New Hampshire
10 Year State Energy Strategy

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Introductions

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What the Strategy Is

- A framework for policy makers to use as they consider energy policy
- An accessible document for legislators, town energy committee members, and members of the public who want to learn more
- Provides a high level view, while also including extensive footnotes and a ‘further reading’ appendix for those who want to get into the weeds
- Fuel neutral and technology neutral

Legislative Charge

- Under RSA 12-P:7-a, Division of Policy and Programs is charged with drafting the 10 year Energy Strategy and revising it every 3 years
- Statue lays out what is to be addressed in the Strategy, but does not limit it
- Examples:
  - Projected demand, renewables, distributed energy resources, energy efficiency and other demand side resources, siting, interactions with regional markets.
- "…(E)nsure reliability, safety, fuel diversity, and affordability of New Hampshire's energy sources, while protecting natural, historic, and aesthetic resources and encouraging local and renewable energy resources."

Goal 1: Prioritize cost-effective energy policies

- New Hampshire spends on $4,078 (2019) per resident on energy
- Commercial and Industrial:
  - Cost factor for businesses looking to relocate or expand
- Residential:
  - Cost falls disproportionally on lower wage earners who can least afford it

- "…(T)he primary goal of this Strategy is to pursue cost-effective energy policies":

Goal 2: Ensure a secure, reliable, and resilient energy system

- We are in a period of massive change when it comes to the energy sector
  - Move from centralized, to decentralized
  - Proliferation of distributed generation and new technologies
  - Integration of intermittent/non-dispatchable resources
- Cybersecurity
- Grid Modernization (IR 15-296)
- Workforce Issues
- Resource Adequacy

Goal 3: Adopt all-resource energy strategies and minimize government barriers to innovation

- No single energy resource will solve the state and region's energy challenges
- Policy makers and regulators should not discriminate on the basis of technology when pursuing cost effective technology
- Government policies should not impose unreasonable regulations on the siting or installation of new technologies and the necessary support infrastructure to construct, service, or maintain them

Goal 4: Achieve cost effective energy savings

- Energy efficiency is often the cheapest and cleanest energy resource
- Reductions in costs for consumers through reduced energy consumption
- Reduced transmission costs for electricity

Goal 5: Achieve environmental protection that is cost-effective and enables economic growth

- “Climate change related to greenhouse gases is a real, escalating issue, with significant impacts. These consequences are overarching across society, with economic, environmental, and public health impacts”
- Most successful way of reducing carbon emissions is to achieve a market where low or no emissions are economically competitive without government mandates and subsidies
- Transition should not inflict unnecessary economic harm on ratepayers

Goal 6: Government intervention in energy markets should be limited, justifiable, and technology neutral

- Many policy interventions have laudable goals, but problems arise when they turn from targeted mechanisms to near permanent supports
- Can end up favoring the politically well connected and business interests
- Any intervention should be time limited, narrow, and necessary to achieve a specific policy goal

Goal 7: Encourage market selection of cost-effective energy resources

- Energy transition is occurring at the wholesale/regional level as well
- Growing popularity of Purchase Power Agreements (PPAs) leads to segmentation which distorts energy markets
- Critical to ensure those market mechanisms work properly and foster both reliable and low cost electricity generation for the New England grid
- Path forward: Forward Clean Energy Market (FCEM)

Goal 8: Generate in-state economic activity without reliance on permanent long-term subsidization of energy

- Exercise of government power to economically favor one technology over another should be limited and justifiable
- Government support should be based on quantifiable data demonstrating consumer benefit
- Subsides always help the business being subsidized, but costs to ratepayers and taxpayers in the immediate and long term must be accounted for as well in order to properly weigh a policy under consideration.

Goal 9: Support New Hampshire's interests in regional energy matters

- New Hampshire is part of a regional grid and decisions made by other states can have an impact on New Hampshire ratepayers
- States should have the latitude to make policy choices regarding electricity generation, including mandates
- Those increased costs should not be borne by other states in the region
- New Hampshire should seek regional policies that allocate costs according to each state's preference for higher cost resources and infrastructure

Goal 10: Ensure that energy infrastructure can be sited while incorporating input and guidance from stakeholders

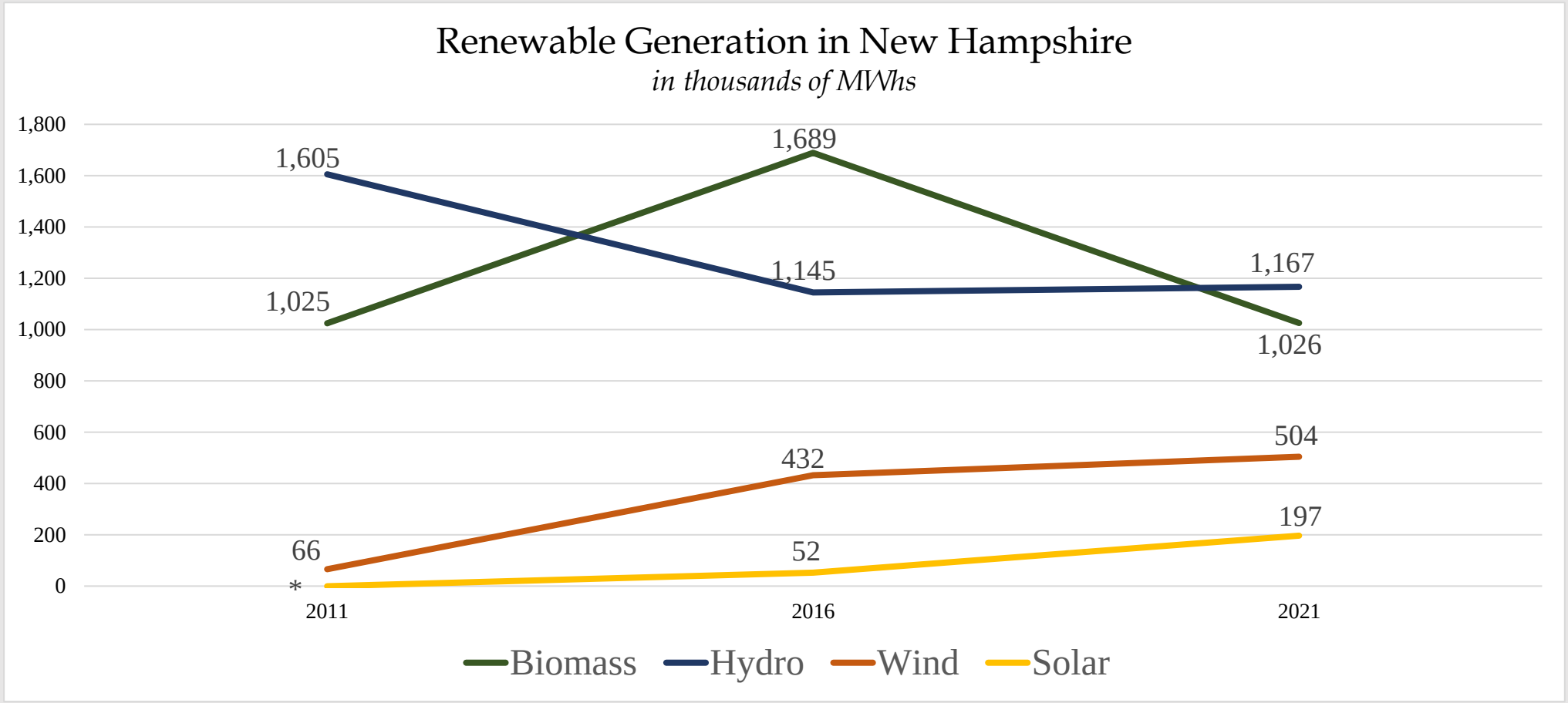
- Energy infrastructure siting is a challenging and necessary process
- Delivering appropriate energy infrastructure requires predictability, defined processes, good communication, and clear standards for achievement.
- Fine balance between the concerns of those impacted and the larger state and regional needs

Sections 2 & 3: Data

- Section 2: Energy Overview:
- Mostly data about generation, demand forecasts, electric generation infrastructure
- Further discussion about cybersecurity, grid modernization, resource adequacy, and workforce issues as well as regional electric markets
- Section 3: Fuel Diversity:
- Discussion of fuel types for electric generation, heating, and transportation

Fuel Diversity: Natural Gas

- Natural gas makes up 50% of New England's generation fleet
- ISO-NE expects natural gas to set the marginal rates for electricity in most hours through the end of the decade
- Price spikes: spot market price increase of 208% between May 2019 and May 2022
- Limited pipeline capacity during the coldest winter days for electricity generation, requiring other resources such as oil and coal to come online
- 6.5% increase in natural gas import capacity into the region through removal of bottlenecks, first increase since 2008.


Renewable Generation in New Hampshire
in thousands of MWhs
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
1,605
1,689
1,145
1,167
1,025
1,026
504
432
66
197
52
*
2011
2016
2021
Biomass
Hydro
Wind
Solar

Fuel Diversity: Renewable Generation Forecast

- ISO-NE has 830MW worth of projects in the interconnection queue for New Hampshire alone
- Largely solar, solar paired with battery, or stand alone battery
- Historically 70% of projects in the queue never come to fruition, but that still leaves 210MW of new generation
- Conway: 110MW solar array in development

Fuel Diversity: Cost Effectiveness of Renewables

- Lazard produces an analysis of the Levelized Cost of Energy (LCOE) that allows for comparisons between types of generation
- Key takeaways:
  - Nationally, new utility scale solar and on shore wind are both less expensive than new natural gas plant
  - However, both are more expensive than existing natural gas plant, though within in striking distance
  - Siting is critical: New Hampshire is not Arizona or Oklahoma

Fuel Diversity: Offshore Wind

- Gulf of Maine has shown great potential for the development of offshore wind
  - Consistent and high wind speeds make it ideal from a generation standpoint
  - Close to load centers of coastal New England
  - Potential interconnection points in New Hampshire
- Issues to address:
  - Siting challenges with marine interests and compensation
  - Development of floating technology
  - Transmission constraints

Fuel Diversity: Heating

- Cold weather state means heating is a significant source of energy demand
- 90% of homes rely on either propane, natural gas, or oil for heating
- Wood pellet systems and heat pumps are growing in popularity as price of fossil fuels increase
- Very costly systems to replace

Fuel Diversity: Transportation

- Gas and diesel powered vehicles continue to dominate the market
- Electric Vehicles poised to make massive inroads due to a myriad of factors
- Move to EVs will increase demand on the electric grid, which is why time of use rate designs are critical.

Demand Side Resources: Energy Efficiency

- Energy Efficiency continues to be a low-cost and clean energy resource
- New Hampshire should continue to capture cost effective energy efficiency in all sectors, including buildings, manufacturing, and transportation
- Weatherization of homes through NHSaves and WAP
- Zoning for Increased Density
  - Increases energy efficiency for both heating and transportation

Demand Side Resources: Transportation

- Low density for most of New Hampshire makes viable public transit difficult
  - Success stories do exist: Bus service linking NH to Boston
  - Commuting post-COVID?
- Personal vehicles are the dominant transportation mode
  - Road design can help increase efficiencies, such as traffic signal timing and prioritization, roundabouts, and all electronic tolling
- Freight Rail
  - Sale of PanAm to CSX is a once in a generation opportunity for the revitalization of freight rail
  - One gallon of fuel can move one ton of cargo 480 miles; 1/4 emissions of truck

Siting: Challenges

- Siting remains challenging
- Balance the need to support growth and grid resilience with protection of the natural environment
- Utility scale renewable generation tends to be very site-specific
- Also adds the challenge of building new transmission infrastructure

Siting: Site Evaluation Committee

- A variety of factors, such as increased demand for electricity, heightened reliability standards, replacement of aging infrastructure, and the interconnection of new generation, require New Hampshire to be proactive in establishing policies and procedures to appropriately site energy infrastructure for its needs.

- In order to meet current and future energy demands, New Hampshire needs a predictable, defined process with clear standards for communication and achievement. New Hampshire's current Site Evaluation Committee (SEC) has significant shortcomings that policymakers should look into reforming.

Questions?

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