



New Hampshire State Energy Strategy: Transportation Options & Fuel Choice

Presented to:

State Energy Advisory Council



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Today, we will continue the discussion of policies and programs related to transportation and thermal fuels that could move NH closer to achieving the ideals expressed in the energy vision.



1. » Strategy Development Process Overview



2. » Transportation Policy Discussion



3. » Fuel Choice Policy Discussion



4. » Next Steps



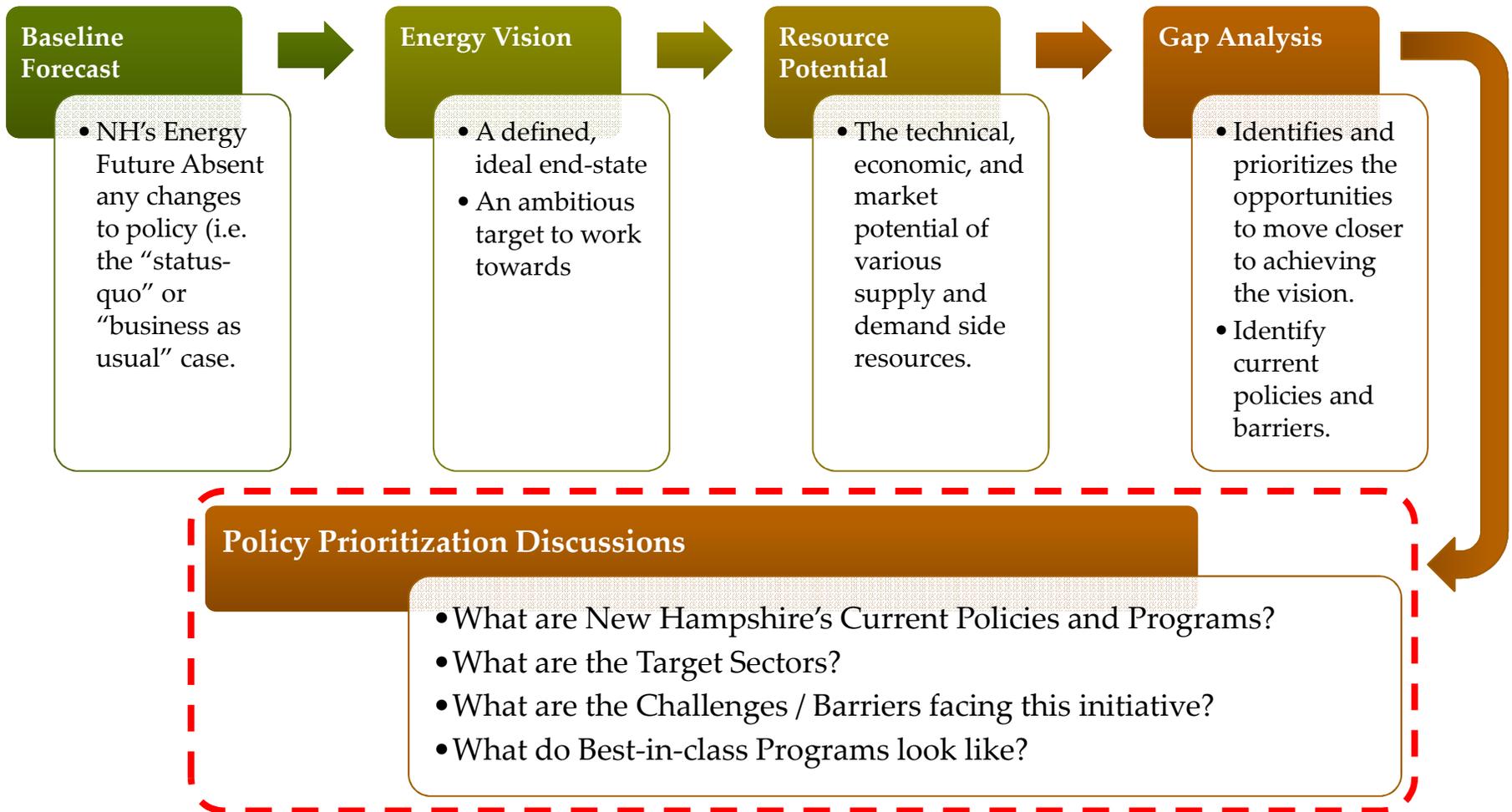
1. » Strategy Development Process Overview

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To date, Navigant has prepared the BAU forecast, developed the energy vision, analyzed the resource potential and identified the biggest opportunities to move NH closer to achieving the vision.



1. » **Strategy Development Process Overview**



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3. » **Fuel Choice Policy Discussion**

4. » **Next Steps**

Strategies to improve transportation efficiency may build on existing policies or borrow from the best-in-class initiatives of other states.



Improving the fuel economy of passenger vehicles presents the greatest opportunity to reduce transportation related fuel expenditures.

Current State of Fuel Economy in NH

- Average North American fuel economy is 21.9 mpg, average for NH of 18.4 mpg
- NH is the only New England state not mandating the sale of vehicles meeting the California Low Emission Vehicles (LEV) standard
- Federal Corporate Average Fuel Economy (CAFE) standard of 22-36 mpg in 2014 up to 30-61 mpg by 2025
- Anti-idling policies for school buses and state vehicles
- State vehicle fuel economy procurement standard (previously better than CAFE)

Target Sectors

- Light duty fleet vehicles

Challenges / Barriers

- Federal standards pre-empt state standards
- Prevailing consumer preferences
- Fleet turnover is slow

Best-in-class Program Elements / Program Examples

- Registration fees based on fuel efficiency (currently based on weight in NH)
- Cash for Clunkers

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To date, electric vehicle adoption rates in NH are relatively low due to current vehicle price premiums, range anxiety, and other concerns.

Existing Electric Vehicle Programs

- Granite State Clean Cities Coalition - DOE sponsored program supports local actions to reduce petroleum consumption in transportation
- NH is part of the Northeast Electric Vehicle Network
- Up to a \$7,500 Federal Tax Credit available for EV purchases

Target Sectors

- Residential and light duty fleet vehicles

Challenges / Barriers

- Chicken vs egg issue concerning vehicles and charging infrastructure
- Range anxiety, consumer preferences, upfront capital cost, consumer education
- Permitting processes and building standards for charging stations

Best-in-class Program Elements

- October 2013 MOU to promote zero emission vehicles and create a plan of action within six months to do so (CA, CT, MD, MA, NY, OR, RI, VT)
- MA programs for \$2,500 rebates/vehicle, and \$600,000 in funding for fleets
- GA offers 20% of the vehicle cost as a tax credit (up to \$5,000) and 10% charging infrastructure installation tax credit (up to \$2,500)
- IL rebates 50% of equipment and installation with a maximum total rebate award of \$49,000 or 50% of the total project cost for up to 15 stations

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The commercial sector is projected to drive use of natural gas as a transportation fuel.

Existing Natural Gas Vehicle Programs and Fueling Infrastructure

- Granite State Clean Cities Coalition - DOE sponsored program supports local actions to encourage alternative petroleum fuels in transportation
- Currently no state level programs encouraging NG adoption
- One public refueling station in Nashua, announcements for one in Pembroke and one in Concord

Target Sectors

- Medium & Heavy duty vehicles, Fleets, Municipalities
- Trucking, waste disposal and buses

Challenges / Barriers

- Complicated permitting, siting and storage regulations
- Limited access to natural gas and fueling stations
- Small portion of fuel usage in New Hampshire

Best-in-class Program Elements

- Waste Management is converting its fleet to natural gas, and has opened 50 refueling stations
- Shell is creating natural gas “corridors” in Alberta, the Gulf Coast, and the Great Lakes Region
- Clean Energy Fuels is building a network of refueling stations across the U.S.

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Bussing and rail options are available, but with limited schedules, destinations, and coordination.

Existing Mass Transit Options

- 12 separate local transportation organizations, and 9 long distance bus services
- The Amtrak Down-easter to the East, and the Vermonter to the West

Target Sectors

- Youth, students, seniors, commuters, tourists

Challenges / Barriers

- A lack of concentrated centers of demand, and distributed population make it difficult to coordinate routes and schedules
- Limited number of runs on each route due to lack of demand and funding

Best-in-class Program Elements

- MA: Pioneer Valley Transit Authority links transit across 24 member communities
- CA: SF Bay Area – Clipper Card (One card coordinates billing and scheduling for 8 regional mass transit operators and parking)
- General Transit Feed Specification used for app development for trip planning and coordination

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Smart planning and alternative means of transportation present a great opportunity to reduce solo vehicle miles traveled.

Current State of Smart Growth

- Disparate initiatives enacted by towns and municipalities
- Federal Transportation Investment Generating Economic Recovery (TIGER) funds being used in Concord and Portsmouth

Target Sectors

- Communities looking at planning

Challenges / Barriers

- Slow growth projections
- Changing demographics will require different infrastructure
- May require significant funding

Best-in-class Program Elements

- Burlington VT – Active Walk/Bike Council Infrastructure and Intersections Work Group responsible for identifying, prioritizing, and leading improvements for pedestrians and bicycles access.
- Boston Bikes and Hubway – Bike share networks and bike lane expansion
- CA Senate Bill (SB) 375 calls on regional transportation planning agencies and local governments to develop strategies for reducing per capita VMT through higher density development

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Pricing programs may also create an incentive structure that would discourage solo-VMT and foster alternative means of transportation.

Current Pricing Programs to Reduce VMT

- No state-wide programs are currently in place directly dis-incenting solo-VMT

Target Sectors

- Commuter VMT

Challenges / Barriers

- Tolling funds specifically allocated to road maintenance

Best-in-class Program Elements

- Mileage based user fees (pilots in CO, MN, NV, NY, OR, TX, IW, WA)
- VMT surcharge and insurance premiums based on VMT
- CA Senate Bill (SB) 375, calls on regional transportation planning agencies and local governments to reducing per capita VMT through promoting alternatives to solo-driving, and pricing policies that raise the cost of driving and parking

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Which of the following options offer the best fit with NH's objectives?

Improvements to Fuel Economy

- Registration fees tied to MPG
- Cash for Clunkers

Electric Vehicle Adoption

- Substantial rebates for both vehicles and charging infrastructure

Natural Gas Vehicle Adoption

- Private investment in NG fueling infrastructure

Public Transit Options

- Coordination between regional transit providers
- Common software platforms

Smart Growth Strategies

- Higher density development
- Bike-shares and Bikeways
- Pedestrian friendly zoning

Pricing Programs to Reduce VMT

- Mileage based user fees
- VMT surcharge

- *Does this target the biggest opportunities previously identified?*
- *Does this approach fit well in NH?*
- *Does it effectively leverage private financing?*
- *Does it help address economic and energy disparities?*
- *Are there other considerations?*

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Strategies to increase fuel choice may build on existing policies or borrow from the best-in-class initiatives of other states.

- What are New Hampshire's Current Policies and Programs?
- What are the Target Sectors?
- What are the Challenges / Barriers facing this initiative?
- What do Best-in-class Programs look like?

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Natural Gas

Geothermal

Air Source
Heat Pumps

Biomass

Solar
Thermal

District
Heating

Residential gas access is limited, with commercial access expanding through “virtual pipelines.”

Current State of Natural Gas Availability

- Liberty Utilities serves the 93 corridor while Unitil/Northern Utilities serves the 95 corridor
- Trucked CNG available through Xpress Natural Gas, NG Advantage, Advanced Vehicles Service Group and Oscomp
- Rebates available through NH Saves for gas water heaters, furnaces and boilers

Target Sectors

- Residential, Commercial, Industrial

Challenges / Barriers

- PUC restrictions on the mandatory payback period for expanding infrastructure to reach new customers *Recently relaxed for Liberty Utilities
- High price/mile for expansion
- Permitting processes for trucked natural gas

Best-in-class Program Elements

- CT Natural gas expansion plans for on-main customers through lengthened payback periods, a “portfolio” approach to expansion and on-bill financing
- Energize CT provides up to \$15,000 in financing at 2.99% for heating equipment
- Proper incentives for gas utilities to attract customers on existing pipelines

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At present, geothermal heat is in limited use in New Hampshire largely due to high upfront capital requirements.

Current State of Geothermal Adoption

- Residential rebates available through NH Electric Co-op and PSNH
- Commercial systems are eligible for rebates and demand response programs
- 30% federal tax credit for qualified systems through 2016

Target Sectors

- Residential, Commercial

Challenges / Barriers

- High installation cost per household due to rocky soil in New Hampshire
- Increased electrical load when replacing fuel heating
- If efficiency is not addressed at the same time, the customer switches fuels but may not reduce energy usage

Best-in-class Program Elements

- Indiana actively markets geothermal heating to customers , offering rebates and residential loans
- Maryland offers reduced sales and property tax, as well as direct rebates

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Recent innovations have made air source heat pumps a better fit with New Hampshire's cooler climate.

Current state of Air Source Heat Pump Technology and Programs

- Recent innovations in inverter controlled heat pumps and dual stage-compressors allow operation down to ~5°F
- Incentives through NH Saves for mini-split cooling systems and heat pumps

Target Sectors

- Residential, Commercial

Challenges / Barriers

- Increased electrical load when replacing fuel heating
- Consumers are unaware of the technological advances
- Backup heat is needed for days below 5°F

Best-in-class Program Elements

- Green Mountain Energy runs a cold climate heat pump lease program in VT
- Maine has the easiest user interface for the administration of similar rebate programs in NH, MA, VT, ME

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Biomass heat options currently see the greatest public support from New Hampshire state government.

Current Programs for Biomass

- Rebates of 30% up to \$6000 (Residential) or \$50,000 (Commercial) are available for bulk-fed wood pellet central heating boilers and furnaces

Target Sectors

- Residential, Commercial

Challenges / Barriers

- Particulate emissions and storage requirements limit urban applications
- Coordination issues with pellet manufacturers led to shortages in early 2014
- Restrictions on firewood imports due to risk of disease / invasive species

Best-in-class Program Elements

- Efficiency Maine offers similar rebates alongside home energy loans
- Following EPA Process for Implementing a Wood Stove Change-out Program

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Multiple solar thermal rebates are available across New Hampshire.

Current Solar Thermal Programs

- Rebates between \$1,500-\$1,900 for residential systems
- Up to \$50,000 in rebates for commercial systems
- 30% federal tax credit for qualified systems through 2016

Target Sectors

- Residential, Commercial

Challenges/Barriers

- Limited sunlight and snow collection during the winter can affect thermal output
- Space requirements and upfront costs

Best-in-class Program Elements

- Hybrid solar systems are available including solar thermal and biomass/natural gas/oil systems as well as PV and hot water systems
- NYSERDA Solar Thermal Incentive Program (\$25 million available)

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District heating can offer significant savings through economies of scale and the capture of waste heat.

Current Programs for District Heating

- District heating is used on the University of New Hampshire and in Concord
- A district heating system is being developed in Claremont

Target Sectors

- Residential, Commercial

Challenges/Barriers

- Requires coordination amongst multiple parties and groups within a region
- Systems do not fall under standardized government funding programs
- Initial capital cost

Best-in-class Program Elements

- High efficiency systems in Denmark, Finland, and the United Kingdom
- Drake Landing, Alberta developed a community solar thermal storage system

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Other

Which of the following options offer the best fit with NH's objectives?

Natural Gas

- Longer Payback Periods
- On-Bill Financing
- Portfolio Approach to expansion

Geothermal

- Active Marketing Campaigns
- Expanded Rebates and Financing Options

Air Source Heat Pumps

- Cold climate heat pump lease program
- Easy to navigate online application portal for rebate program administration

Biomass

- Bundling of biomass rebates with efficiency loans
- Implementing EPA Process

Solar Thermal

- Substantial funding of incentive programs

District Heating

- Funding replication of successful installations in-state

- *Does this target the biggest opportunities identified in the gap analysis?*
- *Does this approach fit well in NH?*
- *Does it effectively leverage private financing?*
- *Does it help address economic and energy disparities?*
- *Are there other considerations?*

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Navigant will continue the discussion of strategies addressing power generation, and grid modernization in the upcoming meetings.

Fuel Choice and Transportation Options Policy Discussion

- Based on today's discussion, Navigant will roadmap the highest priority initiatives, identifying key dates, stakeholders, and policy track ownership.

Power Generation and Grid Modernization Policy Discussion

- On April 21st, we'll return to continue the discussion of policy options focusing on power generation and grid modernization.

Draft Strategy Discussion

- Draft Strategy Document Complete on May 1st.
- On May 16th we'll return with a presentation of the draft strategy.

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