Targeting Energy Efficiency To Realize Network Deferrals

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Agenda

• Con Edison System
• Forecasting and Planning
• Targeted Demand Side Management
The Electric System - Restructured

- **Generating Station** (electricity generated at 13.8 to 22.0 kV)
- **Transformers** (voltage stepped up to transmission voltage)
- **Transmission Substation**
- **Area Substation** (voltage stepped down to distribution voltage)
- **Distribution**
- **Feeders**
- **Network Customers** (residential, commercial, industrial, hospitals, schools, and street and traffic lights)
- **Connection To Others**

Gen - NYISO - Con Edison

Radial Customers
Con Edison – The Landscape

- 660 sq. mile service territory
- 133,000 miles of T&D cable (over 96,000 miles are underground)
- 13,825 people/sq. mile
- 20 MW/sq. mile but 235MW/sq. mile in NYC
- 3.3 million electric, 1.1 million gas, and 1,700 steam accounts; serve about 9.3 million people
- Over 650,000,000 sq. ft. of office space
- 462,000 businesses
- 900,000 residential buildings
- 58 billion kWh of electric consumption

- 70,000 people/sq. mile
- 2000 MW/sq. mile
Electric Consumption by Customer Class – CECONY vs. U.S.

U.S.

- Commercial: 38%
- Industrial: 35%
- Residential: 27%

CECONY

- Commercial: 28%
- Industrial: 70%
- Residential: 2%

Source: Bernstein Research, Consolidated Edison Company of New York
High peak demand and low asset utilization = inefficient system

2012 System Load Duration Curve

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<th>Load Range (MW)</th>
<th>Number of Hours</th>
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23 hours (or 0.3% of the year) comprised the top 800 MW

8,784 Hours - Leap Year
Forecasting and Planning

“Planning for Efficiency”, Public Utilities Fortnightly, August 2011
Long-Term Impact of DSM = lower demand growth = lower costs = lower bills

ConEd - 10-year growth without DSM = 1.6%
ConEd -10-year growth with DSM = 1.2%

*growth = CAGR
Peak Forecasting Process

- Actual Peak
- Weather Adjustment
- Demand Growth/Decline
- Demand Management + Other Adjustments

Final Peak Demand Forecast
Growth Forecasts for Peak Demand for 82 CECONY Electric Networks

Five-Year Compounded Growth Rates

- **> 1.4%**
- **> 0.7% & < 1.4%**
- **< 0.4%**
Forecasting Energy Efficiency and Demand Management Programs

- We forecast the impact of energy efficiency and demand management programs to better assess future revenue requirements and capital planning needs.
- Programs in the forecast include: Con Edison EEPS, NYSERDA EEPS, NYPA DSM, Con Edison Targeted DSM, and mandatory Con Edison Demand Response Programs; also looking at DG

**Forecasting Process for DSM Impact on Peak Demand**

1. **Forecast Magnitude and Delivery Date of DSM Program Impact**
2. **Allocate Annual Energy Reduction to Network Areas**
3. **Perform Conversion to Peak Demand Impact**
4. **305MW of Peak Demand System Reductions thru 2017**

**Forecasting Process for DSM Impact on Revenue and Volume**

1. **Forecast Magnitude and Delivery Date of DSM Program Impact**
2. **Quantify Monthly Energy Reduction Impact for Each Program**
3. **Allocate Monthly Impact to Customer Rate Classes**
4. **1,596 GWhs of Incremental Annual Energy Reductions over 2012 Base Year by end of 2017**

To Demand Forecasting

To Revenue and Volume Forecasting
Planning Process – Using DSM to defer capital projects involves many internal stakeholders

- Demand Side Management (EE + DR)
- Distributed Generation
- Peak Load Forecast
- Peak Load Forecast w/ DSM & DG
- Regional Distribution Planning
- Potential DSM Projects
- Area Substation Planning
- Transmission Planning
- Central Engineering
Permanent demand reduction by 2018 can defer capital investment
Targeted Demand Side Management

“Con Edison’s Targeted Demand Side Management Program: Replacing Distribution Infrastructure with Load Reduction”, ACEEE 2010

Targeted DSM: How It Works

Area Station
Firm contract MW reductions for A/S load relief

Distribution
kW scale reductions for secondary load relief

EE
DG
DR
EE
DG
DR
EE
Targeted Steam A/C Program

- Incentives available in 15 networks
  - Install new steam chillers in lieu of electric
  - Replace electric chillers with steam
- All steam chiller plants and hybrid steam-electric
- Steam turbine and double stage absorption

Eligible networks and map subject to change annually
DG is Playing a Greater Role in Planning

Cumulative Installed Capacity (MW)

- **PlaNYC Goal**: 800 MW
- **PV growth assumes NY-Sun funding until 2020**
- **CHP until 2018 is a result of actual pipeline projects going into service, and growth thereafter based on historic adoption rates.**

Source: Con Edison, NYC Mayor’s Office
NYSERDA is offering a 10% bonus incentive in “Targeted Zones”

CHP project transparency and telemetry will allow for performance monitoring for potential inclusion in Company DG forecasting and system planning.