Background on Maine & New England Natural Gas Systems

Provided to:

Maine Climate Council Energy Working Group

Stephen Leahy
Northeast Gas Association
About NGA

- Non-profit trade association
- Local gas utilities (LDCs) serving New England, New York, New Jersey, Pennsylvania
- Several interstate pipeline companies
- LNG importers, suppliers and transporters; CNG suppliers
- Over 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 20, 2018

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, anti-employee poaching practices, refusals to deal with any company, and the like.

https://www.northeastgas.org/compliance_docs.php
Topics

- System Overview
- Recent Growth Trends / Efficiency
- Affordability & System Balancing
- Gas’ Role in Helping Build a Sustainable Energy Future
Northeast U.S. Natural Gas Service Areas

Gas Customers: 13.5 million
% of Home Heating: 59%
% of Power Gen: >40%
Maine Natural Gas System

Gas = 12% of primary energy
Gas = 8% of home heating
Gas = 25% of power gen
~48,000 gas customers

Newer, more “state of the art” system compared to rest of New England.

Less older, “leak-prone” pipe. Maine system has less than 3% of cast iron/bare steel.

MA share = 19%
RI share = 28%
Residential Customer Choice: Increasingly Natural Gas

Since 2012, natural gas has added over 1 million new household customers in the Northeast states.

Northeast Homes, Fuel Type %
Natural Gas: 59%
Heating Oil: 21%
Electricity: 16%

New England Homes, Fuel Type %
Natural Gas: 40%
Heating Oil: 35%
Electricity: 14%
Propane: 6%

Maine Homes, Fuel Type %
Natural Gas: 8%
Heating Oil: 62%
Propane: 11%
Wood: 10%
Electricity: 7%

Household data is 2018; source: U.S. Census
Energy Affordability

ACEEE has released several studies that see value in converting homes heated with heating oil and propane to electricity, but find less value in converting natural gas homes, especially in colder climates: “For the residential sector, recent ACEEE research has found that some applications (oil- and propane-heated homes and homes in the South) can meet the criteria for beneficial electrification discussed above. For these applications it can make sense to electrify the next time a heating or cooling system or water heater needs to be replaced. But for many homes, electrification may not currently make sense and as a result, natural gas use will likely continue for decades, particularly in the North.”

Increasing Peak Day Demand

- Most LDCs in Northeast set multiple sendout records in last few winters.
- New England natural gas utilities collectively set 3 new sendout records the first week of Jan. 2018 – with new all-time peak set on 1-6-18, at close to 4.4 Bcf.
Natural Gas Power Gen Additions, Last 20 Years

Source: Repsol, 2015
Some Recent Additions to Gas Generation Capacity

- Footprint Power
  Salem Harbor
  Salem, MA
  674 MWs
  Online June 2018

- CPV Towantic Energy Center
  Oxford, CT
  805 MWs
  Online June 2018

- PSEG Power
  Bridgeport Harbor Station 5
  Bridgeport, CT
  485 MWs
  Online June 2019

- NRG Canal 3
  Sandwich, MA
  333 MWs
  Online June 2019

- Exelon West Medway
  Medway, MA
  200 MWs
  Online June 2019
Tufts University, Medford, MA

New central energy plant that went fully operational in 2018 - providing energy-efficient cogeneration technology to produce electricity as well as steam, fueled by natural gas. The university noted in fall 2018 that the plant is "Sustainable, cost-efficient, and environmentally friendly... a powerful addition to campus."

Harvard University, Allston, MA

New district energy facility will be fully operational in 2020. Harvard: "It has been designed to be as flexible as possible so emerging technologies can be incorporated over time as the University works towards its climate action goals to be fossil fuel-free by 2050 and fossil fuel-neutral by 2026. The facility currently relies on natural gas because that's the dominant lowest carbon fuel source available for this scale of facilities in the New England region."
Northeast States Lead U.S. in Gas Efficiency Investments

9 Northeast states = $572 million investment in 2018, 40% of U.S. total.


Marcellus Shale producing ~32 Bcf/d.

PA is 2nd largest gas producing state in U.S.
Canadian Pipeline Exports to Eastern U.S. Declining

Canada’s National Energy Board (NEB):
“After almost 20 years of producing natural gas, the Sable Offshore Energy Project (SOEP) ceased production on 31 December 2018. The shutdown of SOEP comes after the permanent closure of another offshore facility, Encana’s Deep Panuke field, which ceased production in May 2018.”
LNG Imports & Storage

Everett LNG has 3.4 Bcf of storage available at its facility in Everett, MA. Trucking terminal as well.

Repsol has approx. 10 Bcf of storage available at its Canaport LNG facility in Saint John, N.B. Interconnects with M&NE Pipeline.

LNG plays a key role in balancing the market.

Utility LNG Storage Facilities

Maine has one, in Lewiston.
PNGTS Projects in Process

PNGTS Projects Meeting the Demand

- C2C (2017)
  - 82k Dth/day
- Portland XPress (2018-2020)
  - 183k Dth/day
- Westbrook XPress I & II (2019-2021)
  - 108k Dth/day
- Westbrook XPress III (2022)
  - 18k Dth/day

Source: PNGTS, 12-19
“The first phase of Atlantic Bridge, providing 40,000 dekatherms per day of incremental firm transportation service, began operating in November 2017.

“The project facilities in New York were placed into service in the fall of 2019, and allowed for the full project capacity to be available from New Jersey to Massachusetts. We anticipate placing Atlantic Bridge fully into service in the second half of 2020, following completion of the Weymouth Compressor Station, which will facilitate delivery of much-needed natural gas to project customers in Maine and Atlantic Canada.”
Emissions Reductions

New England Generator Air Emissions, 2001 vs. 2017

<table>
<thead>
<tr>
<th>Carbon Dioxide (CO₂)</th>
<th>major driver of climate change</th>
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</thead>
<tbody>
<tr>
<td>Nitrogen Oxide (NOₓ)</td>
<td>adds to smog</td>
</tr>
<tr>
<td>Sulfur Dioxide (SO₂)</td>
<td>with NOₓ leads to acid rain</td>
</tr>
</tbody>
</table>

34% decrease

34% decrease

98% decrease

The 70 million short tons of carbon dioxide emissions avoided regionally between 2001 and 2017 is like taking more than 15.5 million passenger vehicles off the road for a year. For comparison, in 2016, roughly 5.1 million vehicles were registered in New England.

Source: ISO New England and the US Environmental Protection Agency’s Greenhouse Gas Equivalencies Calculator

<table>
<thead>
<tr>
<th>State</th>
<th>1990</th>
<th>2016</th>
<th>Percentage Change</th>
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<tbody>
<tr>
<td>CT</td>
<td>44.8</td>
<td>34.5</td>
<td>-23%</td>
</tr>
<tr>
<td>ME</td>
<td>23.5</td>
<td>16.6</td>
<td>-29.6%</td>
</tr>
<tr>
<td>MA</td>
<td>85.9</td>
<td>64.5</td>
<td>-24.8%</td>
</tr>
<tr>
<td>NH</td>
<td>21.6</td>
<td>13.8</td>
<td>-36%</td>
</tr>
<tr>
<td>RI</td>
<td>11.4</td>
<td>9.8</td>
<td>-13.9%</td>
</tr>
<tr>
<td>VT</td>
<td>6.9</td>
<td>6</td>
<td>-13.5%</td>
</tr>
<tr>
<td>US</td>
<td>5,991.6</td>
<td>5,189.4</td>
<td>-13.4%</td>
</tr>
</tbody>
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Source: U.S. EIA, 2-19

CH₄ (Methane) Emissions, MA, 1990-2016

Chart: MA DEP, GHG Emissions Inventory, 1990-2016, released 2019
Some options might include:

**Enhanced energy efficiency**

**Renewable Natural Gas (RNG)** - connecting RNG facilities to the gas system.

**Power-to-gas** - converting excess renewable electricity to hydrogen through electrolysis of water; potential role of RNG.

**Carbon capture** – potentially linked to power generation sector.
System Safety & Public Awareness