

Power Generation and Natural Gas in New England

Connecticut IRP Stakeholder Meeting

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Mark Babula, Principal Engineer – System Planning
ISO New England Inc.

Presentation Overview

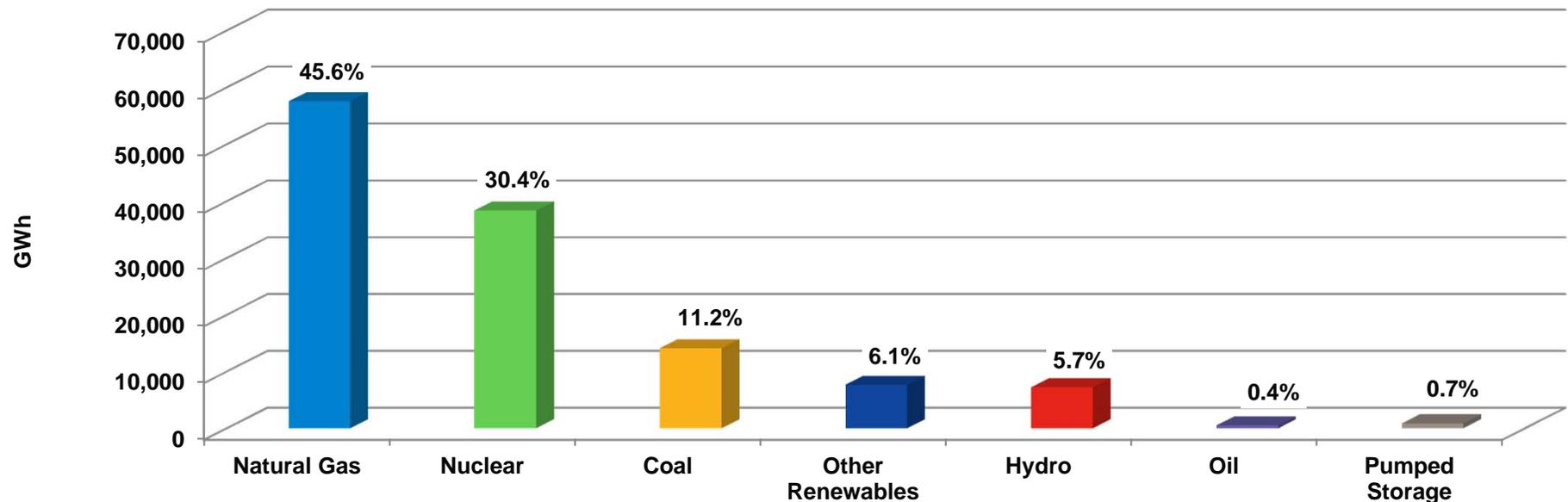
- System Capacity and Energy Production
- A Look at Today and the Future
- ISO-NE Strategic Planning Initiative
- ISO-NE's Natural Gas Study
- Coordination of Natural Gas Studies
- Questions

2011 Summer Installed Generation Capacity by Primary Fuel Type (Total = 32,037 MW)

Fuel	Capacity (MW)	Percent (%)
Natural Gas	13,631	42.5
Oil *	7,112	22.2
Nuclear	4,629	14.5
Coal	2,664	8.3
Pump Storage	1,678	5.2
Hydroelectric	1,341	4.2
Other Renewables **	982	3.1

- Values include existing generation and expected generation capacity additions.
- Values do not include Hydro-Québec Interconnection Capability Credits (HQICC), 2,035 MW (CSO) of demand resources, 1,236 MW (CSO) of capacity import, or 100 MW of capacity export.
- * The “Oil” category includes both heavy & light oil, as well as dual fuel units claiming primary oil and secondary gas.
- ** The “Other Renewables” category includes landfill gas, other biomass gas, refuse (municipal solid waste), wood and wood-waste solids, wind, solar, and tire-derived fuels.

2010 Energy Production by Fuel Type



* The "Oil" category includes both heavy & light oil, as well as dual fuel units claiming primary oil and secondary gas.

** The "Other Renewables" category includes landfill gas, other biomass gas, refuse (municipal solid waste), wood and wood-waste solids, wind, solar, and tire-derived fuels.

A Look at Today and the Future

- Today
 - ISO-NE has oil-fired generators which provide fuel diversity; BUT
 - How many more years will these units be available?
 - What about dual-fuel capability?
 - Which generators can truly “switch-on-the-fly”?
 - Sustainability becomes the next big issue
- Future
 - Position New England to integrate demand and variable (wind, solar, storage) resources into the operation of the power system
 - Facilitate dispatch of several different types of “Limited Energy Resources” - including natural gas units
 - Gas-fired generation already provides most of the ramping capability
 - Who will build additional gas pipeline infrastructure?

ISO-NE Strategic Planning Initiative

- ISO and stakeholders engage in discussion of interrelated issues
 - Potential Retirements
 - Impact of EPA rules and wholesale market conditions
 - Integration of variable energy resources, DR and more natural gas
 - Reliance on Natural Gas
 - Operational issues during peak winter periods
 - Increased coordination with natural gas pipeline operations
 - Identification of future pipeline capacity needs, gas contingencies
 - Alignment of Planning and Markets
 - Reflecting reliability needs found in the planning process in the market design with enough lead time and locational specificity
 - Is use of reliability agreements for resources – and back stop transmission solutions the right approach moving forward?

ISO-NE Strategic Planning Initiative

Risk Related to Natural Gas

- Seasonal variations in availability of gas supply & transportation (i.e. firm versus non-firm entitlements)
- Regional gas sector contingencies cause a “*rebalancing*” of regional natural gas markets
- More gas-fired generation is projected to come online due to its “environmental” benefits, possibly as a replacement for retiring coal and oil-fired generating units
- Natural gas-fired generation will be needed to balance the variable output of intermittent wind power resources
- What is the capability of the pipelines to support generator ramping, especially when OFOs are in effect?

ISO-NE's Natural Gas Study

- A deterministic assessment of regional pipeline capacity to serve seasonal needs of regional gas-fired generation
- Timeframe of Analysis
 - Short-term timeframe: Winter 2011/12 through Winter 2014/15 (i.e. the FCM window)
 - Near-term timeframe: Summer 2015 through Summer 2020 (i.e. the long-lead time window)
- Three separate, but inter-related assessments
 1. Reference Assessment
 - Determine if the regional pipeline system is surplus or deficient, after satisfying all firm, in-region gas demands (i.e. core gas sector, firm industrial/commercial customers, and firm gas-fired generators, etc.)
 - Identify any seasonal surplus pipeline capacity and convert it into a “equivalent-capacity” intermediate or peaking power technology

ISO-NE's Natural Gas Study, *cont.*

2. Repowering Assessment

- ISO-NE has developed a list of “*at-risk*” units that may be “*marginal*” with respect to the economics of complying with upcoming U.S. EPA air and water regulations
- Assume the potential repowering of all “*marginal facilities*” to equivalent capacity, natural gas-fired units
- Re-execute the deterministic assessment similar to the Reference Assessment

3. Contingency Assessment

- Assess the impacts from hypothetical gas sector contingencies
 - 1) Loss of regional pipeline capacity
 - 2) Loss of regional LNG supplies
 - 3) Loss of regional offshore gas supplies

ISO-NE's Natural Gas Study, *cont.*

- Due to the confidential nature of the “at-risk” list of “marginal facilities” contained within the Repowering Assessment and the Critical Energy Infrastructure Information (CEII) contained within the Contingency Assessment, prospective bidders were required to sign a “Confidentiality/CEII Agreement” prior to receiving the ISO’s Gas Study Scope-of-Work
- The winning Consultant, ICF Resources, LLC (Fairfax, VA), started work in August and should be done by October
- Publication of the results and findings are due sometime in the fourth quarter of 2011
 - Both confidential and public versions of the report
 - The report supplements ISO-NE’s Strategic Planning Initiative

Coordination of Natural Gas Studies

- ISO-NE, NYISO, and PJM will discuss related individual or coordinated study efforts as “next steps”
- Depending on the results and findings, a multi-regional gas study may be applicable, to analyze issues that are common across the wider-area footprint or may have similar solutions based upon regional markets

