

NH Energy Landscape Patterns, Policy and Potential

**Municipal Association Annual Conference
November 16, 2022**

Clifton Below

Chair, Community Power Coalition of NH & Assistant Mayor, City of Lebanon

Henry Herndon

Consultant to Community Power Coalition of New Hampshire

Chris Skoglund

Director of Energy Transition, Clean Energy NH

Panel Overview

- **Patterns and Projections**

- **Chris Skoglund**

- Director of Energy Transition, CENH

- **Policy and Potential**

- **Henry Herndon**

- Consultant to CPCNH

- **Clifton Below**

- Chair, CPCNH & Assistant Mayor, City of Lebanon

**NH Energy Landscape
Patterns, Policy and Potential**

Energy Patterns and Projections

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Chris Skoglund

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Director of Energy Transition

Clean Energy NH



ABOUT CLEAN ENERGY NH

New Hampshire's leading clean energy advocate
(501(c)3 Nonprofit), dedicated to:



**Strengthening
NH's Economy**



**Protecting Public
Health**



**Reducing
Emissions**

Learn more & become a member at:

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Presentation Overview

- **New Hampshire Energy System**
- **New Hampshire in a Larger Context**
- **A Look to the Future**

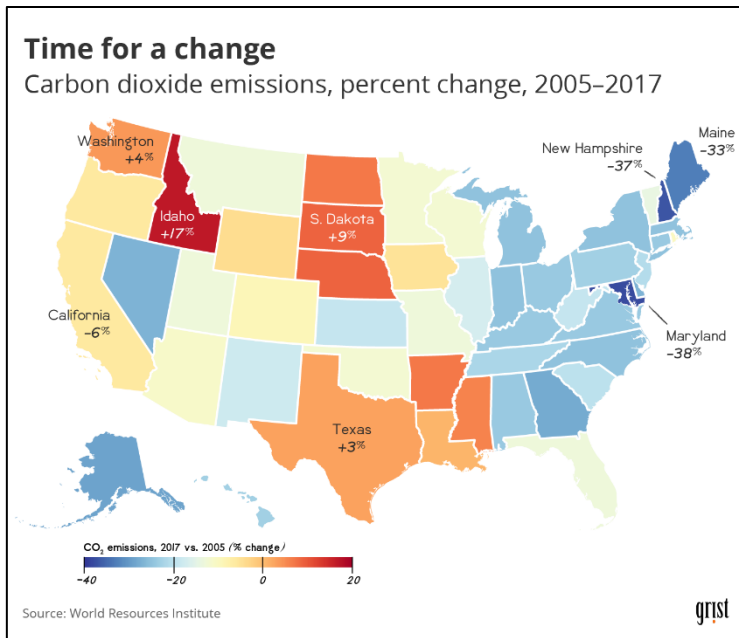
Presentation Takeaways

- **NH Energy Prices Are HIGH**
- **NH Energy System Highly Exposed**
- **Energy Prices and Costs Result of Policy Decisions**
- **Energy Costs Impact on NH's Competitive Edge**
- **The Future Is Ours to Make**

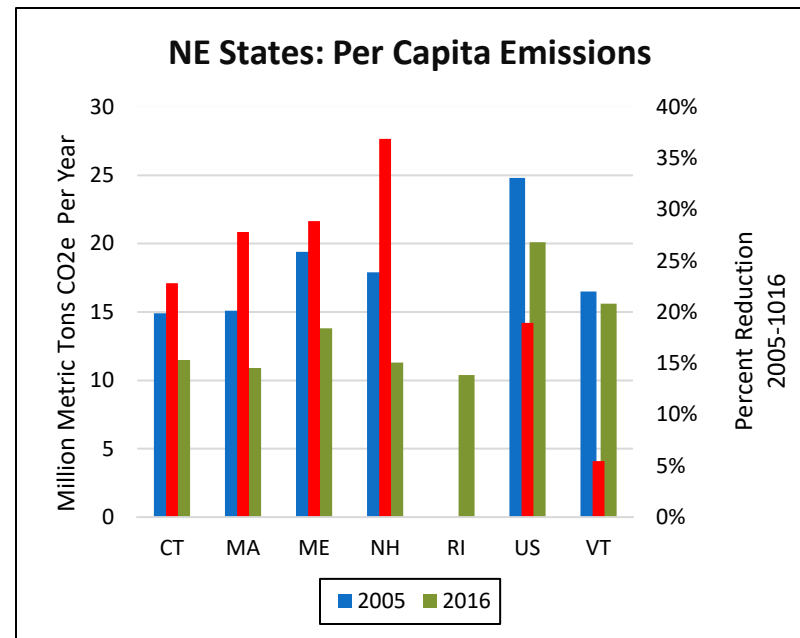
New Hampshire In Focus



2019 Headline: “NH Leading the Way”



Source: Grist, World Resources Institute

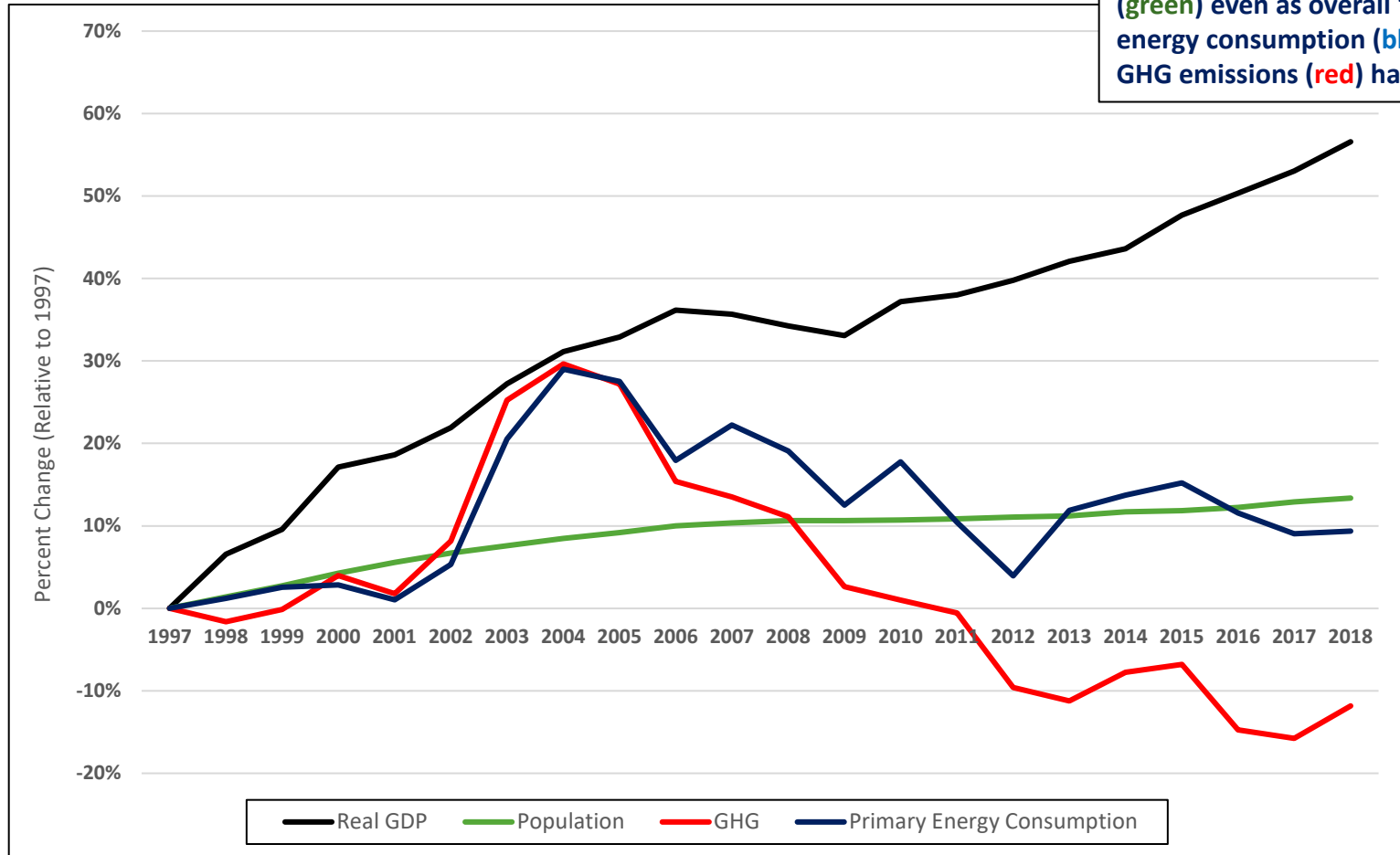


Data Source: EIA State Energy Data System, Environmental Action Network Data; NHDES Analysis. Subject to revision. August 2020.

2019 Finding: New Hampshire ranked **SECOND in nation in percent emissions reductions between 2005 and 2016, and first in New England.**

NH Economic, Energy, & Emissions Trends **ARE** Positive

Economic growth (black) has exceeded the population growth (green) even as overall “primary” energy consumption (blue) and GHG emissions (red) have FALLEN.

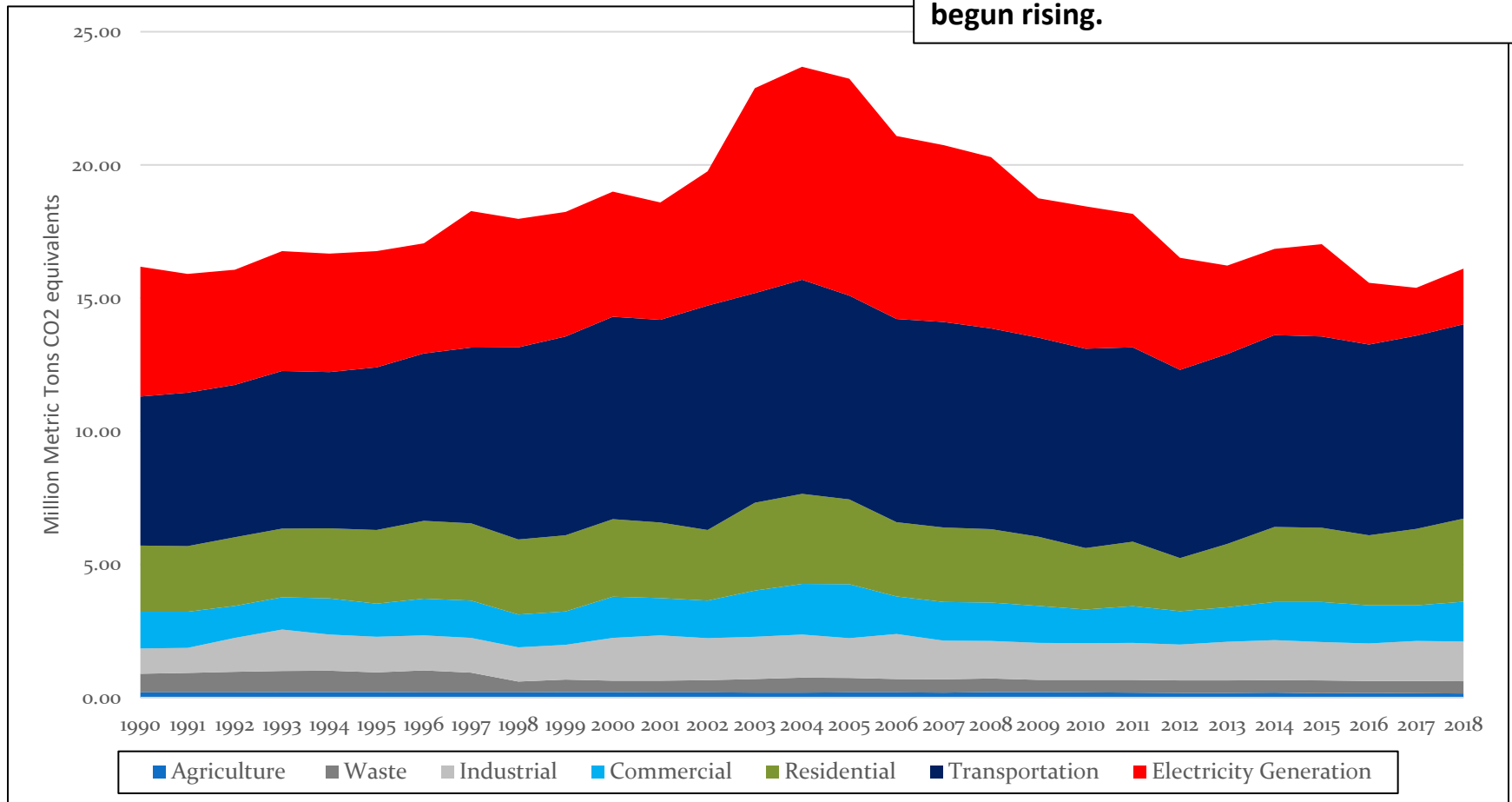


Data Source: Federal Reserve Economic Data, US Energy Information Administration, US Census Bureau. August 2020.

NH GHG Emissions Inventory By Sector

Compared to base year (1990), TOTAL emission are virtually unchanged in 2018. Compared to peak emissions in 2004/2005, emissions have fallen more than 30%.

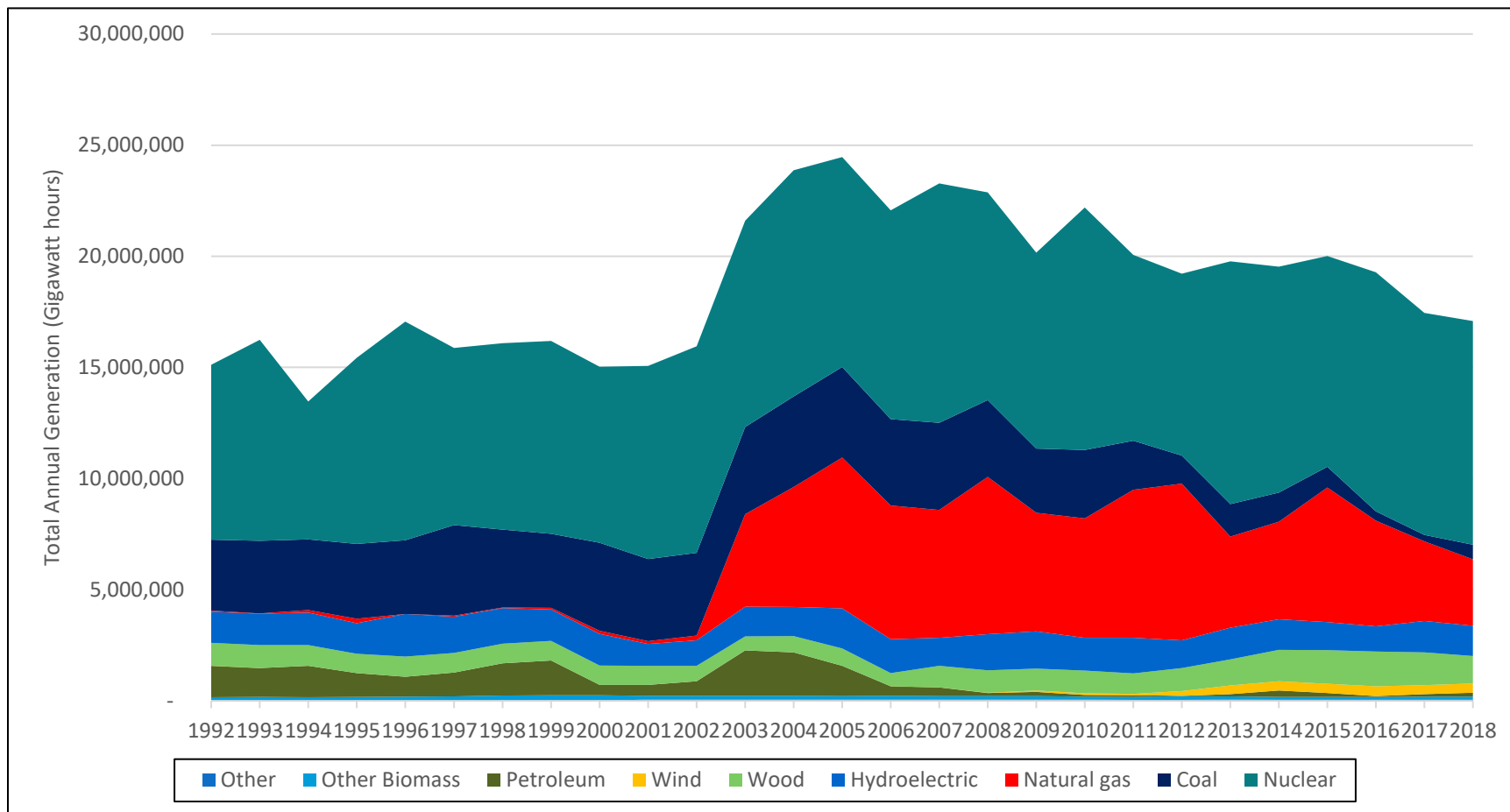
Electric sector emissions (top/red) have fallen nearly 74% since 2005. Other sectors declined through 2011, and have remained flat or begun rising.



Data Source: 2018 NH GHG Emissions Inventory: US Energy Information Administration, US EPA Data, RGGI Inc.; NHDES Analysis. August 2020.

Overall Electric Generation Changes in NH

Analysis of NH's energy consumption across sectors, including retail electric sales, shows far less change. NH's emissions are falling but the economy is consuming a MORE energy.

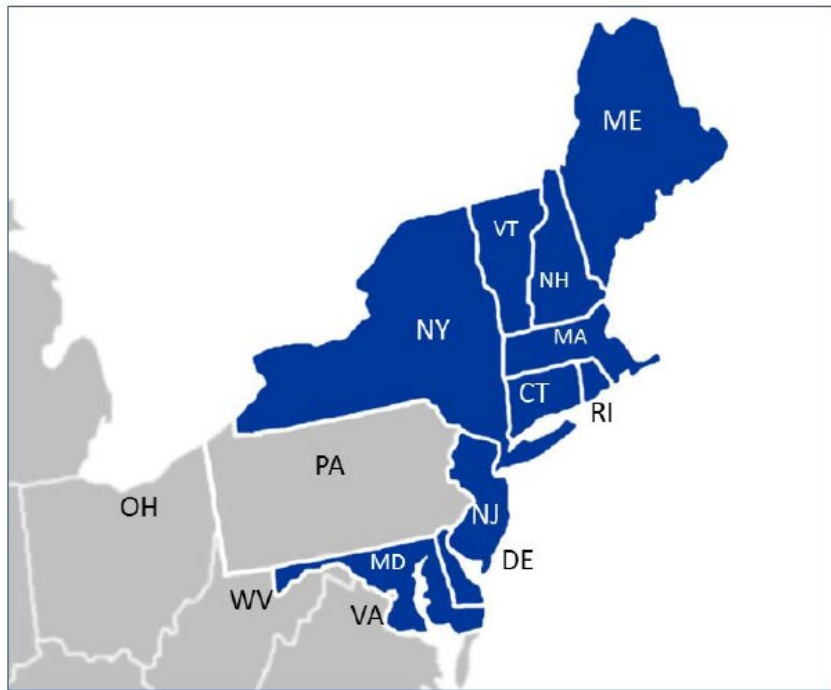


Data Source: US Energy Information Administration. August 2020.



New Hampshire in Context

Regional Greenhouse Gas Initiative



- The Regional Greenhouse Gas Initiative (RGGI) is a ten (10) state cooperative effort among northeastern states to cap and reduce CO₂ emissions from the power sector.
- Electric generation facilities purchase emission allowances through auctions and participating states invest proceeds in energy efficiency, renewable energy, and other consumer benefit programs.

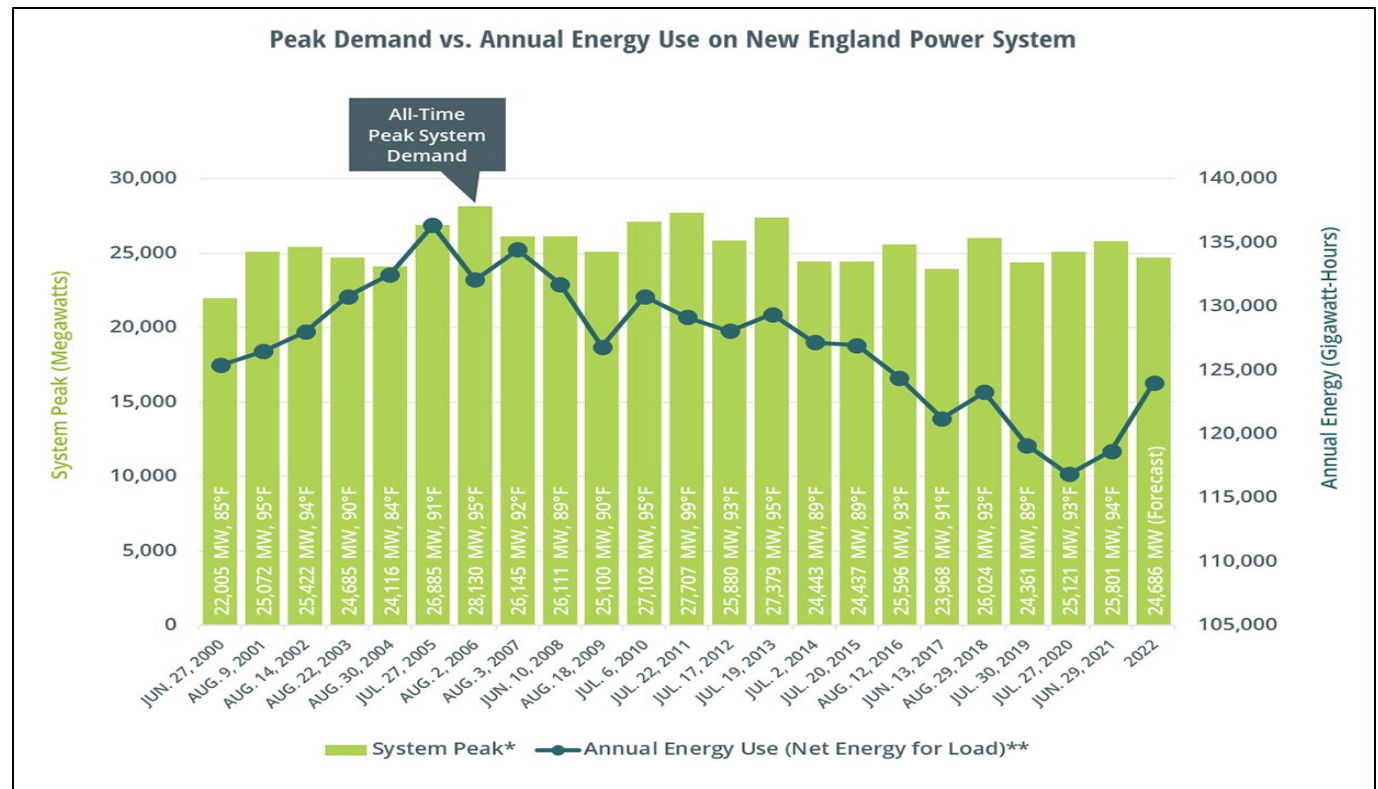
NH Emissions & Regional Electrical Market



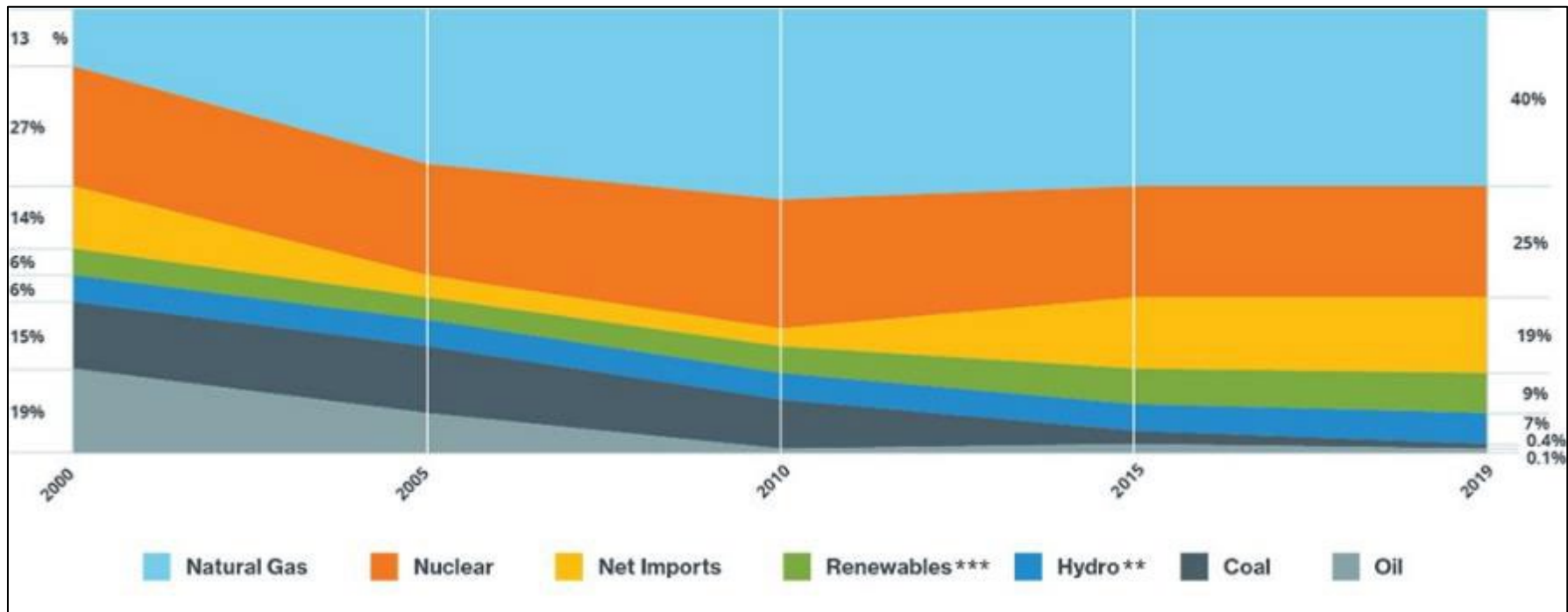
- NH's electric generation facilities do not provide electricity for NH alone.
- Electricity within New England is shared over transmission lines, and managed by a region grid operator, ISO-NE.
- The electricity consumption across NE impacts NH generators and emissions.

New England Peak Demand & Total Electricity Consumption

NH GHG emissions in the electric sector have fallen as regional “peak demand” and total regional electricity consumption have declined.



Overall Electric Generation Changes in New England

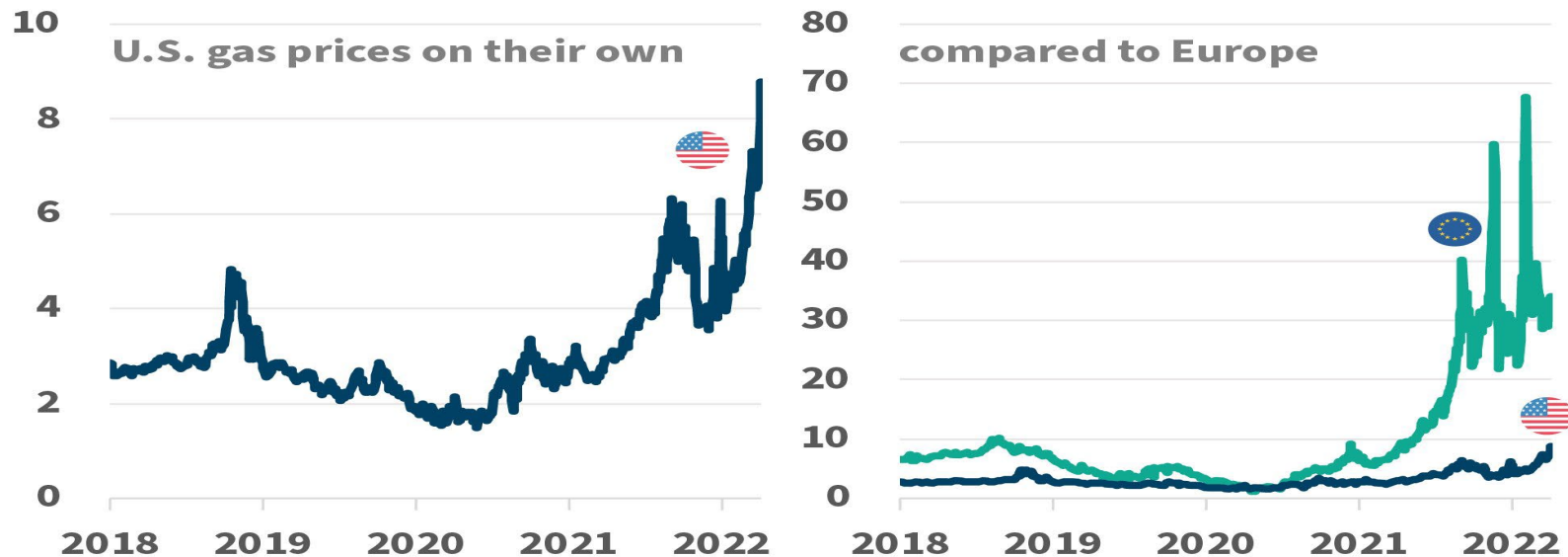


Source: ISO New England, Generation Data And Net Energy And Peak Load by Source Report

New England Competes for Energy Global Energy Market

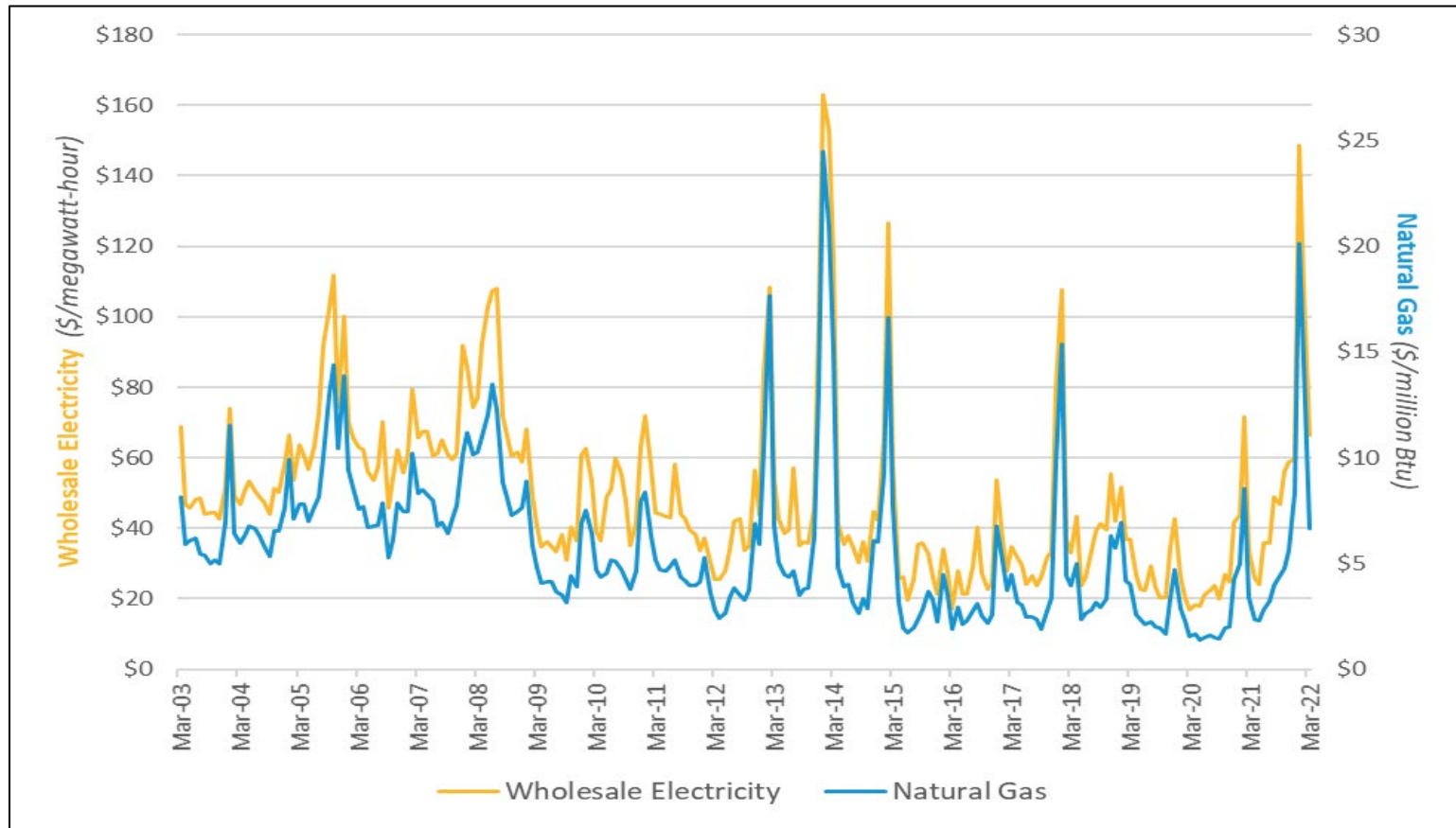
Natural gas prices in the United States and Europe

U.S. dollars per million British thermal units (MMBtu)



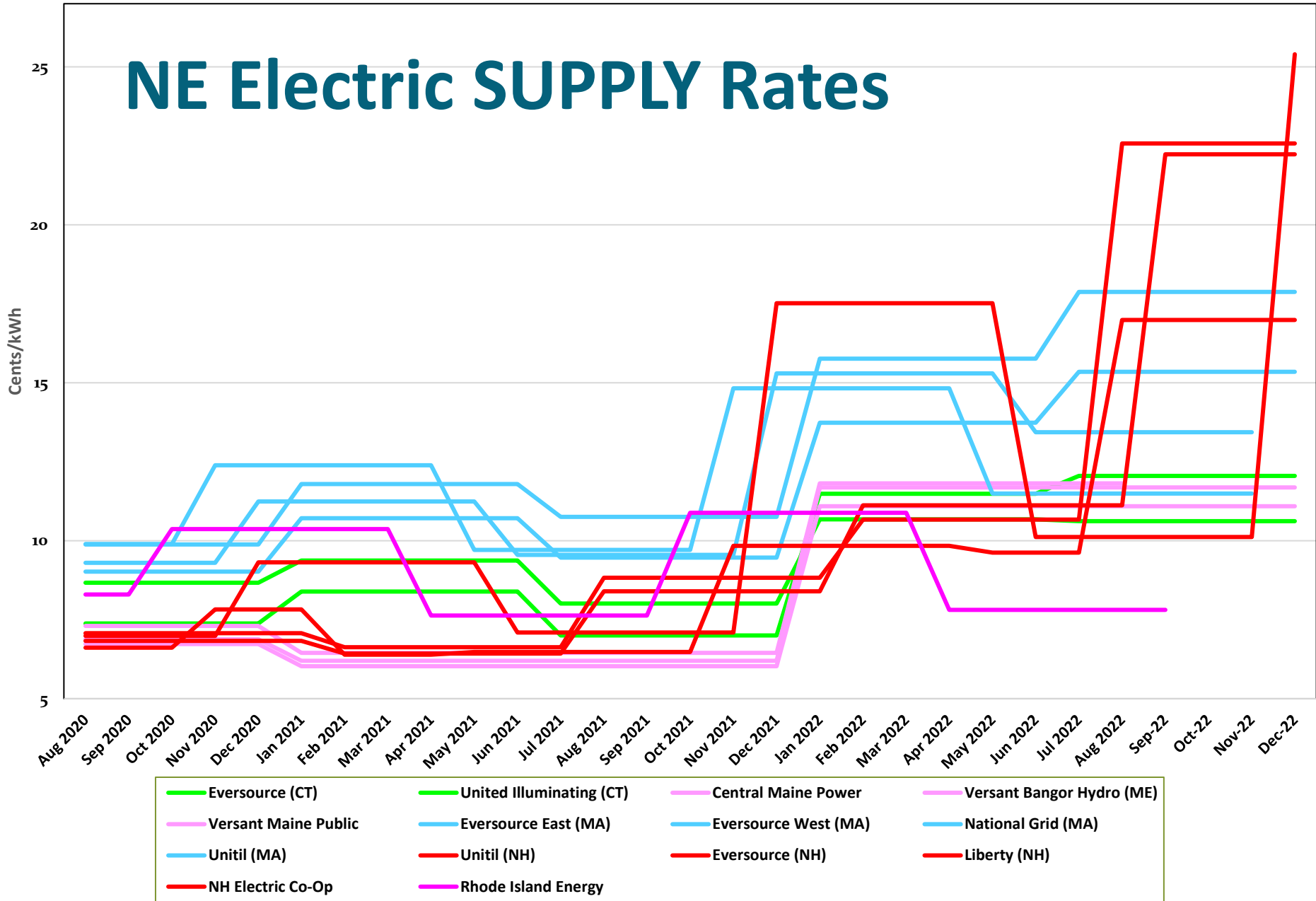
Source: Bloomberg. Prompt month contract prices to May 5, 2022. Henry Hub for the United States. Title Transfer Facility (TTF) for Europe.

ISO-NE Wholesale Market Vulnerable to Winter Price Spikes



Source: ISO-NE, 2022, <https://isonewswire.com/2022/04/27/monthly-wholesale-electricity-prices-and-demand-in-new-england-march-2022/>

NE Electric SUPPLY Rates



Source: NHPR 2022:

<https://www.nhpr.org/nh-news/2022-09-08/why-electricity-prices-are-rising-unevenly-across-new-england>

A 'Tsunami of Shutoffs': 20 Million US Homes Are Behind on Energy Bills

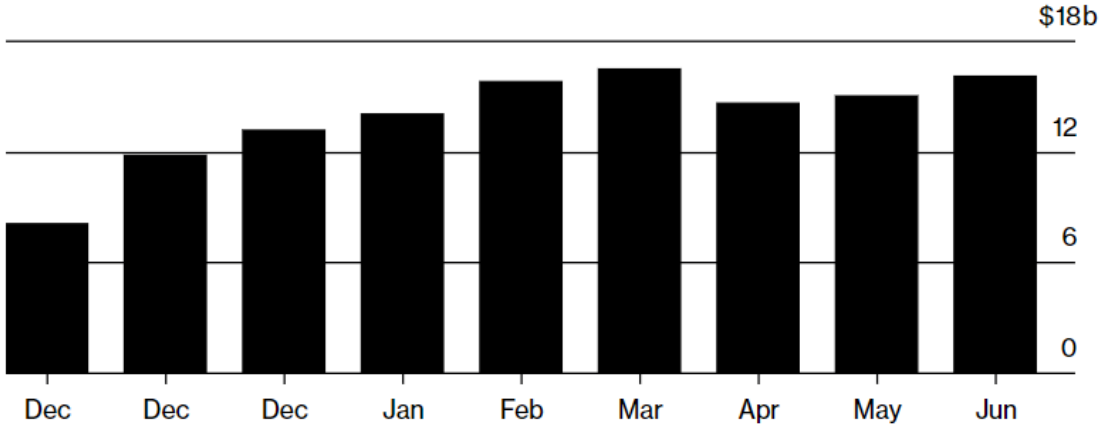
Surging electricity prices spur worst-ever crisis in late utility payments.



About 1 in 6 American households are behind on their utility bills, the highest number on record, according to the National Energy Assistance Directors Association. *Photographer: Michael Nagle/Bloomberg*

The Nice household is one of **some 20 million across the country—about 1 in 6 American homes—that have fallen behind on their utility bills.** It is, according to the National Energy Assistance Directors Association (Neada), the worst crisis the group has ever documented. Underpinning those numbers is a blistering surge in electricity prices, propelled by the soaring cost of natural gas.

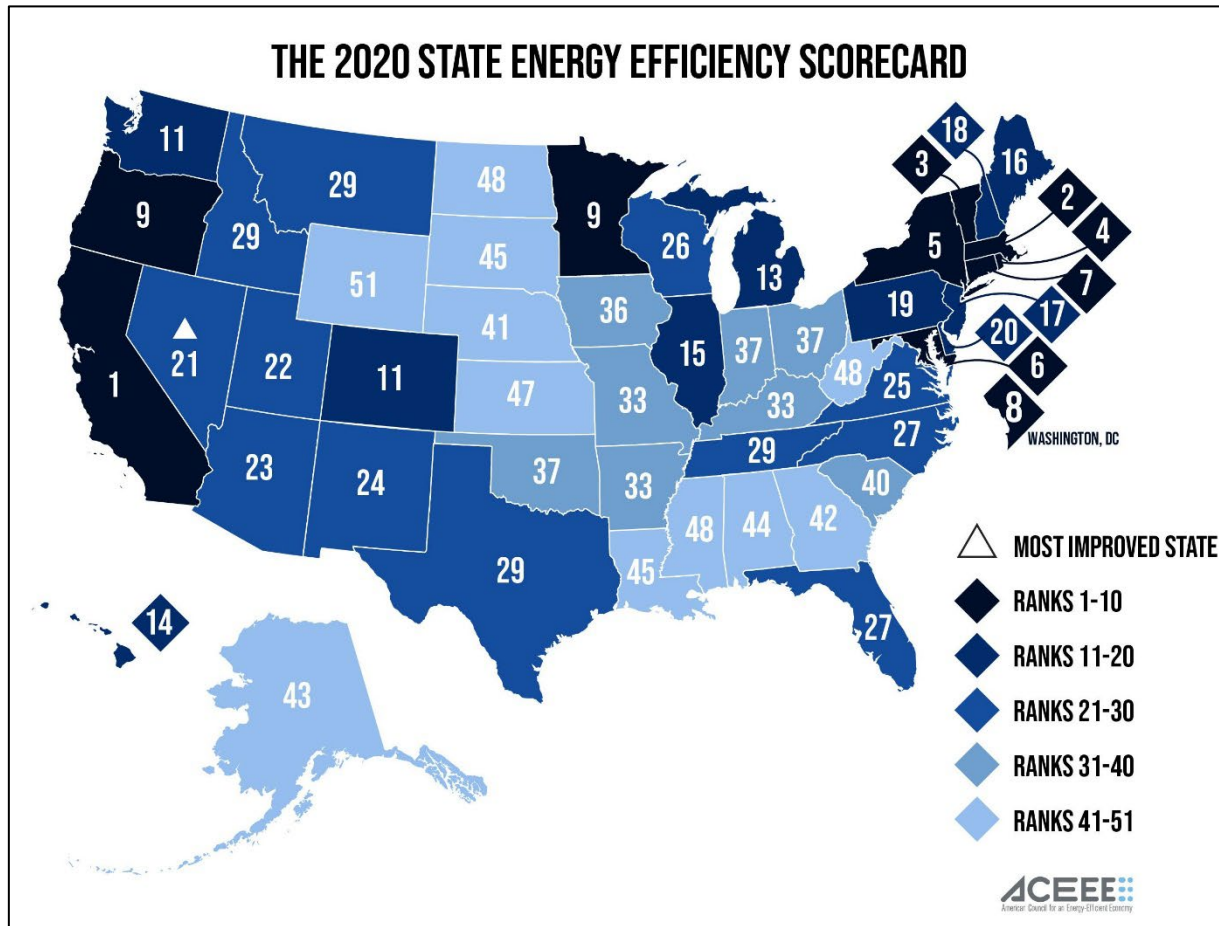
Total US Overdue Utility Balance





State Energy Policies Add Up

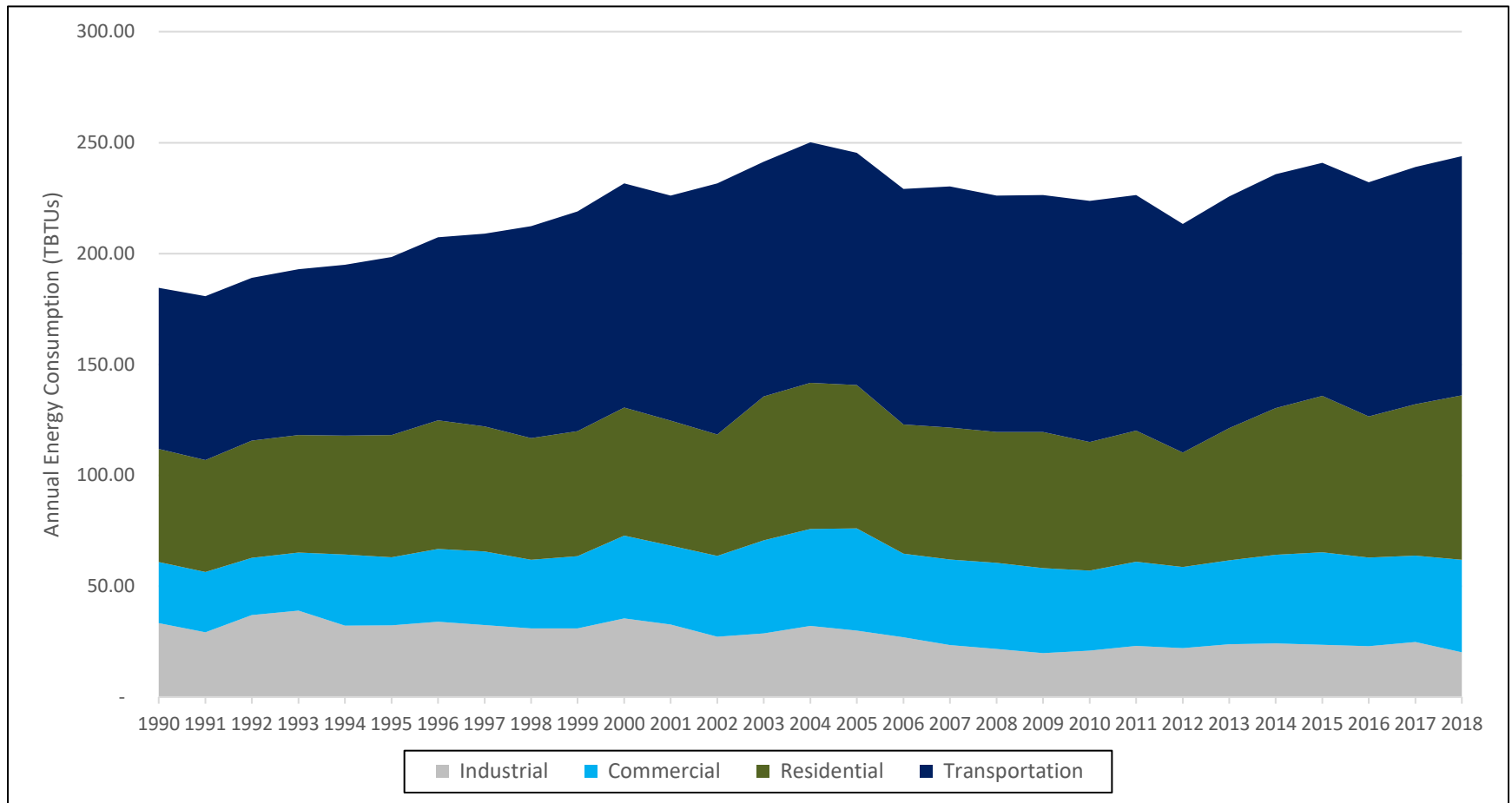
NH Energy Policy Lags Northeast and Nation



Source: ACEEE, 2021, <https://www.aceee.org/press-release/2020/12/2020-state-energy-efficiency-scorecard>

NH Energy Consumption By Sector 1990-2019

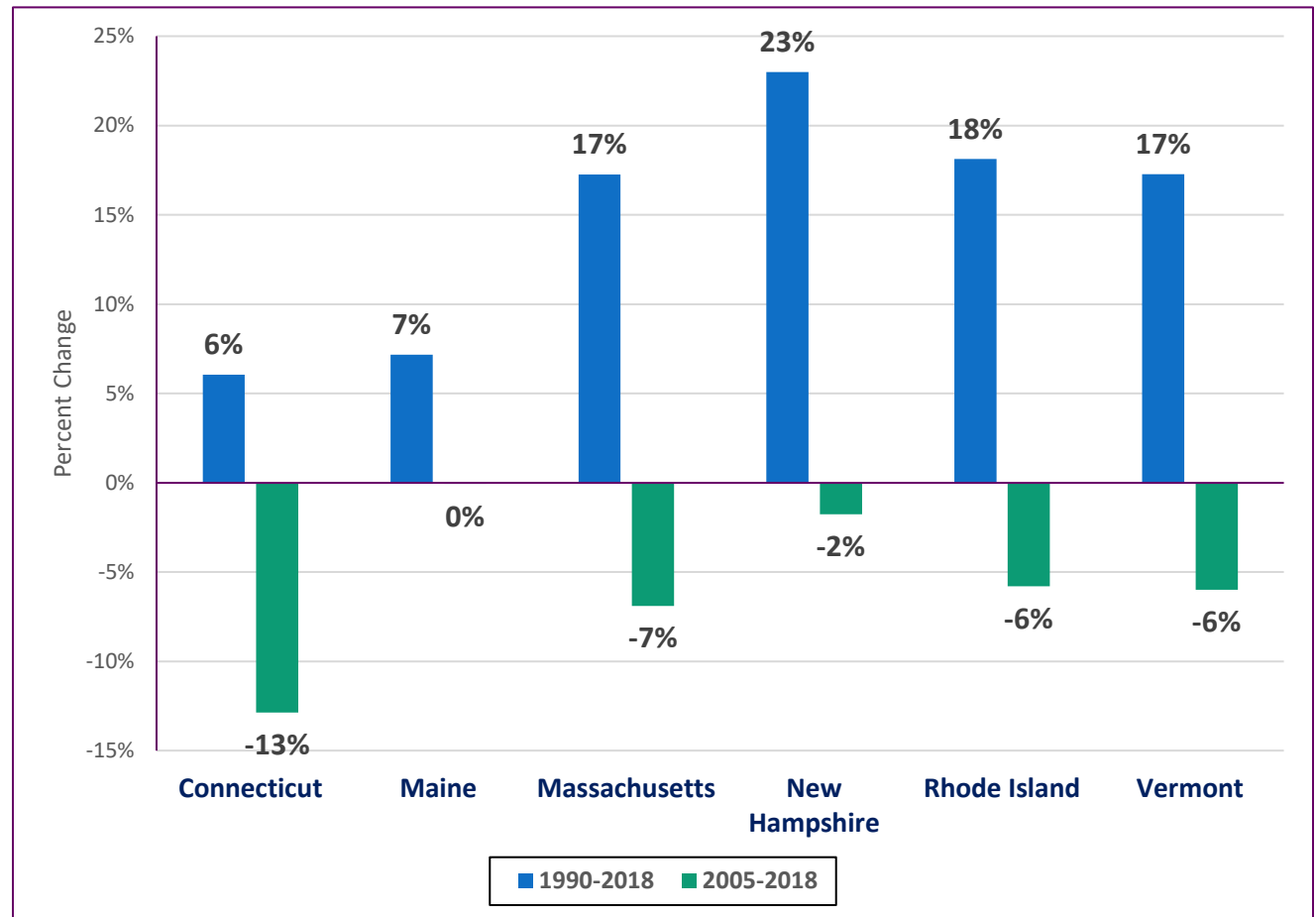
Analysis of NH's energy consumption across sectors, **INCLUDING RETAIL ELECTRIC SALES**, shows far less change. NH's emissions are falling, but the economy is consuming a slightly more energy.



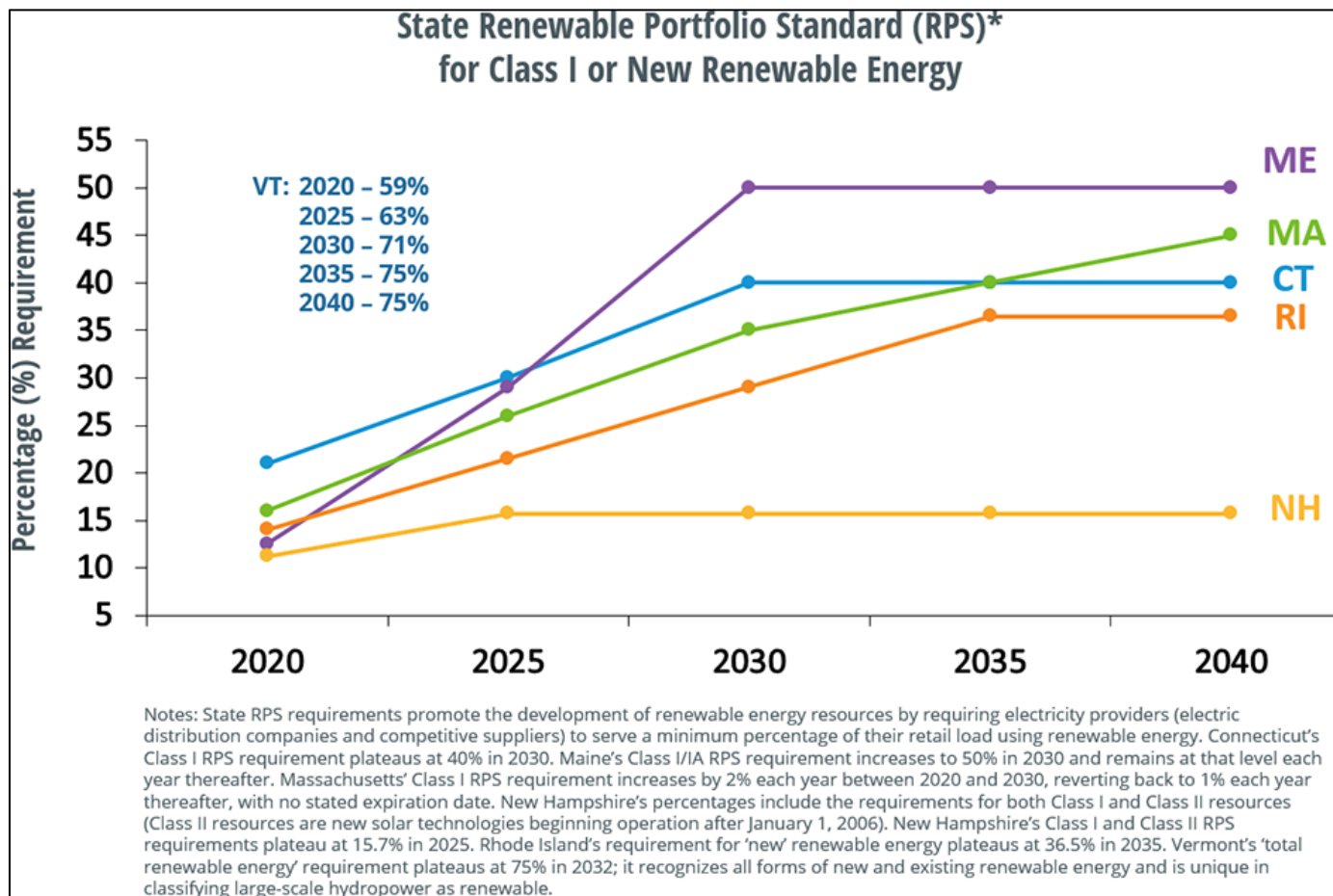
Source: US DOE EIA State Energy Data System. August 2020.

New England Electric Sales Change in TOTAL Consumption

NH electricity consumption (GWh/year) across all sectors increased more than any other NE state from 1990-present, and declined from less than almost any state between 2005 and 2018.



New England States Renewable Portfolio Standards



Final Installed 2021 Solar PV Nameplate Capacity (MW)

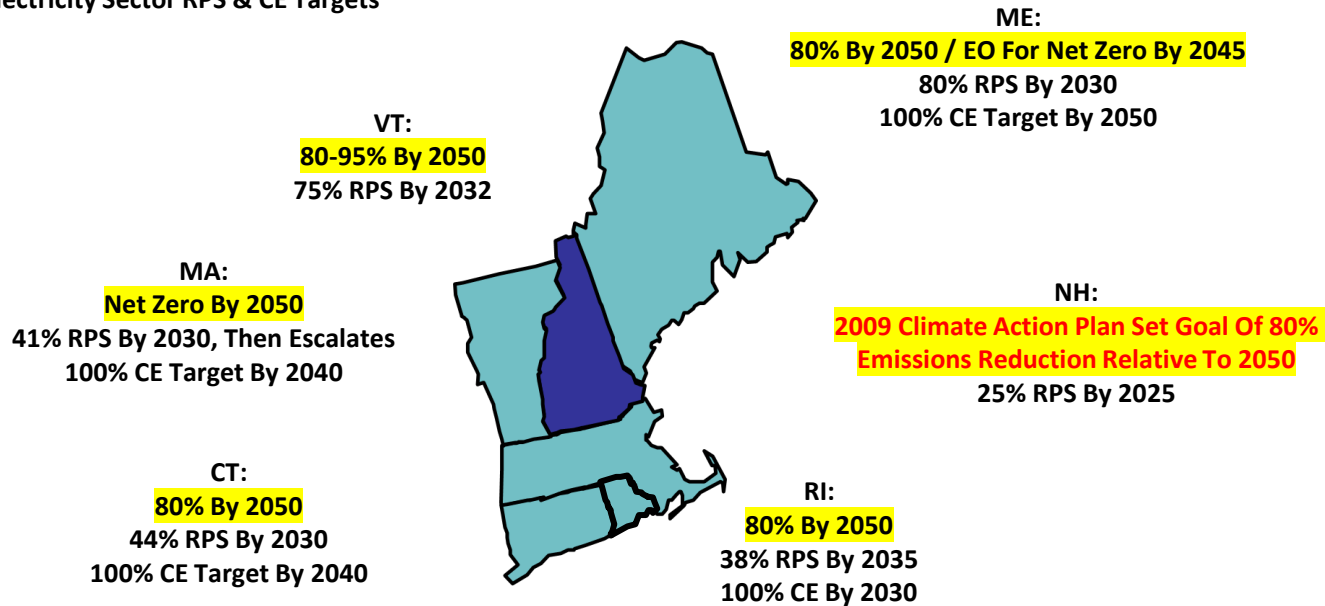
| State | Installed Capacity (MW _{AC}) | No. of Installations |
|--------------------|--|----------------------|
| Massachusetts* | 2,953.43 | 130,040 |
| Connecticut | 809.08 | 63,735 |
| Vermont* | 434.24 | 17,296 |
| New Hampshire | 156.88 | 12,186 |
| Rhode Island | 288.38 | 12,641 |
| Maine | 125.05 | 7,403 |
| New England | 4,767.06 | 243,301 |

Source: ISO-NE, Final 2022 PV Forecast Presentation, April 28, 2022

Climate Change Targets ARE Common

New Hampshire is an Outlier

LEGISLATED Economy-wide Emissions Reduction Targets Electricity Sector RPS & CE Targets

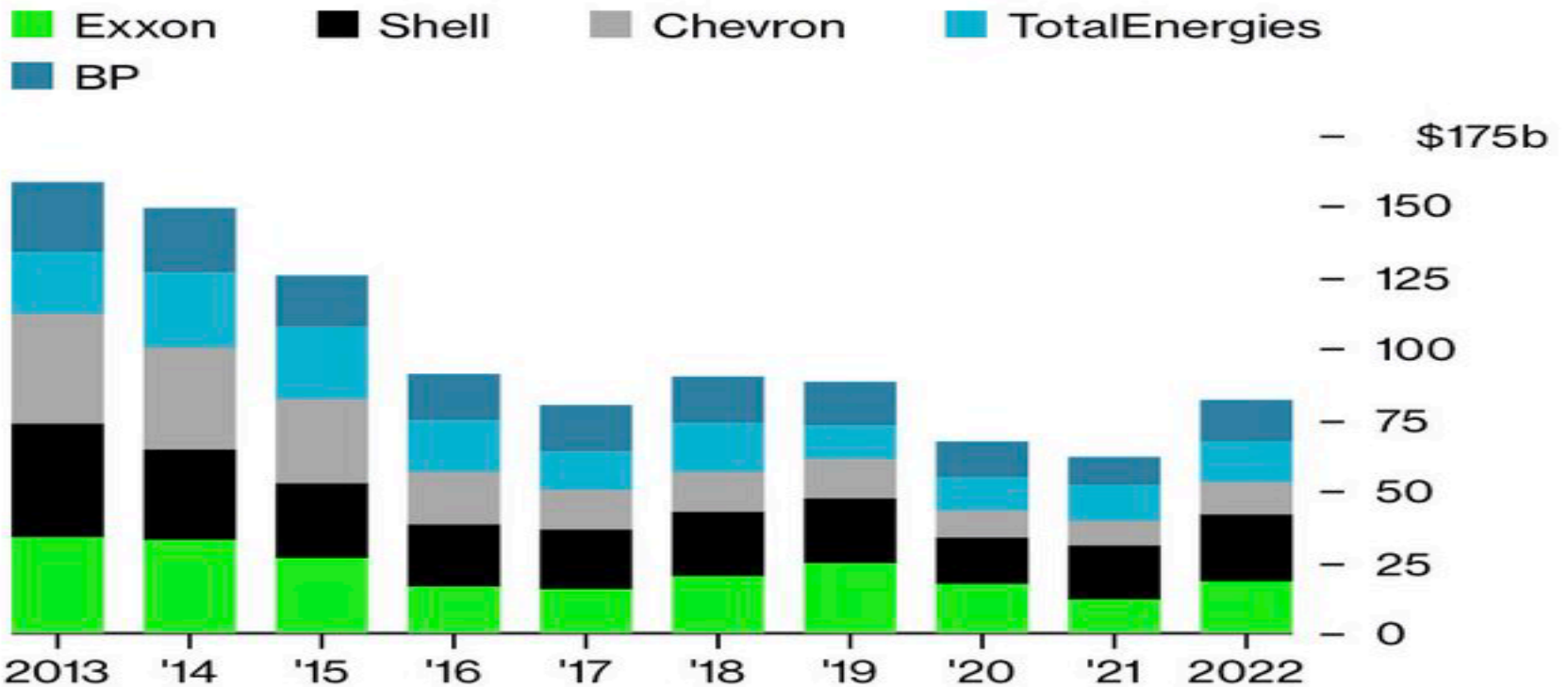


The five OTHER New England states are aggressively pursuing efforts aimed at increasing renewable energy generation and reducing carbon emissions.

SIDE NOTE: Fossil Fuel Producers May Not Come to Rescue

Capital Cutback

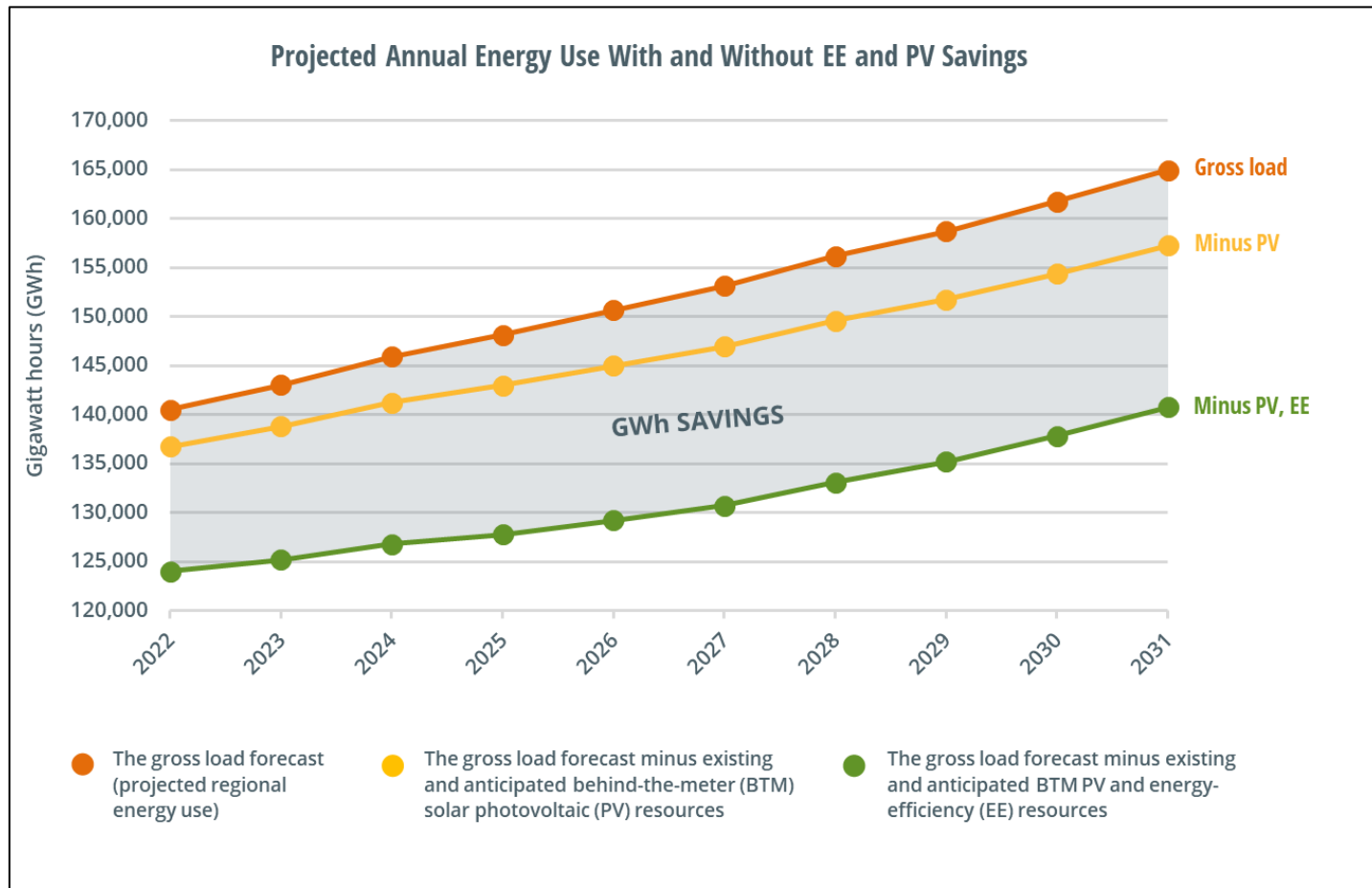
Big Oil's spending is half that of 2013, when crude last topped \$100





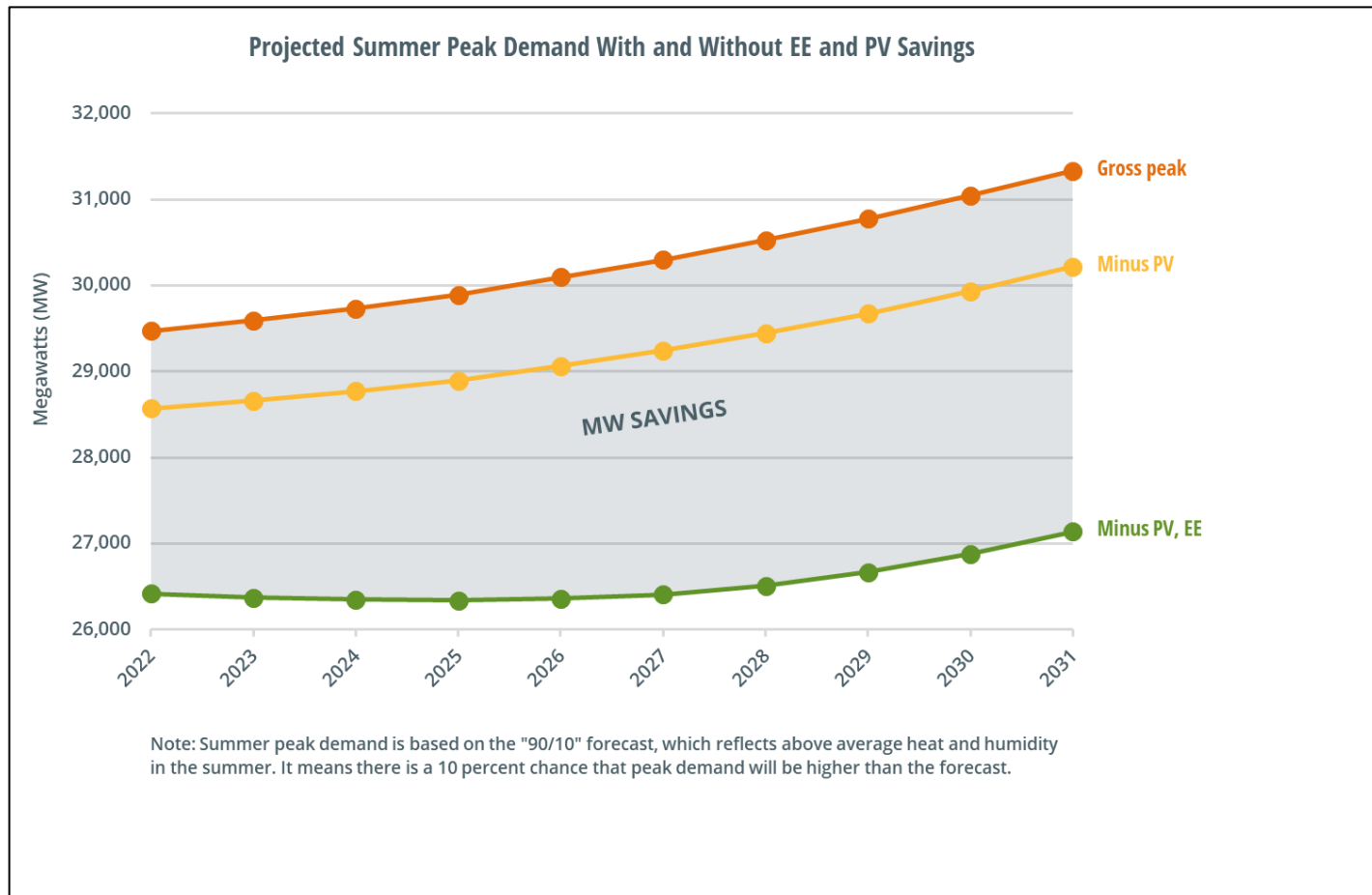
A Look Forward

FORECAST New England Total Electricity Consumption



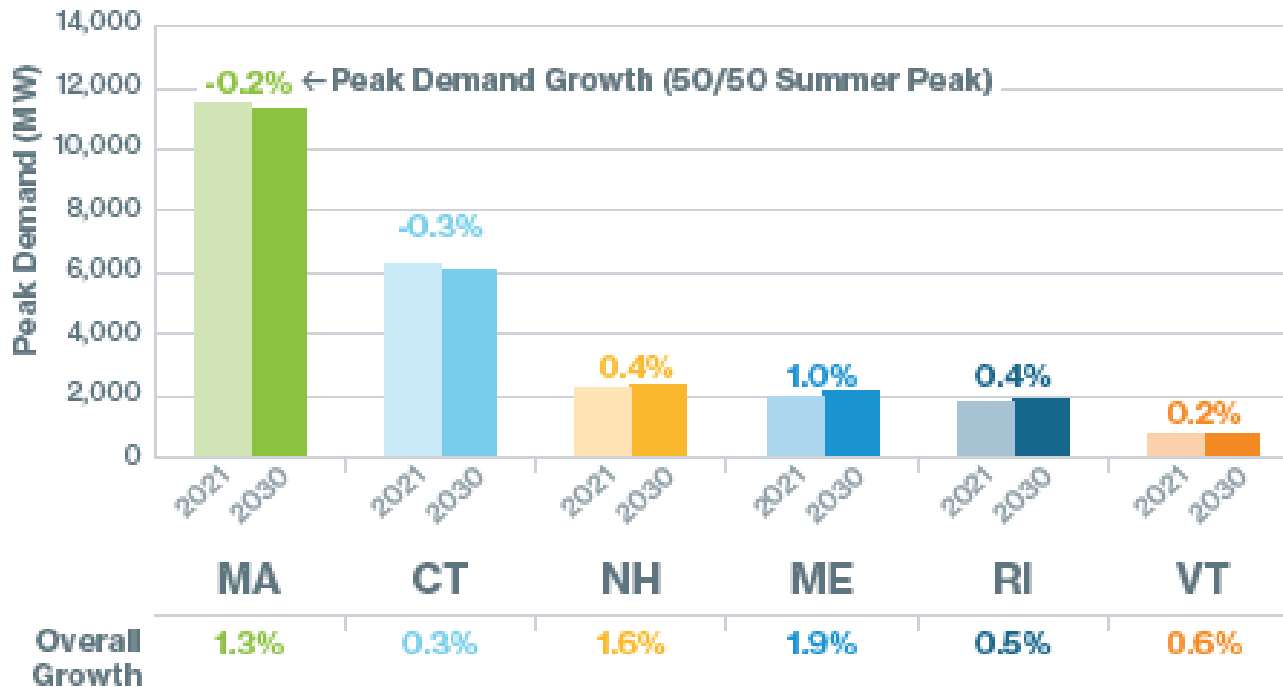
Source: ISO-NE, Electricity Use and Demand, November 2022 <https://www.iso-ne.com/about/key-stats/electricity-use/>

FORECAST New England Peak Electricity Demand



ISO's Electrification Forecast Shows Demand Growth

Compound annual growth rates for peak demand and overall electricity use, net of energy efficiency and solar photovoltaics (PV), 2019-2028



Source: ISO-NE 2021 Forecast Data and 2021 Capacity, Energy, Loads, and Transmission Report

Source: ISO-NE, 2021-2022 State Energy Profiles

https://www.iso-ne.com/static-assets/documents/2021/03/new_england_power_grid_state_profiles.pdf

Final 2022-2031 PV Forecast Nameplate Capacity (MW)

| States | | | |
|-----------------------------------|---------------|---------------|----------|
| | Thru 2021 | 2022 | 2031 |
| CT | 809.1 | 113.4 | 1 |
| MA | 2953.4 | 448.8 | 4 |
| ME | 125.1 | 107.8 | 2 |
| NH | 156.9 | 30.0 | 1 |
| RI | 288.4 | 52.1 | 1 |
| VT | 434.2 | 28.5 | 1 |
| Regional - Annual (MW) | 4767.1 | 780.6 | 8 |
| Regional - Cumulative (MW) | 4767.1 | 5547.6 | 6 |

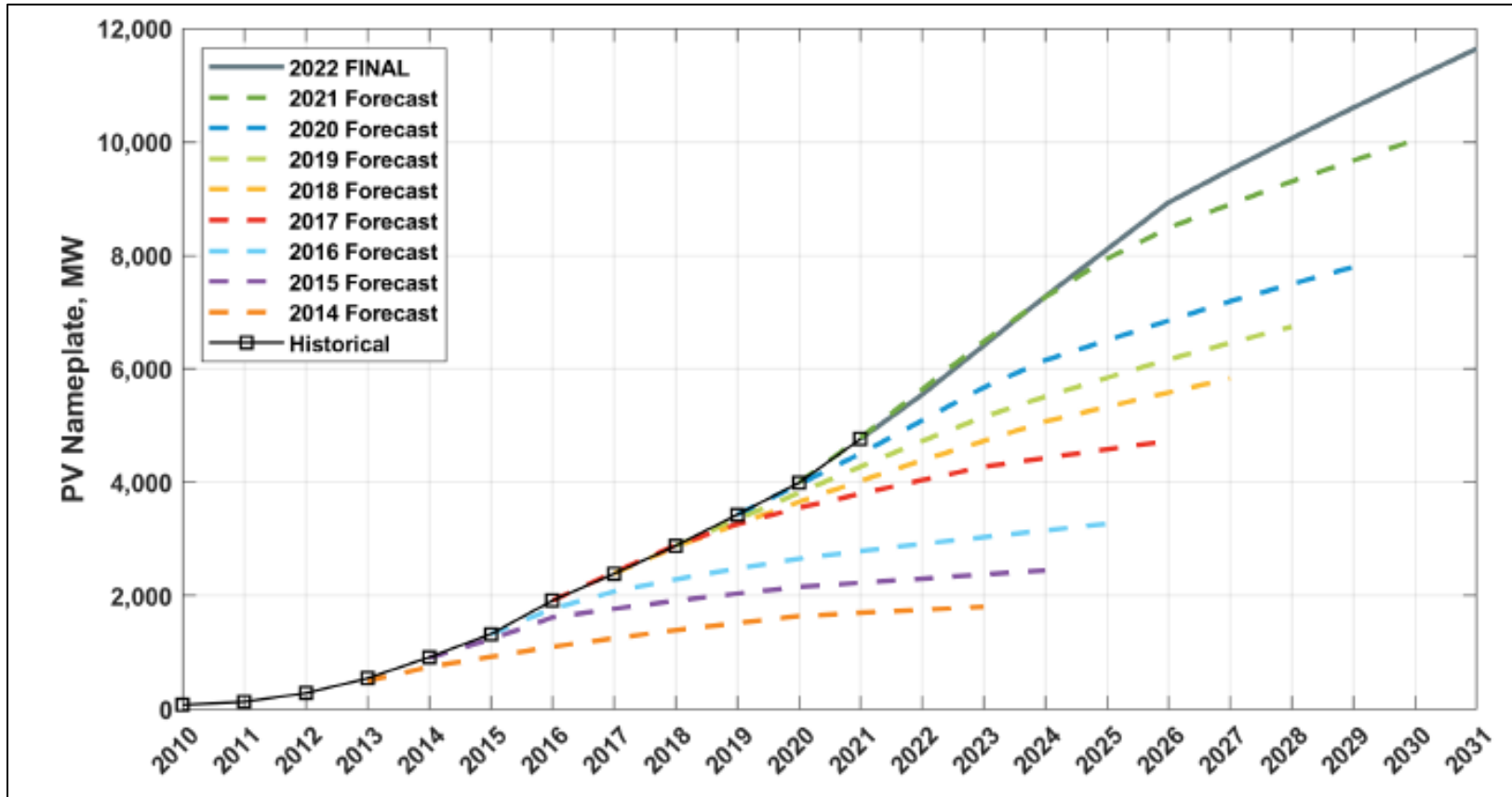
| States | | Totals |
|-----------------------------------|----------------|-----------------|
| | 2031 | |
| CT | 86.9 | 1,879.9 |
| MA | 283.4 | 6,527.3 |
| ME | 25.5 | 1,241.1 |
| NH | 26.8 | 429.8 |
| RI | 39.2 | 748.5 |
| VT | 25.5 | 693.7 |
| Regional - Annual (MW) | 487.3 | 11,520.4 |
| Regional - Cumulative (MW) | 11520.4 | 11,520.4 |

Source: ISO-NE, Final 2022 PV Forecast Presentation, April 28, 2022



The Future Is Not Written

PV Forecast Retrospective Look Nameplate Capacity (MW)



Source: ISO-NE, Final 2022 PV Forecast Presentation, April 28, 2022

Technological Adoption Can Occur Quickly Once Started

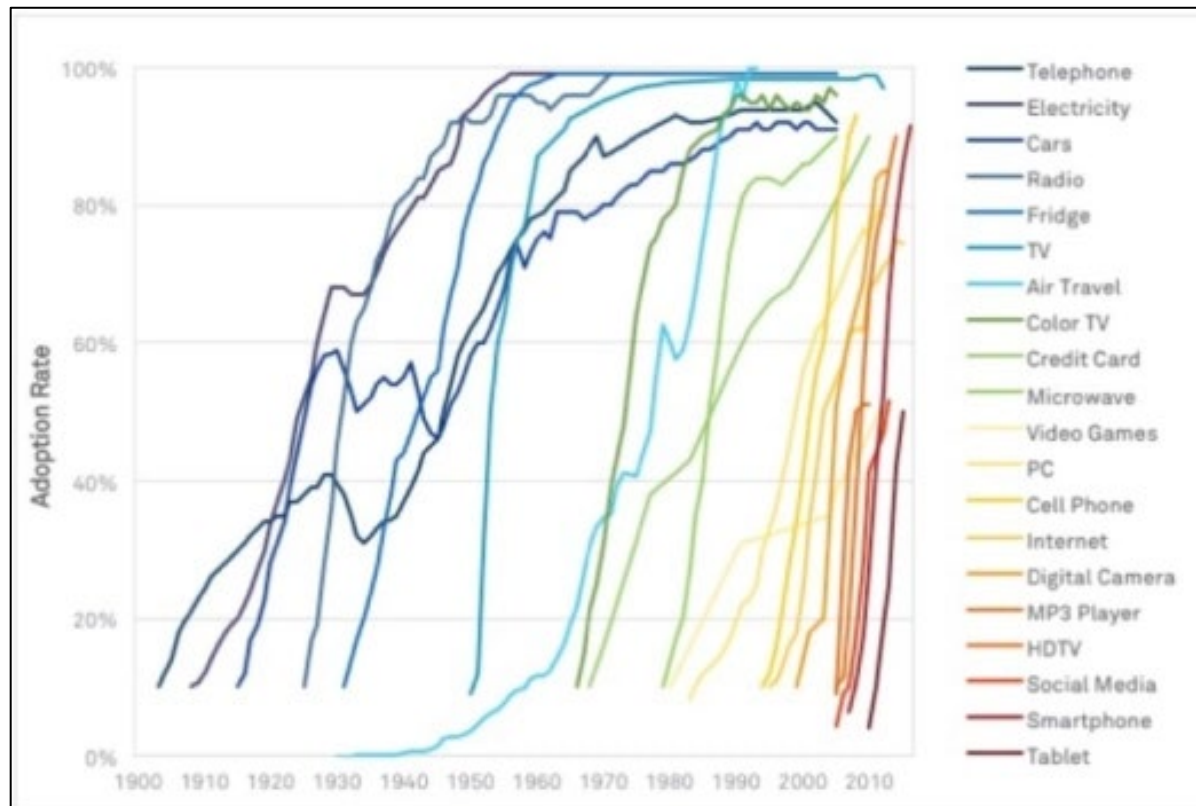
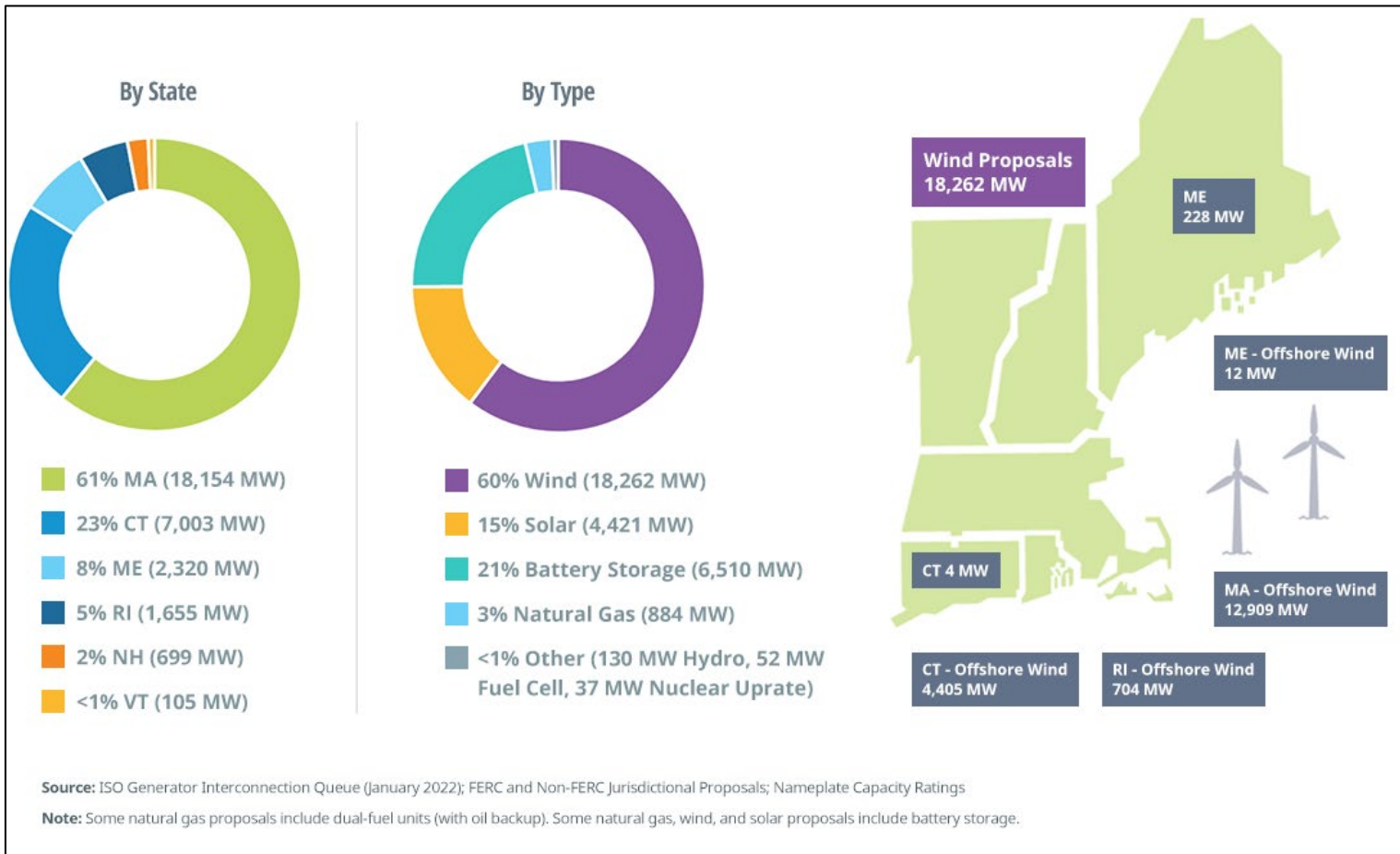


Image Credit: Tony Seba

ISO Generator Interconnection Queue > 30,000 MW of Renewables + Storage



Policies and Potential

1. **The Inflation Reduction Act** expands incentives that to-date have only been available to private companies to local governments;
2. **Community Power and CPCNH** are preparing to launch power supply service in 2023, giving cities and towns market power and the ability to develop local, cost-effective projects to benefit their communities;
3. **Statewide Energy Data Platform** is in development that will greatly improve the ability of innovative energy companies to create value for customers and for the system; and
4. **2023 NH Legislative Session** is planned to remove regulatory barriers holding back cost-effective, development of in-state energy generators and battery storage at the community scale.