

June 18, 2020

Natural Gas in the Region - Current & Future Role

EBC Energy Resources Webinar



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 & CNG suppliers
- ◆ ~ 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.

Topics

- ◆ System Overview
- ◆ Natural Gas Market Trends
- ◆ Utility Approaches to Decarbonization
- ◆ Pathways Forward

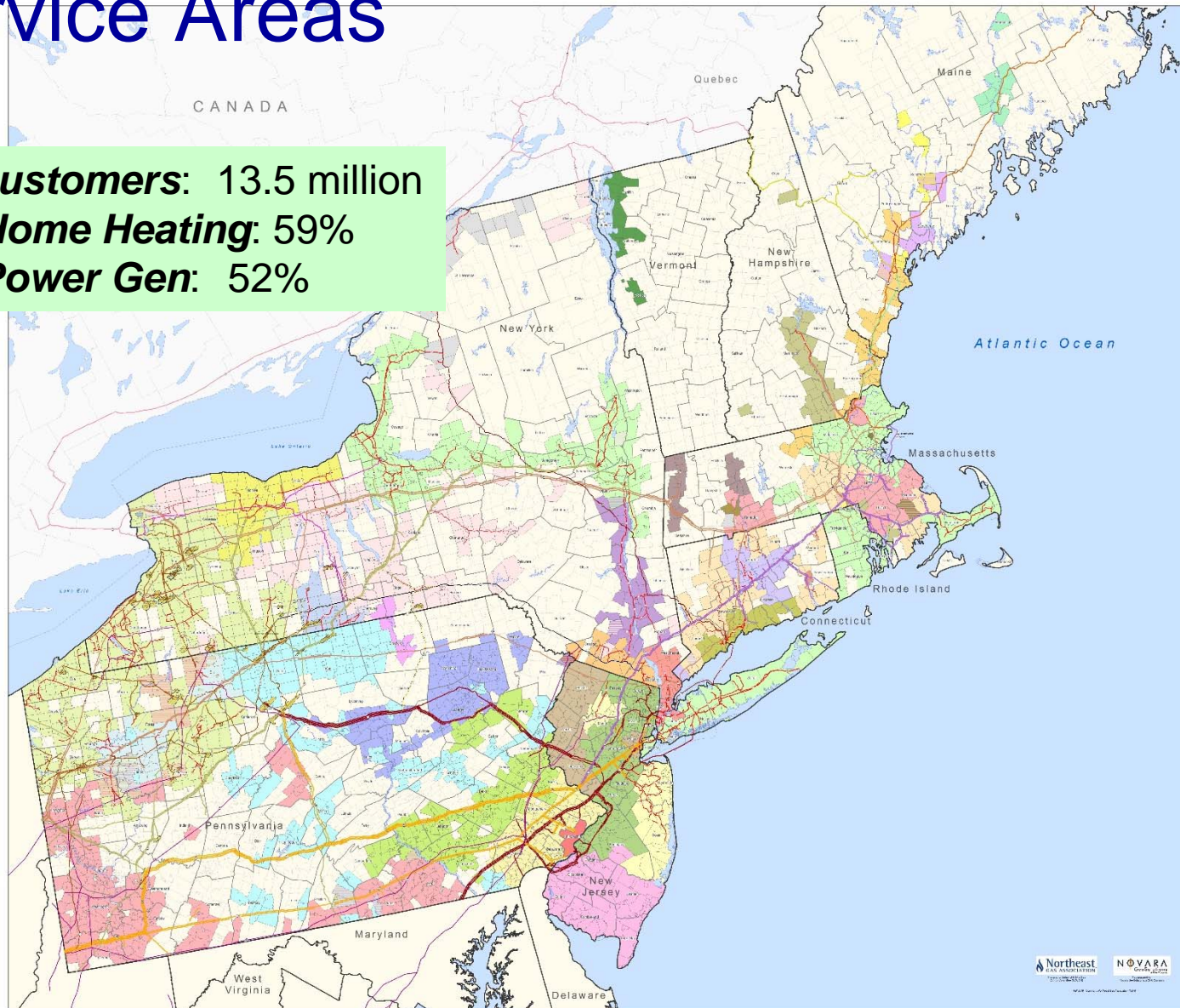
Key Points

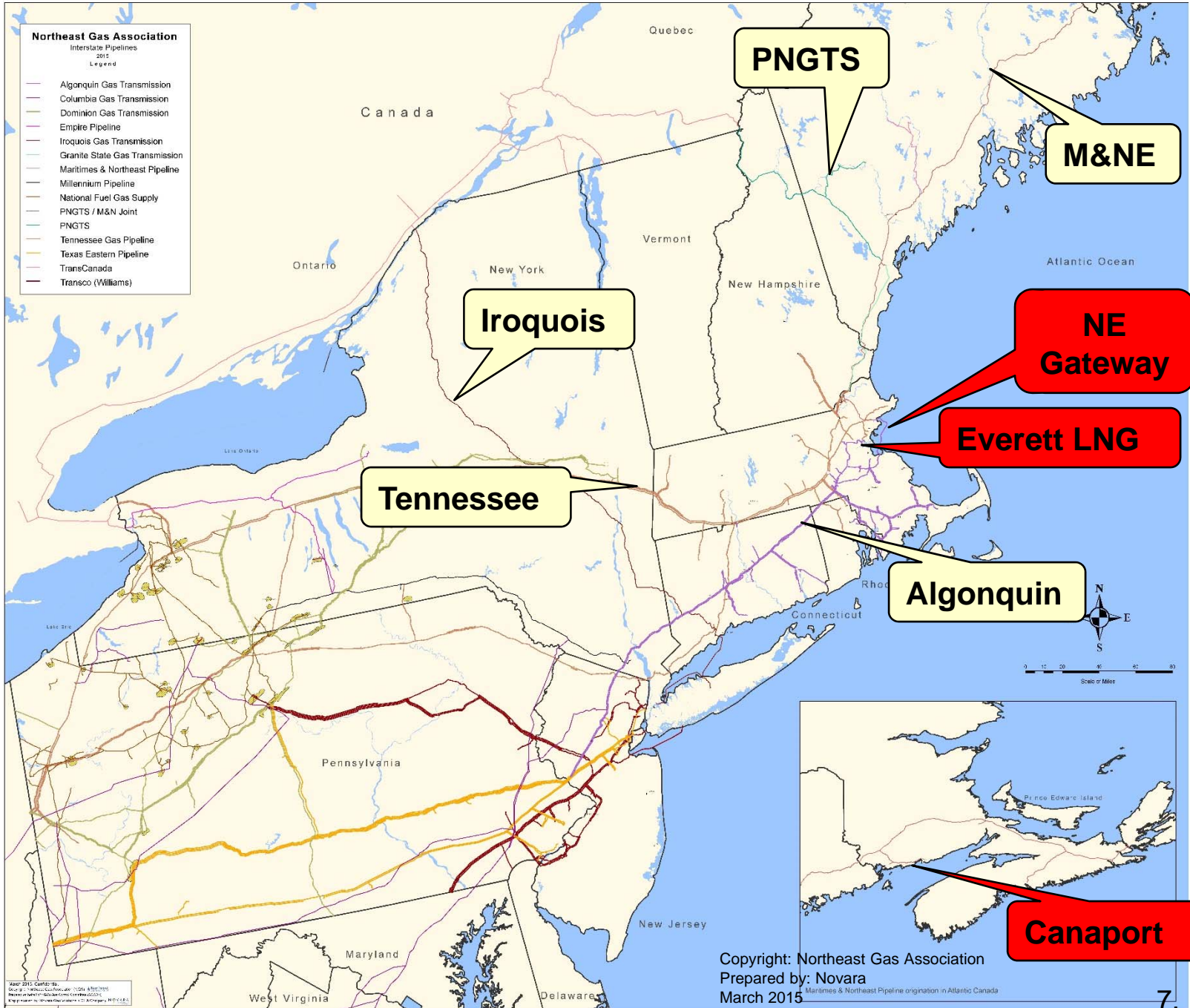
- Natural gas has grown to be a preferred fuel for homes, businesses and the power sector in the last 2 decades.
- The region has made significant advances in reducing air pollution and staying on target for meeting 2020 GHG reduction goals ...thanks in large measure to gas.
- Going forward, the gas industry is working to lower its carbon content and reduce its environmental impact, recognizing its environmental responsibility.
- The region's energy system is in transition; the natural gas pathway remains part of the discussion.

Northeast U.S. Natural Gas Service Areas



Gas Customers: 13.5 million
% of Home Heating: 59%
% of Power Gen: 52%





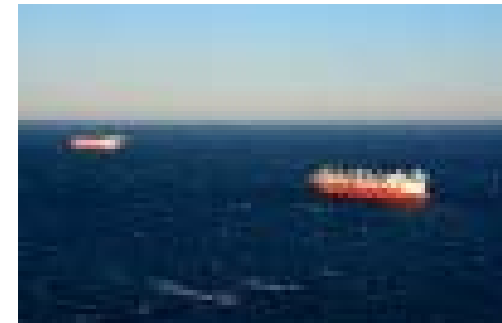
Maine has one, in Lewiston.



LNG Imports & Storage



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



Northeast Gateway offshore Cape Ann, MA, can inject gas from vessel to underwater Pipeline.



LNG plays a key role in balancing the market.

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

LNG trucking is also a means of deliveries supplies to the region, from Quebec, PA.

CNG Deliveries

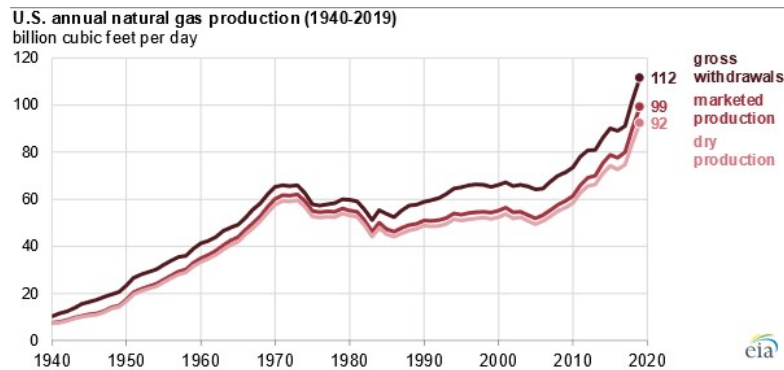


- ◆ Compressed natural gas (CNG) stations in several states provide fuel for vehicle/trucks and also fuel supply for truck deliveries to *off-system customers* – from paper mills to medical centers
- ◆ Building the market prior to development of gas distribution or transmission system
 - e.g., Middlebury, Vermont as “gas island” by NG Advantage, with gas sourced at Vermont Gas

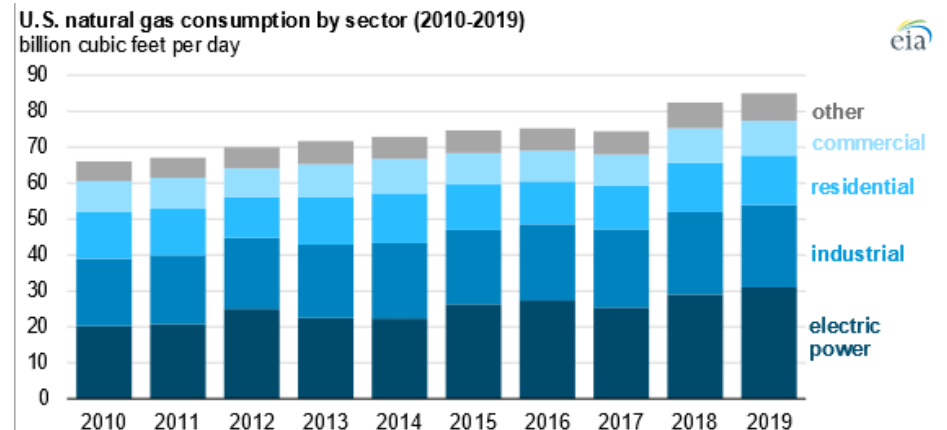
REGIONAL MARKET DEVELOPMENTS



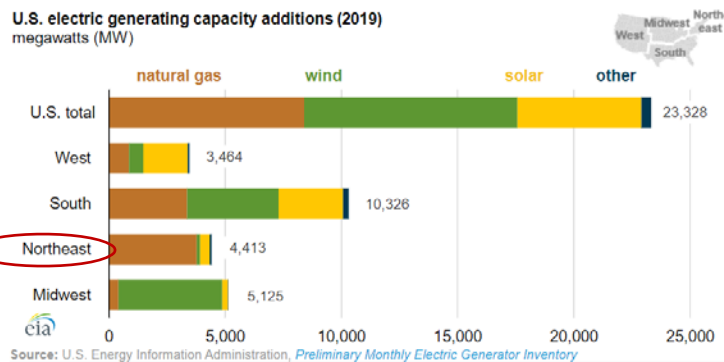
U.S. Production & Consumption Set New Records Last Year



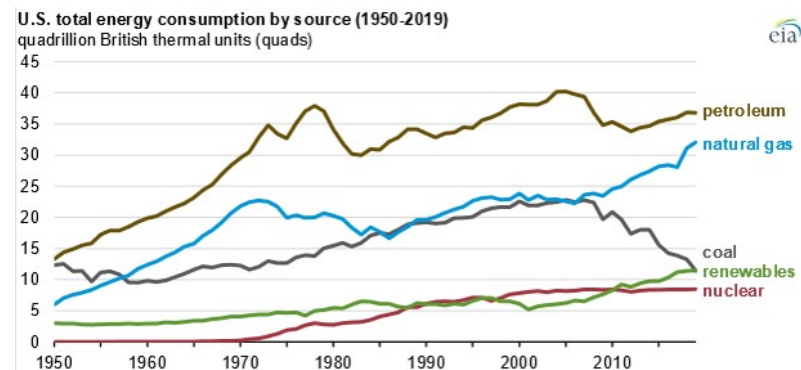
U.S. natural gas production in 2019 set new all-time records.



U.S. natural gas consumption in 2019 set new all-time record: **85 Bcf/d**.



Source: U.S. Energy Information Administration, Preliminary Monthly Electric Generator Inventory



Residential Customer Growth Has Continued in Region

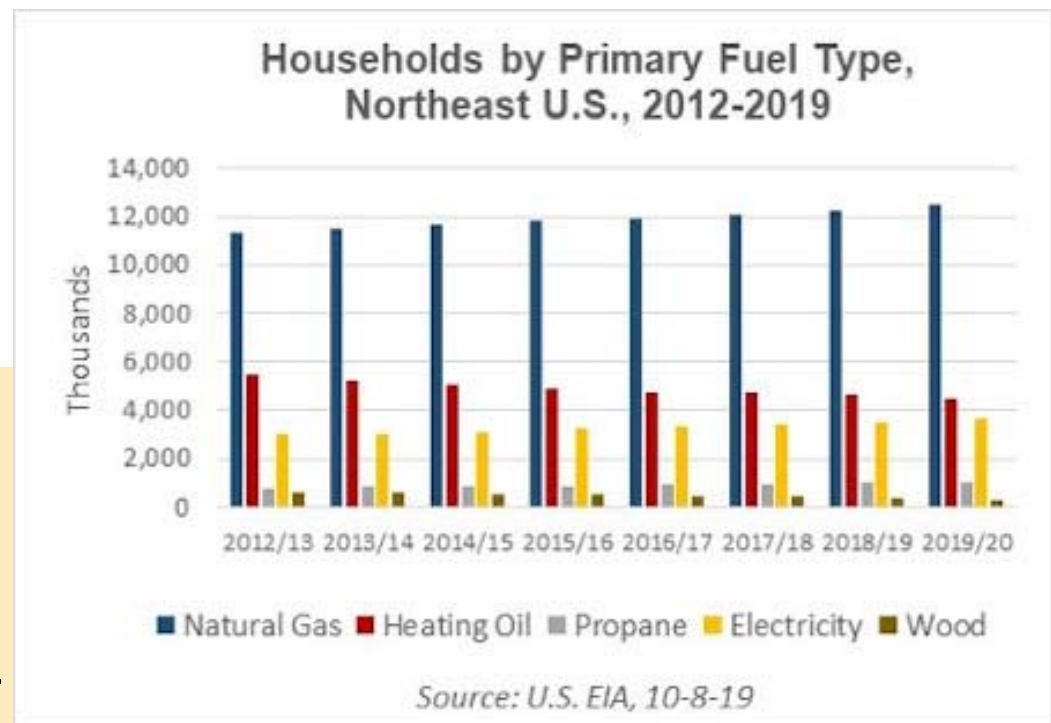


Northeast Homes, Fuel Type %

Natural Gas:	59%
Heating Oil:	21%
Electricity:	16%

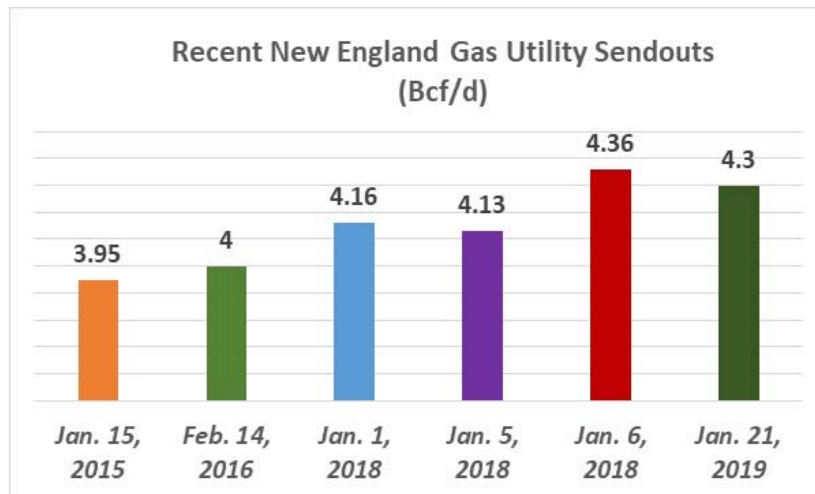
New England Homes, Fuel Type %

Natural Gas:	40%
Heating Oil:	35%
Electricity:	14%



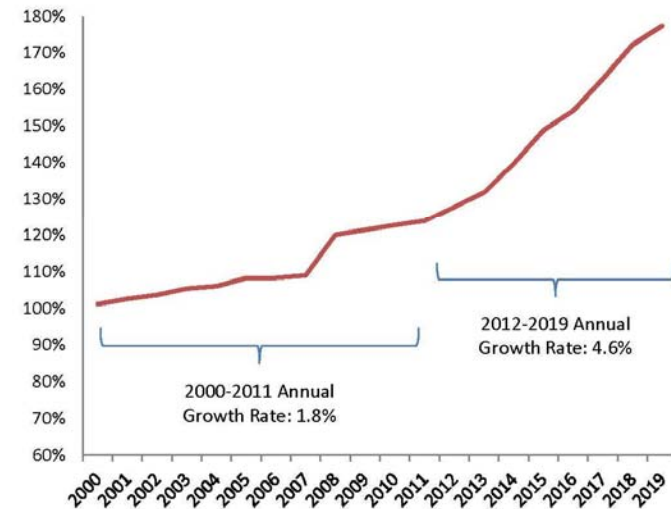
Since 2012, natural gas has added over 1 million new household customers in the Northeast states.

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.

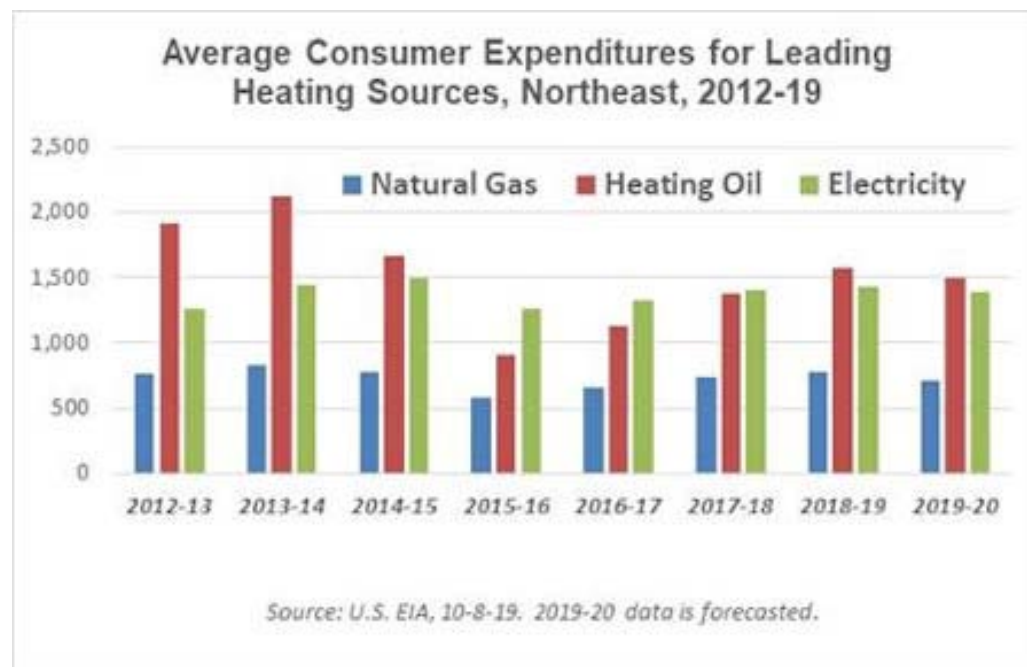
Con Edison Peak Day Natural Gas Demand (Weather-Normalized, Compared to 2000)



“Supply and demand increasingly out of balance
– ~50% peak growth in last 10 years
– Last new supply added in 2013
– Use of delivered services rising”

Source: Con Edison, 4-25-19, at NGA Forum

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: “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.”

In January 2019, NYSERDA released “New Efficiency: New York - Analysis of Residential Heat Pump Potential and Economics,” assessing the potential of residential heat pumps. It noted that “generally, installations replacing natural gas have negative IRRs.”

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



Cricket Valley Energy
Dover, NY
1,100 MWs
Online Spring 2020

Combined Heat & Power (CHP) / Cogen

Tufts University, Medford, MA



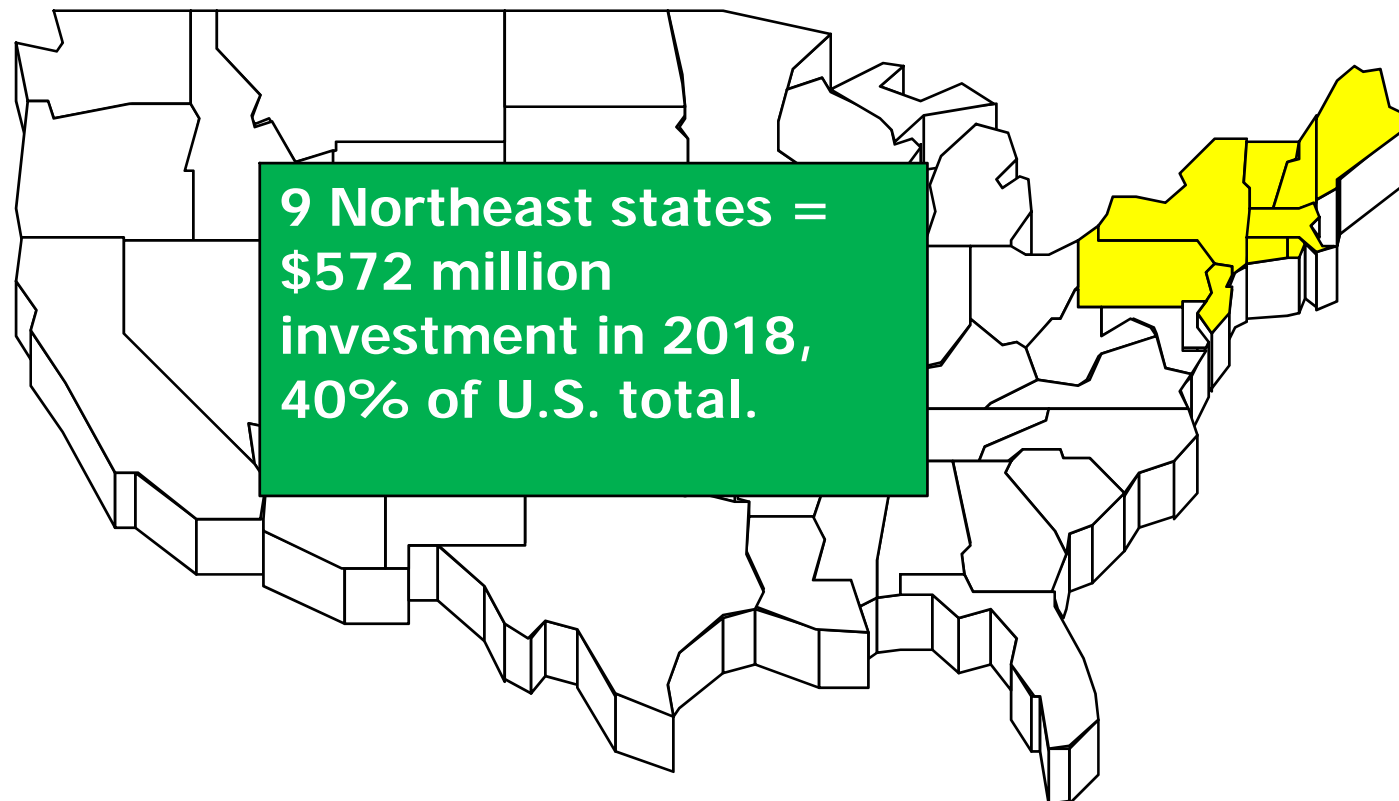
New central energy plant that went fully operational in 2018 - providing energy-efficient cogeneration technology to produce electricity as well as steam, fueled by natural gas. The university noted in fall 2018 that the plant is "Sustainable, cost-efficient, and environmentally friendly... a powerful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



Source: ACEEE, "2019 State Energy Efficiency Scorecard", released Sept. 2019

Emissions Reductions, Power Sector

New England Grid

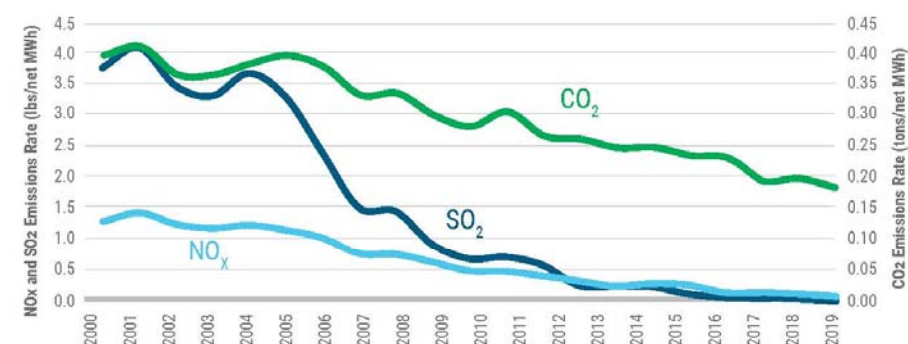
Annual Emissions of NO_x, SO₂, and CO₂, 2001 to 2018 (kilotons)

Year	NO _x	SO ₂	CO ₂	
	kilotons (short)	kilotons (short)	kilotons (short)	kilotons (metric)
2001	59.73	200.01	52,991	48,073
2002	56.40	161.10	54,497	49,439
2003	54.23	159.41	56,278	51,055
2004	50.64	149.75	56,723	51,458
2005	58.01	150.00	60,580	54,957
2006	42.86	101.78	51,649	46,855
2007	35.00	108.80	59,169	53,677
2008	32.57	94.18	55,427	50,283
2009	27.55	76.85	49,380	44,797
2010	28.79	80.88	52,321	47,465
2011	25.30	57.01	46,959	42,601
2012	20.32	16.61	41,975	38,079
2013	20.32	18.04	40,901	37,105
2014	20.49	11.67	39,319	35,670
2015	18.86	9.11	40,312	36,570
2016	16.27	4.47	37,467	33,990
2017	15.30	4.00	34,969	31,723
2018	15.61	4.96	34,096	30,931
Percent Reduction, 2001-2018	74	98	36	36

Table: ISO-NE, May 2020

New York Grid

Figure 1: Emissions Rates from Electric Generation in New York: 2000-2019



New York power sector emissions rate reductions since the launch of NYISO markets in 1999 according to the US EPA Air Markets Program data

↓ 55%
Carbon Dioxide
CO₂

↓ 99%
Sulfur Dioxide
SO₂

↓ 92%
Nitrogen Oxide
NO_x

Chart: NY ISO, June 2020

Environmental Issues – GHG

MA GHG Emissions by Sector

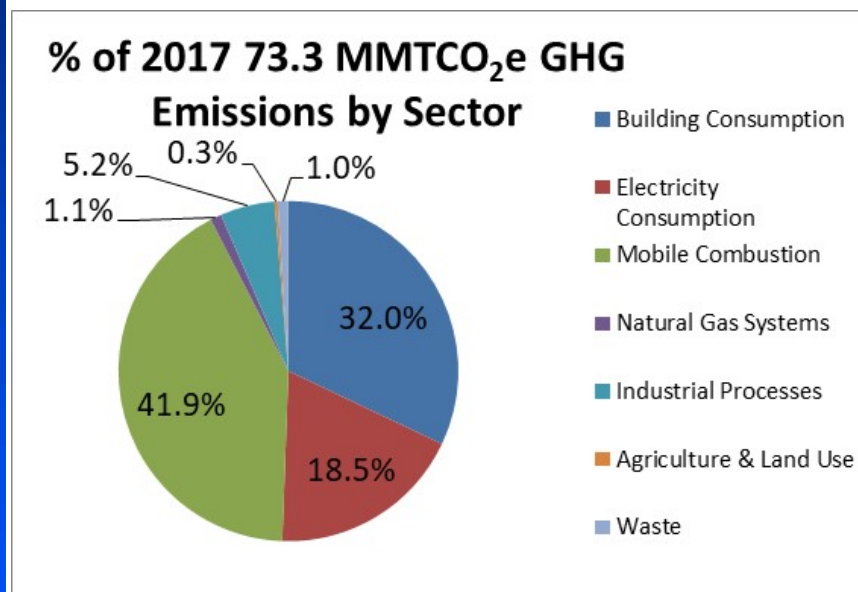


Chart: MA DEP, GHG Emissions Inventory, 1990-2017, released 2020

MA Methane Emissions by Sector

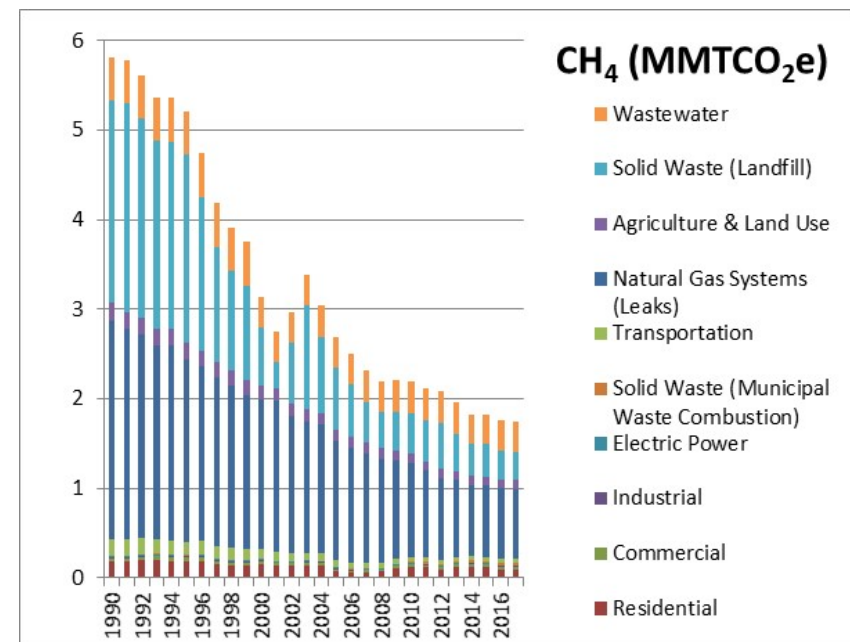


Chart: MA DEP, GHG Emissions Inventory, 1990-2017, released 2020

According to MA DEP’s latest GHG inventory report, natural gas systems in MA = 1.1% of total state GHG emissions (it was 2.6% in 1990). Gas system leaks declined by 67% since 1990.

UTILITY APPROACHES TO DECARBONIZATION



Renewable Natural Gas (RNG) - Lower Carbon Input

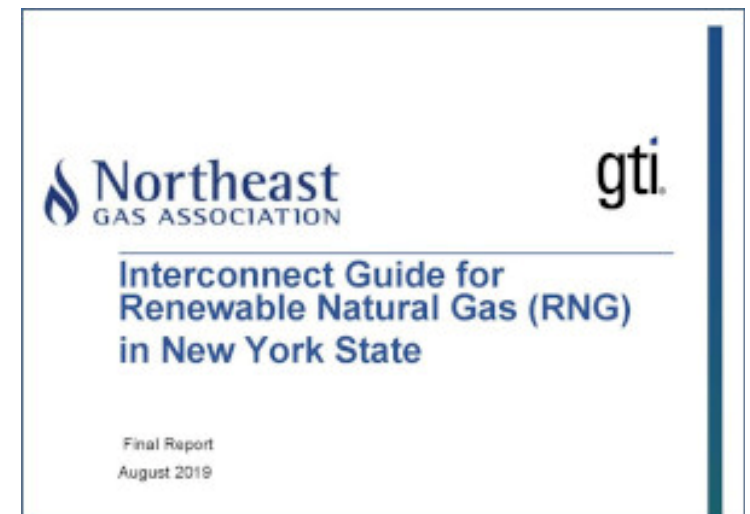


Renewable Natural Gas (RNG), also known as bio-methane or biogas, is pipeline quality gas derived from biomass that is fully interchangeable with natural gas. The future natural gas network could include renewable gas from dairy farms, waste water treatment plants, landfills, wood waste and food waste plants.

Several gas utilities in the Northeast are looking to incorporate RNG into their supply mix.

NGA & GTI study:

https://www.northeastgas.org/renewable_natural_gas.php



The Road Ahead



- ◆ Massachusetts government looking at **2050 roadmap**, including role of gas.
- ◆ Regional policy interest in advancing **electrification in transportation & building sectors**.
- ◆ Gas companies continue to advance **decarbonization** measures, system upgrades, and new technologies.