ Are the participant characteristics captured correctly

■ Attribution

- ◆ Energy Savings attributable to DSM program (Net-to-Gross) – very difficult to determine

PSCo Electric DSM in Colorado

■ PSCo Electric Service Territory (2009)

- ◆ 1.36M Customers (1.15M Residential)
- ◆ 27,279 GWh Sales (at customer)
- ◆ \$2,214M Electric Revenue

■ DSM Goals (2010)

- ◆ 222 GWh Savings (at customer)
- ◆ \$64M in Utility Spend
- ◆ \$230M TRC Net Benefits (Lifetime)

■ Deemed Savings

- ◆ PSCo proposed Deemed Savings in Plan – Approved by Commission

■ Costly M&V Programs

PSCo DSM M&V in Colorado

- Third-party Quantitative On-Going M&V (Nexant)
 - ◆ Verification for Prescriptive Programs:
 - Sample of Site Visits per program (90/10 precision)
 - Installation of equipment
 - Characteristics of equipment
 - Characteristics of participant entered in Deemed Savings
 - ◆ Verification of Custom/Large Projects
 - Pre- and post-monitoring of equipment for 2+ weeks
 - ◆ Deviations applied retroactively as a realization rate of energy and demand savings (2009 Actual - 97.67% Energy, 98.67% Demand)
 - ◆ Annual Cost - \$2.4M (3.7% of Total Spend)

PSCo DSM M&V in Colorado

- **Periodic Third-Party Comprehensive Process/Impact Evaluations**
 - ◆ Performed for each program every 2-8 years
 - More frequent for new or highly variable programs
 - ◆ Evaluates Process of Program
 - Rebate levels, administration
 - Benchmarks against similar programs across nation
 - ◆ Evaluates Program Impacts
 - Deemed Savings Assumptions
 - Attribution (Net-to-Gross)
 - Impact changes implemented prospectively
 - ◆ \$50k to \$200k per evaluation per program
 - ◆ Annual Cost - \$0.5M (<1% of Total Spend) (4 programs)
 - ◆ Total EM&V Annual Cost - \$2.9M (4.5% of Total Spend)

SPS Electric DSM in New Mexico

- SPS-New Mexico Electric Service Territory (2009)
 - ◆ 113,000 Customers (91,000 Residential)
 - ◆ 4,207 GWh Sales (at customer)
 - ◆ \$265M Electric Revenue
- DSM Achievements (2009)
 - ◆ 13.6 GWh
 - ◆ \$3.1M in Utility Spend
 - ◆ \$5M-\$10M TRC Net Benefits (Lifetime)
- **3rd party Independent M&V Evaluator Determines Savings**

SPS DSM M&V in New Mexico

- **Third-party Comprehensive On-Going M&V (ADM)**
 - ◆ Verification
 - Sample of Site Visits per program (90/10 precision)
 - Installation of equipment
 - Characteristics of equipment
 - Characteristics of participant entered in Deemed Savings
 - ◆ Measurement
 - Deemed Savings
 - Attribution (Net-to-Gross)
 - Pre-and post-monitoring of equipment for 2+ weeks
 - ◆ Process
 - Partial process evaluation

SPS DSM M&V in New Mexico

- **Third-party Comprehensive On-Going M&V (ADM) (cont.)**
 - ◆ Results applied retroactively
 - ◆ Comparison to Utility Estimated Savings (2009 Actual – 95.6% Energy, 69.1% Demand)
 - ◆ Annual Cost - \$219k (7% of Total Spend)
- **Periodic Third-Party Comprehensive Program Evaluations**
 - ◆ Impact Evaluations Not Planned
 - On-Going M&V continuously measures impacts of program
 - In-Depth Process Evaluation not completed

Possible DSM M&V Options in South Dakota

- **NSP South Dakota Electric Service Territory (2009)**
 - ◆ 82,600 Customers (71,900 Residential)
 - ◆ 1,918 GWh Sales (at customer)
 - ◆ \$142M Electric Revenue
- **DSM Goals (2011)**
 - ◆ 3.0 GWh
 - ◆ Business Lighting, Residential Air Source Heat Pumps, Saver's Switch, C&I Interruptible
 - ◆ \$750k in Utility Spend
 - ◆ \$3M TRC Net Benefits (Lifetime)

Possible DSM M&V Options in South Dakota

■ On-Going M&V Options

- ◆ Qualitative M&V Site Visits (similar to MN)
- ◆ On-Going Quantitative M&V (similar to CO) \$40k additional (6% of budget)
- ◆ Comprehensive On-Going Quantitative (similar to NM) \$100k additional (13% of budget)

■ Comprehensive Process/Impact Evaluation Options

- ◆ Borrow results from other states – no additional cost
- ◆ Fund comprehensive evaluation within state across utilities \$50k additional (7% of budget)
- ◆ Fund comprehensive evaluation within state/utility \$100k additional (13% of budget)

