Gas/Electric Synopsis

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Agenda

• Introduction
• Gas Overview
• Winter 2013 Event
• Opportunities
Lower Demand Forecasts

![Graph showing load forecasts from 2013 to 2028](image)

- **Load, MW**
- **2011 Load Forecast**
- **2012 Load Forecast**
- **2013 Load Forecast**

Load forecasts range from approximately 140,000 MW to 190,000 MW for the years 2013 to 2028.
The graph shows the generation mix for different energy sources over time.

- **COAL** shows a steady trend with minor fluctuations.
- **GAS** also remains stable with slight variations.
- **NUCLEAR** has a consistent level throughout the years.
- **DEMAND RESPONSE** displays a steady increase over the years.
- **WIND** demonstrates a rise, particularly notable in recent years.

The x-axis represents the capacity auction delivery year, starting from 2007/08 to 2015/16.
Average Annual Henry Hub Spot Natural Gas Prices (1990-2040)

Source: EIA
Natural Gas Production By Source (1990-2040)

Trillions Cubic Feet


HISTORY

PROJECTIONS

Source: EIA

- Shale Gas
- Tight gas
- Lower 48 Onshore
- Lower 48 Offshore
- Coalbed Methane
- Alaska

www.pjm.com
Natural Gas Consumption by Sector (1990-2040)

HISTORY
PROJECTIONS

INDUSTRIAL

ELECTRIC POWER

RESIDENTIAL

COMMERCIAL

TRANSPORTATION

Source: EIA
Gas Infrastructure

NATURAL GAS SYSTEM & RESOURCES
In the Eastern Interconnection

Legend
- Gas Storage Point
- Major Gas Lines (36" or more)
- Gas Lines (24" or more)
- Stage Gas Plants
- Stage Gas Rigs

Zones
- ERCOT
- FERC
- ISO-NE
- ISER
- EPP
- NYISO
- MISO
- PJM
- EKPC
Pipeline Products

Firm Transportation
- Plain
- Enhanced/No Notice
- Limited
- Small Customer
- Laterals
- Seasonal

Interruptible Transportation
- Plain
- Small Customer
- Laterals
- Lower Priority

Storage
- Firm
- Interruptible
- LNG
- Seasonal
- Time-limited
- Flexible

Balancing
- Firm
- Interruptible
- Park and Loan
- Variance
**Operating Days**

**Gas Day**
- **Day 1: Morning**
  - Shippers submit requests with gas pipeline
- **Day 1: Afternoon**
  - Gas requests are confirmed or rejected
- **Day 1: Evening**
  - Confirmed gas delivery requests are scheduled
- **Day 2: Early Morning**
  - Gas deliveries begin

**Electric Day**
- **Day 1: Morning**
  - Electricity demand forecasted
- **Day 1: Afternoon**
  - Generation scheduled and confirmed
- **Day 1: Evening**
  - Generation schedules adjusted and reliability analysis performed
- **Day 2: Early Morning**
  - Real-time dispatch begins
• Currently limited to publically available information
• Pilot program with NiSource discontinued
  – FERC Order on ISO-NE required reliability need and generator notification
• Seeking improved communication and data exchange
  – Such as gas burn schedules on a day-ahead or real-time basis
- North NJ, temps in teens
- Pipeline constraint (firm)
- Gens behind LDC
- 2,000 MW curtailed

- Sandy line outages
- Out of merit dispatch
- Spot gas drove up regional power prices
- Out of merit generators made whole
- Increased Balancing Operating Reserve charges