EIPC GAS-ELECTRIC SYSTEM INTERFACE STUDY

Status Update

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NYISO Executive Regulatory Policy Advisor

IPSAC Webinar
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Acknowledgement and Disclaimer

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Four Study Targets & Status Updates
Four Study Targets

• **Target 1**: Develop baseline assessment, including descriptions of the natural gas-electric system interfaces, interaction effects, specific drivers of the pipeline/LDC planning process

  *COMPLETE* – Report posted on EIPC Website

• **Target 2**: Evaluate the capability of the natural gas systems to meet individual and aggregate core and non-core gas demand over a 5- and 10-year horizon

• **Target 3**: Identify contingencies on the natural gas system that could adversely affect electric system reliability, and *vice versa*

• **Target 4**: Review the operational / planning issues affecting the availability of dual fuel capable generation - *COMPLETE*
Target 1 – Baseline Assessment

- Assess baseline gas-electric systems and interfaces
- Define gas pipeline, storage facilities
- Define pipeline and LDC transportation options for generators
- Assess generator contracting and fuel assurance practices
- Evaluate secondary market for released capacity
Interstate/Interprovincial Pipelines
Qualitative Assessment of Gas/Electric Interface

• Gas-electric interface addressed for each PPA
• Considers bulk power security and resource adequacy issues from the RTO’s perspective
  – Gas supply diversity
  – Access to pipeline and storage infrastructure
  – Character of service
  – Tariff provisions and penalties
  – Secondary market liquidity
• Relational assessments relative to 6 PPAs
  – Green: favorable conditions
  – Yellow: neutral conditions
  – Red: unfavorable conditions
<table>
<thead>
<tr>
<th>Criterion</th>
<th>PJM</th>
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<td>Active Secondary Market</td>
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Target 2 – Infrastructure Adequacy

- Electric simulation modeling
  - AURORAxmp model used to develop generator gas demands
  - Reference, High, Low gas demand cases
  - Sensitivities developed with stakeholder groups
  - Assumptions / inputs developed with PPAs and SSC
- Residential/Commercial/Industrial ("RCI") sectors’ gas demand forecast
  - Infrastructure expansions, load growth, LDC expansion, oil-to-gas conversion, EE/DR/DSM programs
- GPCM Model used to combine core and non-core demand forecasts
  - Identify constraints and unconstrained locations
  - Frequency & duration analysis of constraints
  - Identify mitigation opportunities
Target 2: Status

- Initial Target 2 Draft Report posted on June 20th
- SSC Meeting in Atlanta on June 25-26th
  - Review initial results & draft report; finalize Sensitivities
- SSC Webinar on July 7th
  - Discuss modeling of pipeline constraints using GPCM model
- July – September
  - Initial Aurora analyses revised based on comments received
  - Aurora and GPCM analysis conducted on 3 Scenarios & 37 Sensitivities
  - Revised Draft Report preparation
- Revised Target 2 Draft Report was scheduled to be posted on September 30— but additional review was needed
  - EIPC is working with DOE to resolve the issues
  - Schedule impact TBD
Target 3 – Contingency Analysis

- Hydraulic modeling of selected areas
  - WinFlow (steady-state) / WinTran (transient)
- Gas contingencies
  - Loss of supply, loss of storage, line break, loss of compression
- Electric contingencies
  - Loss of electrical supply (bulk power system outage), loss or outage of electric-drive compression
- Identify top three to five gas and electric contingencies in each PPA and in Study Region as a whole
- Identify possible mitigation measures / infrastructure work-arounds
Target 3: Current Status

• LAI configuring their hydraulic models (WinFlow & WinTran)
  – FERC has now provided CEII data on jurisdictional pipelines
  – Delays in receipt of CEII data have caused a delay in the schedule for completion of Target 3 to 1Qtr 2015

• LAI/PPAs working with Canadian pipelines and certain LDCs to obtain additional information needed for the hydraulic analysis

• Contingency lists are under development for each PPA Region
  – Electric and Gas contingencies will be identified

• Next Steps
  – SSC Webinar – Mid-February 2015
Target 4 – Dual-Fuel Capability

• Liquid fuel storage capability and method of resupply for dual-fuel units

• Operating characteristics of new plants
  – Fuel switching, regulatory barriers
  – Pressure-sensing capabilities, reaction time

• Analysis of petroleum market and supply options

• Compare trade-offs between gas system expansion (firm transportation contracts) and adding dual-fuel capability (incl. liquid storage capacity)
Target 4: Status

• Sept – Oct – Analysis completed
• November 6\textsuperscript{th} – Draft Report Posted for comment
• November 14\textsuperscript{th} - SSC Webinar
  – Present study results & review Draft Report
  – Answer stakeholder questions
• November 21\textsuperscript{st} – Due date for written comments
• December 5\textsuperscript{th} – Final Draft Submitted to DOE
  – Target 4 Complete
Target 4: Primary Findings

• Going forward, new gas-fired plants are expected to use ultra low sulfur diesel (ULSD) as the primary back up fuel

• Anticipated heavy reliance on ULSD represents a major change in the distillate oil market
  – ULSD supply chain is robust

• Air permits typically cap oil use to 720 hours, but some permits have established lower annual hourly limits

• At most locations, the cost of dual-fuel capability is much less expensive than the incremental cost of firm transportation to satisfy the fuel assurance objective
Dual-Fuel vs. Firm Transportation

- 27 locations selected by PPAs
  - Focus on areas where new development likely
  - Constraint levels from Target 2 results

- Dual Fuel: Plant costs and USLD logistics by location
  - Identification of depot and transport mode
  - Est. normal delivery lag and potential weather delays
  - Net price based on rack price, shipping, demurrage
  - Target inventory and fuel storage tank volume

- Firm Transportation: Natural gas supply and delivery by location
  - Identification of pipeline path from a production basin to plant location
  - FT reservation rates (incremental), avoided IT costs
  - Lateral as proxy for LDC upgrade costs, if applicable
Comparison Results for Simple Cycle

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- **Dual-Fuel Capability**
- **Firm Transportation for Natural Gas**
Project Administration Timeline
Project Administration Timeline*

• Target 4 Final Draft Report to DOE – Dec 5th
• Target 2 Draft Report posted & finalized – Dates TBD
• Target 3 Draft Report posted – Jan 30, 2015
• SSC Webinar – February 2015 – Date TBD
  – Discuss Target 3 Draft Report
• Target 3 Final Draft Report to DOE – Feb 27th
• Draft Revision to Phase II Report posted – April 10th
• SSC Meeting – April 2015 – Date TBD
  – Discuss Revised Phase II Report
• Revised Final Draft Report to DOE – May 22nd
• Final Report Submitted to DOE – June 12, 2015
  – Project Completed

* Note: Dates under review & subject to change
QUESTIONS?