

Table: Gas-Electric Interdependency Studies

The following are recent (2009-2012)¹ natural gas regional/national infrastructure assessments WIEB has identified (links to the studies are provided after the table):

Geographic Area of the Study	Group Responsible (Contractor Used)	Title & Date of Release	Notes / general conclusions	Study Range
New England ISO service region	New England ISO (ICF Internat'l)	Phase I: Draft <i>Assessment of New England's NG Pipeline Capacity to Satisfy Short and Near-Term Electric Needs</i> June 15, 2012	NG pipeline capacity will be insufficient to satisfy gas needs at New England's power plants, during the next 10 years. ²	2011-2020
ERCOT service region	ERCOT (Black & Veatch)	<i>Gas Curtailment Risk Study</i> ³ March 2012	Natural gas pipeline infrastructure is sufficient to meet projected needs during the analysis period in the scenarios analyzed.	1-yr, 5-yr & 10-yr time horizons
MISO service region	MISO (EnVision Energy Solutions)	<i>Gas & Electric Infrastructure Interdependency Analysis</i> February 22, 2012	The Midwest will need expanded pipeline capacity or additional storage to meet the expected rise in NG demand from electricity generation.	2011-2030
NYISO, ISO-NE, PJM and Ontario IESO service regions	NYISO (TBD)	In April 2012, NYISO issued an RFP for a comprehensive study of the gas-electric interface within the state and adjoining regions. End of 2013 (target for completion)	NYISO, ISO-NE, PJM and Ontario IESO are participating in this multi-regional gas study. As of Sept. 11, 2012, revisiting scope of work	10 yrs.
NYISO & NY State Energy Research and Development Authority (NYSERDA)	Charles River Associates	<i>The Ability to Meet Future Gas Demands from Electricity Generation in New York State (Final Report)</i> July 2002	Although results are dated, report is included as an example of scoping.	Examines cases in 2002, 2005 and 2010
California and the Western U.S.	California Energy Commission (CEC) (ICF Internat'l)	<i>The Value of Natural Gas Storage and the Impact of Renewable Generation on California's Natural Gas Infrastructure</i> December 2009 ⁴	It surveys the infrastructure of the Western U.S., but analyzes the implications for California. Concludes CA's natural gas infrastructure is generally adequate.	2008-2020
Pacific NW (NW US and Western Canada)	PNUCC-NWGA Power & Natural Gas Planning Task Force ⁵ (Work being performed by task force members)	<i>Natural Gas Limitations resulting from an Extended Winter Peak Load Event</i> Developing reliability analysis of I-5 corridor.	The Task Force is developing a series of additional studies/reports. ⁶	10 yrs.

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Wyoming	Wyoming Infrastructure Authority, et. al. (ICF Internat'l)	<i>Wyoming Wind Collector System and Integration Study: Phase 2</i> Dec. 2010	It assesses the infrastructure necessary to support a 12 GW wind collector system incl. gas pipeline and storage for firming capacity	2010
National	NERC	<i>2011 Special Reliability Assessment: A Primer of the Natural Gas and Electric Power Interdependency in the US (Phase I)</i> December, 2011	General conclusions regarding storage, communications and reliability	Includes some projections through 2030
National	NERC (Coordinating with INGAA and NGSA)	Phase II Reliability Assessment (expected December 2012)	"Phase II of this study will leverage this report as a platform for discussion with both industries."	TBD
National	INGAA (ICF Internat'l)	<i>National Pipeline and Storage Infrastructure Projections through 2030</i> October 2009	Projects infrastructure needs and costs through 2030	2010-2030
National	INGAA	<i>North American Natural Gas Midstream Infrastructure Through 2035: A Secure Energy Future</i> June 2011	Update to the October 2009 Report –provides updated projections on infrastructure needs and costs	2011-2035
National	American Public Power Institute (APPA) et al. (Aspen Environmental Group, AEG)	<i>Implications of Greater Reliance on NG for Electricity Generation</i> July 2010	Presents a broad assessment of issues that would arise as utilities replaced their base load coal-fired electricity generating units with new units fired by natural gas.	Through 2030
National	American Public Power Institute (APPA) et al. (AEG)	<i>Gas Storage Needed to Support Electricity Generation</i> June 2012	Update to the June 2010 Report --provides more detail on gas storage and explores changes to gas storage in the past two years	2010-2012

Links to studies:

- ISO-NE (overview):
http://www.iso-ne.com/committees/comm_wkgrps/othr/clg/mtrls/2012/mar82012/march_2012_clg_babula.pdf
(A copy of the draft report can be obtained through WIEB staff.)
- ERCOT:
<http://www.ercot.com/content/news/presentations/2012/BV%20ERCOT%20Gas%20Study%20Report%20March%202012.pdf>
- MISO (February & July Reports):
https://www.midwestiso.org/Library/Repository/Communication%20Material/Key%20Presentations%20and%20Whitepapers/Natural%20Gas-Electric%20Infrastructure%20Interdependency%20Analysis_022212_Final%20Public.pdf
<https://www.midwestiso.org/Library/Repository/Communication%20Material/Key%20Presentations%20and%20Whitepapers/Embedded%20Gas%20Units%20Infrastructure%20Analysis.pdf>

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- NY (2002): http://www.nyserda.ny.gov/en/Page-Sections/Energy-Prices-Supplies-and-Weather-Data/Current-Outlook-Summary/~media/Files/EDPPP/Energy%20Prices/Current%20Outlook/Presentations/the_gas_report.ashx
- NY-ISO (2012 RFP announcement): http://www.iso-ne.com/committees/comm_wkgrps/othr/egoc/mins/2012/egoc_mtg_38_draft_for_approval_minutes_052412.pdf
- California: <http://uc-ciee.org/downloads/CNGStorage.Brock.pdf>
- Pacific Northwest I-5 Assessment (page 49): <http://www.columbiagrid.org/client/pdfs/2012SA-webversion.pdf>
- Wyoming: http://www.icfi.com/~media/Files/ICFi/Reports/wyoming_collector_integration_final.ashx
- National/NERC 2011: http://www.nerc.com/files/Gas_Electric_Interdependencies_Phase_I.pdf
- National/INGAA 2009: <http://www.ingaa.org/File.aspx?id=10509>
- National/INGAA 2011 (executive summary): <http://www.ingaa.org/File.aspx?id=14911>
- National/APPA 2010: <http://www.publicpower.org/files/PDFs/ImplicationsOfGreaterRelianceOnNGforElectricityGeneration.pdf>
- National/APPA 2012: not yet available online; a copy can be obtained through WIEB staff.

¹ The 2002 New York study is also included in the table as an additional example of the scope an assessment could have.

² New England: Supply at wellhead sufficient. Firm contracts can be met (primarily LDCs contract this way). Power generators primarily contract for interruptible pipeline transportation services. Under all scenarios modeled (winter design day conditions), there is not enough gas supply capability remaining to meet the anticipated power sector gas demand after LDC firm demands are fully met.

³ ERCOT: Curtailment is defined as the loss of normally expected gas delivery as a consequence of supply or transportation interruptions caused by weather-driven, contractual or operational issues. Study considers the physical capabilities of the natural gas infrastructure in serving electric generators rather than the contractual arrangements to serve electric generators with natural gas.

⁴ California: The CEC has prepared (or commissioned) a number of related reports e.g., *Impact of Variations in Renewable Generation on California's Natural Gas Infrastructure*, Oct. 2009 (ICF), <http://www.energy.ca.gov/2009publications/CEC-500-2009-083/CEC-500-2009-083.PDF>. Links to related reports can be found at the following sites: <http://www.energy.ca.gov/publications/> and <http://uc-ciee.org/all-documents/a/lbrsearch>.

⁵The Pacific Northwest Utilities Conference Committee (PNUCC) & Northwest Gas Association (NWGA) have been coordinating efforts over the past 12-18 months to investigate the interdependencies of natural gas and electricity generation. Their mission is to explore and address the long-term planning and reliability challenges stemming from the high interdependence of the Pacific NW's two main energy delivery industries --power and natural gas. On the operational side, the Task Force has developed the Northwest Mutual Assistance Agreement which currently has 18 member/signatory companies. Each signatory entity utilizes, operates or controls natural gas transportation and/or storage facilities in the Pacific Northwest. Copies of the Northwest Mutual Assistance Agreement are available from Kevin Sullivan, Western Energy Institute: (971)255-4734.

⁶*Natural Gas-Electricity Primer*, Power and Natural Gas Planning Task Force (August 2012), available at <http://www.ferc.gov/eventcalendar/Files/20120830220205-primer.pdf>; *The Role of Natural Gas in the Northwest's Electric Power Supply*, White paper (June 13, 2012).