

April 26, 2018
Milford, MA

Regional Gas Market Update

Presentation to:

ISO-NE Planning Advisory Committee



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Northeast Gas Association

Topic Areas

- Natural gas safety message.
- Recent market growth, and cold snap experience.
- Infrastructure developments.
- Market trends.

About NGA

- ◆ Non-profit trade association
- ◆ Local gas utilities (LDCs) serving New England, New York, New Jersey, Pennsylvania
- ◆ Several interstate pipeline companies
- ◆ LNG importers (Distrigas, Repsol) and LNG trucking companies
- ◆ ~ 400 “associate member” companies, from industry suppliers and contractors to electric grid operators
- ◆ www.northeastgas.org





NGA'S ANTITRUST COMPLIANCE PROCEDURES

Adopted by the NGA Board of Directors on June 4, 2003

Objective

The Northeast Gas Association (NGA) and its member companies are committed to full compliance with all laws and regulations, and to maintaining the highest ethical standards in the way we conduct our operations and activities. Our commitment includes strict compliance with federal and state antitrust laws, which are designed to protect this country's free competitive economy.

Responsibility for Antitrust Compliance

Compliance with the antitrust laws is a serious business. Antitrust violations may result in heavy fines for corporations, and in fines and even imprisonment for individuals. While NGA's attorneys provide guidance on antitrust matters, you bear the ultimate responsibility for assuring that your actions and the actions of any of those under your direction comply with the antitrust laws.

Antitrust Guidelines

In all NGA operations and activities, you must avoid any discussions or conduct that might violate the antitrust laws or even raise an appearance of impropriety. The following guidelines will help you do that:

- **Do** consult counsel about any documents that touch on sensitive antitrust subjects such as pricing, market allocations, refusals to deal with any company, and the like.

Continued on NGA web site...

<http://www.northeastgas.org/about-nga/antitrust-guidelines>

Important Message, This Month – & All Year

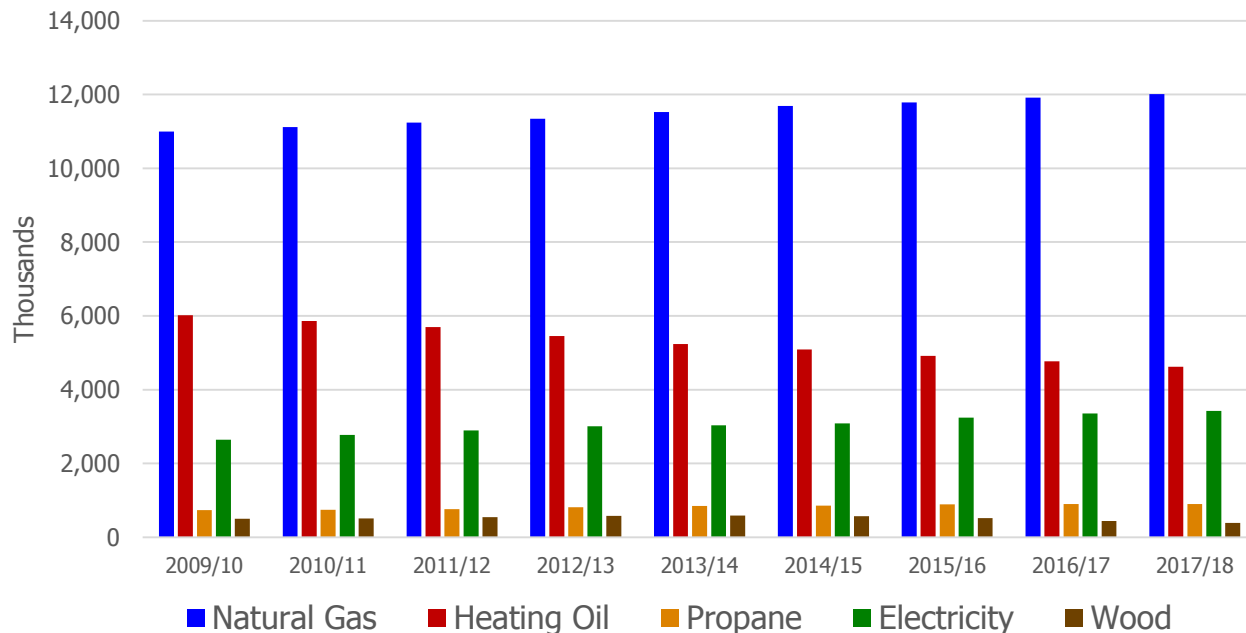


NORTHEAST MARKET GROWTH, & RECENT COLD SNAP



Gas Utility Customer Base in Region Continues to Grow

Households by Primary Fuel Type, Northeast U.S., 2009-2017

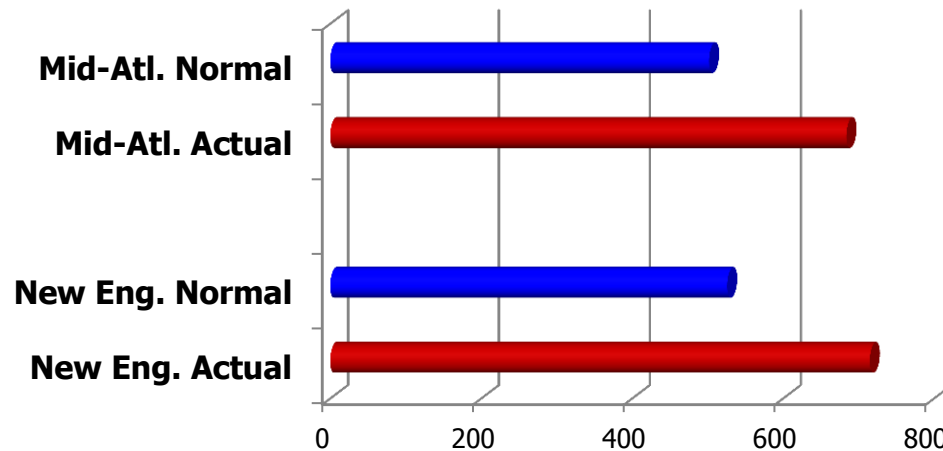


Source: U.S. EIA, 10-11-17

Over 1 million new natural gas household customers in last 8 years in the Northeast.

2-Week Period of Record Cold: *Dec. 26 – Jan. 7*

**Heating Degree Days,
*Dec. 24, 2017 thru Jan. 6, 2018***

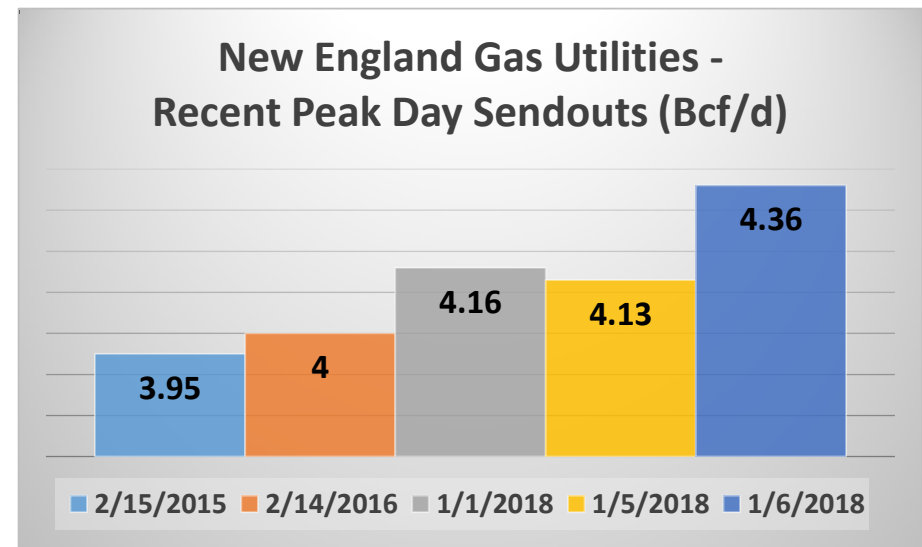


Source: U.S. NOAA

Temperatures (measured in HDD) were about 35% colder than normal in both regions over this period.

Recent Cold Snap: Gas Utility Sendout Records Set

- New U.S. gas sendout record set on Jan. 1, 2018: 150 Bcf.
- Most LDCs in Northeast set multiple sendout records in first week of Jan. 2018.
- New England natural gas utilities set 3 new sendout records that week – with new all-time peak set on 1-6-18, at close to 4.4 Bcf.



Key Role of LNG as Supply Input

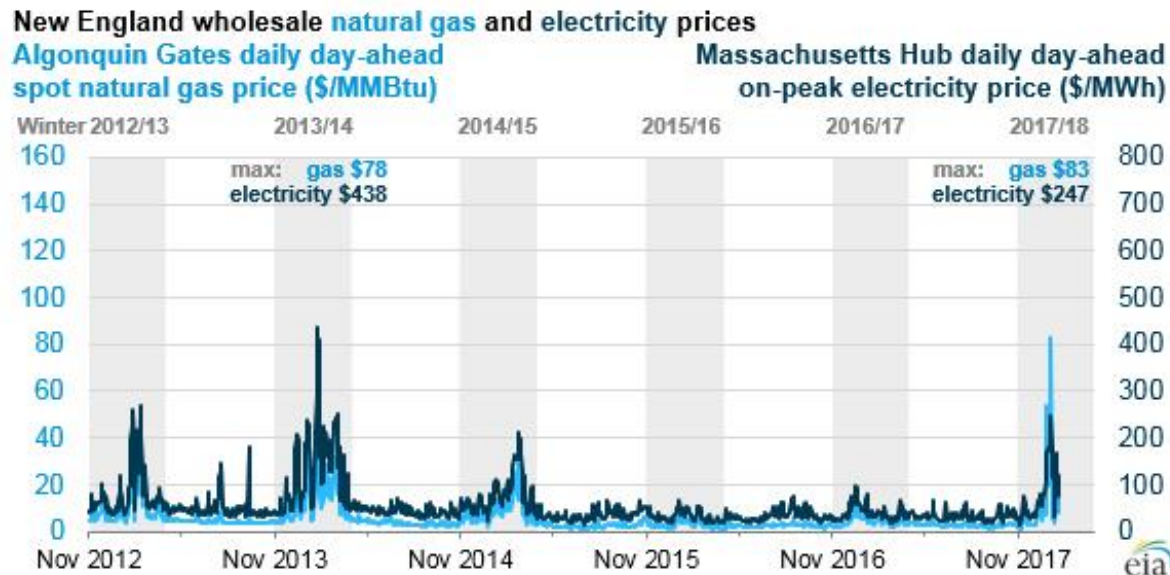
From December 19, 2017 to January 28, 2018, **Distrigas** imported six cargoes, totaling ~ 16 Bcf.

Canaport LNG provided LNG inputs into the Maritimes & Northeast Pipeline during the period. It imported three cargoes in Jan. 2018, ~9 Bcf.



LNG ship Provalys at Distrigas dock in Everett, MA on Jan. 4, 2018, during a snowstorm.

Impact on Gas & Power Spot Prices

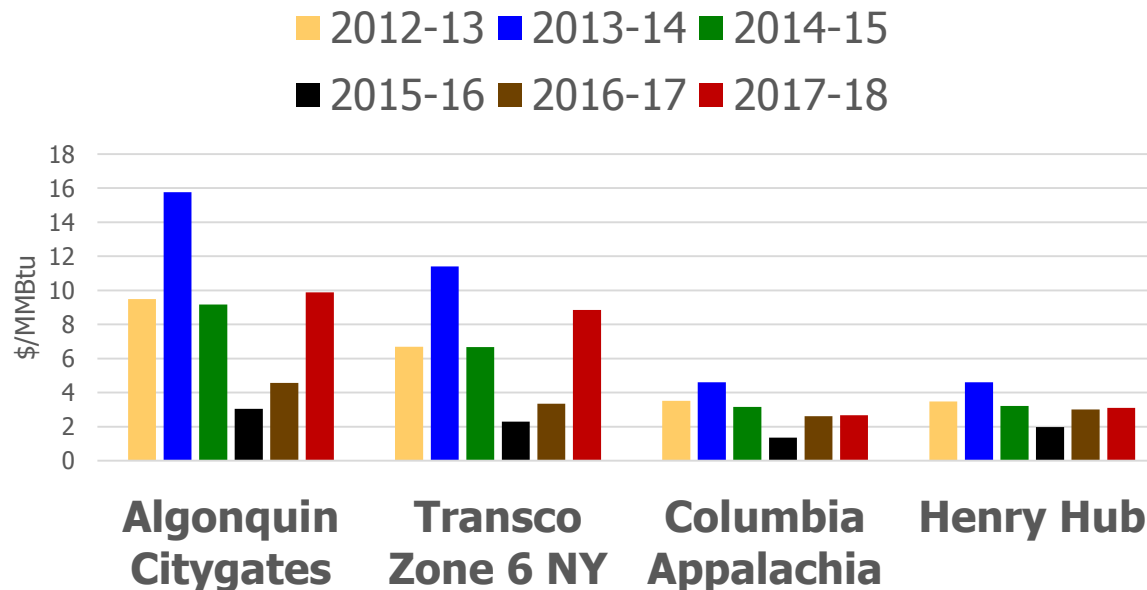


Source: U.S. Energy Information Administration, based on SNL

FERC report, 4-19-18: “Natural gas prices in New York City, New England, and the Mid-Atlantic all set all-time record highs, with next-day trades reaching as high as \$175/MMBtu in New York City on January 4. Although Operational Flow Orders limited shippers’ flexibility to exceed their contractual obligations to meet varying natural gas demand, **there were no pipeline outages or firm service curtailments.**” [*emphasis added*]

Various Gas Hub Prices, Recent Winters

Average Day-Ahead Natural Gas Prices, Recent Winters (\$/MMBtu)



Source: U.S. FERC, data as of 2-14-18

Note: Algonquin = New England proxy; Transco Zone 6 NY = New York City area; Columbia Appalachia = Marcellus; Henry Hub = national benchmark in Louisiana

Communication with Power Grids

- Good communication protocols in place between gas pipeline control rooms and the power grids.
- NGA's Gas Supply Task Force held two status calls with the 3 Northeast ISOs during cold snap – on Dec. 27 and Jan. 5. Calls held at request of ISO-NE.



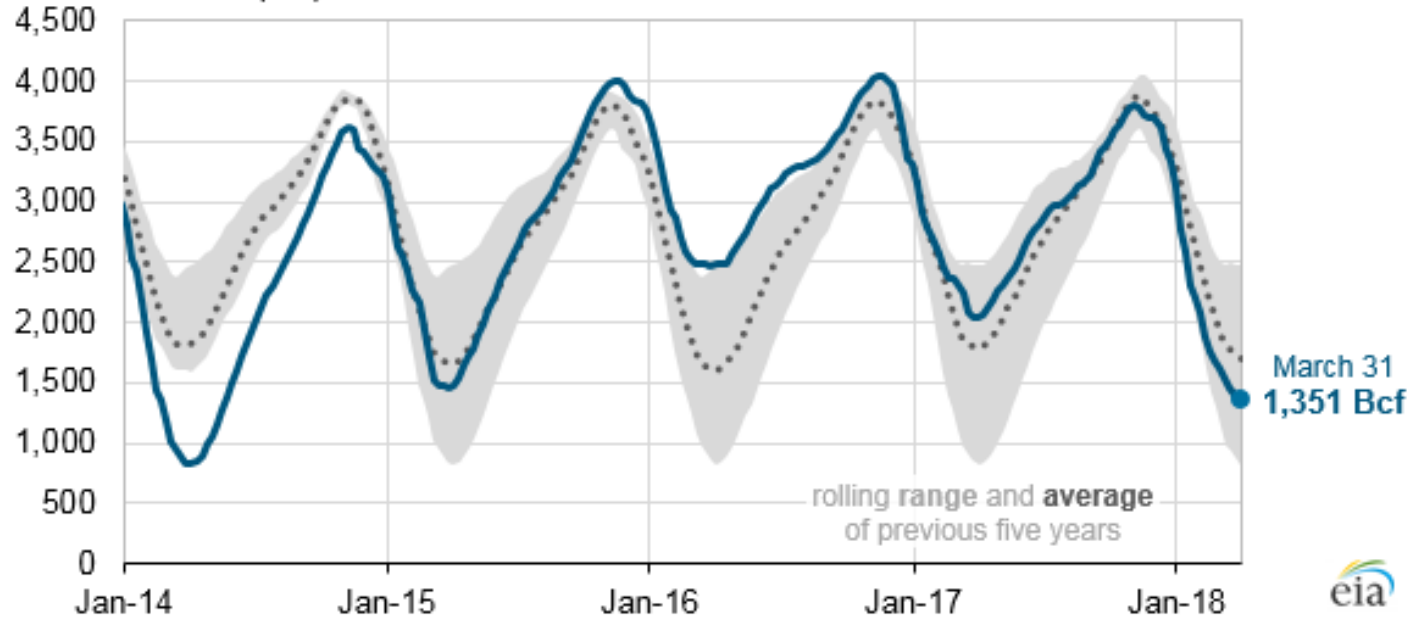
What Did We Learn?

- Gas utility demand continues to rise – reflecting customer growth.
- Gas utilities delivered supplies reliably during *very* challenging conditions.
- Gas market in region continues to experience extreme spot price volatility during high-demand (winter) periods – reflecting system constraints.
- Power grids performed well, but generator fuel supply remains an issue (gas, oil, other).



National Storage Position: *Active Refill Season Ahead*

Weekly natural gas storage inventories (Jan 2014-Mar 2018)
billion cubic feet (Bcf)



U.S. natural gas storage levels at end of winter season were 21% below the recent 5-year average; at lowest level since 2014. EIA projects storage to be refilled to 3.8 Tcf level by Nov. April cold weather delayed start of some planned pipeline maintenance.

INFRASTRUCTURE DEVELOPMENTS



Northeast Pipeline Projects Recently Entered Service

Dominion: “*New Market Project*”

Enbridge: “*AIM Project*”

Enbridge: “*Atlantic Bridge Project*” [partial]

National Fuel Gas: “*Line D Project*”

PNGTS: “*C2C Project*”

Tennessee: “*Susquehanna West Project*”

Tennessee: “*CT Expansion*”

Transco: “*New York Bay Expansion*”

Transco: “*Garden State Expansion Project*”



Projects Entering Service in New England Over Last 1.5 Years

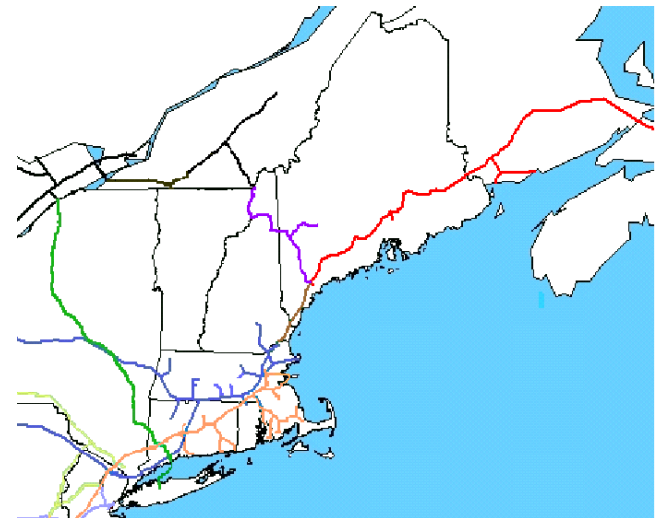
Enbridge: “*AIM Project*”:
342 MMcf/d

Enbridge: “*Atlantic Bridge Project*”
[partial]: **40 MMcf/d**

PNGTS: “*C2C Project*”:
42 MMcf/d

Tennessee: “*CT Expansion*”:
72 MMcf/d

*Nearly half a billion cubic feet
per day of new pipeline
capacity added in region since
Nov. 2016*



Pipeline Projects in Near-Term Development Stage, NE Market

Planned In-Service in 2018/19:

Millennium: “*Valley Lateral Project*”; “*Eastern System Upgrade*”

Empire Pipeline: “*Empire North Project*”

Enbridge: “*PennEast Project*”; “***Atlantic Bridge Project***” [part 2]

PNGTS: “***Portland XPress***” [partial]

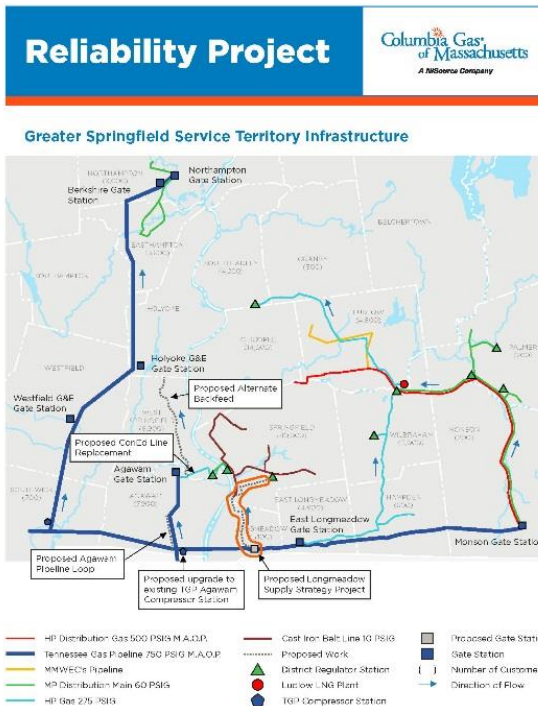
Tennessee: “*Orion*”; “*Triad*”

Transco: “*Atlantic Sunrise*”; “*Northeast Supply Enhancement*”; “*Rivervale South to Market*”

Red = New England



Building for Reliability & System Expansion: *Utility Examples*



The proposed Granite Bridge project would connect the existing Portland Natural Gas Transmission System and Maritimes and Northeast Pipeline facilities in Stratham with the existing Tennessee Gas Pipeline facilities in Manchester. The proposed 16" pipeline would utilize an Energy Infrastructure Corridor and be buried completely within the NHDOT right-of-way along Route 101, mitigating environmental and private and municipal property impacts. The project also includes a proposed Liquefied Natural Gas (LNG) storage facility capable of storing up to two billion cubic feet of natural gas. Announced Dec. 2017.

A proposed multi-faceted solution of five integrated supporting infrastructure projects designed specifically to meet the needs of Columbia Gas customers. In addition, through an agreement with Holyoke Gas & Electric, these five projects will also set the course to lifting the moratorium on new natural gas service in Northampton and Easthampton. Announced Nov. 2017.

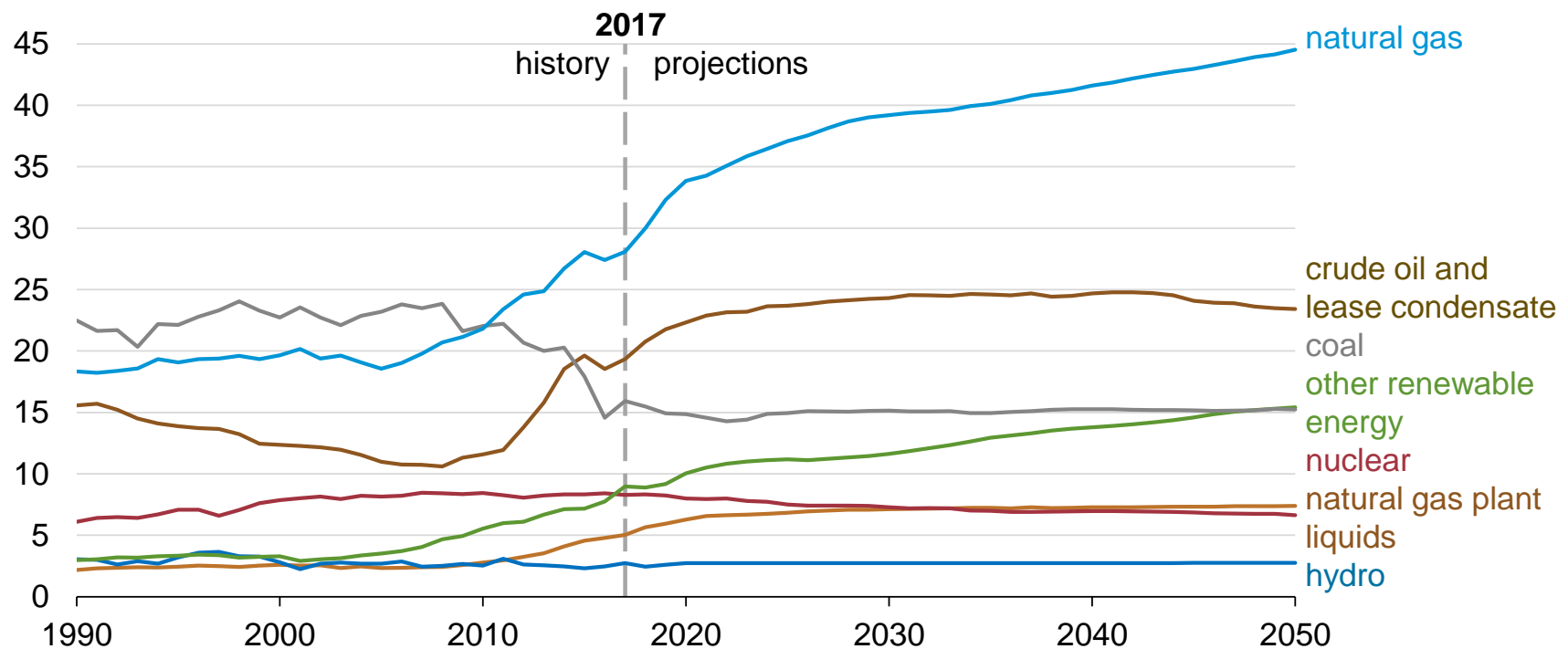
MARKET TRENDS



Long-Term, Gas Leads Total U.S. Energy Production (*EIA*)

Energy production (Reference case)

quadrillion British thermal units

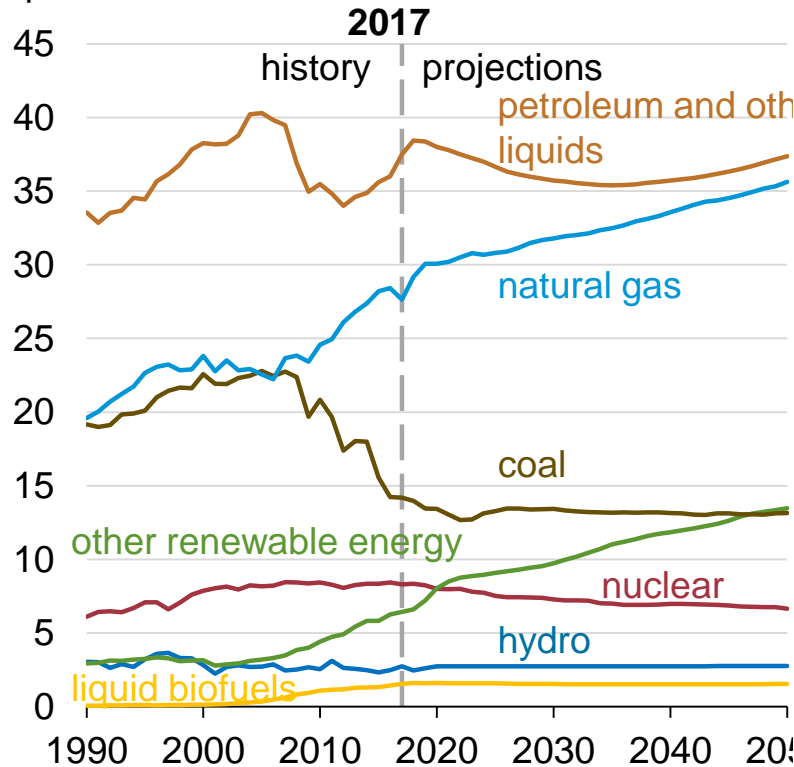


EIA Outlook: Demand is Strong, Price is Projected to be Stable



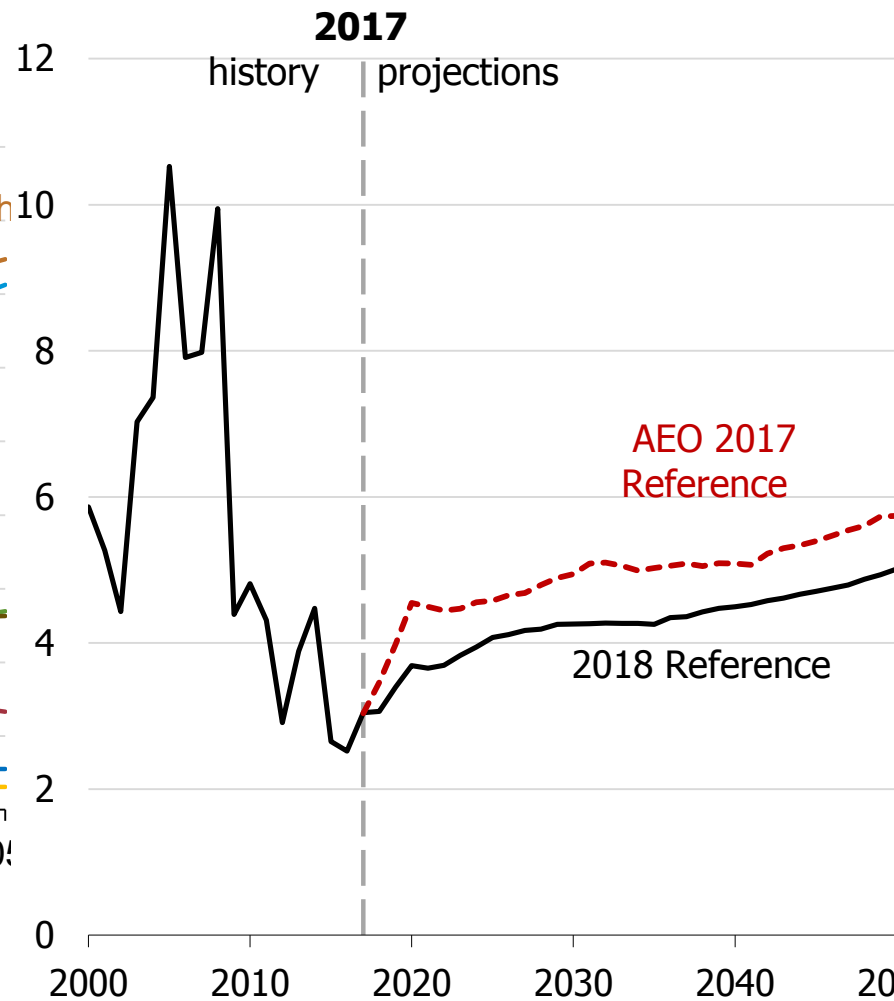
Energy consumption by fuel (Reference case)

quadrillion British thermal units



Natural gas spot price at Henry Hub

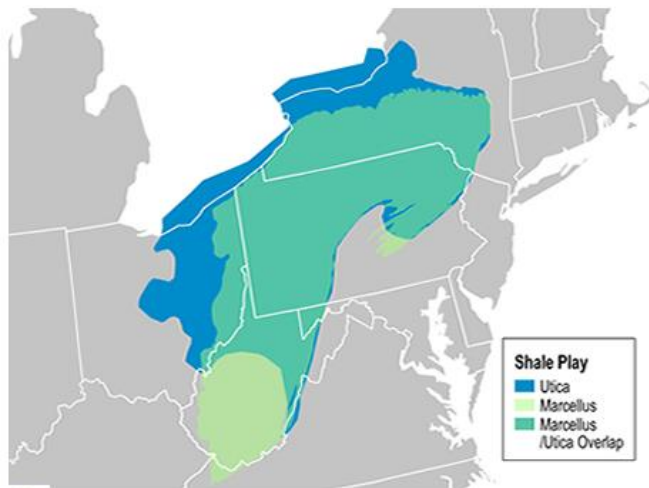
2017 dollars per million British thermal units



Northeast Production Remains Robust

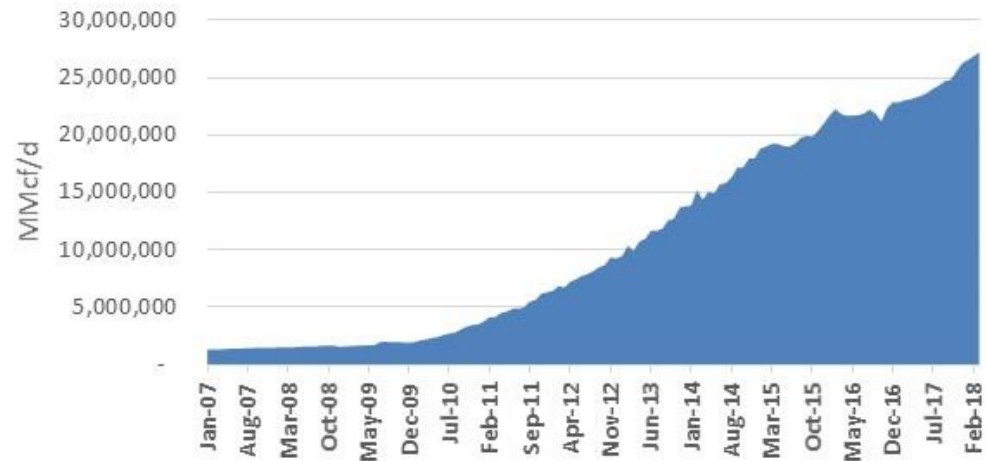
Source: U.S. EIA, 7-14

Utica and Marcellus shale plays



Source: U.S. Energy Information Administration.

Appalachian Gas Production, Jan. 2007-Mar. 2018



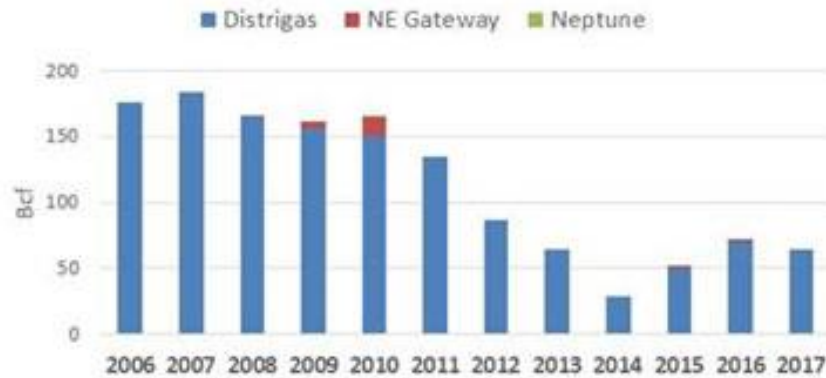
Source: U.S. EIA, "Drilling Productivity Report"

Northeast region currently producing ~**27 Bcf/d**. Further growth expected.

PA is 2nd largest gas producing state in U.S.

LNG Imports in Region: Valuable but Lower Levels

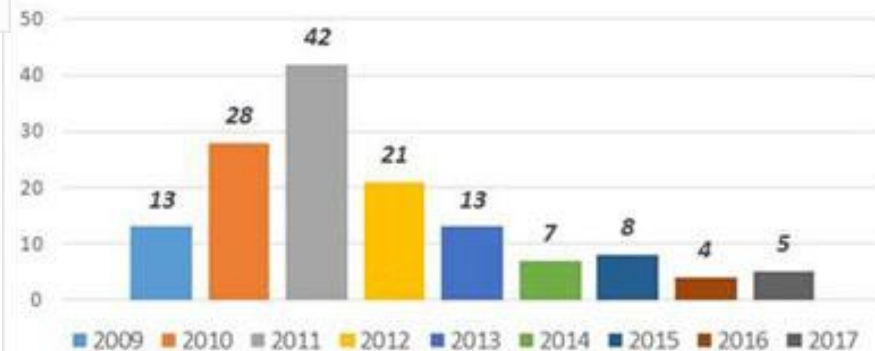
LNG Imports, New England Terminals, 2006-17



Source: U.S. Dept. of Energy/Office of Fossil Energy, 2-18

LNG remains key to winter peaking needs in region.

Number of Import Cargoes, Canaport LNG, 2009-17



Source: National Energy Board of Canada

U.S. LNG Exports Trending Upward

Monthly U.S. natural gas exports (2006-2017)
billion cubic feet per day

Chart: U.S. EIA, 3-18



Cheniere LNG export facility, Sabine Pass, LA, in service in 2016.

Dominion LNG export facility at Cove Point, MD, began export operations March 2018.

Other facilities in U.S. Gulf area are under construction.

EIA, April 2018: “EIA forecasts dry natural gas production will average 81.1 Bcf/d in 2018, establishing a new record. EIA expects natural gas production will rise by 1.7 Bcf/d in 2019... Growing U.S. natural gas production is expected to support both growing domestic consumption and increasing natural gas exports in the forecast. EIA also expects net natural gas exports to increase from 0.4 Bcf/d in 2017 to an annual average of 2.2 Bcf/d in 2018 and 4.4 Bcf/d in 2019.”

Questions?