To the Members of the SB 191 Advisory Council:

A report came out the other day about global climate change. It said that for life to be comfortable on planet earth, our atmosphere should contain no more than 350 ppm of carbon, but we are now above 400 ppm and rising rapidly. Oceanic algae produces 80% of atmospheric oxygen, but our oceans are turning acid and lifeless faster than any time in 300 million years. Pretty sobering stuff!

If this doesn't change in the next 20 years, we will have reached the point of no return and earth will turn from being a comfortable place to live into hell. Right now in California they are experiencing the worst drought in recorded history. Last year there were floods in Colorado that were record breaking. We have massive forest fires all over the United States. 2012 was the hottest year in U.S. history. If we don't address climate change as a global emergency, we are going to see more of these wild weather events. It is predicted that the global temperature could rise by at least 4 degrees by 2100. Four degrees might not sound like a lot, but what if your body temperature went up by 4 degrees? You probably would be rushed to the hospital and you would be seriously ill, probably delusional.

We are living in a fool's paradise if we actually believe that putting wind turbines around Newfound Lake will make a difference in reducing carbon from the atmosphere. On their best day, the Groton turbines are 24-26% efficient. I live nearby and I can tell you some days they don't turn at all. Furthermore, the energy is usually generated when demand is lowest (late night) and not available when needed (extremely cold and hot days when high pressure exists and there is no wind). As a result, wind puts energy on the grid when it's not needed and fails to deliver when it is needed. And since wind is sporadic and there are no batteries to store the energy, they have to be backed up with fossil fuels. Some other form of energy has to be running all the time to even out the power distribution. It is well documented that we simply do not have enough wind onshore in NH to make wind turbines efficient or to justify destroying the Lakes Region. The only place where they possibly would make a difference is off-shore from Hampton Beach and Rye Beach. Off-shore wind is expensive and the wind corporations would rather not do that, but that is where the wind blows consistently.

Large industrial hydro-electricity isn't the answer either. The boreal forests of Canada, just like the Amazon and marine plant life, are the functional lungs of the earth. Together they produce the oxygen in the atmosphere. The forests also pull greenhouse gases from the air and store that carbon in their limbs, trunks, and roots.

To produce hydropower, Hydro Quebec drowned huge regions of northern Quebec, destroying over 7 million acres of boreal forests, thereby decreasing the amount of CO2 that would have been absorbed if the forests were left undisturbed. The rotting organic material has led to the release of huge amounts of the greenhouse gases methane and CO2. Thorough cleaning of the area before flooding could have reduced these greenhouse gasses, but this was not done at Hydro Quebec. And this is an on-going enterprise. Hydro Quebec continues to flood more land and divert more rivers to export energy to the New England market.

The destruction of the forests in Northern Quebec isn't the only example of reckless energy production. Environmental Defense says the Alberta tar sands is the most destructive project on earth, having

destroyed previously untouched boreal forests comparable to an area larger than New Hampshire, Vermont, Maine and Rhode Island combined. The accumulative effect of all these destructive projects is, in effect, like trying to produce heat by burning down the very house we live in.

The people who oppose Northern Pass and on-shore wind turbines are not nimbys. We are honestly trying to find real solutions to a horrendous problem. But the first thing we all must come to terms with is that we are not going to be able to keep doing everything we've always done and hope for a miracle to solve our energy issues. We must change our behavior. We are going to have to change the conversation from the beauty of New Hampshire and real estate values to how we are going to save our planet. Importing industrial hydro and erecting onshore wind turbines in NH are simply ways to pretend we are doing something about renewable energy, but in actuality these two methods just make matters worse. There are no quick fixes to the predicament we're in, but there are steps we can take.

The first thing we should be talking about is how to educate the public on energy efficiency and conservation. We have to make serious bone-cutting changes in the way we live our lives. We can no longer be wasteful with our energy usage. We have to stop cutting down the forest and we must protect the oceans. We need trees and water life to sequester the CO2 that we're producing. If we're serious about renewable energy, we have to put wind turbines off the coast where they could actually do some good. We could capture methane from the landfills and produce energy from trash. We could use ocean tides to produce energy. We could put solar panels on every building in New Hampshire, like they're doing in Germany. We should have video conferencing in this state so the people don't have to drive to Concord practically every day to testify on one bill or another. We should have rail service so we can take cars off the road to conserve fuel and reduce carbon.

Voters in four communities (Sugar Hill, Easton, Plymouth and Grafton) have passed Rights Based Ordinances for Sustainable Energy which prohibit industrial hydro-electricity and wind energy to be produced or transported through their towns. With the assistance of Community Environmental Legal Defense Fund (CELDF), these communities have stood up to their town counsels who told them it was illegal to protect themselves from environmentally destructive energy projects. They stood up to State government which declares towns can't deny what the State allows. And they stood up to giant international corporations which believe they possess greater legal and constitutional rights than community majorities. More voters are realizing that, unless the people say, "We will not obey," we will accelerate the destruction of our planet.

Whether you believe that global climate change is the fault of people's behavior or not, climate change is real and people are going to have to immediately address it if we plan on continuing life on this planet. There are steps we can take right now, but pretending that industrial hydro or on-shore wind turbines will help solve the problem is simply nonsense.

Pamela Martin
Plymouth, NH

I hope I am still within the timeframe to provide comments. I have just 4 comments mainly centered on your slides 7, 11 and 14.

1) **RPS Mandates and Renewables:** Slide 7 of your presentation states that 20% of in-state generation will come from renewables by 2025. During the Q&A you clarified that this 20% is independent of the RPS mandates. Given the costs/penalties associated with the RPS mandates, I believe it's important to distinguish those renewables that are recognized under the RPS. It is also important to identify the percentage of in-state renewables that are selling their energy and credits out of state. If you look at the Class I resources operating in NH today you will find that the majority are selling their energy and RECs out of state. Thus, NH has not been able to meet compliance.

2) **REC Prices, historic and forecasted:** During the Q&A period, you stated that REC prices were acknowledged in slide 14 but it's not possible to understand their contribution to costs. I hope you will consider calling out the historic costs for RECs and what Navigant forecasts these costs to be. Since long-term power purchase agreements for renewables typically bundle the energy, RECs and capacity into a single price per kwh, we cannot tell the influence of REC prices in either slides 11 or 14.

3) **Transmission Costs:** I think it's important for us to understand transmission costs for projects that are not eligible for regional cost allocation and also NH's portion of regional renewables-related transmission costs that will be allocated. I encourage you to review the ISO-NE's Governor's report on the estimated costs for transmission should the region's RPS mandates be met with wind energy. See: http://www.iso-ne.com/committees/comm_wkgrps/prtcpnts_comm/pac/reports/2010/economicstudyreportfinal_022610.pdf

4) **Transmission congestion and annual capacity factors:** While the ISO-NE Market Monitor reports state New England does not have a transmission congestion problem, congestion issues have arisen in Maine, NH and Vermont due to an overbuilding of wind resources and insufficient transmission capacity to deliver the energy. For example, the Granite Reliable Wind project (99MW sited in Coos County) has been curtailed back to 50% of its maximum output by the ISO-NE. Augmenting on my comment 3, it is important that the State indentify the costs and impacts of building more transmission resources as we prepare the energy plan. Renewables-related congestion will lower annual capacity factors which could result in over-stating the contribution of renewables to our energy mix.

Thank you again for the opportunity to provide comments. Please do not hesitate if you have any questions.

Respectfully,
--Lisa Linowes

_____
executive director, windaction.org

Comments of HotZero LLC

On Statewide Energy Plan – February 18, 2014

We greatly appreciate the opportunity to provide some commentary on the development of a statewide energy plan pursuant to SB191. HotZero LLC was created in 2013 to help bring to New Hampshire communities tools which are used broadly elsewhere in the world to reduce the cost of heating buildings. Our three principals have over one hundred years collective experience in the ever changing energy industry. Mike Jesanis, our Managing Director, formerly led National Grid's US business, an acknowledged leader in promoting energy efficiency and increasing competitive dynamics in the production and delivery of electric energy. Mike also serves as a board member of companies engaged in the natural gas and energy efficiency sectors. Dick Henry, our Founding Director, headed the efforts of several non-profits to help building owners maximize energy efficiency opportunities, and has aided utilities in developing creative uses for aging infrastructure. Doug Foy, our Chairman, is known nationally and internationally for integrating strong economic and environmental principles into policies and actions which protect both our environment and our economy. Doug also serves on the boards of companies involved in emerging energy technology and services, and in energy efficiency.

We have had a chance to review the materials presented by Navigant earlier this month and want to provide our insights with respect to the materials and to provide our suggestions as to issues which should be addressed in a new state energy plan.

The Navigant presentation sharply reminds us why energy matters. Residents and businesses spend approximately $6 billion each year on energy. Nothing in the Navigant forecasts suggests that the state's energy bill will fall. It also reminds us that our energy bills have more to do with transportation and heating costs, than electricity costs. The forecasts suggest that consumption of natural gas, particularly with business customers, will rise, but they are silent as to how that natural gas will make its way through the bottlenecks which exist today and are likely to exist in the future as natural gas is used for heating, industrial processes, production of electricity and potentially transportation.

It is this last point, the potential for greater use of natural gas, where we want to make our first observation and recommendation. Our observation is that the use of per capita figures for energy consumption obscures a significant problem facing the state – not all regions or cities and towns are average. Only 51 cities and towns have any natural gas service available, and **only 17 of those communities have more than 1,000 connections.** In other words only 7% of NH's cities and towns have economically significant access to natural gas. Customers in the other 217 cities and towns remain almost entirely dependent on petroleum products - oil, propane or kerosene for heating and are paying on average two or more times what those having access to natural gas are paying for the same amount of heat. Petroleum customers are also more exposed to high levels of price volatility, which can be highest when weather is coldest. This winter also proved that petroleum customers bear significant delivery risk as the state's largest oil dealer failed to deliver product during the coldest part of the winter.

The communities paying a higher share of heating costs are also likely to be paying a higher share of transportation costs, as these communities tend to be farther away from major New Hampshire and New England cities. On the other hand electricity costs are **not** likely to be materially different among communities now that most restructuring costs have been repaid, however it is likely from our past experience that more remote communities often have less resilient electric systems.

Beyond energy, there appears to be some correlation between local energy costs and local property taxes. In New Hampshire, the communities with the highest property tax rates are generally unlikely to have access to natural gas. For the 17 communities with a property tax rate above $30/$1000 of value, only 6 have any access to natural gas – **only 1 has connections with more than 1,000** customers. For the 50 communities with the highest property tax rates in the state, only 15 have any access to natural gas – of **which 3 have more than 1,000** connections. We are not suggesting a causal link between property taxes and access to natural gas; however, these communities will have greater difficulty attracting new businesses and residents given the double whammy of high property taxes and high energy costs.

These observations naturally lead to our principal policy suggestion – NH's focus needs to be on the competitiveness of every part of the state rather than the state as a whole. A primary focus on macro policies such as the right level of renewables or whether the state spends enough money (collected through customer rates) on energy efficiency, **will not likely reduce the disparity among New Hampshire communities**. And a strategy to expand natural gas availability may pay dividends for those customers near an existing pipeline, but are unlikely to help the hundreds of thousands of residents who are not near existing pipelines. This is especially true in the "granite" state because the cost of building high pressure transmission lines is unusually expensive due to our geology.

Instead, the state's policy should focus on increasing local competitiveness – including greater support for community based initiatives to support improving building efficiency, and to develop local sources of thermal energy and electricity. Distributed thermal and electric generation backed up by the grid will be more resilient and much cheaper to build than hardening the existing grid that never was designed for the increasingly extreme weather events we are and will be facing in the decades to come.

Turning to the nine questions posed in the Navigant document:

1. What does a secure and resilient energy system look like in 2023?

   We believe that the definition of security and resiliency should focus on end customer and community. Goals might include:
   a. A significant reduction (say 1/3) in regional differences in energy costs within NH
   b. A significant reduction (say 1/3) in the volatility of energy costs due to markets and/or weather
   c. A significant reduction (say 1/3) in the amount of energy **not** delivered due to shortcomings in energy delivery systems (including long-term outages and momentary interruptions). Given our prior electricity expertise, a focus on utility response times will always be inadequate to deliver order of magnitude improvements in energy delivery.

2. Is the electric grid stable and reliable during extreme weather events in 2023?
    a. We would recommend a focus beyond the electric grid. Is the energy system stable? Customers shouldn't lose their power or their fuel supplier because of weather. Customers shouldn't experience the level of cost volatility now experienced. CNG and LNG may work for some customers, but will have deliverability and price risks under extreme conditions. Thermal reliability is as important if not more important to our built environment as electricity. Without heat the damage to our built and social infrastructures can be extremely expensive.
    b. More undergrounding would be deemed economic if we correctly assessed the cost of lost power (i.e. beyond overtime paid to utility crews). The ever growing digital world can rarely tolerate bumpy service.

3. Is NH's grid vulnerable to security threats (cyber security and others) in 2023?
    a. Yes, but not worth the State's time. This is a national issue and can be left to FERC and NERC to oversee.

4. What effect does resource intermittency have on NH's energy system?
    a. This is principally a regional, rather than a local issue, and principally impacts **transmission resources** needed in the area. The problem of resource intermittency is related to our dependency on a bulk power system delivered to customers through Transmission &Distribution lines (T&D). A better alternative is to design a system for the future which relies more heavily on distributed generation and storage resources (both customer and community based). This would make local systems much more resilient and potentially less costly with centralized thermal generation and/or expanded combined heat & power capabilities.

5. In 2023, where is NH ranked amongst its peers regarding energy efficiency, cost, or emissions?
    a. Energy efficiency is a means to an end. Our strategy should be about cost and cost volatility. More efficient buildings cost less to operate and are less vulnerable to fuel prices/weather/etc. The effectiveness of efficiency programs should be measured based on the outcome of building efficiency metrics, rather than the input of utility or state sponsored efficiency programs. Emission standards need to be part of regional/national solution to ensure cost competitiveness. Our greatest challenges are not statewide threats but local air and water violations that are close to triggering EPA non-attainment standards. For example an EPA county-wide air quality non-attainment classification will be devastating to the businesses within these local economies.

6. Do businesses and individuals actively seek to locate operations and settle in NH because of its energy policy in 2023?
    a. It is probably unrealistic to expect NH to compete on cost, but an innovative and wide spread resiliency implementation could be attractive to residential and business immigrants. Put another way we should insure that no one leaves the state or fails to come to the state because of disparity in energy prices, particularly at the local level.

7. Are consumers able to protect themselves from fuel price fluctuations?
8. Are consumers empowered to manage their energy consumption?

a. Yes in the future, but only if we stop babying customers. Customers, both residential and commercial, are quite capable of making supplier choices and placing orders for products and services. This includes energy for those reliant on heating oil, kerosene, and propane, and those requiring transportation fuels. But we treat electricity and natural gas customers differently, as if they're all incapable of bearing any responsibility for their choices. Currently gas and electric customers can purchase all they want, and can change their order quantity any time they want without any change in price and without any notice to their supplier. If we want customers to be engaged, they need to be responsible for their entire transaction. How much electricity do they want this month? Who are they buying it from? Is it green or brown? Are prices fixed or variable? If we engage customers, they will become smarter about their use, and more actively seek out tools to manage that use, whether they are efficiency tools, or smart grid tools.
b. We need to break the current practice of managing energy consumption by gas and electric consumers as a utility responsibility.
c. Customers need more self-help resources, critically access to low-cost, long term, financing. PACE or PACE-like programs can minimize the need for the use of utility-sponsored rebate programs.

9. Are natural resources including air, water, and the scenic vistas of the state adequately protected in 2023?

a. Air and water quality resources have steadily improved over the last 40 years due to ever stringent regulatory requirements. These are often affected by energy decisions and air and water quality should continue to improve as we develop better and better energy performance standards and tie our financing mechanisms and availability to meeting these requirements. By giving strong price signals to violators and rewarding innovators should be the best way to protect these critical shared resources well into the future. As our society becomes more and more digital our natural resources become one of the main attributes which help to attract and retain a highly skilled workforce.

An Energy Vision Statement for New Hampshire
Proposed by the NH CleanTech Council:

"New Hampshire citizens, businesses, and industries spend over $6 billion on energy each year; two-thirds of these expenditures leave the state entirely to pay for imported fuels. This export of nearly $4 billion dollars is a significant drain on the state economy, equal to nearly 7 percent of annual Gross State Product."[i]

Recognizing this, **the primary principle for a New Hampshire Energy vision should be to reduce the export of energy dollars from 66%, to 50% by 2023, keeping over $1 billion each year in New Hampshire.**[1]

This is a measurable goal that will not only guide energy policy, but will form the foundation for a robust and innovative economic development strategy.

1. *What does a secure and resilient energy system look like in 2023?*

A secure and resilient energy system is one that reduces New Hampshire's exposure to energy product shortages and price volatility by reducing our dependence on imported fuels through greater efficiency and expanded native energy production that comes from a variety of resources, including generation, storage, demand control, and conservation. Such an energy system will include a well-maintained and modernized and smart grid, with diverse resources distributed at the point of use. It will include the expanded use of native generation resources, as well as maximizing the deployment of energy efficiency as a supply resource. Such a system will send clear market signals to those who will invest in and facilitate our state's energy system and enable consumers to make informed choices about when, how, and what type of energy they produce and consume. This system will be supported by a regulatory and policy framework that is built upon a state government that is better tooled to adequately regulate a power infrastructure that includes multiple and complementing generation systems and recognizes its vital role in both enabling and helping guide this more modern power infrastructure.

2. *Is the electric grid stable and reliable during extreme weather events in 2023?*

While NH leaders cannot control the regional electric grid or stop the increasing number of severe, disruptive weather events alone, we must adapt – and we can benefit from leading. Distributed clean energy generation, at a variety of scales and sources, combined with efficiency and grid modernization is a recipe for much greater energy security, and strong economic growth – and it is within our reach.

[1] With the multiplier effect, for every $1 billion we keep in the state and reinvest, that translates to a larger sum and a positive economic impact; approximately $2-$6 billion in total.

3. Is NH's grid vulnerable to security threats (cyber security and others) in 2023?

The national grid is extremely vulnerable to security threats. Once again, New Hampshire's best solution for minimizing these threats and the potential impact on our economy is by reducing its dependence on the regional electric grid (and the fossil energy extraction and distribution system) through greater efficiency and use of clean technology.

4. What effect does resource intermittency have on NH's energy system?

States across the nation have found that utility resistance to an expanded wind and solar generation presence on the grid is easily overcome in most cases when such generation systems are properly sited and modeled. All new generation systems must perform system impact studies that evaluate thermal, voltage, and stability impacts of the new generation, each of which should include, among many other things, anticipating the impact on intermittency. Studies across the country, and here in New England, have consistently shown that large amounts of intermittent renewable generation can safely and reliably be integrated into the grid at very significant levels.

Conversely, resource intermittency of natural gas clearly has a negative effect on NH's economy, as we have seen this winter with utilities being heavily dependent on natural gas for electric generation and at manufacturing facilities with no options other than to buy on a spot market whose prices are not within New Hampshire's control. Electric prices, as a result of gas supply constraints, have routinely been above $300/MWh this winter; these high spikes, which cost millions of dollars per hour, are substantially mitigated by renewable generation.

5. In 2023, where is NH ranked amongst its peers regarding energy efficiency, cost, or emissions?

NH is currently ranked lowest amongst its peers regarding energy efficiency, and in many cases, the cost of energy. Reducing New Hampshire's dependence on imported fossil fuels and keeping fuel dollars in the state through greater efficiency and use of clean technology will lower overall cost over time, and emissions in the short, medium, and long-term.

As a supply resource, energy efficiency is extremely cost effective. Efficiency improvements cost about $600/kW on average, whereas building new power generators costs $2,000-$3,000/kW. Efficiency investments also reduce consumer costs and emissions through reduced power usage. New Hampshire must develop policies that can spur and attract private investment in increased efficiency.

6. Do businesses and individuals actively seek to locate operations and settle in NH because of its energy policy in 2023?

Yes. By keeping $1 billion per year in the New Hampshire economy through a dedication to a clean energy economy, New Hampshire will attract new business. The greatest danger to this prospect of attracting new businesses and individuals to locate in NH is continuing price disparity between natural gas and heating oil in areas not served by natural gas pipelines. For example, if communities in the Upper Valley region are trying to attract businesses with thermal needs that can only be served by LPG or heating oil, their ability to be competitive with regions that have pipeline gas or renewable systems will be drastically impacted. Reducing costs and volatility while increasing reliability through dedication to efficiency and implementation of clean technologies

would present a New Hampshire economy and energy infrastructure that would be exceptionally appealing to many profitable businesses. With an updated and progressive energy policy developed by 2023, we foresee a strong clean tech sector that is supported by and directly participates in providing services and creativity needed to fuel this transition. This clean tech economy will in turn feed an economic engine that invests in and supports local jobs, entrepreneurship and keeps NH's energy dollars in state

7. Are consumers able to protect themselves from fuel price fluctuations?

Consumers are not adequately able, in 2014, to protect themselves from fuel price fluctuations, due to the relative inelasticity of energy demand and the over-reliance on a global, import-based, fuel market. In 2023, consumers will have greater opportunities to choose energy systems where the fuel is free, or locally available, and where they understand both the up-front and lifetime operating costs of a technology.

8. Are consumers empowered to manage their energy consumption?

Consumers are not currently empowered adequately enough to manage their energy consumption, particularly low-income consumers and businesses of all sizes. For example, many industrial and high-tech, precision operations require stable, constant energy inputs, and have load profiles that are well-suited to onsite generation of both heat and electricity, but they are not empowered to finance or choose the systems that are optimized to their needs.. Instead they remain reliant on a price/fuel system that obscures this opportunity. Many electric tariffs have tiered rates that decline with increased use. This is not an empowering rate structure to incent the necessary shift to clean, consumer-controlled, technologies. Electric rates, and thereby company and utility profits, need to be tied more directly to investments in conservation and efficiency, and decoupled away from increased consumption. Efficiency investment and mainstream clean thermal heating and cooling technologies need to be widely available to consumers and financed seamlessly as the purchase of a car.

9. Are natural resources including air, water, and the scenic vistas of the state adequately protected in 2023?

These resources need to be protected through deployment of greater system efficiency, clean energy, and economic stability. Businesses and citizens, and state leadership can best protect these resources by reducing pollution from fossil fuels and realizing the economic gains embedded in the clean energy and clean tech sectors. Aggressive investment in native, renewable generation, coupled with efficiency and grid upgrades is essential to ensuring protection of our air, water, and scenic resources. This economic advantage will give the state and communities the economic resources and security that they need in turn to adequately protect natural resources.

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[i] Vermont Energy Investment Corporation et al. September 30, 2011. *Independent Study of Energy Policy Issues.* http://www.puc.nh.gov/Sustainable%20Energy/Reports/New%20Hampshire%20Independent%20Study%20of%20Energy%20Policy%20Issues%20Final%20Report_9-30-2011.pdf

February 24, 2014

Meredith Hatfield, Director
New Hampshire Office of Energy and Planning
Johnson Hall, 3rd Floor
107 Pleasant Street
Concord, NH 03301

Dear Ms. Hatfield,

Thank you for this opportunity to provide comments regarding New Hampshire's State Energy Strategy, the visioning process, and ultimately our energy future. The Jordan Institute is pleased that New Hampshire has embarked on this process and that the Office of Energy and Planning leads this effort.

The Jordan Institute is a non-profit organization, based in Concord, New Hampshire. We advance public, environmental, and economic health by improving energy performance and resiliency in how buildings are designed, built, renovated, operated, and financed. We seek to achieve the most resilient and sustainable quality of life possible by transforming the energy and built landscape in our region.

Our mission and vision connect directly to the 2025 Straw Man Vision floated by this project's consultant, Navigant: ambitious, progressive, and realistic. We know from experience that many of the concepts highlighted in this Straw Man are technically feasible now and/or are already being implemented. Moreover, we recognize that improving the way we use and think about energy will have far-reaching benefits related to the well-being of our state and our people. We also know that public policies and public buy-in must eliminate barriers which have blocked the private market from more significant advances.

Most importantly, we recognize that resolute, unwavering, and consistent leadership will be required to scale-up this effort, and that this strategy effort is a unique opportunity. These

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solutions are nonpartisan and benefit everyone in New Hampshire and all sectors. In many cases, these solutions are less expensive than our current choices and can leverage very limited public funds. We highly recommend that as costs of implementing this vision are analyzed and discussed, that they be framed in perspective for public consumption. All too often, alarm bells sound as soon as any dollar amount is suggested, regardless of context.

We recommend prioritizing energy efficiency and resiliency when framing this strategy and these solutions. Energy efficiency – in buildings, appliances, vehicles, transmission lines – is cost effective and builds resilience. Resilience is forward thinking and a crucial priority in planning for surprises. In fact, the New Hampshire Department of Health and Human Services has convened a work group to address climate and health solutions, and is framing their work under the umbrella of Resiliency. The Jordan Institute participates in this work group to help interconnect energy solutions to climate and health. The group's working definition of Resiliency is "an ability and capacity to anticipate, prepare for, respond to, and recover from significant threats with minimum damage to human health and well-being, the economy, and the environment." We want our energy future to be able to similarly respond.

Indeed, solving New Hampshire's energy challenges will ease myriad other economic, environmental, and health problems. Transition is not easy, but it happens whether we are active or passive. This State Energy Strategy, when completed, will provide a framework, guidance, and a touchstone for policy makers. It should be a plan that catalyzes a remarkable decade of growth, prosperity, and sustainability.

The Jordan Institute would like to take this opportunity to respond directly to questions posed by Navigant.

Please place yourself in the year 2025 and consider the following questions:

1. **How does the grid respond to extreme weather events in 2025?**
   In 2025, the "grid" will still operate as a network of wires and poles and buried pipes, but it will also be more responsive to disruption and energy moving in multiple directions. Micro grids, smart meters, and group net metering will be background business as usual and charging stations for electric vehicles will be ubiquitous. We will still have problems with the grid and it will still be vulnerable to weather events, cyber-attacks, and deferred maintenance. Eleven years is too short a time to expect dramatic changes. More important than how the grid responds, is how people respond to extreme weather events. With buildings that are more durable, resilient, insulated, and generating their own energy, short outages should be non-events. Anti-islanding technology for distributed generation systems is already available. Those who invest in such systems will be able to withstand and quickly recover from grid disruption.

2. **How are consumers engaging in outage response?**
   Through "smart" technology – computers, phones, meters, mental telepathy – not sure what innovations will be available – consumers will be able to communicate with utilities if necessary. That said, in eleven years, utilities should be positioned to know immediately when, where, and why outages have occurred, and they should not have to rely on a "call" from a consumer.
3. **Is the grid less vulnerable to security threats (cyber security and others) in 2025?**
   The grid will always be vulnerable to security threats. If New Hampshire has implemented policies and programs to improve the way we use energy, then everyone - residents, businesses, and municipalities - will be a lot less vulnerable to security threats.
4. **How has resource intermittency been addressed in NH's energy system?**
   In 2025, inverters, energy storage systems (electric vehicles, compressed air, pumping), and combined heat and power systems will have improved to address intermittency. While intermittency may still be an issue that is being resolved, market forces will be have made tremendous strides.
5. **How is NH responding to fuel shortages or supply disruptions in 2025?**
   Fuel shortages and supply disruptions will still be an issue in New Hampshire and elsewhere. However, if New Hampshire has implemented policies and programs to improve the way we use energy, then everyone - residents, businesses, and municipalities - will be a lot less vulnerable to such disruptions. With more efficient buildings requiring less energy and a growing percentage of energy coming from renewable, fuel-free, and local sources, New Hampshire will be less reliant on fossil fuels. Additionally, a diverse portfolio of fuels and distributed generation will minimize disruptions. Again, eleven years is a short period of time, and this vision will only be realized if policies are implemented in the near term.
6. **Are consumers empowered to manage their energy bills?**
   Consumers who want to manage their energy bills are already empowered to do so. Such management will be commonplace for many, but not all in 2025.
7. **Has the state lowered its per capita energy expenditures?**
   The majority of homeowners and businesses will better understand the costs involved in energy – the whole equation including externalities – and will be empowered to manage and lower their costs as desired. Energy rates are predicted to continue to rise, but significant improvements to the way energy is used will mean that regardless of energy rates, energy bills will be lower.
8. **In 2025, where is NH ranked among its peers regarding energy efficiency, cost, or emissions?**
   New Hampshire could be considered a leader regarding energy efficiency, energy costs, and emissions. We can learn from the experiences of others, invest in technologies which are now significantly less expensive than just a few years ago, and leap-frog into a leadership role. However, other states started this type of effort more than a decade ago and have community buy-in. New Hampshire leading will require significant political dexterity.
9. **Do businesses and individuals actively seek to locate operations and settle in NH because of its energy policy? If so, what is the main driver of this?**
   Businesses and individuals already actively seek to settle in New Hampshire for many reasons unrelated to energy policy – environment, skilled work force, health, et cetera. In

2025, many other states will have also improved their energy policies. However, we will have access to clean and abundant water, which will surely become a most precious resource. This will lure many businesses and individuals to the state.

10. **What role does NH play in the creation and development of new energy-related technology?**
    Unless significant investment is made in the very short term, New Hampshire's role in energy- related technology will be about average. However, we have a skilled workforce and innovation hubs that are focused in other areas but could be redirected to create and develop such technology.
11. **Are alternative fuels in both the thermal and transportation sectors helping to reduce harmful emissions and increasing the use of in-state resources?**
    Biomass and biofuels will no longer be considered "alternative" fuels for thermal and transportation applications and will be drivers for fuel diversity, local economic development, and superior forest management. Additionally, fuels derived from waste – methane from farms and landfills, construction and demolition materials, and trash will meet higher emissions standards.
12. **Are transportation consumption patterns aligned with business and neighborhood development to reduce emissions and improve air quality?**
    In 2025, this conversation will still be in its infancy, although patterns may be in the early stages of shifting. New Hampshire's rural nature and independent streak will still conflict with smart growth.
13. **How does NH use advances in technology to protect its natural resources?**
    New Hampshire has always understood and benefited from the connections between technology, natural resources, and economic development. We hope that an improved energy policy landscape will further connect these priorities.
14. **Do siting requirements in 2025 protect both the atmosphere and landscape?**
    Siting requirements for energy project development in 2014 already consider and protect New Hampshire's atmosphere and landscape. As New Hampshire's citizenry become more educated about energy issues, balancing goals and needs and preferences will be better established.

The Jordan Institute is convinced that by adopting the Straw Man Vision and pursuing the steps to achieve it, New Hampshire will flourish and thrive, but only through significant will-power and persistence. Thank you for this opportunity. Please feel free to contact me with questions or comments. I look forward to working with everyone to make this vision a reality.

Sincerely,

Laura Richardson
Executive Director
lrichardson@jordaninstitute.org

February 28, 2014

Ms. Meredith Hatfield
NH Office of Energy and Planning
95 Pleasant Street
Concord NH 03301

Dear Ms. Hatfield:

The New Hampshire CleanTech Council is pleased to submit these additional comments to the Energy Planning Council and the Navigant team consultants as you consider further changes to the draft Vision statement that was the subject of the Council's meeting on February 21.

The CleanTech Council is represents a broad spectrum of employers in the clean technology sector in New Hampshire. We seek government policies and regulations that reduce the amount of imported fuels and keep the dollars that pay for those fuels in the New Hampshire economy. We aim to provide a stable and predictable policy environment from which this mainstream market may flourish in New Hampshire, bringing with it reduced costs, a hedge or elimination of fossil price volatility, reduced air and water pollution, and high-paying jobs that cannot be off-shored. Such a business environment not only provides benefit for our industry but also for all other industries in New Hampshire. Certainty of policies, minimizing energy cost volatility, and long-term environmental sustainability are essential considerations in the state's energy framework. For many employers, cost of energy is only one consideration of many. Perhaps even more than absolute cost, these factors will serve to make New Hampshire an attractive state for businesses to relocate and grow. We think these factors need to be given stronger emphasis in the draft Vision.

The CleanTech sector, which can contribute greatly to our state's energy security and economic vitality, depends on a skilled workforce. If businesses in our sector perceive that such a workforce is not available here, they will locate and grow elsewhere. A highly skilled and well-trained workforce is fundamental to our state effectively responding to energy challenges. This point is not given sufficient emphasis in the draft Vision. Additionally, ensuring a cleaner environment by way of energy security and economic vitality protects tourism, a significant part of the state's economy, but also protects our quality of life within the environment so that New Hampshire will remain an attractive place to live for workers.

During the presentation on February 21, Representative Pastor made reference to the economic disparities that exist within our state that derive from access to natural gas pipeline distribution. Much of New Hampshire's geographic area is unlikely to see pipeline gas within the 10-year scope of this energy plan. For residents and businesses within these areas, heat energy (40% of NH's total energy consumption) is largely dependent on much more costly imported heating oil, propane and utility-provided electricity. The plan Vision needs to better recognize that these energy access disparities create a substantial economic disincentive to employers seeking to locate in these areas and the cost of living of their employees. When neighboring states and regions have access to pipeline gas and/or renewable power contracts, they become a far more attractive site for potential employers. In addition, most areas of New Hampshire that are not served by pipeline gas have greater thermal requirements than more southern areas that have access to pipeline gas, creating greater disparity. The reduction of

our state's dependence on imported heating oil products needs to be given stronger, more explicit, reference in the Vision statement.

Additionally, the CleanTech Council believes that a healthy balance between distributed resources and grid-scale renewable energy is essential to our future energy mix, and critical to reliability of the grid, security of our energy system, and stability in future energy costs. The right balance will better retain wealth within our state and minimize the exportation of both energy dollars and pollution.

The CleanTech Council believes the final Vision needs to communicate a greater sense of urgency around the importance of energy planning, policy and private sector investment to the economic viability of our state. New Hampshire is the second most petroleum dependent state in the country in per capita use across all energy pathways (Hawaii is #1). This is an unacceptable condition in today's marketplace. Our ability as a state to address fundamental challenges in energy use, efficiency, transitioning to renewables, and reduced dependence on imported non-renewable fuels over which we have no control is fundamental to our state's economic well-being. Equally important is strategic vision of how to deploy the private capital and investment that is needed to effect this transition. This point is not given strong enough emphasis in the draft Vision.

With emphasis on these additional points, we believe the consultants and the Energy Advisory Council will have crafted a strong vision statement that will provide the planning process with clear priorities and direction as you move to the development of strategies and actions to achieve this Vision. We commend you for the excellent, but still improvable, draft presented on February 21. We look forward to continued participation in the planning process.

Sincerely,

Taylor Caswell
Chair, New Hampshire CleanTech Council

ENE Comments To The New Hampshire State Energy Advisory Council On Navigant's Straw-Man Energy Vision

March 4, 2014

ENE (Environment Northeast) is a non-profit clean energy research and policy organization headquartered in Maine with offices in New England and Canada. We appreciate the opportunity to provide written comments to the State Energy Advisory Council and Navigant Consulting, Inc. regarding the draft energy vision.

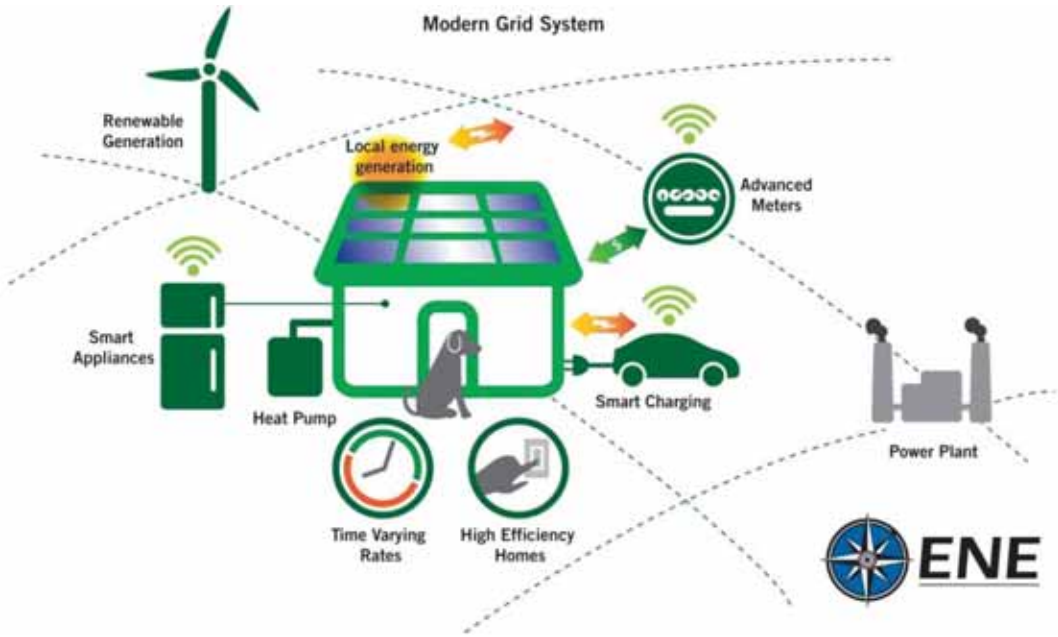
The draft presents a compelling vision for a cleaner and more secure energy future for New Hampshire. It will help guide the transition to a smart and efficient energy system that embraces new consumer-oriented energy technologies, advances economic benefits and is low-carbon. Achieving these long-term goals will require a new approach that:

1) capitalizes on emerging electricity-based consumer technologies; 2) accelerates the uptake of clean power sources; 3) reforms the way we plan and pay for our energy grid; 4), maximizes cost-effective energy efficiency and 5)reduces emissions across the state economy.

A vision for the state will be focused on:

A Modernized Grid

With modern technology and revised planning frameworks, our electric system is capable of delivering greater consumer and economic benefits, improved system resiliency, and significant GHG reductions. In order to realize these benefits we must move beyond the outdated model of centralized power stations sending one-way electricity flows to homes and businesses. Instead, we must develop a Modern Grid System using an array of technologies and multi-directional power flows to meet our energy needs.



A modernized grid system in New Hampshire will include:

- Utility business models that incentivize the deployment of advanced metering infrastructure, smart consumer technologies, and investments in the distribution system to support two-way power flow for distributed generation, electric vehicles, and other energy storage devices.
- Utility rate design that will provide financial incentives to customers to invest in energy efficiency and smart, integrated technologies capable of reducing costs and emissions.
- Utility, state, and regional planning processes that fully incorporate the potential for distributed resources, energy efficiency, and storage in order to avoid unnecessary investments in more costly transmission and distribution resources.

Maximized Energy Efficiency

In 2025, New Hampshire will have reformed utility incentives to favor energy efficiency over capital expenditures. Reducing energy consumption is the most cost-effective way to meet our energy needs and reduce GHG emissions. Saving energy costs less than increasing supply, and lower energy consumption translates into less pollution and fewer dollars leaving the state to pay for imported fossil fuels. Investments in energy efficiency programs – CORE Electric Programs create $7.00 in savings for every $1 invested – can also reduce the need for expensive new electricity infrastructure. In the electric sector, using less energy also facilitates achievement of renewable and alternative energy requirements at lower costs. An ENE analysis, *Energy Efficiency in New Hampshire: Engine of Economic Growth*[1], found that increasing efficiency program investments to levels needed to capture all cost-effective electric efficiency over 15 years would increase economic activity in the state by $14 billion.

Electrified Buildings and Transportation

Replacing fossil fuel use with electricity in buildings and automobiles would generate significant GHG emission reductions and cost savings. In addition to sustainably harvested forest-based fuels, the energy vision should address electrified heating options in order to provide a proper framework for policy prioritization. In buildings, cold-climate air and ground source heat pumps are now capable of meeting the majority of space and water heating needs, even on the coldest winter days. Heat pumps are also capable of cooling buildings in the summer more efficiently than traditional air conditioners. Due to their higher efficiency and use of electricity rather than fossil fuels, heat pumps reduce emissions and heating and cooling costs. Electric vehicles likewise can reduce transportation emissions by over 60% using the current New England power pool mix. Compared to similarly-sized conventional vehicles, electric vehicles also benefit from 60% to 70% lower operating costs.

Increased Renewable Energy

Utilizing renewable energy reduces use of fossil fuels that emit GHGs and whose prices have proven to be historically volatile. Small-scale distributed generation using renewable sources provides the additional benefits of reducing reliance on the grid, reducing losses from transmitting and distributing energy, and increasing resiliency. It can also promote a thriving clean energy market in the state.

[1] Previously submitted to the SEAC, available at http://www.env-ne.org/resources/detail/energy-efficiency-engine-of-economic-growth-nh-results

Lower Economy-wide Carbon Emissions

ENE would like to see an energy vision that more specifically addresses the goal of having clean, low carbon energy. In 2025, New Hampshire will have reduced emissions across all sectors in the state. This will be accomplished in the most cost-effective manner, taking advantage of the flexibility and speed of markets, and leveraging impacts through collaboration with other states when desirable.

Respectfully submitted,

Ellen Hawes, Forest Policy Analyst

For Further Information:
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ENE

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ENE is a nonprofit organization that researches and advocates innovative policies that tackle our environmental challenges while promoting sustainable economic development. ENE is at the forefront of state and regional efforts to combat global warming with solutions that promote clean energy, clean air and healthy forests.

State of New Hampshire
Office of Energy and Planning
RE: Information related to State Energy Strategy
March 6, 2014

Dear Chairman Hatfield and Committee Members,

I am submitting for your consideration some articles which describe alternative energy resources being explored by other states in our region, and one which expresses a caution against becoming overly committed to natural gas as our energy savior.

I like to compare using natural gas as a bridge to the camel's nose under the tent. If you aren't careful, soon you have the whole camel in the tent.

The argument then becomes that since we have invested so heavily in natural gas, we should continue in that direction to preserve our investment. Natural gas, of course, still contributes to climate change.

I would prefer to see the money that would be required to transition to natural gas be used to move directly to clean, renewable sources whenever possible. I must leave the technical presentation to others, but I would call your attention to House Bill 1312, Establishing a committee to study offshore wind energy and the development of other ocean power technology.

In the time I have spent in numerous public hearings with this Energy Advisory Council, I have been impressed and encouraged by the high level of technical awareness and concern demonstrated by Committee members for the future of our State.

Thank you for your consideration,

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Public Service of New Hampshire

A Northeast Utilities Company

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William J. Quinlan
President and Chief Operating Officer

March 7, 2014

Meredith Hatfield, Director
NH Office of Energy & Planning
Gov. Hugh J. Gallen State Office Park
107 Pleasant Street
Concord, New Hampshire 03301

Dear Meredith,

Public Service Company of New Hampshire ("PSNH"), a subsidiary of Northeast Utilities ("NU"), is pleased to submit these comments in response to the Straw-man Energy Vision ("Energy Vision") presented during the recent meeting of the New Hampshire State Energy Advisory Council ("Council") on February 21, 2014.

PSNH is very encouraged about the State's initiative to create a long term strategy for the energy sector in New Hampshire. PSNH and NU especially commend the Council for its desire to set an aspirational vision that will serve as the guidepost to develop an energy strategy for New Hampshire over the next 10 years as it seeks to improve the energy landscape in the State.

We look forward to continued dialogue with the Council over the next few months and initially provide these comments focused on the key five vision factors identified during the February 21st meeting: 1) grid modernization, 2) energy efficiency, 3) renewables mix, 4) transportation options and 5) alternative fuels.

Grid Modernization

PSNH is committed to help New Hampshire modernize the state's electric system. Overall we believe that cost-effective modernization of the electric distribution system should focus on four primary objectives: (1) to reduce the effects of outages; (2) to optimize demand, including reducing system and customer costs; (3) to integrate distributed resources; and, (4) to improve workforce and asset management. These four objectives will be beneficial to customers in both today's and tomorrow's operating environments.

To that end, PSNH and NU are already undertaking significant investments in the "21st Century Electric System" and we are focusing our attention both on the "grid-side" as well as the "customer-side" of that system.

On the "grid-side" we have been leaders in the U.S. in efforts to automate our grid to attain a greater awareness of system conditions and provide a higher level of reliability to our customers. For example, at one of our affiliates, NSTAR, we have more than 5,000 sensors monitoring the state of the grid and we are implementing a $20 million program to have a system that automatically heals when it senses a fault, without human intervention. In New Hampshire we have been running a pilot for a few years that is determining the best approach to achieve these same capabilities within the specific context of PSNH's electric distribution system as it exists today. We believe these grid side investments can pay significant dividends for our customers by reducing the number of outage events, reducing the time associated with an outage event and reducing the cost associated with maintaining our grid.

We are also working for ways to better integrate distributed generation, especially solar photovoltaic generation into our systems. For example, we are implementing a $10 million pilot at NSTAR, with support from the DOE, to enhance our visibility into the underground secondary network in Boston to allow us to test the integration of inverter-based renewable generation onto the grid. We are also working to refine and improve our interconnection processes to provide a harmonized customer experience across all of our companies, including PSNH.

On the "customer-side" we believe that our customers want more information, more choices and a different interaction with the grid. To that end we are investing in the systems and developing the right partnerships with third parties to bring these new tools to our customers. For example, we were one of the first utilities to launch the "Green Button" to allow customers to easily view usage data, encourage awareness, and for third parties to develop solutions to the benefit of customers. We also continue to expand our energy efficiency programs and infrastructure to provide customers with energy usage analyses and ideas on how to more effectively and efficiently manage their consumption. Finally, we know customers do not like to be in the dark; we are making significant investments in outage management technologies and

process changes that will allow us to proactively notify customers when they are experiencing an outage and provide them with many outage event details.

These are just some of the examples of the grid modernization investments that we are making and can continue to advance at PSNH. We look forward to developing even further the grid in New Hampshire, efforts that will be enhanced if proper regulatory models are implemented to encourage utilities to speed and expand on these already very successful initiatives.

Energy Efficiency

The Energy Vision presented to stakeholders laid out an ambitious vision for energy efficiency and its role in a new energy landscape in New Hampshire. The Energy Vision outlines the goal of having nearly all older buildings benefit from deep energy efficiency retrofits, while indicating that "these efforts incorporate the latest energy efficient technologies, resulting from flexible policies and programs that allow customers to pick technologies they wish to use with a focus on return on investment."

NU is and has long been a leader in developing and delivering award-winning energy efficiency programs. NU plans to manage close to $500 million of energy efficiency investments in 2014 in Connecticut, Massachusetts and New Hampshire. However, as a product of legislative and regulatory requirements that are unique to each state, the bulk of these investments will be centered in Connecticut and Massachusetts. PSNH agrees that there is an opportunity to significantly increase energy efficiency investments in New Hampshire, and we believe that these increased investments will help tens of thousands of customers reduce their energy costs, reduce the need for additional generation, and boost the local economy and employment. We support the development of policies that allow investments to be undertaken based on specific project economics and expected returns on investment.

New Hampshire needs capable partners who can deliver on this vision. Utilities are the natural and best provider of energy efficiency programs. Customers look to their regulated utilities as trusted, reliable, non-biased resources for comprehensive energy solutions. Moreover, customers can take comfort in the prudent oversight regarding program design, delivery and results that is inherent in a regulated utility environment. PSNH and NU have the expertise and experience to scale the energy efficiency ecosystem through innovative approaches to engage

customers, key stakeholders and vendors, and put in place robust funding and financing mechanisms. For instance NU's subsidiary companies in Connecticut and Massachusetts are:

- Engaging large commercial and industrial customers at the executive level in multi-year partnerships through Memorandums of Understanding that seek to make significant reductions in their energy use.
- Partnering with cities and towns to reduce their own consumption while serving as channels to small businesses and residents.
- Enhancing the Home Energy Solutions program by focusing on deeper solutions and driving effective outreach, innovative program design, vendor/contractor engagement and availability of low-cost financing.
- Achieving one of the highest levels of efficiency savings as a percentage of sales in the country.
- Helping Massachusetts achieve the #1 ranking in the AEEE state scorecard and Connecticut move up the rankings over the past few years.

PSNH also believes that utility customer funding is critical in order to help achieve the State's goals. PSNH supports the desire to minimize customer charge driven subsidies and, over time, move to a more self-sustaining market-based funding approach. However, PSNH also notes that leading energy efficiency programs in the nation rely on significant customer funding to achieve their aggressive goals. Any moves to reduce rebates should be done thoughtfully, be segment-focused, data-driven, and done with an understanding of the potential tradeoffs. Corporations, institutions and consumers, all look at energy efficiency as an area of investment and, as such, return-on-investment or paybacks become important criteria in their decision making, and rebates have a direct influence in the process. PSNH will continue to look for grants and donations that may become available for energy efficiency, thus reducing the need for customer funding.

Finally, PSNH agrees that financing to support participant contributions is an important tool in expanding energy efficiency programs. PSNH's affiliates have implemented broad-based and low-cost financing approaches in Massachusetts – by, for example, tapping into local banks and credit unions. The private capital from these sources has been plentiful and low-cost, and has also served to reinforce existing relationships with communities. However, PSNH believes it is

important to consider the all-in cost of financing and caution against approaches that seek to raise large amounts of costly (all-in cost) private capital as a substitute for rebates.

Renewable Mix

PSNH remains supportive of the State's desire to meet its Renewable Portfolio Standard targets. PSNH also highlights that meeting RPS standards should not be solely a byproduct of environmental concerns; nor should it be developed absent energy considerations. Energy and environmental policies need to be developed in tandem and balanced with economic consequences.

PSNH has a long supported the development of local New Hampshire renewable energy projects through strategic investments that have helped the state move toward a cleaner energy future: the company assisted in the development of the state's first wind farm, in Lempster, and purchases nearly all of the project's energy and Renewable Energy Credits; PSNH replaced a 50 megawatt coal-fired boiler at Schiller Station with a similar sized biomass boiler; and, the company enabled the development of the new Burgess biomass power plant in Berlin by entering into an innovative Power Purchase Agreement.

Although renewable development in New England and New Hampshire have had significant opportunity, the region finds itself continuing to struggle with a renewable energy supply deficiency, and thereby higher costs for RPS compliance. Ultimately these costs are borne by New Hampshire customers.

With the challenges for siting new generation in the region and the threat of the expiration of government tax credits for renewable projects, it will be difficult for renewable generation to be developed without significant subsidization from customers or the State. The State needs to consider ways to avoid these potential costs and should evaluate additional options to achieve the State's clean energy objectives. A diverse generation mix is a great tool to address the growing and risky dependence on gas in the New England region and New Hampshire.

PSNH recommends that the State evaluate cost effective options to meet New Hampshire's renewable goals. To the extent new resources are considered it should be clear that those

resources will benefit New Hampshire's customers by limiting the fuel dependence on natural gas for power generation and lowering wholesale energy prices.

PSNH is supportive of a review that includes consideration for new deliveries of large scale hydropower in Canada. The region would benefit significantly through displacing fossil power generation, reducing regional carbon emissions, lessening the fuel dependence on natural gas for power generation, and lowering wholesale energy prices. New Hampshire has an opportunity to tap into Canadian hydroelectric facilities that are available now or under development, through the development of new transmission infrastructure which would provide jobs and tax revenues in addition to energy and environmental benefits. Efforts such as NESCOE's should continue to be supported to ensure that such transmission infrastructure is built and provides benefits to New Hampshire.

Transportation Options

PSNH believes that plug-in electric vehicles ("EVs") could be an important part of an integrated climate change and energy independence strategy for New England and New Hampshire -- especially for the major urban centers where commuting distances are relatively short. Automotive manufacturers have made significant commitments to battery electric (e.g., the Nissan Leaf) and plug-in hybrid or range extended EVs (e.g., the Chevrolet Volt) and most other manufacturers have similar vehicles in development (e.g., Ford, BMW, Mercedes).

In recent years, NU and its affiliates have been actively engaged in several activities in support of EV deployment. NU has taken a leadership role in advancing initiatives to provide resources and information to customers interested in EVs and EV charging. For example, PSNH and its affiliates have established an EV Tech Center, which includes a dedicated hotline with trained representatives taking calls from 8 a.m. to 5 p.m., Monday through Friday, as well as the "Plug My Ride" website (www.PlugMyRide.org). These resources provide a single point of contact for customers seeking answers to electric vehicle-related questions. In addition, NU has maintained over the past six years an active role in monitoring the key technical and regulatory developments in the EV space and through its members has actively supported efforts such as Connecticut's Electric Vehicles Infrastructure Council, Massachusetts's Electric Vehicle Initiative and Task Force, and the Infrastructure Working Council. Also, NU was the Founder and Chair of the Regional Electric Initiative (REVI) which includes all the major New England utilities. Finally,

NU has experience on deployment of charging stations to advance energy goals in Connecticut and Massachusetts.

As outlined by the Baseline Energy Forecast developed by Navigant as part of this effort, transportation is the largest source of greenhouse gas emissions in New Hampshire, and it also represents, by a significant margin, the largest component in terms of energy expenditures. Transportation is also the largest source of dependence on foreign oil and should be top priority for reform based on economic, environmental, and national security concerns. The Obama administration has made improvement in Corporate Average Fuel Economy (CAFE) standards a top priority and has also enabled policy to incent the development and commercialization of alternative fuel vehicles, primarily bio fuels and electric, and to a lesser extent, natural gas.

Based on NU's extensive work with automotive manufacturers and national organizations focused on electric transportation, we believe over the long haul that electric and natural gas transportation hold significant potential to improve our environment and lessen dependence on foreign fuels. EVs could materially lower regional CO2 emissions given New England's clean electric system that emits 30% less CO2 per kWh than the national average. At 3 miles/kWh, an EV in New England accounts for 0.3 lbs CO2 per mile while a conventional vehicle at 25 MPG would account for about 2.5 times as much CO2.

A significant conversion to electric transportation could also have significant benefits to the electric system. If the proper mechanisms are put in place and most of the charging occurs at night, system utilization would be improved which would ultimately help drive down distribution rates to our customers. In addition if the charging occurs at night, environmental benefits would be enhanced due to the generation fleet normally used at night time. The key is to be able to work with stakeholders in designing programs and/or incentives to ensure our customers charge during off peak hours. We also believe that driving patterns support these efforts, as we expect most of the EV owners will prefer to charge overnight at their residences.

PSNH will continue its leadership in supporting the roll out of these vehicles with policies and approaches geared to minimize the cost of fuel, infrastructure, and maximize convenience for the EV customer. The state should guard against proposals whereby third parties pocket the

differential between the price of gasoline and the price of electricity, as that fuel savings is the key customer incentive to switch to an electric vehicle. We believe that New Hampshire should consider additional incentives to support customers in acquiring these (initially expensive) vehicles, including the potential for an off-peak EV recharging rate. Finally PSNH could work collaboratively with stakeholders to develop a pilot program to understand the best ways to incent charging to occur over night during off peak hours.

We also believe that natural gas transportation will continue to evolve and present an attractive alternative for transportation that is not well suited for electrification, especially for heavy duty fleet vehicles. Our sister companies, Yankee Gas and NSTAR Gas continue to work in deploying the proper infrastructure in their states to support increased penetration of natural gas transportation.

Alternative Fuels

We agree with the Energy Vision's desire to provide consumers with greater choices in the fuels they consume. We support the Energy Vision's desire to allow for customer choice as it relates to access to new heating technologies and fuels. We also support the use of market-based financing mechanisms to remove cost barriers and allow customers of all income levels access to these options.

PSNH believes that natural gas for heating purposes should be an option that needs to be explored further. A potential move away from fuel oil and propane to gas can offer multiple benefits for residents, businesses, the economy and the environment. Today, New Hampshire has a unique opportunity to take advantage of shale gas, and technological breakthroughs associated with it, which represent truly profound changes in the U.S. and world energy markets.

We also note that while New England's electricity generation is the second cleanest in the country, after the Pacific Northwest (which relies heavily on hydropower), New Hampshire's space heating environmental footprint significantly lags the U.S. due to its high dependence on home heating fuel oil.

Still, many New Hampshire consumers do not have a choice to take advantage of fuel-changing opportunities. Although we understand that expanding the natural gas system will not be economic in many instances, we believe New Hampshire should evaluate this opportunity in detail in order to determine areas of the State where natural gas can become a choice to New Hampshire's businesses and residents.

Conclusion

In closing, PSNH and NU thank the Council for the opportunity to submit these comments regarding the Energy Vision Straw-man draft. We look forward to continue to work with the Council and New Hampshire on these topics in order to implement a new vision for the energy landscape in the State.

Sincerely,

William J. Quinlan
President and Chief Operating Officer

Public Service of New Hampshire

A Northeast Utilities Company

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William J. Quinlan
President and Chief Operating Officer

March 21, 2014

Meredith Hatfield, Director
NH Office of Energy & Planning
Gov. Hugh J. Gallen State Office Park
107 Pleasant Street
Concord, New Hampshire 03301

Re: NH Energy Strategy

Dear Meredith,

I am writing to respond to the request for input to the Resource Potential forecast as prepared by Navigant Consulting. The Resource Potential forecast, similar to the Business as Usual (BAU) projection, will prove to be a critical foundational document toward the development of the final energy strategy for the State of New Hampshire.

Public Service of New Hampshire (PSNH) appreciates the opportunity to provide feedback to the ongoing process. I recognize the future economic well-being of New Hampshire depends upon a comprehensive, long-term energy strategy; and the current process provides a good basis for the development of the strategy. PSNH hopes to be a partner in the development and also in the strategy's implementation as we too strive for a successful energy future for our state.

After reviewing the document provided by Navigant Consulting and participating in the webinar, I want to share the following specific points:

- In the Resource Potential methodology there is a general explanation of the steps taken to define how a resource was determined to move from total potential to technical and economic potential (pages 6 and 7) which is helpful for understanding the process, however a review of how this process specifically works for each resource would help to clarify the details surrounding each and how the calculations were made.
- The Resource Potential forecast has been crafted with various assumptions in each category, some of which can have significant impacts on the results of the technical and economic potentials – it would be helpful to understand these critical assumptions and have a sensitivity analysis around them to show how they can impact the potential presented.
- For each category of technical and economic resource potential it would helpful to understand the context of the results shown in comparison to where the resources stand today and increases needed which would aid in an overall understanding of how easy or difficult it would be to achieve them.

- The constraints in the natural gas pipeline infrastructure and the resultant large basis jumps in winter months may not be reflected in the gas forecasts used for this analysis. We recommend additional analysis be undertaken to fully understand the long-term impacts of these constraints and price increases on the resource potential study.
- The Economic Resource Potential results could be impacted by the availability of subsidies for a specific technology – how have subsidies been incorporated into the calculations for each resource category?
- The Resource Potential for a specific category could be impacted by how other resources are treated within the forecast. The calculation could also depend on the policies in affect that could impact a specific area. These factors could lead to higher or lower technical or economic potential in a category. How are these interdependencies among the various resources and or policies taken into account in the analysis?
- Specific to the Thermal energy efficiency potential calculations for the residential and commercial sectors (pages 9 and 10); it would be helpful to more fully understand how these calculations are made and why there is such a large difference in this potential compared to the electric efficiency potential.
- Specific to page 20 and 21 of the draft, it would be helpful to more fully understand the assumption around the utility scale solar PV and offshore wind being capped by state demand.
- Specific to page 22 of the draft, it would be helpful to more fully understand the assumptions around CHP and storage as there has recently been a significant amount of activity around these topics and how they will be utilized in the future.

The work required to prepare an effective and useful energy strategy is massive and the draft Resource Potential forecast is a significant part of this on-going process. The questions provided in this letter will assist in a more clear understanding of what is possible in the future and contribute to a final strategy that can be successfully implemented.

PSNH has a long history partnering with the State of New Hampshire to help positively position the state in many areas of its economy; I am appreciative of the opportunity to continue this partnership. I hope to continue to work with you and the state Energy Advisory Council as you model and finalize a plan that sets New Hampshire on its future course.

Thank you for this opportunity and I look forward to a continued dialogue.

Sincerely,

William J. Quinlan
President and Chief Operating Officer

ENE Comments To The New Hampshire State Energy Advisory Council On Navigant's Resource Potential Study

March 23, 2014

ENE (Environment Northeast) is a non-profit clean energy research and policy organization headquartered in Maine with offices in New England and Canada. We appreciate the opportunity to provide written comments to the State Energy Advisory Council and Navigant Consulting, Inc. regarding the resource potential study.

Biomass

Navigant's estimates on biomass availability rely in part on Appendix 8 of the New Hampshire Climate Action Plan (CAP). While the exact methodology used to translate those estimates of fuel availability into technical potential is not detailed, we want to caution that the energy content of available wood listed in Table 7 of the Appendix has not been limited in any way by merchantability, transportation limitations, or sustainability (beyond available growth). Elsewhere the CAP assumes 50% of unharvested growth is available for biomass, but this is not calculated in the Appendix. The figure of 26,650 BBTUs from the 2003 unharvested growth in New Hampshire's forest seems very close to what is given as the technical potential of residential thermal fuel in Navigant's resource potential study. The more limited economic potential in the resource potential study is given as 20,000 BBTU.

The BBTU estimate in the CAP is derived from a calculation of 2.08 million available tons of biomass per year (20% moisture content). Other studies have found a similar annual available growth, but have come up with much smaller amount of energy realistically available when adjusting for the fact that a large portion of this wood is suitable for much higher value products, such as sawtimber, and the fact that not all landowners are interested in harvesting. Goernt et al (2012)[1] uses only 30% of annual growth less removals available for biomass to adjust for merchantibility, leaving 738,000 metric dry tons a year in New Hampshire. A study by the Biomass Thermal Energy Council[2] finds 2.53 million green tons in 2025 as available growth, but excludes the portion of the harvest used for higher value wood, and reduces this by 50% to be conservative. This leaves an estimate of 400,000 green tons/year (250,000 tons at 20% moisture) in the state. Furthermore, for logistical and sustainability reasons, it is unrealistic to assume that more than 65% of logging residue would be removed from site.

The current low value of biomass in practice provides a constraint on overall harvesting. The policy prioritization process should clarify what limits have been used to assess the technical versus total potential, and take into account the fact that reaching the technical limitations of the biomass resource may be undesirable for economic and sustainability reasons. The energy strategy should not undermine

[1] Goerndt, M.E., Aguilar, F.X., Miles, P., Shifley, S., Song N. and H. Steltzer. 2012. Regional Assessment of Woody Biomass Physical Availability as an Energy Feedstock for Combined Combustion in the US Northern Region. *Journal of Forestry:* April/May 2012 p. 138-148.

[2] Biomass Thermal Energy Council. 2010. Heating the Northeast with Renewable Biomass A Vision for 2025.

other goals of the CAP, such as preserving the carbon sequestration potential of forests and promoting durable wood goods.

Cross-sector constraints

Navigant has noted that their resource study does not include a cross-sector analysis. Final goals in the energy strategy for the transportation, thermal and electric sector must take this into account, particularly as relates to the biomass availability noted above. This also has potential relevance for natural gas availability in the transportation and thermal sector.

Thermal Sector

ENE believes that geothermal potential should not be presented as separate from electric thermal potential (slides 16-17) in the resource potential study because electric ground-source heat pumps are essentially an electricity-based technology.

Energy Efficiency Resources

Navigant should clarify how technical and economic potential results for energy efficiency are derived for the year 2025. The 2009 PUC report, *Additional Opportunities for Energy Efficiency in New Hampshire*, which is cited as a data source, present results for the year 2018. Additionally, savings numbers reported in slides 10-12 of the resource potential study seem to be different from numbers in the cited PUC report.

Respectfully submitted,

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ENE is a nonprofit organization that researches and advocates innovative policies that tackle our environmental challenges while promoting sustainable economic development. ENE is at the forefront of state and regional efforts to combat global warming with solutions that promote clean energy, clean air and healthy forests.

ENE Comments to the New Hampshire State Energy Advisory Council on Policy Prioritization

March 28, 2014

ENE is a non-profit organization that researches and advocates innovative policies that tackle our environmental challenges while promoting sustainable economies. ENE is at the forefront of efforts to combat global warming with solutions that promote clean energy, clean air and healthy forests.

ENE thanks the Energy Advisory Council for the opportunity to present our recommendations for policies that will help New Hampshire achieve its energy vision for 2025. The policy prioritization process is an important step in developing a coherent, deliberate, and comprehensive energy policy for New Hampshire. We present key policies for each of the three sectors: electric, thermal and transportation.

I. ENE's Electricity Sector Strategy Recommendations

Energy Efficiency

Expanding energy efficiency for all fuels – electric, gas, and oil customers – will deliver multiple benefits to New Hampshire. Strategic investments in energy efficiency help reduce consumer and business energy costs while avoiding greenhouse gas emissions. In addition to lower energy bills, reduced energy demand means less money leaving the state to import carbon-intensive fossil fuels. Energy efficiency investments generate significant local economic benefits, including increased Gross State Product and thousands of new jobs.[1]

New Hampshire should adopt multi-year energy savings targets for the utilities' customer energy efficiency programs. Electric and natural gas savings targets should be established on a statewide basis, and be subject to approval by the Public Utilities Commission (PUC). Utility program administrators would be required to meet the targets. Multi-year targets provide greater market certainty for sustained energy efficiency investments. The charts in Figure 1 and Figure 2 depict the multi-year energy savings goals in place in Massachusetts and Rhode Island.

Multi-year targets should be complemented by a requirement for utilities to procure all cost-effective energy efficiency that is less expensive than supply. Energy efficiency investments deliver real energy savings that can displace generation from supply-side resources. An all cost-effective efficiency requirement would require the utility to consider all available energy resources, including energy efficiency, and to invest in efficiency whenever it is cheaper than traditional supply. Energy efficiency can also play an important role in addressing grid reliability and high fuel prices. Regional electricity prices closely track natural gas prices, thus escalating natural gas prices and pipeline constraints affect both electric and natural gas customers. Energy efficiency is a resource that can be quickly deployed to reduce system price and reliability challenges, and can be targeted to specific geographic areas to defer expensive system upgrades and lessen seasonal peaks.

[1] http://www.env-ne.org/resources/open/p/id/964

Figure 1. Massachusetts Electric Energy Savings Targets[2]

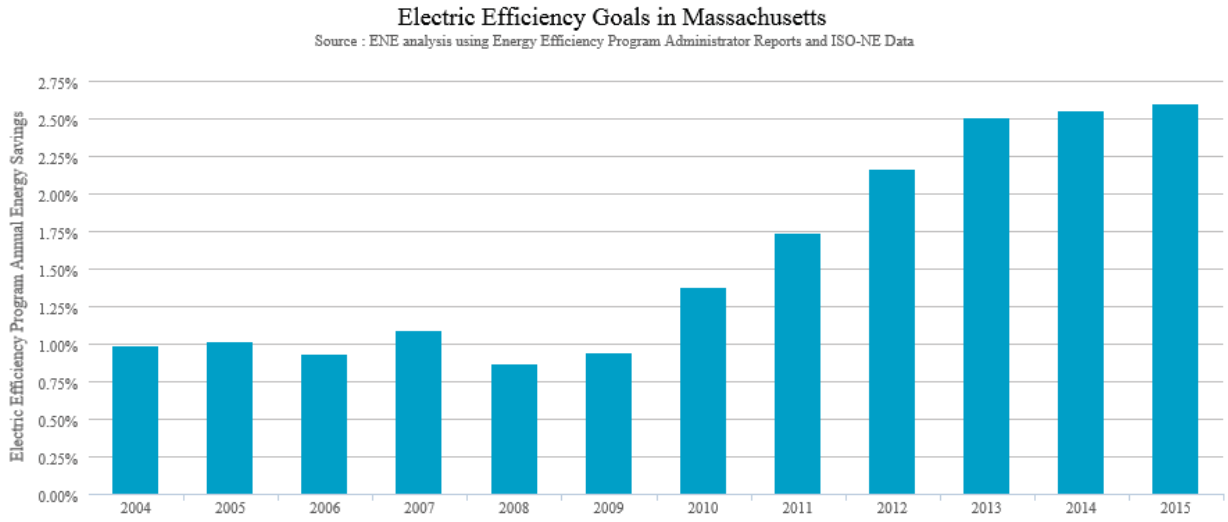
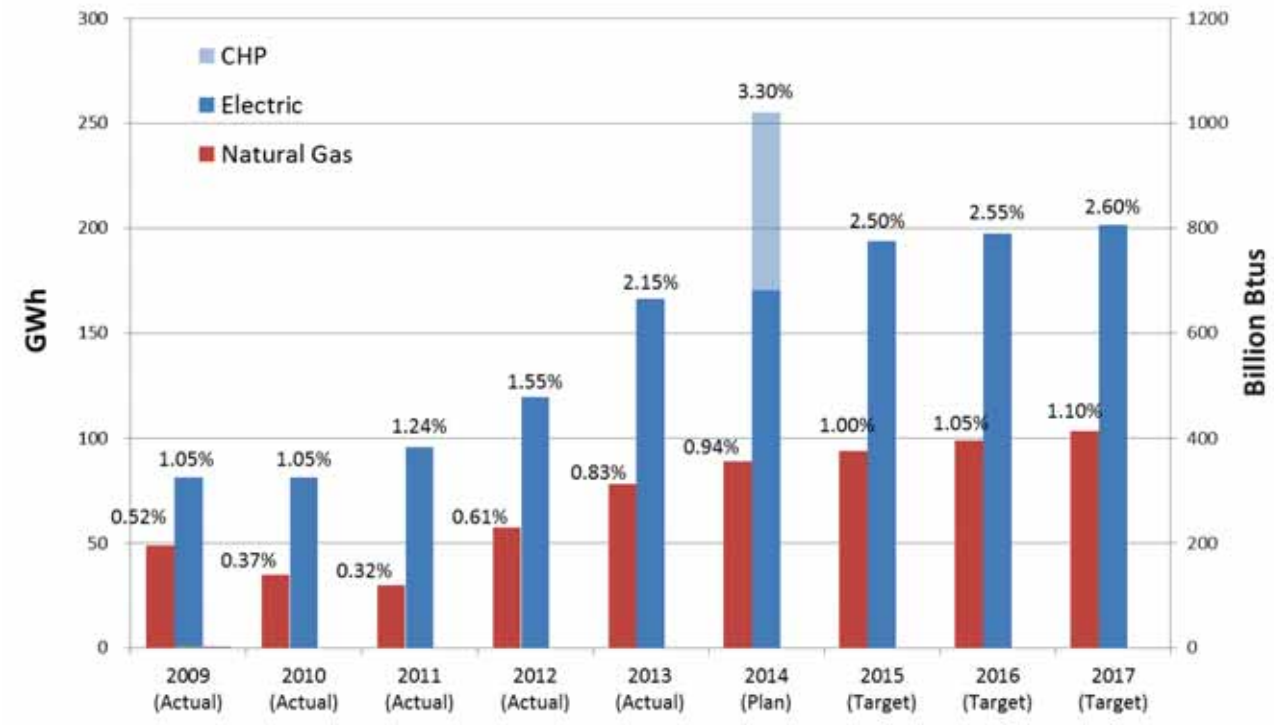


Figure 2. Rhode Island Electric, Natural Gas, and CHP Energy Savings Targets[3]



[2] http://eneclimatevision.org/policy-successes/energy-efficiency-investments

[3] "2015-2017 Savings Targets Recommendations" presentation by the Rhode Island Energy Efficiency & Resource Management Council, Rhode Island Public Utilities Commission Technical Session, February 25, 2014.

Financing mechanisms should not be considered standalone alternatives to comprehensive energy efficiency programming. Property Assessed Clean Energy (PACE) funding, revolving loan programs, and other financing vehicles are a complementary element of comprehensive energy efficiency programs. Financing alone will not capture all cost-effective energy efficiency, and will not deliver the same results as well-designed energy efficiency programs.

ENE recommends establishing a stakeholder council to oversee and guide the development of statewide energy savings targets, and ensure the program administrators are pursuing all cost-effective energy efficiency that is cheaper than supply. The stakeholder council would not diminish the authority of the PUC, but would rather serve as an advisory body throughout the planning and implementation phases. The stakeholder council would include key parties who are engaged in energy policy in the state. Ideally, council decisions would be consensus-based and informed by objective analysis. Three states at the top of the American Council for an Energy-Efficient Economy's *2013 State Energy Efficiency Scorecard* – Massachusetts (#1), Connecticut (#5), and Rhode Island (#6) – have efficiency stakeholder councils in place.

New Hampshire should explore revenue decoupling mechanisms that eliminate the utilities' financial incentive to promote electric and gas sales, to make them stronger allies in promoting efficiency.

New Hampshire should adopt the most recent edition of the International Energy Conservation Code (IECC) for residential and commercial buildings. In addition, ENE recommends a legislative requirement to adopt each new IECC edition within one year of its publication. Updated on a three-year cycle, each new edition of the IECC builds upon the efficiency requirements of the prior version. The 2012 IECC is approximately 30% more efficient than the 2006 IECC edition. The 2015 IECC raises efficiency requirements by 45-50% over the 2006 IECC.[4]

Extending and Expanding Support for Renewable Energy

Cleaning up New Hampshire's energy supply will reduce greenhouse gas emissions, improve the stability and sustainability of the current energy system, and promote jobs and economic development in the state and region. Supporting both grid scale and distributed renewable energy through incentives and policies will reduce air and water pollution and enhance price stability by reducing exposure to volatile fossil fuel prices.

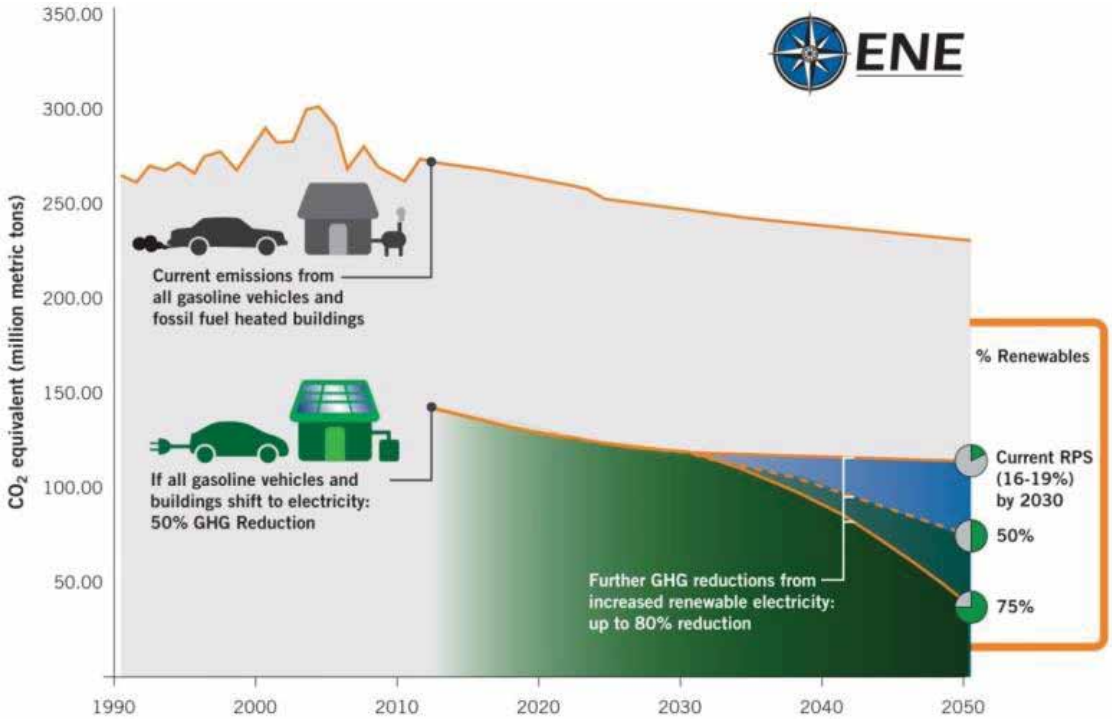
New Hampshire's existing renewable portfolio standard (RPS) should be extended and expanded from current requirements in order to provide financial support for sustainable, low-carbon power sources that can help the state meet climate targets while promoting economic growth. In order to provide clarity to investors, RPS targets should be increased to at least 75% renewable energy by 2050, with potential revisions to 2025 and other interim targets to support the 2050 goal.

Advanced consumer technologies that are increasingly available to provide heat and transport to New Hampshire citizens will increase the state's reliance on electricity to meet a growing share of its energy needs. Electric vehicles operate at greater efficiency and lower cost than gasoline-powered vehicles, and produce fewer GHG emissions. Air sourced heat pumps are capable of heating and cooling buildings at lower cost to consumers and the climate. While electrification in and of itself will help reduce GHG emissions from the heat and transport sector, supplying a greater percent of New Hampshire's electricity from clean generation sources will be needed to meet greenhouse gas (GHG) reduction goals. If

[4] U.S. Department of Energy, Energy Efficiency & Renewable Energy, Building Technologies Program. "Building Energy Codes – IECC 2012 and Beyond." http://apps1.eere.energy.gov/buildings/publications/pdfs/corporate/ns/webinar_residential_energycodes_20110222.pdf

renewable thermal technologies are supported through the RPS, heat pumps should also be allowed to generate credits. Realizing the full GHG reduction benefit of electric vehicles and heat pumps will require that electricity supply come from clean power sources. If 75% of electricity supply is provided by renewables, GHG emissions from cars and buildings in the region would drop by 80% (see Figure 3) and help the state meet its GHG reduction goals.

Figure 3: GHG Emissions Benefit Achieved by Supplying Renewable Power to Electric Vehicles and Heat Pumps



Economy-wide Carbon Pricing

A market-based mechanism that puts a price on carbon will spur innovation and drive a cost-effective transition to a more sustainable, low-emissions future. New Hampshire should build on the successful Regional Greenhouse Gas Initiative (RGGI) to extend carbon pricing across the state economy in order to capture least-cost emissions reductions and support the transition to a sustainable energy system.

Market-based environmental programs achieve outcomes at lowest cost by leading businesses and consumers to account for the societal cost impacts and adjust behavior accordingly. Under RGGI, emissions across the region have dropped significantly since the program was launched, even as electricity prices dropped (coming down by 8% from before the program launched in 2008 to 2012[5]). Extending RGGI beyond the power sector or establishing a carbon tax in other sectors of the economy would create incentives to reduce emissions, while at the same time raising revenue for the state to cut taxes or invest in additional emissions reductions.

Markets are able to react quickly and can deliver reductions in pollution cost-effectively. If revenue from carbon pricing is returned to consumers or invested in energy efficiency, carbon pricing can also

[5] See ENE Emissions Trends Report at: http://www.env-ne.org/public/resources/ENE_RGGI_Past__Future_121210.pdf

promote economic growth – particularly in states like New Hampshire that do not produce fossil fuels. For example, since establishing a revenue-neutral carbon tax in 2008 British Columbia's consumption of fossil fuels has dropped faster than the rest of Canada, without damaging the Provincial economy. British Columbia was also able to reduce income taxes to the lowest level in Canada,[6] though revenue could also be used to lower sales taxes or other taxes. Investing carbon revenue in energy efficiency could create even greater benefits, as consumer savings on energy bills are reinvested in the local economy. Independent analysis found that New Hampshire's investment of RGGI revenue in energy efficiency over the program's first 2.5 years of operations will generate $17 million in net benefits over ten years.[7]

Reforming the Electric Grid

The transmission and distribution (T&D) planning and investment policies that exist today in New England were developed in a different era, when large fossil-fueled power plants were constructed to energize the region's population centers. Electric T&D planning and cost allocation has not kept pace with changes in energy technologies and environmental and consumer goals. While the New England states have set aggressive targets for meeting our energy needs with demand-side resources- including energy efficiency, demand response, distributed generation, and combined heat and power- the outdated processes used to determine new grid investments are barriers to pursuing and integrating clean energy resources. Realizing the potential of new technologies, strategies and tools that help consumers control energy use, such as time-varying rates and advanced meters, and technologies that help the utility manage the grid system, such as energy storage and clean distributed generation, will require a new way of thinking about the grid. The goal is to transform the grid from a centralized network run by the electricity producers, distributors, and system operators to a more decentralized consumer interactive network. A smarter system would be better able to take advantage of energy efficiency, clean distributed resources, and energy storage (including electric vehicles) to meet our energy needs. The challenge is to construct a system that facilitates development of new clean heat and power sources, energy efficiency, and electric vehicles through policy and planning reform at the state and regional levels to maximize consumer value and environmental benefit.

In ENE's vision of the modern grid system, the home and business are the centerpieces of the energy system. Consumers will have greater control over energy use within and around buildings through technologies such as rooftop solar water heating and photovoltaic systems, advanced meters that help consumers control and monitor power usage, and technologies such as smart appliances, heat pumps, and electric vehicles that can help power the home or office when not being driven. Community energy systems will also play an important role in a decentralized power grid. Energy efficiency is a "first resource" through targeted deployment that offers a cost-effective alternative to building more poles and wires to supply additional power.

The modern grid should have the following characteristics:

- Fully integrated, flexible, low carbon energy network
- Smart and dynamic electric system
- Widespread clean energy supply, distributed generation, deep energy efficiency
- Increasingly electrified buildings and vehicles
- Incorporation of new, customer-side energy resources

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[6] Based on analysis of data from Statistics Canada by Professor Steward Elgie, see: http://www.sustainableprosperity.ca/article3685

[7] Analysis Group, 2011, *The Economic Impact of the Regional Greenhouse Gas Initiative on Ten Northeast and Mid-Atlantic States,* available at: http://www.analysisgroup.com/rggi.aspx

- Consumer-centered system
- Connecting to local, distributed generation
- Incentives for off-peak consumption
- Homes and businesses as micro-utilities
- Efficient, clean technologies
- Two-way power flow for distributed generation and electric vehicles
- Rates that incentivize energy efficiency, conservation, load shifting
- Infrastructure that supports energy efficiency, DG, storage, vehicles
- Energy efficiency, DG, EVs, etc. utilized as grid resources

Existing regulatory policies for grid planning and financing risk perpetuating the status quo. To achieve this future, existing policies and rules at the state and regional levels need significant reform in the following areas:

Planning barriers- *current planning processes fail to include non-transmission alternatives*

- Existing T&D planning processes largely ignore the proven ability of non-transmission alternatives (i.e., energy efficiency, demand response, distributed generation, storage) that would help forestall and/or avoid construction of new transmission and distribution lines
- The existing planning process also does not account for the likely impact of new advanced electric technologies on the grid, and strategies for grid modernization that would minimize any adverse impacts.
- Planning process is reactive and primarily focused on traditional utility solutions.
- Incongruity of a regulatory model for traditional "poles & wires" solutions and market model for non-wires solutions has resulted in an un-level playing field for new technologies and resources.
- Planning mindset is focused on long-lived, predictable assets that are part of a centrally-controlled network.
- Current planning schedule is often too late for the incorporation of non-traditional solutions; however some states, such as Maine and Vermont, have taken steps to ensure that non-transmission alternatives are examined in a timely fashion.

Cost allocation barriers- *current regulatory framework creates an un-level playing field*

- Utilities and transmission companies are able to earn a higher return on equity for traditional poles & wires solutions, but non-transmission alternatives are not eligible for the same return.
- Regional rules on the cost allocation of new transmission infrastructure significantly disadvantages non-transmission alternatives because the costs of new wires are divided among the ratepayers of all of the states based on the state's contribution to the ISO-NE load, while the cost of non-transmission alternatives are spread over the ratepayers of the individual state in which the project is located.
- State regulators determine whether distribution utilities receive cost recovery and a return on equity for distribution-level system investments. The utility has the burden of proving that investments are prudent, valuable, used, and useful.
- Utilities, seeking to retain a familiar level of financial risk, will not adopt new technologies or strategies for modernizing the grid until state regulators clarify and

establish clear guidelines for determining whether utilities can recover investments in new technologies/strategies.

- Regulators point to uncertainty about costs, benefits, and risks.

ENE recommends that New Hampshire enact policies to modernize the grid that achieve the following:

1. Utilities should be provided clear incentives (e.g., revenue decoupling mechanism) to promote and prioritize energy efficiency, renewable energy, combined heat and power, and demand response strategies over traditional transmission and generation.
2. Reward utilities for taking a coordinated approach to improving the efficient use of the distribution system, including providing capacity for strategic electrification of buildings and transportation.
3. Ensure that investments in advanced metering infrastructure maximize consumer benefits from energy efficiency, distributed generation, demand response, load management and automation, and electric vehicles.
4. Reward utilities for deploying high-value, targeted non-transmission alternatives to provide capacity on the transmission and distribution network, potentially deferring or avoiding costly infrastructure upgrades.
5. Ensure that utilities support and are equipped to receive and deliver net-metered energy on a large scale, including stored power from electric vehicles. Utility planning processes must anticipate the impacts to the grid of consumer engagement with energy efficiency and distributed generation resources.

II. ENE's Thermal Sector Strategy Recommendations

Natural Gas

ENE recommends that before any natural gas expansion is considered in New Hampshire, all alternatives are explored, including installation of air source heat pumps and/or solar PV combined with efficiency. Any expansion of natural gas infrastructure should be incremental and cost-effective. Expansion of distribution should take a 'near main' approach as it reflects an efficient strategy of expanding with only low capital investment. Consideration should also be given to requiring coordination of any natural gas conversions with NH's greenhouse gas emission reduction goals and ongoing energy efficiency efforts. ENE believes that increasing natural gas usage will conflict with state goals to reduce carbon pollution.

Thermal Efficiency

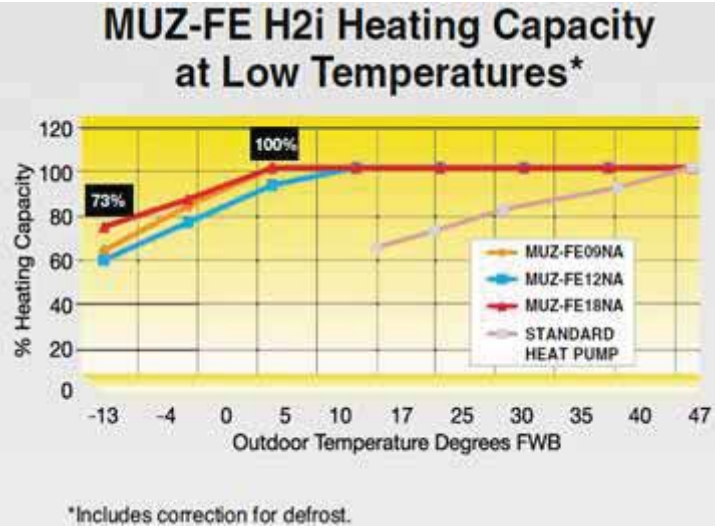
ENE supports analyzing an expanded energy efficiency future that includes heating oil and other delivered fuels, including propane and kerosene. Energy efficiency, especially improving the efficiency of the building envelope through weatherization, should be the first choice of every home owner and business since it is the least expensive option to reduce home heating bills, and avoids the need to purchase imported, carbon-emitting fuels. Considerable environmental and macroeconomic benefits will accrue to New Hampshire and its residents and businesses by giving comprehensive, all-fuels energy efficiency top policy priority.

ENE recommends designing incentives and rebates to support adoption of energy efficiency improvements to both heating equipment, the building envelope and clean heating technologies such as air source heat pumps to overcome the barrier of upfront cost of weatherization, equipment upgrades, and replacing existing heating systems.

Renewable Thermal

New Hampshire's support for renewable thermal technologies through the RPS creates an important incentive for the adoption of technologies that can reduce energy costs and greenhouse gas emissions, and air source heat pumps designed for cold climates should be included with other technologies eligible to generate credit under the RPS. Heat pumps are advancing rapidly and are increasingly able to operate at extremely low temperatures in the northeast. Whereas natural gas and oil systems have a maximum potential efficiency of 100%, heat pumps are already 200% to 400% more efficient than combustion technologies – even in Northeast winters – and the efficiencies are likely to continue improving (see Figure 4 below)[8]. HPs are able to achieve this efficiency because they move heat from outside a building to inside rather than directly create it from another energy source.

Figure 4. Heating capacity for advanced heat pumps



Cold climate air source heat pumps (ccASHPs) are furthermore capable of being installed in buildings at fairly low costs, and are more widely applicable than some other renewable thermal technologies. Specifically, ccASHPs do not require the land or vertical drilling of ground source heat pumps, and can thus be installed at lower cost. Additionally, ccASHPs are ductless and require no modifications to existing oil, gas, or propone heating systems, but can significantly offset use of these more expensive heating fuels.

III. ENE's Transportation Sector Strategy Recommendations

The current transportation system is unsustainable. The transportation sector is the second largest source of U.S. GHG emissions, responsible for 28% of emissions nationally, and nearly 40% in Northeast and Mid-Atlantic states. In New Hampshire, transportation is responsible for 41% of emissions. Additionally, the current transportation system is almost entirely dependent on gasoline and diesel,

[8] Available at: http://www.mitsubishipro.com/media/382145/m-series_revised_july13.pdf

resulting in a transfer of wealth from New Hampshire to other regions and countries. Electrifying the transport sector will also save drivers money. At recent electricity and gasoline prices, the fuel costs of a battery-electric vehicle like the Nissan Leaf are approximately 65 percent lower than the fuel costs of a conventional medium sedan.[9] Shifting a greater portion of driving to electric vehicles will reduce our total expenditure on transportation fuels and slow the flow of wealth out of the state.

The suite of policies and actions outlined below can begin the process of bringing additional choice to consumers and speeding the transition off of petroleum-based fuels.

Establish 2025 Target for Electric Vehicles

Electric vehicles (EVs) provide significant reductions in greenhouse gas emissions compared to existing vehicles on the road. Replacing only ten percent of the 600,000 conventional automobiles in New Hampshire with electric vehicles could reduce New Hampshire's greenhouse gas emissions by nearly a quarter of a million tons with the current electricity mix.[10] As we continue to clean our electric sector over the coming decades, the greenhouse gas benefits of electric vehicles will increase and can represent a substantial percentage of the proportional reductions from the transportation sector.

Provide Consumer Incentives to Accelerate EV Adoption

Electric vehicles purchased in or after 2010 may be eligible for a federal income tax credit of up to $7,500.[11] New Hampshire should capitalize on this by further reducing costs to encourage electric vehicle adoption. Other states, such as Massachusetts and California, have enacted financial incentives for EV buyers that could serve as models. New Hampshire should:

1. Establish a long-term rebate program for qualified electric vehicles, with a framework for determining rebate levels as battery costs change over time.
2. Exempt charging equipment and relevant electric vehicle parts from the state excise tax.

Regulatory Framework to Maximize Benefits of EV Adoption

Public utilities commissions need to make structural reforms to ensure that electric vehicles are integrated into the electric system in a manner that enhances system reliability, minimizes costs, and protects consumers.

1. Establish and publicize mechanisms to incentivize EV owners to charge vehicles during low-cost off-peak periods. These mechanisms may include, but not be limited to, time-varying electricity rates.
2. Adopt rules that encourage utilities to support the integration of electric vehicles into the electric grid to increase asset utilization, load management, and energy storage.
3. Integrate electric vehicles into short and long term distribution-level system planning and load forecasting. Provide for reporting of EV charging station location and capacity and direct the registry of motor vehicles to share EV registrations with the electric distribution utilities.

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[9] ENE analysis assumes gasoline price of $3.63 per gallon of gasoline and $0.15 per kWh of electricity. The conventional vehicle fuel efficiency (miles per gallon) and electric efficiency (kWh/100 miles) from U.S. DOE. Fuel efficiency of the "medium sedan" category is the average of MY 2012 Chevrolet Impala, Ford Fusion, Honda Accord, Nissan Altima, and Toyota Camry. Available from: http://www.fueleconomy.gov/.

[10] Based upon reductions per vehicle shown in Chart 2.

[11] The Internal Revenue Service maintains an index of qualified electric drive motor vehicles eligible for the federal tax credit. Available from: http://www.irs.gov/Businesses/Qualified-Vehicles-Acquired-after-12-31-2009

4. Require electric utilities to provide consumer education on electric vehicle charging rates and costs of residential charging infrastructure installation.

Facilitate Build-out of EV Charging Infrastructure

A significant build-out of electric charging infrastructure is needed to support widespread electric vehicle adoption. New Hampshire can facilitate deployment by providing guidance and standards for infrastructure site selection and integration of charging infrastructure into the built environment:

1. Establish targets for charging infrastructure to accommodate the electric vehicle target.
2. Develop statewide guidelines for public electric vehicle charging stations that inform technical design and optimal site selection to serve diverse consumer groups.
3. Clarify that 1) non-utilities are allowed to own and operate EV charging stations, and 2) all owners of EV charging stations will be able to purchase electricity on fair terms.[12]
4. Make charging costs easily visible in a format understandable to consumers and prohibit member-only public charging stations.
5. Require state and local building code officials to implement standards related to electric vehicle charging and provide expedited inspection of home charging infrastructure.
6. Recommend standardized signage for use by cities and towns to identify EV parking and charging locations.

Lead by Example

New Hampshire can accelerate transportation electrification and prime the market for vehicles and infrastructure by committing to electric vehicle usage and providing guidance and incentives for municipalities.

1. Establish a yearly minimum percentage of electric vehicles for state fleet purchases and increase the percent of vehicles that must be zero emissions over time.
2. Develop model RFPs or procurement standards for vehicle and charging equipment by state agencies and municipalities.[13]

[12] Retail rate structures should be designed to avoid discriminating against electric vehicle charging stations. Charging station owners should be able to act as a supplier of generation services but must be subject to the same requirements, such as renewable portfolio standards, as other entities providing electric energy from the wholesale markets.
[13] Rhode Island recently added the all-electric Ford Focus, Nissan Leaf, and Honda Fit to its list of eligible alternative fuel vehicles. Plug-in gas-electric models include the Chevrolet Volt, Ford C-Max, Toyota Prius Hatchback, and Ford Fusion. For additional information, see: https://www.purchasing.ri.gov/RIVIP/StateAgencyBids/7458316.pdf.

ENE appreciates the opportunity to provide comments on policy recommendations and looks forward to continuing discussions on these and other matters at the Energy Advisory Council.

Thank you.

Respectfully submitted,

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ENE is a nonprofit organization that researches and advocates innovative policies that tackle our environmental challenges while promoting sustainable economic development. ENE is at the forefront of state and regional efforts to combat global warming with solutions that promote clean energy, clean air and healthy forests.

NH CleanTech Council
Comments on initial Gap Analysis and Energy Efficiency Policy Options
April 7th, 2014

The NH CleanTech Council supports policy options that align with the following principles:

- Open and Competitive Markets
- Wealth Retention/Economic Development
- Innovation/Creativity
- Job Creation & Retention/Community Integration

As indicated in the gap analysis presented on March 28, 2014, there are tremendous savings opportunities in residential and commercial thermal and electric efficiency: these savings provide significant local economic benefits and reduce the amount of energy dollars that would otherwise leave the state each year. We support the following strategic opportunities to support increased savings in efficiency:

1. Leveraging and enabling private investment in clean technologies and renewable energy development projects. Whether it be at the customer level, making loans for energy projects as simple as possible, or at the investment level through the securitization of clean energy-based assets, private financing needs to be mainstreamed in order to realize nearly all facets of the vision.
    a. Advancing commercial PACE, through the measures included in HB 532, which include removing the project cap (in dollars) and clarifying the lien position of the bank for debt
    b. Expanding loan programs, private finance vehicles such as REITs, MLPs, and yieldcos, as well as other opportunities seen in other states using public-private banking models.

2. Consistent public goals and programming that advances market transformation and responds dynamically to a changing landscape, through:
    a. Energy Efficiency Resource Standard (EERS): Numerous studies point to a net economic gain to NH if it enacts and pursues a cost-effective energy efficiency resource standard (2013 GDS/VEIC report, NEEP 2014 report, 2011 NH Energy Policy Issues Report)
    b. Enhancing CORE Energy Efficiency programming, housed either through utilities or with a third party entity.
    c. Expanding new business models for energy efficiency delivery, including performance contracting

3. New utility business models and rate re-design.
    a. New utility business models that align ratepayer, policy, and shareholder interests must be pursued in order to realize NH's energy vision.
    b. Peak, Time-of-Use, stand-by, and other rates needs to be modified and/or expanded to reflect goals that are reach well-beyond traditional utility rate recovery.

In terms of policy options for energy efficiency, there are additional options that have not been presented, which we offer for consideration and inclusion in the strategy:

- Thermal (unregulated fuels) Systems Benefit Charge. A thermal SBC that can be returned to ratepayers in the forms of fuel conversion incentives and efficiency investments would better serve to stabilize consumer costs and incent the biomass, solar, and geo-thermal conversion. Equality in the thermal and electric sectors is an important component toward creating open and competitive fuel markets. Currently, the SBC is only levied on electric and natural gas ratepayers. The CTC recognizes the politically unripe nature of this option, but nonetheless include it here based upon its merit as sound policy and ability to improve the rate of wealth retention in NH.
- Regulatory reform: need to address the PUC-regulated CORE process and reform it to decrease adjudicative burden, modify performance incentive structures to be more market transformation focused, and provide policy/regulatory stability to encourage sustainable and increase levels of market investment while assuring ability to be market responsive and dynamic.
- Energy Code Adoptions and Compliance support: Require adopt of IECC (and related) building energy codes at a minimum 6 year cycle, with enabling legislation to encourage municipalities to adopt new codes on short, 3-year cycle. Require state facilities to adopt/utilize appropriate energy codes on 3-year cycle (lead-by-example).

SOCIETY FOR THE PROTECTION OF NEW HAMPSHIRE FORESTS
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Dear Meredith,

The Society for the Protection of New Hampshire Forests is pleased to be able to participate in the process of helping the Energy Strategy Council develop a new Energy Strategy for the State of New Hampshire.

The senior staff at the Forest Society and I have reviewed the current draft of the "New Hampshire Straw-man Energy Vision for 2025" and we fully support it as drafted. We believe that the path to a more economically and environmentally healthy energy landscape in our state is highly dependent on first using all energy in the most efficient and effective manner possible, and then gradually replacing fossil fuels with appropriately designed and sited renewable energy technology. Some of these technologies are already available, some are in development and some we cannot foresee at this time, but will appear on the horizon within the timeframe of the Energy Strategy.

We specifically note that much of what is envisioned in the Energy Vision closely parallels the climate action plan adopted in 2009 by a citizens panel appointed by former Governor John Lynch. Initiatives proposed in the CAP will be a major part of the achievement of the Energy Vision, and we urge the Council to recommit the State to the CAP's recommendations and develop policies that will result in their implementation.

Beyond the vision, the Forest Society has some specific concerns and proposals that we hope the Council will consider as it continues its work. These are:

1) All New Hampshire businesses and residents benefit from taking actions to conserve energy and reduce expenditures through efficiency improvements. These capital investments in buildings, industrial processes, lighting, and other uses of energy not only reduce current costs for fossil fuels, but allow for future investments in renewable technologies to be more cost effective because the size and cost of such technologies are lower.

The Forest Society's Conservation Center in Concord is a concrete example of the benefits of creating highly efficient buildings that can then rely on renewable resources for heat. Originally built in 1980 with energy innovation grant assistance from DOE, the Conservation Center now has three sections that demonstrate highly efficient design and the use of both passive solar and biomass heating. A small 5KW photovoltaic system has been demonstrated for more than a decade. The net result is a building that uses 60% less energy than a comparable conventional building of the same size. The

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cost of construction was comparable to conventional construction, and the consensus of the occupants is that it is both comfortable and beautiful to work in.

It is clear to us that among the keys to both building and retrofitting New Hampshire buildings are not just in using state of the art technology. Proper siting, so that buildings can take advantage of passive solar gains can substantially reduce net heating costs. State policy should consider ways to encourage municipal planning agencies and boards to provide guidance to developers on how to plan development to allow for new buildings to effectively use passive solar design. The costs are minimal and the payback is immediate and substantial over time. The good news is that many New Hampshire builders are already responding to marketplace interest in such cost saving designs. Further, rules and regulations at many levels should be examined to determine if they either discourage or encourage building renovations that take advantage of passive solar design. Such design is not technologically complex. In essence, it simply requires that windows be incorporated properly into south facing walls and steps taken to include heat storage materials into interior spaces. It's not rocket science.

2) New Hampshire is blessed as the second most forested state at 84%. There are two key points that should be made about this. First, we have an enormous wood resource that already generates approximately 2.8 million tons of forest products annually. The forests grow approximately 6.58 million tons of new biomass annually, and while a substantial portion of this is unlikely to be available for harvest, it has been estimated by recent studies that at least another 500,000 tons of wood could be sustainably harvested annually for biomass energy.

The Forest Society agrees with the premise that the most efficient way to use this fuel is for thermal and combined heat and power purposes. Low-grade wood comprises about 60% of New Hampshire's standing timber. While we have strongly endorsed the development of the wood to electricity plants that are in place, it is clear that the most beneficial use of low-grade wood in the future is for heating. First, because it is a local resource that can be used directly in round-wood heating units (stoves and boilers) and readily converted into pellets for using modern highly efficient residential, commercial and district heating systems. Second, studies we have reviewed indicate that the local economic benefits of using wood for thermal purposes far outweigh that of simply burning it at low efficiencies in power plants where the heat is wasted.

We concur with others that it would be possible to reduce residential heating oil use by as much as 50% if 500,000 tons of low grade wood could be used for heating.

Of course, a key to the sustainability of this approach is responsible forest management. The Forest Society, NH Timberland Owners Association, DRED and others have long advocated for thoughtful and sustainable forest management. Removal of low grade wood is one of the key tools in the forester's tool box for both producing fuel wood and simultaneously improving the quality of residual forest stands for future harvest of saw timber and other high value wood products. With strong markets for biomass fuel, we believe there is a strong incentive for better forest management.

However, there is a need for experts, perhaps convened under the guidance of the Division of Forests and Lands (DRED) to optimize the use of wood for fuel while simultaneously promoting good forestry practices. The forestry community of New Hampshire has consistently favored violuntary forest management practices as evidenced in the publication *Good Forestry in the Granite State*, and we continue to endorse this. We would encourage the examination of potential economic incentives for good forestry associated with harvesting for wood energy.

3) Careful siting of new energy facilities is essential. New Hampshire's second largest "industry" is now, and for decades has been tourism. A 1999 study done for the Forest Society by Resource Systems Group entitled the "Economic Impact of Open Space in New Hampshire" showed that over 25% of economic activity in the state is related to open space and uses of open space. This amounted to $8.2 billion/year in 1999 dollars. Studies by many others have ranked New Hampshire high or highest in the nation in "quality of life" in part because of our clean air, water, recreational opportunities and scenic rural landscapes.

   While the transition to renewable energy technologies is critical, it is also essential that the development respect the underlying values of our natural resources both for productive uses and their attractive characteristics to tourists and residents alike. In short, there are good and bad places to site new energy facilities such as overhead transmission lines, wind farms, hydro-electric plants, biomass plants, and even large scale solar arrays. The Forest Society encourages the Council to acknowledge this reality and actively encourage policies and procedures that make sure sound decisions are made on the siting of new, especially large scale energy facilities. We want these resources to be used, but in ways that do not undermine the other benefits of our cherished and coveted natural landscapes.

Thank you for the opportunity to offer these comments. We look forward to further opportunities to engage through the public stakeholder activities of Navigant, and through our attendance at Council meetings.

Sincerely,

Paul A. Doscher
Senior Advisor

NEW HAMPSHIRE LEGAL ASSISTANCE

Working for Equal Justice Since 1971

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April 30, 2014

Via Email to: brandy.chambers@nh.gov; meredith.hatfield@nh.gov

Meredith A. Hatfield
Director, NH Office of Energy and Planning
Governor Hugh J. Gallen State Office Park
Johnson Hall 107 Pleasant Street
Concord, NH 03301

RE: NHLA and The Way Home Comments on State Energy Plan

Dear Director Hatfield, and Members of the State Energy Advisory Council:

Please accept and consider these comments on behalf of the New Hampshire Legal Assistance (NHLA) and The Way Home.

NHLA is a statewide non-profit law firm. Our attorneys and paralegals represent low-income and elderly clients in civil cases impacting basic needs, such as housing, food, veterans benefits, safety from domestic violence, access to basic utilities, healthcare and unemployment insurance. NHLA routinely represents the The Way Home before the New Hampshire Public Utilities Commission and the Legislature on low-income energy efficiency related matters.

The Way Home is a non-profit dedicated to helping low-income households obtain and sustain safe, affordable housing throughout the state of New Hampshire. Since 1988, The Way Home has assisted more than 20,000 homeless and high risk families, individuals, veterans and special needs clients with their housing needs.

I. The Low-Income Energy Efficiency Need:

In 2012, there were an estimated 89,000 low-income homes in New Hampshire that have yet to participate in the low-income energy efficiency program in New Hampshire. *See* EESE Board Synthesis of VEIC Report on Low-Income Energy Efficiency, Nov. 30, 2012, p. 6. There is a long waiting list across the state for these services.

Low-income households are unable to do this on their own, many are working poor, or on fixed incomes, including some who are seniors, and they face the persistent market barrier to participation in energy efficiency because of lack of disposable/up-front

income. Moreover, on-bill and other financing mechanisms have not traditionally been a viable option for low-income households. Low-income households need financing to support the Home Energy Assistance (HEA) program of CORE/NH Saves, which works in conjunction with the federal Weatherization Assistance Program, in order to help support the reduction of low-income energy burdens.

II. The Low-Income Energy Efficiency Benefits:

The reduction in energy burden for low-income households is not the only benefit of the low-income energy efficiency program. There are significant nonenergy savings resulting from the low-income energy efficiency program, including reduced disconnections, increased housing affordability, lower reliance on municipal welfare assistance, and a significant increase in economic benefits of sustaining the weatherization workforce as well as increased economic activity and spending resulting from reduced bills. *See e.g.* VEIC Independent Study of Energy Policy Issues, Final Report; 2012, p. 6-1; *see also* Nonenergy Benefits From the Weatherization Assistance Program: A Summary of Findings from the Recent Literature, Oakridge National Laboratory; 2002, pp. 20-23; see also New Hampshire Energy Efficiency Working Group Report, Docket No. DR 96-150; July 6, 1999, pp. A42-A51. Money from energy savings of low-income homes is not put in savings account; it is spent on much needed necessities for low-income families – like rent, medicine, personal maintenance, and food – and much of it is spent right here in the local economy.

III. NHLA and The Way Home Suggestions for the State Energy Plan:

NHLA and The Way Home provide the following suggestions for consideration for inclusion in the State Energy Plan:

1.) *Expand Upon Existing CORE/NH Saves Energy Efficiency Programs*: The CORE/NH Saves energy efficiency programs are award winning, highly successful and highly effective, including the low-income HEA program. NHLA and The Way Home suggest that the State Energy Plan include a recommendation that: a.) The New Hampshire Public Utilities Commission increase funding through the systems-benefits charge to support all CORE/NH Saves programs, and b.) The New Hampshire Legislature increase funding for CORE/NH Saves by increasing the amount from the Regional Greenhouse Gas Initiative that is provided to support all CORE/NH Saves programs. NHLA and The Way Home recommend an "all programs" approach as an equitable way to increase funding to all sectors, including the HEA program.
2.) *Form a Study Commission to Consider the Development and Deployment of an CORE/NH Saves Model to "All-Fuels":* While the HEA program is largely fuel neutral, there are still tens of thousands of low-income households, and many more middle income households who heat with heating oil, kerosene and/or propane who are not likely to be reached by the existing programs. NHLA and The Way Home suggest the State Energy Plan include a

recommendation to create a study commission with relevant stakeholders in order to evaluate whether or not a CORE/NH Saves model can be developed – where the private sector energy suppliers help provide the programs and also receive benefits/incentives. This could include a small per unit usage charge that supports energy efficiency programs for all sectors, including low-income households, as well as supporting a supplemental low-income fuel assistance program. Ongoing cuts in the federal Low Income Home Energy Assistance Program (LIHEAP) program call for a State Energy Plan that considers state-based solutions to helping low-income Granite Staters make it through the winter, including many seniors on fixed incomes. An all fuels approach is a state-based solution which should be considered.

3.) *Set a Goal for Low-Income Homes*: With over 80,000 low-income homes yet to receive energy efficiency services, NHLA and The Way Home suggest the State Energy Plan include a goal of addressing this need by covering 30,000 low-income homes over the next ten (10) years, or 3,000 per year. This is over one-third of the low-income housing stock remaining that need services. An increase in funding would be needed in order to meet this goal.

NHLA and The Way Home sincerely appreciate all your time on this. Thank you for considering these comments as you work on completing this important task.

Respectfully submitted,

Daniel Feltes
Director, Housing Justice Project

cc: Dianne Pitts, The Way Home

I've been following the SB-191 process as well as other energy issues and developments throughout New England. Energy Secretary Moniz being in RI and CT tomorrow is terrific. The QER team asked for comments from the public for tomorrow's two state work sessions. Perhaps the note here to QER is also relevant {I believe it is} to the SB-191 scope. Thanks for considering it.

Sincerely,
Larry Goodman, Hebron, NH
April 20, 2014

Dear QER Review Task Force & DOE Analysis Team:

My name is Larry Goodman. I am a resident of Hebron NH and I am very aware of the significant energy issues facing New England. First of all, thank you for this well timed and necessary conference. The points raised in your 11 page "energy constraints" document are basically identical to the points raised by ISO-NE in their comprehensive January, 17th 2014 letter to Secretary Bose of FERC.

Clearly the issues of reliability, affordability and the ability to perform during scarcity conditions are critical to NE'S energy future. As ISO-NE's document to FERC stated: "a structural bias in the FCM to clear less reliable resources is eroding reliability over time." I am particularly concerned with non-dispatchable "renewable" generation sources that require huge transmission resources and are unable to ever replace baseload power generation anywhere in the IS0-NE footprint.

You are undoubtedly very familiar with the New England Wind Integration Study { NEWIS }. As you know this very comprehensive document looked at wind's potential role in New England and it was authored by three companies directly involved, financially, with industrial scale wind.

Now that both you and ISO-NE have focused on performance metrics as they impact dispatchable and predictable reliability, allow me to highlight the following from the NEWIS:
"The capacity value of wind is dominated by the wind performance during just a few **hours** of the **year** when load demand is high."
"Wind delivers minimum production in peak load months."
"No conventional generation is eliminated as wind is added."

And, since natural gas is clearly the baseload source that NE relies on most, please consider the following:
"Although displacement of fossil fuel generation might be one of the objectives of regional energy policies, a consequence is that it { wind } may **radically** change the market economics for all resources on the system **but especially for the natural gas fired resources that are displaced."**
"Capacity prices from these {gas} plants will likely need to increase if they are to remain economically viable. Higher onpeak/offpeak price differential is created."
The impact of more emphasis on a non-dispatchable "renewable" that can only displace gas, not coal or oil in NE, is expected to result in higher prices for gas and/or gas plant closings. {NEWIS}

You know better than I do obviously that we can't afford higher prices or to lose any natural gas capacity. ISO-NE's letter to FERC was clear in its purpose and intent. There are plenty of renewable options in New England that can deliver dispatchable baseload power.

"Increased wind generation will displace {minimally} other supply side resources {gas} and **reduce** the flexibility of the dispatchable generation mix."

This is exactly what we don't need in New England! Wind is, apparently, the most expensive and least effective way to reduce carbon in New England. There are more effective and efficient renewable options that can deliver during scarcity conditions and do not play havoc with the reliability and affordability of the Grid. Industrial scale wind in NE is a dinosaur. Please do not allow it to continue to receive preferential treatment at the expense of the ratepayers in NE and at the expense of the safety and reliability of the grid itself.

I attended the NH Local Energy Conference two weeks ago. One of the topics we talked about in a round table discussion was teaching energy efficiency / energy conservation in our schools. Since the early 90's we have been teaching our children about the benefits of recycling. I dare say that it may be second nature to them now. I believe that we should, rather need, to teach our children about energy efficiency.

As a member of our Stratham Energy Commission, I am sure if we approached our local school about an opportunity to talk to the kids, they would probably accommodate and arrange a time. And that would be somewhat helpful, but we need more than that. We need it to be a part of the school curriculum. And that would not be easy for us, as committee volunteers, to accomplish. However, if the State took this on as a goal, then maybe each SAU in the State would have to consider incorporating energy efficiency into their curriculum. In my opinion, using this approach to implement this instruction for our youth, will help NH achieve our energy goals. In fact, I think it is imperative that we teach them how important energy is.

Thank you for your consideration of this issue,
John C. Dold
Chair, Stratham Energy Commission

Thank you for the opportunity to provide public input into the SB-191 process.
The four topics below are the ones I'd like to provide input on. After having spent, literally, hundreds of hours self-educating on these topics, I hope you will consider them as fully as I have researched them:

I. Grid Safety & Reliability
II. Economic & Logistical Considerations by Generation Source
III. Navigant Model
IV. Considerations Unique to NH
==========
I. Grid Safety & Reliability
*Non-dispatchable generation capacity should correlate with load/demand seasonally and by time of day.
*Payments in the capacity market should be linked to performance in scarcity conditions.
*Any non-dispatchable source that "displaces" a dispatchable base load generation source should do so with no negative grid or pricing impact.
*"Generation resources should not be paid for simply existing." ISO-NE January 2014

*Renewable generation must demonstrate capacity performance during scarcity conditions and during peak load periods.

II. Economic & Logistical Considerations by Generation Source

*Generation resources can be/should be close to load centers for efficient delivery and to minimize transmission costs.

* Any non-dispatchable source that "displaces" a dispatchable generation source should do so with no negative pricing impact on the base load generation source it "displaces."

*The cost of spinning reserves should be factored into the cost for any nondispatchable {intermittent} source.

* Any intermittent source that contributes to over capacity/negative pricing by providing a surplus of power when power is least needed, should cover the cost for negative pricing.

*As ISO-NE told FERC in writing: "The current Forward Capacity Market is contrary to sound market design." NH residents should not continue to pay for the inefficiencies inherent in rewarding non dispatchable generation sources that do not and can not correlate with load/demand.

III. Navigant Model

*Of course electrons are electrons once they are on the grid and a mix of different generation sources will, at any given point in time, contribute to that electron mix in varying percentages, so a "blended" model is of some very broad use.

*However, each distinct generation source should be evaluated individually to include the following metrics:

-Basic PPA cost{s}
-Transmission costs unique to a particular source/ or plant
-Spinning Reserve cost{s} for non-dispatchable sources
-Generation source ability to correlate with load.
-Likelihood of negative pricing issues with a particular source
-Cost to reduce a metric ton of carbon relative to other options
-Ability to replace not "displace" coal.
-Total cost{s} associated with a generation source

*Please provide NH residents with as much metric driven granularity as possible by each generation source to include: dispatchable/non-dispatchable and renewable/ non-reneweable.

IV. Considerations Unique to NH

*Please continue to consider:

-Our tourism based economy
-The health and safety of our residents
-Our status as a net exporter of electricity
-The apparent willful decision by other states to ask us to site energy facilities they could easily site. {MA has 79% of the identified sites for wind in NE but wants NH to "host" their wind plants.}
-That the best way to cut carbon is to use less power. Energy efficiency trumps production of energy capacity that does not correlate with load every time.
-That effective renewable generation is becoming more localized and that industrial scale renewables that don't correlate with load are both economically and environmentally ineffective and inefficient.

Sincerely,
Larry Goodman, Hebron, NH
May 1, 2014

When I tried to introduce 'Quality Characteristics' of power generation at a SB-99 meeting, I was told that subject belonged to the SB-191 State Energy Strategy. So I would like to introduce this subject prior to creation of the first draft Energy Plan.

Although several forms of generation with some quality characteristics were generally addressed during the April 21 meeting, only renewable generation was included, only a few characteristics were discussed, and we didn't prioritize these characteristics or compare them with those of conventional power generation. After much study of various forms of power generation over the past year, I believe it important for NH power generation quality characteristics to be thoroughly compared for each source, and then these power sources should be ranked based on these characteristics as follows (Most important at top of list):

Positives (Most Desirable Sources of Power Generation):

- Safe
- Reliable/Dependable
- Low cost of power generated
- Dispatchable
- Renewable
- Low fossil fuel consumption
- Low emissions
- Small footprint per MW
- Low health issues (noise, etc)
- Low visibility
- Sited close to load
- High availability/efficiency during high load periods

Negatives (Least Desirable Sources of Power Generation):

- Lower safety
- Unreliable/undependable (unpredictably intermittent)
- High cost of power generated
- Not dispatchable
- Not renewable
- High fossil fuel consumption
- High emissions
- Large area needed per MW
- Many health issues (noise, etc)
- High visibility
- Sited far from load
- Lower availability/efficiency during high load periods

Intermittent sources can improve ranking with:

- Associated energy storage 'partner' for 'balancing', reliability, dispatchability
- The intermittent source and 'partner' are then ranked as a pair for above evaluations

I'm sure more categories could be added.

In addition, I believe two more topics should be addressed:

- Conservation is far better and more cost effective than adding more sources of power.
- Siting more power generation, and transmission, in NH should require local 'host' community agreement, especially since NH already generates ~ twice the power it uses.

Joe Wilkas, Bridgewater, NH May 1, 2014

I would like to make 3 comments on the strategy; I would suggest that they recommend:

- Amending RSA 72:61-72 to allow property tax exemptions for geothermal systems.
- Making a very strong goal for energy efficiency since that is the most cost efficient approach.
- Increasing the value of solar RECs in the state since NH is far below other states in that regard, and there should be much more emphasis on solar PV in NH. NH is well suited to solar PV - much more so than Germany which has a high portion of their energy from solar, and even more than southern states since solar PV is more efficient in cooler weather.

Thank you for your consideration.
Jean Fullerton
June 4, 2014

I am not able to be there for the public comment on Thursday, but I hope that you or someone can address the absence of any mention of bicycles in the report, other than a perfunctory reference on the bottom of page 80.

The simple act of adding a bike lane every time a state road is paved would eventually lead to a much more bike friendly NH. We are woefully behind virtually every European country, where bicycling is an accepted and often utilized form of transportation. In most cases, the minimum accommodation is a painted designated bicycle lane, and more often than not, the lane is separated from traffic by physical barriers, or exists as a separate entity altogether. A more robust biking culture, with the accompanying health and fitness benefits, and reduction of automobile traffic will not develop without the appropriate infrastructure. Most highways are just too dangerous for biking.

Please include this in the NH State Energy Strategy Draft.

Thank you.
Ron Eberhardt, Plainfield, NH
June 10, 2014

I would like to add my comment to the energy strategy for New Hampshire. I strongly support the use of solar energy. The state should make more funds available to both the private and public solar instillations. Grants should be available for lower income home owners.

Thank You,
Roland Goulette
June 10, 2014

I'm a member of the Lebanon Energy Advisory Committee and very pleased to know that the state is moving forward with a more progressive energy strategy. I'd like to echo comments made by Ron Eberhardt (Plainfield Energy Committee) regarding lack of attention in the proposal to the promotion of safe bike lanes. In case you don't know about what's happening in Lebanon in that regard, you might take a look at the following site: http://mascomagreenway.com/

We're raising funds to extend the Northern Rail Trail with a 10-foot wide, 4-mile long PAVED trail which will connect Lebanon with West Lebanon, enabling commuters to use the "Greenway" as a safe alternative to driving from one part of town to the other. For me, having the state promote and support non-motorized transportation should be a key component of its energy strategy.

We are also hoping to participate in an effort to promote residential solar energy and I know full well that cost is of major concern to many folks who'd otherwise consider solar. The state rebate is critical to many people I know who are considering PV installations. I, for one, will be very disappointed if the rebate is reduced or eliminated.

Thanks to all in your office who are working on NH's energy future.
Lorraine Kelly, West Lebanon
June 19, 2014

Thank you for taking time to come north and talk with us. It was very informative. You asked for comments and feedback. The presentation was done well. I have a few comments or thoughts that hopefully will find their way in to any legislation and future planning.

#1: Be very careful when giving perks to any of the competing energy sources. Unintended consequences frequently surface that were not considered in the formation of legislation. Examples such as the bio mass plant in Berlin was given perks to inspire and encourage the industry. No one gave any thought to the adverse impact on the other existing bio mass plants in New Hampshire. They are barely keeping their head above water. An additional legislative perk was given the existing bio mass plants. The net effect is driving up the cost of energy. On the surface the Berlin project was presented as a win / win situation, jobs and needed infrastructure improvements in the Berlin area. Perks are not free, the citizens pay for them one way or other.

#2: The wind projects are being paid a significant rate bonus for the power they generate, to encourage the industry and get is up and running. The 17 cents per KWH of energy from a wind mill is paid for by the citizens in a combination of ways: some by taxes both state and federal as well as energy charge on the monthly electric bill. The truly sad parts of the wind power block of energy is that in most cases the bonus goes off shore to foreign companies, but we feel good about getting the industry up and running and we are going green. The best engineering people I know who are in the industry tell me and I have seen documents to confirm that wind mills are worn out after 25 years, will require replacement. We now buy the infrastructure again, the rate payer pays no matter how well hidden. I recently have been told by some people that the wind mill blades are expected to need replacement after 15 years. Is this such a good investment for the state and the citizens. I do believe that wind can play a part in the energy picture, we just need to take a very detailed look at the true costs associated with wind. Other energy sources have a 60 to 100 year life Expectancy. Moe hidden costs to deal with.

3: The small hydro and privately owned hydro generation operating in New Hampshire are getting on the average 3.5 cents per KWH of energy vs PSNH being allowed to recover 9 cents per KWH of energy because they have overhead. The privately owned hydro sites are on what is called the market or ISO rate. At times of the day they are paid $0.00 per KWH of energy supplied to the grid. It goes out in the grid, somebody is selling this energy and being paid for it. The hydro generator is not paid, certainly not

fair. The wind people get 17 cents per KWH all day long with no periods of being paid $0.00 per KWH. Maybe we could rectify this situation, make the playing field a little more level.

4: The State of Massachusetts passed some legislation that the utilities in that state were to get out of the power production business segment, we were told it will drive the rates down by completion. One unintended consequence was that the hydro stations on the Conn River were sold to a company that could not support the debt load, they went bankrupt. The plants were subsequently sold again and a foreign company purchased them. The plant s are well run by the current owner, the adverse impact is the profit goes off shore. Does not help the US international balance of payments. When undertaking such moves we should look very closely at some of the hidden consequences of such action.
5: The awful Northern Pass is a project that I would prefer to see not built but not for the normal reasons. It again purchases energy from foreign companies and does not help our balance of payments. I reality I believe Northern Pass must be built. The New England area has several Nuclear plants that are either in the process of shutting down or will such down soon. Vermont Yankee will shut down at the end of this year. It is 600 MW or half of Northern Pass. Several Plants are now in the 40 year old category, I suspect some will not be relicensed. Each of the plants of the early 1970 era are rated approximately 600 MW. One more retirement and Northern Pass is used up.

6; You spoke of Vermont and I believe on a couple of times you indicated they were ahead of NH. Be careful how you examine Vermont's situation and NH's situation. In the hydro business Vermont requires one inch f water going over the dam along with any minimum flow requirements and fish bypass water. The sole reason for the one inch of water over the top of the dam is" " It Looks good" When we are in an energy situation such as we are can we afford to give away energy because it looks good. Collectively for all the plants in Vermont this amount to a fairly large number of KWH. Hydro is classed by the EPA as green energy also by the Army Corp of Engineers.
When special interest groups make a lot of noise about a very limited topic we should look very closely at all the unintended consequences that will occur. Older more experienced people are a very valuable resource for these times and situation. Grey hair does have some capability and contribution to give.

7: You pointed out the we are all in the energy boat together. Well said and very true. I frequently hear that New Hampshire is a net exporter of power. I suspect this is true most of the time. However let on large unit go down such as Seabrook and we instantly become an importer of energy.
It must come from somewhere our partners in the power exchange pool. I do not believe that many of the special interest groups understand this.

8: I am sure you will recall my comment about getting an business man on your staff to help someone who has built something from the ground up and made it work. This can be very important and help avoid some of the pitfalls. So many times we get the impression that GOV does not listen to the citizens.
A good example: Several years ago I went to Concords to testify before a senate committee. The senator asked the Municipal association to testify and a town elected official to testify. When it came time for the citizens input she did not have time to listen and adjourned the meeting. This type of action does not improve the image of GOV. Just so no one misunderstands this last comment I do not have any feeling that the citizens were not listened to at the information meeting you hosted, again I say well done and presented.

Thank you for taking time to read my thoughts on energy.

William N Clewes, Littleton, NH June 19, 2014

I am a member of the local (Littleton) energy committee, but am submitting these comments as an individual.

1. It would be great to have a wood pellet/chip plant in the North Country. We just installed a wood-pellet system to heat our Fire House and Highway Garage. We are importing the pellets from Maine. This increases costs and pollution due to vehicle miles travelled. There are lots of forests in the North Country that could be used for pellet/chip production. Our committee is promoting additional wood-based heating systems in Littleton for school, municipal, commercial, and industrial applications. Any reduction in costs would serve us well in this effort.

Comment: Could some sort of incentives (tax exemptions, loan interest loans, etc.) be considered to encourage the private development of such a plant?

2. We are one of a handful of NH towns with a local, independent utility company. Because of this status, we have been ineligible for most of the grants, incentive programs we've heard about (the latest PUC/RGGI program is an exception). Our electrical rates are very low, and the Littleton Water & Light commissioners would like to keep it that way. They don't necessarily resist energy efficiency efforts, but would like to keep the demand steady out of fear that lower demand will drive up rates. I believe that Littleton would be eligible for grants and incentives if LW&L joined the state-wide system, but membership in the program would result in a rate increase for all users.

Comment: Has there been any consideration on ways to encourage (not regulate) local utilities to join the state-wide program? One idea would be a gradual phase-in to ease the transition – perhaps with an opt-out clause if there is heavy resistance by rate payer. Or perhaps energy efficiency savings could be directed towards equipment upkeep or upgrades. In a perfect world, they should be able to take EE actions without penalizing their customers.

3. We are considering a couple of big projects (by small town standards). These potential projects would include public and private entities, as well as school-town cooperation. Pulling together a diverse group such as this exceeds our experience and expertise. For example, we do not have a Town Planner or even a building inspector/code compliance officer.

Comment: Does the state having any resources to assist a town in planning major projects?

-Ron Bolt
June 23, 2014

"25 solar arrays for 25 New Hampshire small towns to meet the 2025 Energy goals."

As the chairman of the Bristol Energy committee, I would like to make the public aware that right sized and appropriately funded solar arrays in New Hampshire, provide a practical approach to renewable energy in this state and should be a larger part of the developing 2014 Energy Strategy plan.
Bristol township has placed a 58 panel, 15 kilowatt array, on the 2013 library roof. This array, 1 year old at the end of this July, is on track to produce enough electricity to meet the library's annual power needs of 18megawatt hours.

Extrapolating from these deployment results, 1megawatt array's could be deployed by towns in New Hampshire and each produce 1300 megawatt hours per year. This is enough power to supply the municipal power needs in a town of 7000 people. Municipal needs includes in order of demand, Water

and sewer, Schools, Fire, Police, Administration, Recreational and Road maintenance facilities. Each array could be built on less than 3 acres of land at the local water and sewer plants and could be built for less than 4 million dollars. If 25 of these array were deployed in small towns in New Hampshire, at a cost of less then one hundred million dollars over the next decade, these arrays would produce one half of New Hampshire's 2025 renewable energy goal.

The funding of these array could be funded as portion of the Alternative Compliance Payments paid by the Utilities into the Renewable Energy Fund at the PUC each year. In 2013 these payments amounted to eighteen million dollars and this year are likely to be in excess of twenty million dollars. The ACP fund will escalate each year based on inflation and the rate approved by the state legislature. Using approximately one third of the New Hampshire ACP funds over the next ten years, would set New Hampshire to achieve 50% of its renewable energy goals from solar (instead of 0.3%), provide no cost or low cost power to 25, financially burdened municipal administrations, and provide both local employment and education to local residents and tradespeople, the skill set of which is then transferable to business and residential deployments or applications. If more money was allocated from the ACP funds, larger arrays could be deployed for the larger cities, providing financial relief to their municipal electrical power billings and fully achieving the New Hampshire Renewable Energy goals of 25% of energy by 2025.

This is a readily implementable energy strategy for New Hampshire, with all the components in place: sites, labor, technology, materials and funding source, all that is needed is the political will, by the NH Legislation, to implement it as an achievable component of this 2014 Energy Strategy Plan.

William Dowey.
Chairman of Bristol (NH) Energy Committee.
June 23, 2014

Following up the comments made by the gentleman from bristol re his pv library experience and myself at the lrcc public comment night, the below indicates what a real goal and plan is and how to imnplement and improve it.

"Massachusetts has set ambitious solar energy targets since 2001 and met each of the goals years in advance. In April 2007, Governor Deval Patrick announced a goal of 250 MW of installed solar power by 2017. This goal was achieved in Q1 of 2013, when Governor Patrick set a new goal to reach 1.6GW by 2020" http://www.solren.com/solectria-renewables-smartgrid-inverters-power-projects-totaling-22mw-massachusetts/

nh needs to get moving now.

- eliminate all or most fossil fuel use from nh by 2020
- close the bow plant immediately except for emergency use. we wasted 500 mil on putting lipstick on this pig
- reduce transaction costs for all renewables. (permits, marketing, metering, etc)
- feed in tariff (thru srecs) and net metering would both be done. it works in ma.
- make three times energy efficiency code mandatory for new construction, twice for retrofit
- require all construction to be net zero

- encourage 3kw of pv with each new car purchase. (3 kw will run a prius or other electreic plugin 12000 miles each year in the nh climate.) if this were done, nearly no new utility infrastructure would be required

go big or go home

cheers
drew gillett, p.e.
gilford nh
June 24, 2014

I attended the meeting in Laconia last week and made some brief comments about banking and appraisals that I wish to elaborate upon. I am a solar installer/integrator and have many occasions to work with or against banks and appraisers in the process of helping my clients attain their energy goals. I'll start with a short story about a banker friend of mine who installed a $30,000 solar electric system 2 years ago. The system makes around $2000 worth or electricity a year. When he went to refinance, the system was appraised at $2000.00. Now this is ridiculous on its face. We have an asset that generates operating capital to reduce the cost of running his house, with a proven track record of 20+ years of failure free service and the appraiser clearly had no idea what he was saying. I have on occasion done small workshops for groups of appraisers and found them remarkably uninterested in altering their perception that this stuff is all new, untested mysterious technology. Customers always ask if a solar hot water or solar electric system will increase the value of their home at sale. There is no question that a system that reduces operating costs and will run with almost no attention for 20 years should indeed have substantial value. I'm not sure what the answer here is and I don't know how appraisers get their information but it would seem there should be some standard mandated values for these things based on size. Perhaps something related to the original rebate application?

Obviously we have the same problem with realtors. if they don't understand what's on the roof and don't know how much energy it produces they clearly won't make any effort to support it. I strongly recommend to customers that they tuck away an energy bill before the solar system was turned on and one soon after so the financial impact is clear. But again if the buyer's realtor is whispering "weird technology" in his/her ear, well you get the point.

As for Banks I think the issue is far broader than solar. We're now at a point where building near or net zero homes is possible, and frankly quite practical. The issue is the cost is often 25-30% higher than a standard house of the same size. The benefit is the dramatic reduction in operating costs. As an example, about 4 years ago I went looking for a financing program that I could offer to my customers. I approached 5 banks with the same story. "If I wanted to buy a $30,000 car right now you would have no problem giving me a loan. 5 years from now that car will be worth dramatically less. But if I wanted to borrow 30,000 for a solar system I would be installing something with both a very long life and something that would reduce the cost of operations for my home immediately and for the long term. That should make me a better customer on paper and therefore you should give me a better rate." I got a bunch of blank stares.

There needs to be a way to get banks to consider operating costs in a much more significant way. if you can't finance that extra 30% to eliminate your energy bills how can we get where we need to go?

Thank you all for hosting these events and pushing the rock a few more steps up the hill.
Jack Bingham
Seacoast Energy
June 25, 2014

Some of these comments were discussed during last nights meeting but I am including to be sure they are covered

Encourage EV charging station growth. This appears to be underway, but locate in sites where EV drivers would be there for typically 4 hours to allow time for a reasonable charge. This would include hotels, vacation/recreational spots, shopping malls etc. Not sure of the details, but it appears as if NH does not have the LEV and PZEV guidelines setup to encourage manufacturers to sell EV vehicles in NH. Tax credit I suspect are part of the issue. The tax credits may be to the benefit of the purchaser from federal taxation and may not require NH support. I am unclear on this.

Encourage growth of natural gas to provide fuel choice for transportation, businesses and homes. Lack of readily available preclude use of natural gas for most municipalities. These refueling stations could also be utilized by commercial vehicles and or personal vehicles. encourage natural gas supply where it would make economic sense for residential and commercial, again to provide fuel choice. More natural gas would reduce CO2 emissions and likely lower costs. One approach may be if a utility wants to expand their pipelines, they must also expand their service to nearby potential customers by "x" miles on each side of the pipeline expansion.

Electricity generation Encourage PV growth with long term policies. this would include tax credits and RECs. presently RECs are valued at substantially lower levels in NH than for example MA. This discourages investment in NH. Potential for offshore wind?? As PV grows what will be reimbursement structure be for those who produce more than they use? It needs to make economic sense for that investment.

Statewide conservation programs NH saves with $3 LED light bulbs is a superb example. We need more of the same kind of support.

As fuel efficiency standards based on Federal mandates, the fuel use will decline in NH. resulting in lower taxes collections and higher cost to provide fuel due to fixed costs to provide less fuel. This will negatively impact fuel prices. How is the predicted increase of EV vehicles calculated into the electricity demand and what fuels will be utilized to provide the electricity?

Statewide education programs to help consumers make the best choice for them, taking into account all the options and ramifications to whatever energy source is utilized.

thanks for putting on the program for us all
Howard Kalet
June 25, 2014

I'll spare you the six pages of notes I took on the Navigant proposal (other than what I'm fairly certain is a scaling error in Fig. 2-5 on CO2 emissions) and try to keep it brief and high-level. I have four areas of concern:

a) Energy Security
b) Cost of Electricity/Energy
c) Push for Efficiency
d) The Vision

I'd be remiss if I didn't open by saying my primary concern is energy security. The Senate Bill highlights availability of energy early on. Energy availability, imho, includes security issues. As you can see in the news item from Israel below, terrorists took out the entire grid in Yemen (of course, you probably won't hear about it much over here):
http://www.israelnationalnews.com/Articles/Article.aspx/15212#.U6wcjpRdW7y

a) We will have massive civil unrest if people lose access to electricity, home heating fuel, and gasoline. You are too young to remember, but I waited in gas lines in New York back in '73/'74 when people kept guns in the event someone tried to 'cut' the line - there were shots fired. On electricity, we are tied to ISO-NE. If the grid is taken down outside the state, can you ensure that the people of NH will still have electricity to their homes? Adequate storage of gasoline and heating fuel stock is not something on which I have data. I did read somewhere at some point that DES had closed gasoline storage in Newington on some environmental regulation, and the storage was moved to Boston – not necessarily helpful in a crisis. As head of the Office for Energy Planning, you are responsible for ensuring the energy supply to NH consumers and businesses in all three areas in the event of an emergency. Our winters are brutal (in spite of global warming ;-) - Europe was held hostage on Crimea this Spring because of their dependence on Russian gas. Some coordination with the National Guard or other emergency services, given the current world climate, should be at the front of your agenda. You mentioned emergency services; I don't know enough about their preparedness from an energy perspective.

b) I find it surprising that you can rationalize raising the gasoline tax while providing bus subsidies (the whole 'transportation' section on AFVs, disincentives for VMT growth (Fig. 5-1/p.40 - 'pricing programs' to reduce VMT). The bottom line is, you've hurt people on the margin that need the most help. You are driving up the cost of delivery of basic goods, which will also be passed along to the consumer. Electricity, however, is my primary concern. As you know, in New Hampshire, our electricity production has declined from 25 GWh to 18 GWh over the past 10 years. As it is, we only use 10 GWh. At the same time, our rates are 38% higher than the national average. Why? ISO-NE will raise what it pays to ensure supply in '17 as a result of the Brayton Pt. closure (to the benefit of Energy Capital Partners and all coal-hating environmentalists). In the past 10 years the increased price of electricity has had a real impact on consumers, not to mention a major preventative to manufacturing companies and jobs relocating to NH. The PUC may have a seat at ISO-NE, but surely you can see the same manipulation of prices that took place in CA is setting up here in New England. Why can't the 'Vision' include efforts to actually REDUCE the cost of energy to consumers? Why can't we have cheaper electricity given supply exceeds demand?

c) On efficiency, I am concerned that the entire Navigant proposal was designed to assist in effecting the GDS proposal to spend $940 million over 5 years with the expectation of saving $200 million per year. Fig. 2-13 makes it clear that NH per capita energy consumption has gone from 190 MBtu in '04 to 160 MBtu in '14 witha projection of 140 MBtu in '28. We have taken 40% of the CO2 emissions out of our energy production (which btw amounts to 2/100's of 1% of what China will be putting out this year - yes, 1 part in 5,000). We are more efficient now, and rank in the top 20% in the US on efficiency (US EIA - NH 9th lowest in per capita energy use). The movement here against coal is meaningless without major

policy changes in China and India. We have become more efficient, and yes, we can always be more efficient, but to make it the centerpiece of your energy plan, imho, is a mistake. I have to let you know that, if I were fortunate enough to be elected Senator, I would be giving very close scrutiny to the projected $200 million in proposed savings, as the State is hardly in a position (even with the suggested funding alternatives) to justify $940 million in spending.

d) As for the Vision, I find it highly biased and lacking in concern for items a) and b) above. There is more to NH's energy needs than making us more efficient.

Best
-Steve Kenda
June 26, 2014

There was a pervasive theme throughout the entire presentation/proposal last evening, namely that CO2 is leading inexorably, and directly, to a climate catastrophe. But it is never stated in the document. Is this because the OEP wants it to be accepted, but is worried that it's scientific underpinning is weak and debatable? I believe it either should be stated, or an alternative statement like "While there is evidence to support the theory that increasing CO2 will raise global temperatures significantly, and hence lead to many environmental problems, the extent of any temperature increase is a subject of substantial debate within the meteorological community" should be inserted.

A couple of years ago there was a governor's committee which spent dozens of hours coming up with proposals to "solve" the global warming problem. But in its final report, it didn't dare mention how its various recommendations would contribute to solving this "warming" problem, even if implemented completely. Instead, it kicked the can down the road, put CO2 numbers in place of temperature numbers. No one disagrees that the concentration of CO2 is rising, the disagreement is over how much, if any, increases in CO2 will increase global temperatures!. Do you plan to kick the can down the road too? The draft report is very unclear on this point.

There are other troubling issues, namely ZEV and LEV automobiles. I am unaware of the contribution to the rising CO2 levels that a switch to electric cars will "solve". Either state the evidence and the numbers, or delete any reference to electric cars. Finally, there are no cautionary comments about the negligible effect anything New Hampshire, or the US, could do if it reduced its CO2 emissions to zero. Is this omission a concession to the fuzzies also?

Fred Ward
June 26, 2014

Rep. John Mann, Cheshire District 02
35 Prentice Hill Road
Alstead, NH 03602
June 27, 2014
(Second set of Comments on Energy Strategy)

1. I feel very strongly that the "draft vision" as written is inappropriate. It envisions a future where everyone's imagined needs are conveniently met. I recommend that the Strategy start with a clear statement of the several significant problems to be solved, including but not limited to those enumerated in Senate Bill 191. Lurking in the background - but very evident nevertheless - are the need to reduce CO2 emissions and the possible need to conserve energy resources for future generations.

I also believe the draft vision is potentially misleading to the public, as it suggests that such an outcome not only is possible, but also is reasonable for people to expect government to work toward. For example, fuel diversity in the "north country" might have been ideal a decade or so ago, but now we will need to be satisfied with what is reasonably available. Which might not be a problem if, for instance, homes are heated with heat pumps.

2. I believe the public will have to know (and care) more about energy in the future, as the vision implies, and therefore I would include elementary-school and secondary-school education on energy, to be integrated into science and math curricula.[1]

3. Energy efficiency is a "perfect" jobs program, that addresses the root of the problem - namely, that automation has displaced workers wholesale, even enabling off-shoring and enabling big-box retailers to outcompete the small merchants and other businessmen who used to form the proud and active civic core of so many small cities and towns. But retrofitting buildings can be neither automated nor offshored. And it requires multiple skill levels, from building science and lead abatement and house construction issues to the direct insulation installation work. It will keep a lot of people busy for a couple of decades, cut people's energy costs, help the economy, and keep money in-state. Maybe this is worth a mention.

4. While a "cost effective energy efficiency" measure is defined broadly as one that is cheaper than supply, this could be more clearly defined. One can assume that a product, such as an LED bulb or a refrigerator, qualifies if it saves its cost within its lifetime. But what about permanent (i.e. very long lasting) changes to a building, for instance is a $10,000 insulation and air sealing job? Are all (correctly implemented) insulation jobs worth doing, given that they will eventually pay for themselves? And assuming this is true, what does the strategy say about the pace at which such insulation work is done?

5. Navigant suggests that, with building energy efficiency, some measures are easily justified today and other measures may be easier to justify in the future as energy costs rise and/or products get cheaper.[2] This might be true for straight product replacement, such as light bulbs and refrigerators. Navigant

[1] A 7th grader should be able to compute, for instance, the Btus per hour needed to maintain the interior of his or her (appropriately simplified) house at a given temperature increment over the outdoor temperature. This is a fundamental 'problem' that drives understanding of many if not most building heating questions (e.g. deciding between, say, new windows or attic insulation).
[2] See final paragraph on page 29 of the Draft Strategy

proposes that the state be prepared to extend the project as the cost/benefit picture improves (i.e. energy costs rise or produces cost less).

However, I don't believe this is appropriate for building retrofit (air sealing, insulation, more efficient heating appliance, window repair), and I think an aim of the energy strategy should be to go right ahead with "deep" retrofits. It may not be feasible financially or politically in NH, and it may take decades anyway, but our aim should be to go for deep retrofit ASAP. Let me offer some reasons.

- First of all, reducing the heating load is an important first step, as it is fuel-neutral, reduces CO2 consumption, lasts virtually forever, improves comfort, pays back cash savings to the building owner which goes back into the NH economy, and eases the entire process of getting energy or fuel into the building. Reducing electricity consumption does a little of this too, of course, although electrical products have finite lifetimes.
- Funding a retrofit project generally[3] requires loans, paid back from energy cost savings. This works if energy prices are stable or declining, as costs go down. However, if prices rise, the borrower may not realize any cash savings. If you cut fuel costs 50% but fuel prices soon double, you have no cash savings. Likewise if you cut costs 25% but prices rise by 1/3. Therefore, in a time of rising prices, lenders will back away from lending money on the basis of cash savings. Only the already well-off will be able to afford a retrofit. Therefore, the time to do the expensive work is ASAP. Afterwards, the savings will pay for all the low fruit.
- Picking the "Low fruit" first will likely make the "higher fruit" more difficult - maybe impossible - to cost-justify. If a programmable thermostat cuts costs by 25%, the potential savings attributable to later steps will also be reduced by 25%, i.e. the payback period for those later steps will be lengthened by 25%, which therefore may be more difficult to fund. This is true even in a period of stable energy prices. Better to do the expensive steps first.
- If fuel prices rise significantly we will likely be in a tough financial situation, and have a harder time in general. Energy efficiency projects will have to compete for scarcer funds in such a situation. Postponing these projects is not a good strategy.[4]
- There is an urgency about building energy efficiency, because this work requires resources to accomplish, and should not be done in a rush or with careless oversight or by amateurs.

[3] For the majority of people

[4] I once suggested - at a town budget hearing - that our town start a "capital reserve fund" saving $5,000 a year over 6 years to insulate the town library. A smarter citizen jumped up and said "That's stupid! We would be putting away $5000 a year and at the same time wasting $5000 a year on avoidable fuel expense, spending twice as much money for the privilege of being chilly* for 6 more years!" So we put the entire $30,000 on a warrant article, which passed with more votes than any other. It would be equally "stupid" to require homeowners to "save up" for insulation projects rather than get assistance in financing.

*A cold [e.g. uninsulated] ceiling can make people feel chilly even in warm air

Letter from a well known UConn Emeritus Physics Professor (Submitted by Joseph D'Aleo, June 27, 2014)

It has been often said that the "science is settled" on the issue of CO2 and climate. Let me put this claim to rest with a simple one-letter proof that it is false. The letter is s, the one that changes model into models. If the science were settled, there would be precisely one model, and it would be in agreement with measurements. Alternatively, one may ask which one of the twenty-some models settled the science so that all the rest could be discarded along with the research funds that have kept those models alive. We can take this further. Not a single climate model predicted the current cooling phase. If the science were settled, the model (singular) would have predicted it.

Let me next address the horror story that we are approaching (or have passed) a "tipping point." Anybody who has worked with amplifiers knows about tipping points. The output "goes to the rail." Not only that, but it stays there. That's the official worry coming from the likes of James Hansen (of NASA) and Al Gore. But therein lies the proof that we are nowhere near a tipping point. The earth, it seems, has seen times when the CO2 concentration was up to 8,000 ppm, and that did not lead to a tipping point. If it did, we would not be here talking about it. In fact, seen on the long scale, the CO2 concentration in the present cycle of glacials (ca. 200 ppm) and interglacials (ca. 300-400 ppm) is lower than it has been for the last 300 million years. Global-warming alarmists tell us that the rising CO2 concentration is (A) anthropogenic and (B) leading to global warming.

(A) CO2 concentration has risen and fallen in the past with no help from mankind. The present rise began in the 1700s, long before humans could have made a meaningful contribution. Alarmists have failed to ask, let alone answer, what the CO2 level would be today if we had never burned any fuels. They simply assume that it would be the "pre-industrial" value.

* The solubility of CO2 in water decreases as water warms, and increases as water cools. The warming of the earth since the Little Ice Age has thus caused the oceans to emit CO2 into the atmosphere.

(B) The first principle of causality is that the cause has to come before the effect. The historical record shows that climate changes precedeCO2 changes. How, then, can one conclude that CO2 is responsible for the current warming? Nobody doubts that CO2 has some greenhouse effect, and nobody doubts that CO2 concentration is increasing. But what would we have to fear if CO2 and temperature actually increased?

* A warmer world is a better world. Look at weather-related death rates in winter and in summer, and the case is overwhelming that warmer is better.

* The higher the CO2 levels, the more vibrant is the biosphere, as numerous experiments in greenhouses have shown. But a quick trip to the museum can make that case in spades. Those huge dinosaurs could not exist anywhere on the earth today because the land is not productive enough. CO2 is plant food, pure and simple.

* CO2 is not pollution by any reasonable definition.

* A warmer world begets more precipitation.

* All computer models predict a smaller temperature gradient between the poles and the equator. Necessarily, this would mean fewer and less violent storms.

* The melting point of ice is 0 ºC in Antarctica, just as it is everywhere else. The highest recorded temperature at the South Pole is -14 C, and the lowest is -117ºC. How, pray, will a putative few degrees of warming melt all the ice and inundate Florida, as is claimed by the warming alarmists?

Consider the change in vocabulary that has occurred. The term global warming has given way to the term climate change, because the former is not supported by the data. The latter term, climate change, admits of all kinds of illogical attributions. If it warms up, that's climate change.
If it cools down, ditto. Any change whatsoever can be said by alarmists to be proof of climate change.

In a way, we have been here before. Lord Kelvin "proved" that the earth could not possibly be as old as the geologists said. He "proved" it using the conservation of energy. What he didn't know was that nuclear energy, not gravitation, provides the internal heat of the sun and the earth.
Similarly, the global-warming alarmists have "proved" that CO2 causes global warming. Except when it doesn't.

To put it fairly but bluntly, the global-warming alarmists have relied on a pathetic version of science in which computer models take precedence over data, and numerical averages of computer outputs are believed to be able to predict the future climate. It would be a travesty if the EPA were to countenance such nonsense.

Best Regards,
Howard C. Hayden
Professor Emeritus of Physics, UConn

FOR IMMEDIATE RELEASE:
April 29, 2014

CONTACT:
Joseph D'Aleo

PRESS RELEASE

UNH and Union of Concerned Scientist Report is Wrong on the Facts

14 Prominent Scientists and Academics Refute Claims with Historical Data

CONCORD, NH – Today a group of prominent scientists and meteorologists called into question the findings of a recent study by the Union of Concerned Scientists and the University of New Hampshire, "Climate Change in New Hampshire: Past, Present, and Future."

"It is disappointing that New Hampshire's leading University has chosen to publish a report which is not grounded on actual facts, but on conjecture," stated Joe D'Aleo. "The authors have based all of their findings on the failed climate models. Scientists like Dr. John Christy and Dr. Judith Curry have written extensively on the failure of the climate models and how the projections fall below accepted levels of scientific significance. UNH and the UCS blindly hold to the model forecasts for their projections, despite the models incredibly poor track record.

Citing data from numerous national and global climate resources, the group identified nine specific claims that actual data refutes. This includes claims about extreme weather, changes in New Hampshire's temperatures, reduction in our snowfall and changes in our agricultural production. All of these claims are contradicted by the facts.

"We cannot understand how scientists can use these flawed models as the basis for their projections," continued Mr. D'Aleo. "Just as concerning is how these scientists do not provide policy

makers and elected officials a fair and unbiased representation of what is going on with our weather and climate. Our brief report can provide decision makers with a better understanding of our climate through actual data instead of the conjecture provided by UNH and the UCS."

See full report here.

IEA report needs to go on the record

http://instituteforenergyresearch.org/wp-content/uploads/2014/06/Protect-the-American-People.-Moratorium-on-Coal-Plant-Closures-Essential.pdf

Recent events in New England and elsewhere in the U.S. have demonstrated that policies which hurt the U.S. coal fleet are placing the reliability, affordability, and security of America's electric supply system at risk:

- These policies will significantly increase wholesale electric rates – and could increase them by as much as 80 percent – according to Dr. Julio Friedmann, Assistant Secretary for Clean Coal at the U.S. Department of Energy (DOE).
- Severe economic hardship will be imposed on people who can least afford it – low income families, minorities, children, and the elderly.
- Recent experience in New England and elsewhere represents a troubling indication of the implications of removing coal plants from the electricity generation mix:
    - Spot prices of natural gas and electricity may spike significantly.
    - Utility bills become unaffordable for many families during price spikes.
    - Energy shortages could occur.
    - What little industry is left in the Northeast may be forced to leave.
- Average electricity rates in New England are already more than 40 percent higher than the national average and may be headed to be 150 percent higher.

New England is merely the precursor to the national problem which is emerging. With the projected closure of 60 gigawatts (GW) of coal plant capacity, virtually the entire U.S. is rapidly reaching the brink of significantly higher prices for electricity and being unable to meet either the summer or winter peak demand for power.

Why Wind Power is Wrong for New Hampshire

Joseph D'Aleo, CCM
January 13, 2014

Wind Power Issues

- Vulnerability to ice storms, common in the northeast
- Lightning and hurricane force high mountain winds
- Wind turbines have serious health effects
- Wind turbines will negatively affect tourism, our #2 industry
- Wind turbines devalue property
- Wind turbines affect weather radar and aviation providing false alarms
- Wind has proven to be undependable, often not the when needed the most during extreme cold and heat. Inefficient back up energy increases costs and CO2 production over more efficient natural gas plants without wind
- Wind would drive up the cost of energy dramatically as it did in Europe, hurting the poor and elderly on fixed incomes
- To limit costs, wind farms are poorly maintained and have shortened lifetimes, with no budget for replacement/repair
- Rising costs of energy is bad for the economy driving jobs away. In Europe this has caused Spain, Germany and soon the UK to stop subsidies as prices and unemployment skyrocketed

Mt Washington Study

FAQ: Why Doesn't the Observatory use Wind Power?

Several years ago a lengthy study was conducted on Mt Washington evaluating the potential to harness wind power. The study concluded that the frequent icing of equipment and the strength and gustiness of the wind at this location was so severe that wind energy would not be a practical or cost effective alternative.

- Fires and blade damage from lighting strikes and extreme winds, are a much higher probability at higher elevations
  - Mt Washington averages 16 thunderstorm days per year. A lightning strike on an unprotected blade can lead to temperature increases of up to 30,000 degrees Celsius, and result in an explosive expansion of the air within the blades
  - Mt Washington frequently gets winds exceeding hurricane force and wind gusts have reached 231 mph.

Scotland wind damage

Icing and Ice Storms

- Major ice storms occur on average every 7 years in the northeast. Ice damage can be very severe to power lines and power poles and turbines.
  - The devastating 1998 ice storm in northern New England and Quebec brought as much as 8.2 inches of ice, left 300,000 people shivering in the dark for a month. Thirty people died in Canada and another 17 in the United States.
  - The storm of 2008 left as many as 1.7 million NH customers without power.
- Heavy ice could lead to major damage to and even the collapse of wind turbines. In Canada's 1998 ice storm, heavy duty towers collapsed under the weight of ice.

Health Impacts

- In Canada, Carmen Krogh, a retired Alberta pharmacist and a group of volunteers surveyed residents in areas near wind farms. Of 76 people who responded to their informal survey, 53 reported at least one health complaint. All across the US, lawsuits have been filed against the wind farms because of these health issues.

- An epidemiology study conducted by World Health Organization demonstrated disturbance by noise and sleep disturbance by noise increased the risk of depression 40%, and 100% respectively. In addition to visual burdens wind turbines create noise pollution which can cause annoyance, stress and sleep disturbance. In light of these statistics it is expected that people may suffer adverse health effects from visual and noise impacts of wind turbines.

Tourism

- Tourism is New Hampshire's second-largest industry. The Outdoor Foundation reports tourism supports 53,000 jobs, generates $261 million in annual state tax revenue and produces nearly $4 billion annually in retail sales and services.

- State parks benefit tourism - *"In a recent survey the Division of Travel and Tourism learned that the main activities associated with New Hampshire were outdoor activities with 90% of them being recreational activities that take part in New Hampshire State Parks. Of those surveyed, 70% agreed that New Hampshire has great state and national parks...provide exceptional opportunities for both residents and visitors travelling from all corners of the globe to enjoy what New Hampshire has to offer whether they are seeking active outdoor recreation, relaxation, or just* ***the natural beauty of our quintessential New England landscape.*** -Lori Harnois, Director, NH Division of Travel and Tourism Development

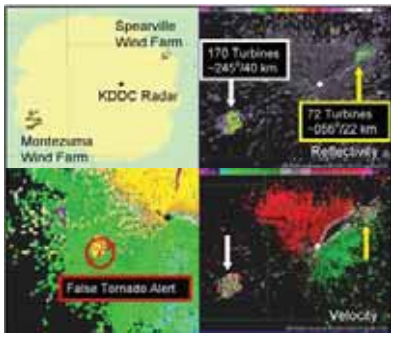
- Plans to dot France with wind farms are facing fierce opposition from critics worried they will blight a landscape that has helped make the country the world's top tourist destination. ...opponents are urging the government to tread carefully so as not to damage France's thousands of kilometers of stunningly beautiful landscapes.

Property Devaluation

- Though proponents of wind pay well for university studies that say wind turbines enhance property value, there is concrete evidence to the contrary.
- In a wind impact study in Dodge and Fond Du Lac Counties in Wisconsin, large turbines (389 feet high) using a literature study, an opinion survey of realtors and sales studies determined that sales were less than outside the areas, and prices were lower. Land values were decreased from 13% to 47% with an average of 30%.

Wind Farms Affect Radar

- The NWS office in Burlington, Vermont has shown how wind farms provide clutter the can trigger alarms that forces the FAA to delay or reroute planes. NOAA has an FAQ on this issue. This confusion causes expensive aircraft re-routing and excess fuel consumption. Boston Center in Nashua could be affected.



Bird/Bat Kill

- According to an estimate published in the Wildlife Society Bulletin in March, almost 600,000 birds are killed by wind farms in America each year, including over 80,000 raptors such as hawks and falcons and eagles (Wildlife Society). Endangered and protected species are included. The Obama administration has given the wind industry a pass on bird kill. In its own documents supporting the rule, the US Department of the Interior states: "large soaring birds, specifically raptors, are especially vulnerable to colliding with wind turbines (Barrios and Rodriguez 2004, Kuvlesky et al. 2007)." It also states that it does not know how to solve that problem.
- In New Hampshire winter is peak viewing time for bald eagles along the Merrimack, if they don't fly into the state's ever-growing number of windmills first. A Union Leader editorial wonders how many will be left 30 years from now if windmills keep popping up along New Hampshire's ridgelines.
- Quietly, bats die, as their lungs are inverted by the negative pressures generated behind the 170 mile-per-hour spinning blades. A new study from the University of Colorado, Denver, estimates that 600,000 bats were killed by wind turbines last year alone – could be as high as 900,000. Bats feed on insects that would otherwise destroy crops, and it pollinates as it goes about its nightly tasks.

Wind is Undependable

- When you need it most, wind is often not available or at best intermittent requiring ready back up fossil fuel sources running in inefficient modes.
  - Strongest winds at wind turbine levels are at night when energy demand is less
  - Frigid arctic air masses often cause winds to go calm.
    - In 2009, Black Bear Lake in Maine reached a state all-time record low of -50F with calm winds.
    - In December 2010, when the UK had the second coldest December since the Little Ice Age in 1659, wind produced less than 0.5% of energy needs (when 20% was promised)
    - The same wind power die down in west Texas was observed in a cold outbreak causing brownouts in Dallas and Houston.
  - In heat waves, stagnant air means little wind.
- This December after celebrating the big wind storm in Germany, the wind died and over a week the country had to rely on nuclear and fossil for electricity

Wind is Expensive

- A Heritage study found that swapping one megawatt-hour (MWh) of electricity from coal or natural gas combined-cycle generation to onshore wind drives the cost up from about $79 to $177 per MWh. Offshore wind is worse at $218 per MWh.
- Heritage analyzed a generic RES that starts at 3 percent of total power generation in 2012 and rises by 1.5 percent per year. They found it would destroy 1 million jobs by 2020, when the standard reaches 15 percent. *The average family would pay $2,400 more per year*.

Improper Maintenance And Security

- In Florida, the *Desert Valley Star* reported in January 2009 that FPL/NER operates 60 wind turbines—and reportedly 40% were "malfunctioning, in disrepair, or need of maintenance."
- *Windtech International* after a survey of 75 wind farm operators in the U.S. in 2008 found that 60% of turbines may be behind in critical maintenance
- Palm Springs keeps turbines more than ½ mile from highways and residences because of the risk of flying broken blade debris from poorly maintained wind farms.
- Renewables UK, an industry trade association, has admitted to 1,500 wind turbine accidents/incidents in the UK alone during the past five years, the *London Telegraph* reported. Those included 300 injuries and four deaths.

Wind is bad for the economy

- In Spain, 2.2 jobs were lost for every green job created and only 1 of 10 green job was permanent. In Italy 3.4 jobs were lost for every temporary green job, Spain ceased subsidization, but the damage had been done. Industry relocated and unemployment reached 27.5%
- In the UK 12 million people are said to be in energy poverty. Many pensioners have had to choose between heating and eating. UK Prime Minister David Cameron has publicly promised to 'roll back' green taxes - *"We've got to get rid of all this green crap."* 280,000 have died from cold and 10,000 from heat. EU has told UK to stop subsidies for renewables
- Even in rock-solid Germany, up to 15% of the populace is now believed to be in "fuel poverty." Some 600,000 low-income Germans were cut off by their power companies. As a result, Germany is building 24 coal fired plants and reinstating some nuclearto provide the back up to the underperforming wind and solar. Blackouts and brownouts are an increased risk.

The EU Walks Back from 'Green'

- The European Union is on the verge of rolling back much of its climate agenda, even as the United States is moving full speed ahead. "It is becoming obvious that Europe's unilateral climate policy, the whole green agenda of the last 20 years, has turned into an unmitigated fiasco. Even EU leaders are beginning to accept reality."
- These green bureaucrats will be replaced later this year by a new set of commissioners who almost certainly will be less green and more concerned about Europe's economic future and competitiveness. The chances of the green lobby to push through any new binding renewables or climate targets are near zero.
- A new ComRes/ITV poll has revealed that half of those polled disagree, or 'don't know' about whether climate change is "really happening" will no doubt be a blow to the 'big green' lobby, that spends tens of billions of pounds worldwide trying to sell the idea of climate change, and its tax-heavy 'solutions'.

Brandy,

I am writing to introduce myself and NG Advantage, as well as offer comments on the **New Hampshire Draft Energy Strategy**. NG Advantage is a provider of compressed natural gas (CNG) to industrial, institutional & commercial fuel users in NH, VT, MA & NY. We are based in Vermont and have been delivering CNG from our compressor station in Milton VT since March 2013. In partnership with Clean Energy Fuels, we are also about to open a new compressor station in Pembroke New Hampshire to serve our NH & MA customers. As Director of Business Development for NG Advantage, I am a 4th generation New Hampshire native and current resident of Bow NH.

Regarding the draft Energy Strategy, on page 13 the report contains the statement:

> "Based on information from New Hampshire's gas utilities, minimal additional expansion of natural gas distribution infrastructure is expected over the forecast period. Additionally, trucked delivery of natural gas to off-main customers via a "virtual pipeline" is not forecast to represent an appreciable quantity of thermal fuel consumption through the forecast period, though the service is expanding in the state."

I must challenge that statement and point out that CNG is a viable source of fuel for industrial customers throughout the State of New Hampshire today. Although the absolute number of customers is small, they represent the largest energy users in the state, and therefore represent an appreciable volume of BTU consumption in the industrial, institutional & commercial sectors. To date the company's customers have saved the environment from 31,643, 857 lbs. of CO2 emissions by replacing their legacy fuel oil with cleaner, less expensive, natural gas. Moreover these customers have almost eliminated dangerous sulfur dioxide, nitrous oxides, and particulate emissions.

With the opening this month of our new delivery station in Pembroke, we obviously expect these numbers to continue to increase, and therefore should be given greater consideration in developing the State Energy Strategy. Since it appears the consultants received their information on the CNG potential from New Hampshire's existing natural gas utilities, it appears they missed an opportunity to gather data from a primary source. I would welcome the opportunity to meet with you, your colleagues, and the consultants to provide them with more accurate summary of the state of the CNG industry in New Hampshire, our views on its future, policies the State of New Hampshire should consider to encourage its development, as well as answer any other questions you have.

All the best,

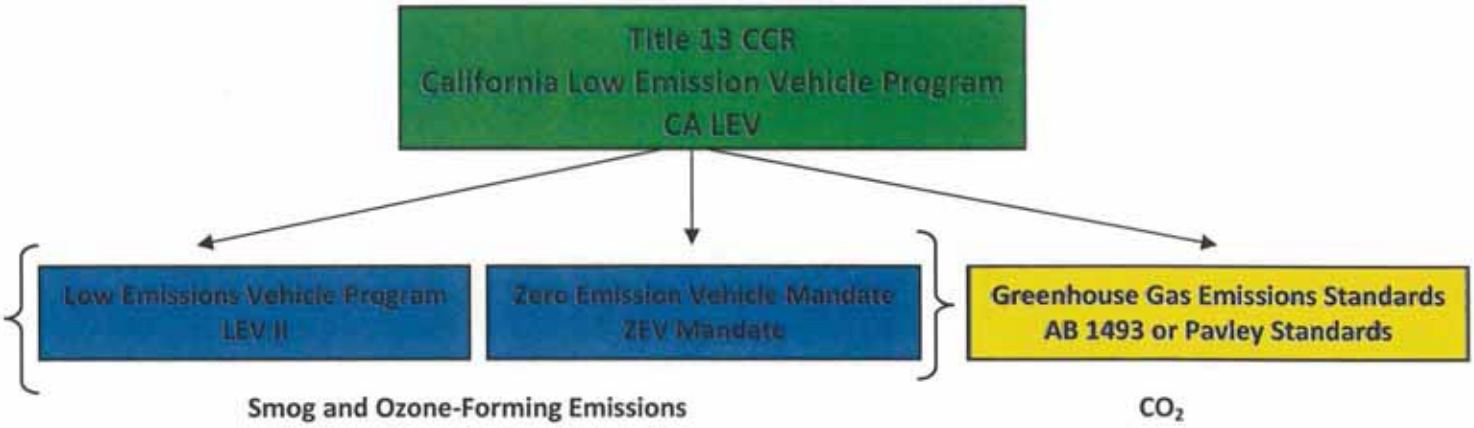
David W. Lavoie
Director of Business Development
NG Advantage LLC

California's Low Emission Vehicle Program in New Hampshire

The Alliance of Automobile Manufacturers – a trade association of twelve car and light truck manufacturers including BMW Group, Chrysler LLC, Ford Motor Company, General Motors, Jaguar Land Rover, Mazda, Mercedes-Benz, Mitsubishi Motors, Porsche, Toyota, Volkswagen, and Volvo – strongly opposes the adoption of the California's Low Emission Vehicle (CA LEV) Program in New Hampshire.

Understanding CA LEV and the ZEV Mandate

CA LEV is a series of standards which regulate tailpipe emissions, fuel efficiency, and the type of motor vehicles sold in participating states. Specifically, CA LEV is comprised of three sections – LEV III, the ZEV Mandate, and greenhouse gas emissions standards (commonly referred to as AB 1493 or the Pavley standards).



- **Greenhouse Gas Emissions Standards (AB 1493 or Pavley Standards)** – AB 1493 regulates carbon dioxide and other greenhouse gas emissions.
- **Low Emission Vehicle Standard (LEV III)** – LEV III regulates smog and ozone-forming emissions such as exhaust $PM_{2.5}$, NOx, volatile organic compounds, carbon monoxide, and air toxics.
- **The Zero Emission Vehicle Mandate (ZEV Mandate)** - The ZEV Mandate is a battery-electric (BEV), plug-in hybrid electric (PHEV), and hydrogen fuel cell (FCV) vehicle mandate intended to force the commercialization of these technologies and to reduce smog and ozone-forming, as well as greenhouse gas emissions.

CA LEV is a California program designed by California legislators and regulators. States electing to participate in CA LEV do so at deference to the California Air Resources Board (CARB). By adopting CA LEV, states' effectively cede authority to California and tie themselves to all future changes California makes to these programs.

Section 177 of the Federal Clean Air Act allows states to follow either the federal or the California program regulating motor vehicle emissions. Furthermore, in choosing CA LEV, states must maintain identical standards to California, within the sections adopted.

The U.S. EPA has deemed the ZEV Mandate severable from the other two provisions of CA LEV. The decision to adopt CA LEV without the ZEV Mandate has precedence. Delaware, Washington, and Pennsylvania have all done so.

Significant changes to both CA LEV and its corresponding federal programs have occurred over the last several years and are outlined below. The Alliance believes that these developments further support the Alliance's position on that the adoption of CA LEV by states is duplicative and unnecessary.

Harmonization of California and Federal Emissions Standards

On May 19, 2009 President Obama announced a National Program on greenhouse gas emissions and fuel economy that bridged the California and federal requirements, beginning in model year 2012 (January 2, 2011). This aggressive, nationwide program calls for a 54.5 mile per gallon fleet average by 2025.

The creation of the National Program was the first major development in the harmonization of the California and federal standards. California amended its AB 1493 regulations to specify that manufacturers that comply with the National Program are compliant with California's greenhouse gas emissions standards for model years 2012 – 2025. Harmonization of these formerly competing standards makes a state's participation in CA LEV's greenhouse gas provisions duplicative and unnecessary.

Smog and ozone-forming emissions from new vehicles have dropped by about 99% since these emissions were first regulated. In 2012, CARB adopted updated "LEV III" Low Emission Vehicle Standards requiring that the various pollutants which contribute to smog, be reduced by another 70% or more. This year U.S. EPA adopted the Tier 3 Rule, which starts in 2017, to match the emission standards required under LEV III. EPA noted that Tier 3 rules are intended "to harmonize with California's Low Emission Vehicle program, thus creating a federal vehicle emissions program that would allow automakers to sell the **same vehicles in all 50 states**." Thus, the criteria pollutant program and the greenhouse gas program are now, for all practical purposes, a single national program.

The adoption of CA LEV is often painted as an effort to "clean the air;" however that misrepresents the benefits CA LEV provides. The difference in air quality benefits under the Tier 2 and LEV II programs were already nearly identical; there was no measureable environmental benefit attributable to LEV II over Tier 2. The harmonization of Tier 3 and LEV III will ensure the benefits associated with these programs are identical.

ZEV Mandate – All Cost, No Benefit

With the National Program in place and the near-term harmonization of LEV III and Tier 3, the ZEV Mandate remains the outstanding provision of CA LEV. The program mandates that specific percentages of a state's new vehicle market consist of BEV, FCV, and PHEVs. It calls for approximately three percent of each participating state's new vehicle sales be BEV, FCV, or PHEVs in 2018. By 2025, the mandate is approximately 15%, of which approximately five percent can by PHEVs and the remaining 10% must be BEVs or FCVs.

In comparison, New Hampshire's 2013 sales data shows that the new vehicle market consisted of approximately 0.12% BEVs and 0.23% PHEVs. In order to meet the percentages dictated by the ZEV Mandate, New Hampshire consumers would need to embrace and purchase of BEVs, FCVs, and PHEVs at a rate that is more than *10 times faster* than the public embraced and purchased hybrid vehicles – a technology, that unlike ZEV technologies, requires absolutely no change in consumer behavior.

While there is *no measureable environmental benefit* associated with the ZEV Mandate, it remains the *most expensive regulation* in the history of CARB. The latest CARB figures estimate that this regulation may cost over $14 billion in incremental costs alone. As a point of comparison for what New Hampshire's costs may be, California suggests the incremental costs in Maine will reach approximately $93 million annually by 2025.

California estimates that in 2016, a BEV75 (battery electric vehicle with a 75 mile range) will cost $17,562 more than a comparable gasoline vehicle. This cost will ultimately be shared by manufacturers, dealers, consumers, and the state. California currently offers consumers significant financial incentives, parking incentives, free electricity, free home chargers and installation, and HOV lane access to make purchasing a BEV more attractive. Currently, to the best of the Alliance's knowledge, New Hampshire offers no incentives for ZEVs.

Not only are the market quotas established by the ZEV Mandate unreasonable, but the infrastructure necessary to support three to 15% of the new vehicle fleet as ZEVs is not in place in New Hampshire, or arguably any other state. California has invested more than $120 million in electric charging stations alone. With respect to hydrogen infrastructure, California has already invested nearly $40 million, with an additional $100 million already appropriated. However, even with these significant investments by California, the feasibility of the ZEV Mandate is still in question.

Conclusions

The Alliance and its member companies strongly support the development, production, and sale of zero emission vehicles and are eager to work with New Hampshire on building consumer acceptance of these advanced technologies outside of a technology mandate. The industry believes the path to consumer acceptance is not mandating sales, but creating appropriate market signals to customers that include incentivizing technology and building a supporting infrastructure.

NEW HAMPSHIRE

ENERGY EFFICIENCY AND SUSTAINABLE ENERGY BOARD
RSA 125-O:5-a
21 South Fruit Street, Suite 10
Concord, N.H. 03301-2429

July 21, 2014

Meredith Hatfield, Director
Office of Energy and Planning
Johnson Hall
107 Pleasant Street
Concord, NH 03301

Dear Ms. Hatfield,

The Energy Efficiency and Sustainable Energy (EESE) Board appreciates the opportunity to comment on the New Hampshire State Energy Strategy draft report dated May 1, 2014. The EESE Board is tasked with promoting and coordinating energy efficiency, demand response, and sustainable energy programs in the state. The EESE Board applauds the development of a State Energy Strategy and notes the need for strong leadership from both the Executive Branch and the General Court in implementing the Strategy. **A strong, stable energy policy in New Hampshire will help keep our energy dollars in the state where they can grow the local economy, lessen energy demand through efficiency, ensure a diverse and stable energy supply to residents and businesses, and reduce negative health and environmental impacts.**

On November 30, 2012, the EESE Board, with unanimous support of Board members, submitted a Final Report to the General Court on the 2011 *New Hampshire Independent Energy Study*[1]. This report stated "The overarching finding of the study and review is that energy efficiency and renewable energy technologies provide significant economic and environmental benefits to residents, business owners and investors in New Hampshire and appropriate policies need to be developed." **Toward this end the EESE Board provided three recommendations that "form an umbrella of key priorities under which all New Hampshire energy programs and policies could be developed and aligned." They are:**

1. **Clearly articulate a comprehensive energy policy;**

[1] *Independent Study of Energy Policy Issues,* Vermont Energy Investment Corp., September 30, 2011, required by Senate Bill 323 (2010 session)

2. **Develop and establish an Energy Efficiency Resource Standard; and**
3. **Maintain and strengthen the Renewable Portfolio Standard.**

The Board's recommendations in the Final Report continue to reflect the top energy policy priorities for New Hampshire. **An actionable strategy to achieve them should be clearly and unequivocally articulated in the final State Energy Strategy.**

Indeed, the 2013 analysis and report, *Energy Efficiency in New Hampshire: Realizing Our Potential*[2] found that increased investment in energy efficiency in New Hampshire could create over 2300 jobs and add $160 million per year to the NH Gross Domestic Product.

Many stakeholder processes, including the 2009 *NH Climate Action Plan*[3] and the State Energy Strategy public meetings, have highlighted the pressing need to prioritize energy efficiency and renewable energy for both economic and environmental reasons. **The final State Energy Strategy should clearly articulate the need for prompt action and propose measurable and comprehensive actions to promote efficiency and renewable energy, to track progress, and to engage all levels of state government and both private and non-profit sectors. The State Energy Strategy should capture recommendations from past work, and should also draw from "best in class" programs regionally and nationally.**

Actions that utilize energy efficiency as a primary energy resource, foster the deployment of local, renewable resources, and reduce fossil fuel use in the state will retain more of New Hampshire's energy dollars in the state, support local economic development, and encourage the development of private market investment in energy in New Hampshire. **The Strategy should also recommend the State coordinate the use of existing financial resources for creative financing mechanisms to deploy renewable energy and energy efficiency projects. We strongly recommend the final Strategy contain a vision statement and recommended actions that reflect these priorities.**

The EESE Board offers the following comments specific to the five vision elements:

1. Energy Efficiency

The EESE Board remains concerned that New Hampshire is falling behind our New England neighbors in setting efficiency targets, and losing the corresponding economic benefits. As noted, an Energy Efficiency Resource Standard (EERS) was previously identified by the EESE Board[4] as a top priority for New Hampshire. All other recommendations relative to energy use in the state should both complement and reinforce an EERS. **The Strategy should recommend**

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[2] *Increasing Energy Efficiency in New Hampshire: Realizing Our Potential,* Vermont Energy Investment Corp. GDS Associates, Inc., Jeffrey H. Taylor & Assoc., Inc. November 15, 2013

[3] *The New Hampshire Climate Action Plan, A Plan for New Hampshire's Energy, Environmental and Economic Development*, NH Department of Environmental Services, March 2009

[4] *Final Report on the New Hampshire Independent Energy Study*, EESE Board, November 16,2012

that New Hampshire adopt an EERS that clearly articulates a policy supporting efficiency as a first-order, lowest cost resource and establish competitive savings targets. The recommended EERS should also call for specific savings targets for electric and gas utilities, enforceable building codes, market transformation opportunities, and public and private financing mechanism that allow both utility and non-regulated energy savings programs to flourish. **The EESE Board further recommends the Strategy call for near-term legislative and/or regulatory action in establishing an EERS for New Hampshire.**

The Strategy should also recognize the unique opportunity State government has to "lead by example" and capitalize upon this by recommending the state adopt a policy to maximize investment in cost effective efficiency measures in state buildings and operations.

2. Grid Modernization

The current draft Strategy calls for the PUC to open a docket on grid modernization. A non-adjudicatory docket would be a solid step toward a more modern, reliable and efficient grid, with empowered consumers and improved outage management. **The Strategy should recommend swift, but sensible action to modernize the grid to stay competitive with the infrastructure and technology modernizations that neighboring states are already prioritizing.**

The Strategy should also address related efforts needed in the form of a broad public information campaign about "smart grid" technology to provide clarity on what is meant by terms such as "smart grid" or "smart meter," and about the capabilities, impacts, and associated costs. Uncertainty and confusion may otherwise cause resistance that could undermine efforts to modernize the grid.

3. Renewable Power Generation

New Hampshire's Renewable Portfolio Standard (RPS) establishes a goal of 24.8% renewable electric and thermal energy by 2025. The state has missed significant time and opportunity to robustly deploy new renewable energy generation, due in large part to frequent changes to the program that create uncertainty in the marketplace. Alternative compliance payments (ACP) represent the maximum value that the state places on a particular renewable energy source. **The Strategy should recommend the ACP value be based on regional market values in order to allow NH to participate and compete in the robust renewable energy markets in neighboring states. Additionally, the Strategy should recommend that the Renewable Energy Fund be used solely for projects and programs that support development of the renewable energy market in New Hampshire**. Significant potential exists to utilize these funds to leverage private investment in renewable energy in the state and the Strategy should reflect this potential.[5]

[5] Numerous economic reports show the value of renewable energy and energy efficiency to the state and locality, including the MA Clean Industry Reports, the Vermont Clean Energy 2014 Industry Report, and the Gittell et al 2007 economic analysis of a NH RPS, to name a few.

Distributed resources represent an important component of a well-balanced power generation portfolio. The RPS resource classes can support (or maintain) the development of some renewable distributed resources through Renewable Energy Certificate revenues. **The Strategy should recommend the State modify the net metering rate structure to provide retail rate compensation for an expanded set of customer generators[6] and pursue policies that enable other creative non-public financing mechanisms, support adequate technical assistance programs, and streamline the RSA 374-G process to reduce administrative burden and enable projects to be completed sooner in order to reach the full technical and economic potentials of all distributed resources, including energy storage resources and combined heat and power. Additionally, the Strategy should recommend the State support efforts to encourage and enable widespread use of the recently revised Commercial Property Assessed Clean Energy (C-PACE) funding mechanism.**

4. Fuel Choice and Availability

The draft Strategy suggests several viable approaches that may expand fuel choice and availability for heating and industrial use. However, **the Strategy should also address fuel choices relative to the transportation sector, discuss the potential for bio-gas in the state, and capture "best-in-class" strategies.**

Currently, about 250,000 New Hampshire homes heat with oil. **Converting about ten percent of these homes to biomass fuels for heating purposes is technically achievable with sustainably harvested biomass yields, would save millions in energy costs each year, and would help transform the market for viable and affordable biomass heating equipment and fuel supplies.** Use of this indigenous fuel will also strengthen the New Hampshire economy by keeping our fuel dollars in the State. **The Strategy should recommend appropriate financial incentives, financing, and industry guidance to make this transition.**

The Strategy recommends establishing targets for higher utilization rates for natural gas among on-main customers, a plan many EESE Board members support. **The Strategy should also recommend policy changes that facilitate the expansion of natural gas use through existing main lines and trucked CNG options. Additionally, the Strategy should recommend that ratepayer-expensed regional tariffs to create green-field pipeline projects, such as is under consideration by NESCOE, be thoroughly analyzed and publicly vetted.**

One fuel source that is not discussed in the strategy is biodiesel, which can be used either in the transportation sector or used in existing oil heat systems (bioheat). New Hampshire has one large commercial scale biodiesel producer and several smaller entities that produce biodiesel from waste grease collected in the state. While the potential market size is limited by waste grease availability, it is still an important re-use of a waste product and provides a low emission

[6] Current net metering rules have two different levels of reimbursement value--one for systems under 101 kW and the other for those over 100kW and up to and including 1 MW.

energy resource for the state. **The Strategy should recommend actions that help develop the market for this fuel, including that the State utilize a certain percentage of waste grease-derived biodiesel in heating oil used in state buildings and that the state seek to lower the sulfur content of liquid fuels in the state consistent with action taken in other New England states[7].**

Bio-gas[8] is another fuel source that is absent from the Strategy. Again, availability is limited by potential sources of bio-gas in the state (e.g. landfills, waste treatment facilities), but failure to capture the gas as a fuel source represents a missed opportunity for NH. **The Strategy could recommend analysis of this potential energy source to determine its economic viability**.

The draft Strategy's Figure 5-12 lists combined heat and power (CHP) as an applicable technology, but fails to **recommend a means to boost development of CHP** in the state. It should do so. **One potential tactic is development of appropriate CHP-supportive rate design (e.g. stand-by charges) and a technical assistance provision targeted to sites that have large, consistent thermal loads.**

The Strategy should recommend New Hampshire consider adoption of a Low Carbon Fuel Standard (LCFS) for motor vehicle fuels that encompasses the Northeast- mid-Atlantic region. Such a tactic could create economic opportunities in the region, reduce exported energy dollars, and reduce emissions of harmful air pollution.

5. Transportation Options

The transportation sector accounts for 35 percent of New Hampshire's energy consumption,[9] and has an enormous economic and environmental impact in the state. Based on the Navigant analysis, per capita energy costs for transportation energy exceed either thermal or electric per capita costs annually for New Hampshire's buildings. **It is critical that the Strategy include actionable recommendations that will encourage the use of more efficient travel modes for movement of goods and people and spur development and adoption of more efficient and cleaner on-road vehicles.**

Noticeably absent from the Strategy is any mention of rail as a means to increase the efficiency of movement of freight and people. Continued reliance solely on trucks for movement of freight within and through the state adds costly wear and tear on our roadways, wastes energy and contributes to air pollution. Utilizing rail for freight movement lessens the energy needed to move those goods, reducing both costs and environmental impacts. With redevelopment of rail networks to support freight comes the opportunity to utilize those same rail lines for passenger rail that could support both our commuting population and tourist travel to the state. **The**

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[7] Other New England states have adopted requirements that lower the sulfur content of fuel oil to 15 - 500 ppm.

[8] Biogas is methane produced by the process of anaerobic digestion of organic material by anaerobes.

[9] http://www.eia.gov/state/?sid=NH

Strategy should include rail as a viable approach to reduce energy use in the transportation sector.

The Strategy appropriately recognizes the significant potential for expanded public transportation options to reduce energy use in the transportation sector. However, the Strategy does not provide any concrete recommendations to ensure adequate funding to develop and support public transportation or to ensure state and regional transportation planning take this need into account. Continued reliance on the road toll (more commonly referred to as the gas tax) is a failure to plan. Vehicles will become increasingly efficient in response to federal policy and the cost of maintaining our existing roadways and bridges and building new infrastructure will continue to escalate. **The Strategy should recommend that the State work collaboratively with other states, particularly the Northeast states who participate in the Transportation Climate Initiative[10], to evaluate other mechanisms to fund a comprehensive transportation system, one that goes beyond traditional highway infrastructure to include public transportation options, freight movement options, and active transportation modes such as biking and walking. The Strategy should further recommend that as State funds becomes available they are utilized to their fullest extent to provide matching funds for, and thus secure, available federal funding to support public transportation.**

We have previously noted the unique position of state government to demonstrate viable technologies and best practices, thereby leading others to adopt similar strategies. This ability to lead by example applies to fleet operations and adoption of advanced vehicle technologies as well. **The Strategy should recommend the State adopt policies that bring highly efficient and clean technology vehicles into the State fleet. The Strategy should recommend that the State provide electric vehicle charging infrastructure at State offices to support adoption of these cleaner vehicles by the largest workforce in the state, state employees. And the Strategy should recommend the State explore other policy options, such as tax credits, that will encourage the private sector to provide the infrastructure necessary to support the next generation of clean vehicles across the state, thus connecting New Hampshire to our neighboring states who have already adopted such policies, and enabling their citizens to travel here for both work and pleasure.**

Finally, the EESE Board applauds the recommendation in the draft Strategy regarding adoption of the **California Low Emission Vehicle program and the Zero Emission Vehicle** program in New Hampshire.

Conclusion

The State Energy Strategy needs to move us forward with clear and specific recommendations that address the State's critical energy issues. The current draft Strategy fails to successfully

[10] TCI includes all New England states, New York, New Jersey, Pennsylvania, Maryland, Delaware, and the District of Columbia.

leverage prior analysis, previous studies and the consultant's extensive knowledge of best practices and successful paradigms from other jurisdictions. **The Strategy should clearly define a course of action, starting in 2015, which maximizes the State's energy potential and ensures our competitiveness in the long run.**

The EESE Board strongly supports a final ten-year energy strategy that will result in measurable goals and clear parameters against which progress toward those goals can be measured, The EESE Board is prepared to assist in establishing these goals, starting now. Centering those goals, and the accompanying actionable strategies, around metrics that will minimize waste, foster the deployment of local, renewable resources, and reduce fossil fuel use in the state will retain more of New Hampshire's energy dollars in the state, support local economic development, and encourage the development of private market investment in energy in New Hampshire. **We know that the State needs to move in this direction. Now is the time to act decisively, with a clear and actionable State Energy Strategy and strong leadership from the Governor's Office and the State Legislature.**

Sincerely,

Katherine W. Peters
Acting Chair
Energy Efficiency and Sustainable Energy Board

WAGNER
FOREST MANAGEMENT, LTD.

July 21, 2014

RE: SB191 Draft Energy Strategy

Please find below the comments of Wagner Forest Management, Ltd. in response to the Draft Energy Strategy developed under SB191.

We would like to preface our comments by thanking Navigant for their work on this project. In particular, the in-person meetings were strikingly clear despite the complex subject matter. We believe this draft represents an important first step, particularly towards measuring the current state of New Hampshire energy policy. That being said, the strengths are overshadowed by insufficiently clear objectives, a and a lack of discrete interim milestones for measuring progress towards those objectives. Also lacking are suggestions for mechanisms to provide oversight and course correction as the state strives to meet our objectives. We support the blueprint laid out by the New Hampshire Clean Tech Council, particularly the recommendation of retaining an additional $1 billion each year within the state.

Likely due to lack of time and resources, the plan does not adequately evaluate the sources of the success or failure of New Hampshire programs. More importantly, there is insufficient analysis of why other states are doing better – for example, section 5.1 states that there is a "widening gap between New Hampshire and surrounding states" but there is no analysis of what programs surrounding states have implemented that has led to this gap. To the extent funding has not been available to perform such a study, a clear recommendation for additional analysis in this area might be a concrete recommendation and deliverable that could stem from this report.

Wagner Forest Management has been, currently is, and expects to continue to be involved in utility and small-scale renewable energy projects. As one of the largest private land managers in the state, we are also exceptionally well versed in the realities of biomass opportunities. We will focus our comments primarily on these areas of expertise.

Utility Scale Renewable Energy

As a company actively involved in both distributed and utility scale renewable energy generation projects, we are baffled by the Energy Vision's near-omission of the role utility scale renewable energy has and can continue to play within New Hampshire's energy mix. Although utility scale and distributed generation are given equal consideration in Figure 3-2, there is hardly a mention in the rest of the draft strategy about the important role utility scale renewable generation has in the energy mix. There is also insufficient discussion of specific policies (long term procurement policies such as those used in Massachusetts and Connecticut, raising Alternative Compliance Payment caps to match those of other New

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England states, and predictable permitting criteria to name but a few) can play in fostering development of renewable energy generation resources in New Hampshire. While small scale projects certainly have a role, we disagree that "small scale" should be relied upon to the exclusion of the large commercial projects that have been an essential foundation of the energy strategy for most other states.

In Section 4.5.1, dealing with power generation, despite showing strong potential for terrestrial wind in figures 4-8 and 4-9, you limit discussion about wind to "distributed wind (smaller than utility scale)." The report referenced in footnote 49 (An Analysis of the Technical and Economic Potential for Mid-Scale Distributed Wind) would suggest this to be an unwise limitiation. For example, Figures 12-14 of this report show the bulk of suitable sites within New Hampshire to be in the northern half of the state - primarily ridgelines in sparsely populated areas. As such, the vast majority of wind energy capacity coming from these locations would not be small scale distributed projects, but rather larger utility scale projects. Excluding the areas better suited to utility scale projects, New Hampshire is, by technical limitations, a fairly poor place for most small scale wind projects. Most towns are located in valleys or in southern areas of the state, where the NREL report shows that wind resources are dramatically limited by the technical realities of geography and topography. You will note that all major commercial wind projects have focused on ridgelines due to these resource-based considerations. In addition to the topography constraints, New Hampshire is the most forested state in the country – further limiting the technical effectiveness of smaller wind installations in most locations.

By contrast, utility scale wind farms represent the vast majority of new renewable energy installations over the past 5 years (by at least two orders of magnitude). Given that terrestrial wind power is a proven economical resource within the state, it would be appropriate for 4.5.1 to specifically note that utility scale terrestrial wind projects have had commercial and operational success, and are a vital resource for achieving the clean domestic energy generation potential of the state. Given that you later recognize the importance of terrestrial wind for meeting the RPS target, and also "the remaining economic potential for additional terrestrial wind power generation is actually higher than" solar technologies, we assume that the omission of Utility Scale Wind from Figure 5-10 is accidental.

We disagree that "areas with the most promising resources (largely ridgelines and coastal areas) may be undesirable because of their proximity to residences" – many ridgelines, particularly in the northern half of the state, are 3 miles or more from the nearest residence. While certain projects with proximity to residences have taken a disproportionate share of newspaper ink, the largest project in the state (Granite Reliable) continues to operate without objections, precisely because it is not proximate to residences. New Hampshire has the landbase to install several projects of similar size and remoteness to Granite Reliable, and we believe that you do a disservice to the state's renewable energy generation potential by damning an entire industry based on the public

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reaction to a subset of proposals. We would be happy to show you maps which could quickly correct this erroneous statement. We would also point out that the NREL study used to support your assertion of the feasibility of mid-scale distributed wind relies almost exclusively on these ridgeline resources you label as "undesireable."

You present a factually incorrect statement when you assert without reference "power intermittency is another challenge for wind technology in the absence of economically feasible utility-scale storage solutions." ISO-NE has reviewed integration of wind resources and found that "New England could potentially integrate wind resources to meet up to 24% of the region's total annual electric energy needs in 2020 if the system includes transmission upgrades comparable to the configurations identified in the Governors' Study " (See the ISO-NE Wind Integration study, http://www.iso-ne.com/committees/comm_wkgrps/prtcpnts_comm/pac/mtrls/2010/nov162010/newis_iso_summary.pdf). This report comes directly from the most authoritative voice on the subject, and should be included in your report.

We wholeheartedly reject and disagree with your conclusion that "although the technical and economic potential exists for additional terrestrial wind, public concerns may mean that the most viable option my be presented by customer and community-scale installations." We suggest in the strongest manner possible that you strike this sentence in its entirety. We would instead recommend a statement that accurately characterizes the technological and economic potential, without misrepresenting viability based on public concerns. A more accurate balance might be "There is substantial technical and economic potential for additional terrestrial wind, although these projects must be properly sited to minimize public concerns. Customer and community-scale installations may also contribute to terrestrial wind deployment where they are technically and economically feasible."

Finally, we believe that section 5.3.3 does not adequately explore the successful policies of other states.

- For utility scale energy projects, a Feed In Tarriff may produce results, but seems politically highly unlikely.

The primary barrier to renewable energy development on a commercial scale is obtaining a long term Power Purchase Agreement (PPA). Because renewable energy projects can guarantee a fixed price for up to 20 years, Massachussets and Connecticut have had dramatic success in furthering renewable energy deployment simply by having their load serving entitites enter into long term PPAs. Such products make financing renewable energy projects much more efficient, and indeed the most recent round of long term PPAs for Massachussets enabled the purchase of renewable energy that was CHEAPER than conventional electricity sources (See the September 23 Boston Globe article entitled "Wind power now competitive with conventional sources"). Clearly such mechanisms are a win for developers, utilities, and ratepayers.

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- The owners of distribution systems should be required to allow generators to co-locate lines from renewable energy projects on existing poles. Obviously costs associated with maintenance and rebuilding should be allocated fairly. There should also be requirements for the owners of distribution systems to facilitate connection directly into these systems, to the maximum extent possible.
- Much of the existing infrastructure is aging, and is in need of replacement. There should be a study to determine low-cost upgrades that could be done concurrently with needed maintenance to facilitate greater renewable energy interconnection. One example would be that uprated wires may come at a small marginal increase in conductor costs, but might enable substantially more generation to tie into existing lines.

Small Scale Renewable Energy

In order to foster small scale renewable energy, we would like to suggest the following strategies:

- Currently it is costly and logistically difficult for small scale producers to certify their REC production. This process should be simplified and streamlined (this is briefly mentioned, but not highlighted).
- It is difficult, perhaps functionally impossible, for small generators to sell RECs – the transaction costs are simply too high. We suggest that the state simplify the process of validating and selling RECs. For example, the load serving entities could have a standard offer sheet for their customers, so that small generators do not need to have a legal team review the contract, and marketers find a buyer.
- Interconnection to the distribution system is difficult for projects over 100 kW. The owners of these lines should set up policies that streamline integration
- During at least one of the meetings (April 21, I believe) we discussed the arbitrary reduction of sREC ACP and the resulting decimation of investor confidence in New Hampshire's energy policies. In addition to restoring sREC pricing, measures should be taken to signal that policies will not be retroactively changed for existing resources. The impact of such uncertainty cannot be overstated, but this event seems to be largely missing from the draft.

Biomass

The DES study referenced in section 4.4.1.2 is overly confusing and complicated. The draft Strategy appears to base most of its biomass conclusions on this study, notably drawing from the study's descriptions of limitations in supply from the forest to conclude there are minimal commercial/industrial thermal applications. We recommend you review 2012 study performed by INRS for NEFA, which is both more recent and a much clearer assessment of NH forests and their potential as a source of energy.

One set of statistics drawn from the NEFA report is that NH forests grow approximately 200 million cubic feet/yr, and are harvested at a rate of 139 million – approximately 30% of total NH forest growth is currently not being harvested. There are a total of 12,800 non-

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recreation jobs in this sector - not to put too fine a point on it, but these are well paying blue collar jobs generally located in regions with the highest unemployment rates. While the room to expand industrial and commercial biomass thermal applications is not limitless, it appears to be substantially higher than is accounted for in the Strategy. We believe it would be useful to incorporate this data into the Strategy, and highlight that the state's forests could sustainably handle a fairly large increase in usage, while increasing jobs and retaining dollars in the New Hampshire economy.

In general, the draft Strategy references compressed natural gas (CNG) as a much more viable, almost preferable alternative to biomass as a source of thermal fuel in the commercial/industrial sectors. While we are not arguing that CNG has a role in NH's energy future, we believe that biomass should remain the preferred source of thermal fuel.

- Natural gas has experienced significant price volatility for almost as long as it has been a major fuel source. Biomass, by contrast, has been much more stable in price, supply, and deliverability.
- As you are keenly aware, much of the increase in natural gas supply has been based on new hydraulic fracturing technology. The controversy surrounding this technology has only grown over time, not diminishing as with other technologies. High profile decisions surrounding community rights (most recently in New York) raise questions about the ability of this technology to continue expansion of supply. These questions may be dwarfed by the uncertainty surrounding what regulations, if any, ultimately get applied by Federal regulators.
- Energy dollars spent on CNG leave NH, while dollars spent on biomass/wood stay in the state and promote local job creation
- The "Plan" references CNG being trucked to commercial/industrial applications in rural applications not near nat. gas pipelines. There is no reference to the relative cost of this fuel. While nat. gas is currently selling for $4.50/MMBTU, (vs $5-6/MMBTU for wood fuel in commercial/industrial applications). This is an apples to oranges comparison, as the natural gas pricing ignores the costs of compression, storage, transportation, and delivery.
- There were enormous spikes in natural gas prices this winter (and all expectations are for spikes for years to come). There is no guaranty that the NE Governors plan to build pipeline infrastructure will mitigate cost or supply issues within New Hampshire. It seems more likely that new generators will locate in MA and CT to reduce the possibility of transmission constraints. Indeed, any expanded capacity may be taken up by these new facilities and retrofits of facilities such as Salem Harbor, leaving little supply available to NH industries at a reasonable cost. Biomass supplies, by contrast, are local and more knowable.

Finally, in sections 3.3 and 5.4 you mention the benefit of keeping dollars in state – we think it would be helpful and appropriate to specifically call out the job creation inherent in this assumption. Because most of the biomass resource to be used is grown, harvested,

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transported, processed, and marketed in New Hampshire, by New Hampshire employees, the economic and employment impacts of biomass resource does not seem to be adequately highlighted. It may be worth stressing that many jobs in this industry provide living wages, and would disproportionately provide employment to some of the poorest areas of the state.

Other comments

In Section 4.3.1 you discuss the report "Additional Opportunities for Energy Efficiency in New Hampshire" but do not discuss what our progress and experience is 5 years after the report was released. Are we meeting those opportunities, and if not, why not? It would seem that focusing on the lessons learned from the successes and failures of past policies would make for a much more useful report.

Although there is considerable attention paid to smart grid technologies in the report, our experience leads us to be pessimistic about fulfilling these objectives. Time and again we have heard that the state's aging infrastructure is ill prepared to handle current demands – adding additional complexity without fixing the underlying infrastructure seems likely to lead to highly publicized and politicized failures. In addition, many of the technologies are dependent upon a communications infrastructure that simply does not exist in wide swaths of the state. We suggest instead a call for policies that simplify interconnection of generators, easing restrictions on co-location of power lines, and rebuilding aging infrastructure with uprated components better able to handle generation and communication in the renewable energy friendly remote parts of the state.

We at Wagner thank you for your consideration of our comments. We recognize that the tight budget and timelines associated with this project have made it difficult to fully explore the areas we would all agree are necessary for the final report. We hope that these comments are received in the spirit they are given, that additional data and information may lead to the strongest possible report, which hopefully will be the first step towards achieving the visionary dream you have offered.

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League of Women Voters New Hampshire
4 Park St., Suite 200
Concord, N.H. 03301

July 22, 2014

New Hampshire Office of Energy and Planning
RE: Draft State Energy Strategy

The League of Women Voters NH appreciates the opportunities all our citizens have been afforded to hear about the proposed energy strategy in the public hearings across the state and to submit comments. We were impressed by the turnout and the questions asked which is indicative of the interest they have in seeing progress made in New Hampshire.

It was discouraging to learn that efforts in New Hampshire are not forecast to meet its renewable portfolio standard of 25% renewable energy sources by 2025. This goal set in 2009 needs much more support by our Legislature. The economic benefits from reducing our reliance on imported fuels would keep more money in New Hampshire and this seems to be an obvious step to pursue.
The League would support and recommend a concerted effort to meet the 25 by 25 goal as a minimum. To continue this emphasis, the next Legislative session should be encouraged to:

1. Promote low and non-CO2 emitting customer-sited distributed generation of energy as described in the Climate Action Plan developed by DES and proposed to guide state energy policy in 2009. This includes net metering, and favorable rules for interconnected renewable generation systems with the grid.
2. Pass legislation to encourage development of a smart micro grid that leverages electric plug-in hybrid technology that can be programmed to charge when demand is lowest or when intermittent renewable generation such as wind is available. We know the needed technology has already been improved, solar panels are much more common and less expensive, and some towns have permitting rules for individual windmills.
3. Improve rule-making for RGGI that supports comprehensive education for consumers, more help for building efficiency upgrades and rewards renewable generation of power
4. Pass a carbon tax on consumers to encourage less dependence on fossil fuels and needed improved efficiencies that would add to the benefits of RGGI for supporting increased rehabilitation of older homes and businesses as well as public buildings.
5. Encourage as much solar installation as possible on buildings when roofs need repair and require it for new buildings.
6. Support increased development of regional mass transit including park and ride lots with plug-in ports for electric car charging in the remaining parts of N.H. without them.

Although we recognize that the implementation of the recommendations above will take time and recognize that the production of affordable and accessible energy is critical to the state, the League of Women Voters has serious reservations about expansion of transmission infrastructure for carbon based fuel. Although recommended in the plan, an expansion is expensive and once in place would not be shut down or eliminated easily. Therefore, an expansion would support continued – and long term - use of fossil fuels.

Liz Tentarelli, Co-President, LWVNH
Sally Davis, Co-President, LWVNH

Lyme Energy Committee
Lyme, NH

July 22, 2014

We, the Energy Committee for the Town of Lyme, offer the following comments to the draft New Hampshire State Energy Strategy, dated May 1, 2014.

As a small town, we understand the difficulty of completing a major project with limited resources. Given your time and budget constraints, we commend Navigant for the work done to date on this project. Given that no document is ever perfect, we hope that our suggestions, reflections, and recommendations are received as intended - sharing a goal of making the strongest possible Strategy.

Although a lofty vision for 2025 was laid out, we find the Strategy noticeably lacking in discrete actionable items. We believe New Hampshire is a special, perhaps unique state, in that our towns and villages have a higher degree of coordination and public service than is found in many states. This close-knit setup allows for rapid spreading of ideas and initiatives through word of mouth and local efforts – provided there is leadership and coordination materials available.

As an example, we would like to highlight our town's recent experience with the Solarize program. With limited resources from Vital Communities (such as website assistance and program templates) local influencers were able to facilitate the purchase and installation of nearly 50 photovoltaic systems in 2014, nearly 10% of the total housing stock of the town. These types of programs, relying primarily on passionate locals and word of mouth, represent an amazing opportunity for low cost deployment of economic technologies, whether they be in the areas of efficiency, distributed generation, or fuel switching. Combined with friendly competitions between towns, we believe that our success in the Solarize program could be replicated in other towns and expanded to other technologies. However, for such programs to be successful we need leadership, coordination, and discrete biannual targets and milestones– specifics that were not included in the draft Strategy.

Another missed opportunity for specific actionable plans relates to public infrastructure. Our town's recent experience shows that there is substantial opportunity for cost savings by doing energy efficiency and fuel switching upgrades on public buildings. In order to get voters to approve these upgrades, a substantial amount of education is needed about the economic and environmental benefits about these upgrades. Many walk away from these educational events intrigued by the idea of retaining income and not sending dollars to out of state fuel sources, but are unclear of the next steps, or how to finance their own improvements. By leveraging public building retrofit processes to enable group education and bulk procurement, we see tremendous opportunity to facilitate a town by town approach to meeting the Strategy's goals. Again, we feel that the draft Strategy's lack of goals greatly limits the likelihood of successful adoption. We suggest that the Strategy

suggest a pilot program, perhaps of 5 towns. Based on the experience in those towns, the program would be improved and deployed to more towns the following year. We suggest that the draft Strategy specify the number of locations to be targeted each year, with an end goal of reaching the entire state by 2025. It is only by setting ambitious but achievable targets that we will be able to meet the Strategy's goals.

In general, our Committee is primarily focused on residential and municipal actions, and thus we are broadly supportive of the goals of increased energy efficiency, more distributed generation, and fuel switching to native technologies and fuel sources. Energy efficiency and distributed generation lead directly to a retention of wealth in our towns, and may lead to more local spending and increasing the benefits to our local economy. Our town has seen the positive benefits that local energy sources such as biomass can have, and we believe biomass based energy solutions lead to increased local employment and economic improvement. We believe that these benefits deserve greater highlighting in the final Strategy. We also strongly suggest that specific metrics and targets be set, so that our leaders can confirm that we are on the path to meeting the Strategy's objectives. One such metric could be that by 2025 New Hampshire has reduced spending on non-New Hampshire based fuels by $1 billion annually. This is a specific target, with clear benefits to the state and its residents.

Finally, our experience indicates that the single largest barrier to the deployment of energy efficiency, distributed generation, and fuel switching technologies is financing. If our towns were able to leverage the historically low interest rates that state bonding currently affords, many of our schools could be retrofitted with pellet boilers, better insulation, and solar panels in a manner that annual debt service would be lower than the savings in energy costs.

Financing is perhaps even more important for individuals. We support the idea of a green bank to facilitate financing economic improvements, but find the details in the draft Strategy lacking. We strongly suggest that the final Strategy provide a more specific plan about implementation and deployment of this important tool. Again, we stress that targets and metrics should be specified, so that our leaders can evaluate whether the program is on track to meet our 2025 targets.

We thank you for the diligent efforts you have put into this initiative. We hope that you recognize the strong local resources that town Energy Committees represent, and look forward to a final Strategy that creates a path towards greater economic prosperity, decreased pollution, and greater energy security.

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July 23, 2014

Meredith Hatfield, Director
NH Office of Energy and Planning
Concord, NH 03301

Dear Director Hatfield and Members of the Energy Advisory Council:

I specifically write to highlight the importance of distributed generation in solving the many challenges that the delivery of electric energy in a cost-effective, reliable and sustainable way poses to the State and its residents. Intelligently-sited and reliably-designed distributed generation provides many direct and indirect benefits. During times of peak energy prices, it can provide a fixed and reliable source of power. It can also defer the construction of costly utility infrastructure that is only needed to deliver power on the most extreme peak days. Also, by reducing its importation of out-of-state power, New Hampshire can reduce the transmission rates that it pays in transmission charges, which are an ever increasing component of retail electric rates. Finally, the construction of these projects will provide jobs throughout the state and will increase property tax revenues at a time when local governments are in need.

More generally, I urge you to set a goal in the state energy strategy to reduce the export of our energy dollars from 66% (nearly $4 billion annually)[1], to 50% by 2023, retaining over $1 billion of economic wealth each year in New Hampshire. This goal can be reached by pursuing the following three strategies:

1. Significantly ramp up energy efficiency and conservation through system wide efficiency investments (customer-side and utility/supplier-side), to reduce overall energy use;
2. Replace imported fossil fuel use with locally produced renewable energy, with an emphasis on:
    a. distributed generation
    b. utility-scale generation
    c. thermal and electric fuel switching for heating, cooling, and transportation needs;

and,

3. Unleash the private market to finance the infrastructure by minimizing policy risk, sending clear market signals, and better leveraging our minimal available public funds.

Regards,

Elijah D. Emerson

[1] Vermont Energy Investment Corporation et al. September 30, 2011. *Independent Study of Energy Policy Issues.*

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Meredith A. Hatfield, Director
NH Office of Energy and Planning
Governor Hugh J. Gallen State Office Park
Johnson Hall, Third Floor
107 Pleasant Street
Concord, NH 03301

24 July 2014

Via email to Meredith.hatfield@nh.gov; brandy.chambers@nhgov

Dear Meredith,

I am pleased to provide comments on the Draft State Energy Strategy on behalf of New Hampshire Audubon. We are a statewide non-governmental organization dedicated to protecting New Hampshire's environment for wildlife and for people.

Firstly, we would like to express our appreciation to you, the Energy Advisory Council, and Navigant for the time, expertise, and effort involved in producing the Draft Strategy. Members of our staff and Environmental Policy Committee have reviewed the draft and provide the following comments.

We strongly support the Vision outlined in the Draft Strategy. However, we feel that the Summary would benefit from an introductory sentence or two that addresses energy in more general terms. Perhaps something like "In 2025, a broad range of clean, economical energy sources are available to New Hampshire consumers." It would also be helpful to include a bit of clarification regarding "a cleaner, more sustainable and resilient energy system," since this phrase could be interpreted differently by different readers.

In keeping with the directive in SB191 that the Strategy "minimize negative impacts to the economy, the environment, and the natural beauty of our state," we would like to see a statement regarding such impacts included in the Vision. Such a statement could be a final paragraph of the Summary or a separate *Impacts* section following *Transportation Options*. We propose the following wording for such a statement:

The selection of appropriate energy scenarios is grounded in environmental and public health considerations ranging from energy extraction and generation to ultimate use. Environmentally sound energy choices minimize negative impacts to air, water, land, wildlife, and scenic resources.

In the Introduction, we suggest changing "the possibility of alternative resources" to "the potential contribution of alternative resources" on the third line below Figure 1.1.

We are pleased that recommended strategies include numerous examples from other states. New Hampshire can benefit greatly by adopting strategies that have a proven record of success elsewhere. We are also pleased that the Strategy has drawn many recommendations from the 2009 New Hampshire Climate Action Plan, and hope that inclusion in the present document will lead to their implementation.

We strongly support the emphasis on energy efficiency and grid modernization as high priority strategies. Increased financing opportunities for weatherization of existing housing stock and municipal, commercial, and industrial buildings will provide economic, environmental, and public health benefits for generations to come. Grid modernization, in particular investment in Smart Grid infrastructure, provides consumers with greater awareness of and control over household energy use and the associated costs.

In the introductory paragraph on *Fuel Choice and Availability*, we would like to see acknowledgement that the significant social and environmental costs of extracting and transporting fossil fuels provide additional justification for reducing dependence on these fuel sources.

The final State Energy Strategy will be an important step forward for New Hampshire, but its ultimate impact will depend on implementation. We hope that the agency actions and legislative initiatives required to move forward with the strategies outlined will quickly follow completion of the final document. To that end, we recommend that the Energy Advisory Council identify and commit to specific goals in each of the resource areas for action before the first Strategy update in three years.

We appreciate the opportunity to comment on the Draft Strategy, and look forward to working with the administrative, legislative, and executive branches of government and our colleagues in the non-governmental sector toward an efficient and sustainable energy future.

Sincerely,

Michael J. Bartlett

President

GDS Associates, Inc.
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Principal & Northeast Region Manager

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July 24, 2014

Director Meredith Hatfield
NH Office of Energy and Planning
Concord, NH 03301

Dear Director Hatfield and Members of the Energy Advisory Council:

Thanks for the opportunity to submit comments regarding the draft 10 Year, NH State Energy Strategy. Our Northeast Region office of GDS Associates has been actively engaged in developing, analyzing and implementing state energy policy for clients throughout the region and nationwide since 1999. We were pleased to see a lot of excellent concepts included within the current draft State Energy Strategy report. However, we share a common concern among many parties in New Hampshire that believe the report does not go far enough in identifying and recommending specific targets/goals to help guide subsequent policy and implementation activities. As such, we respectfully suggest the following:

Please consider including a goal within the state energy strategy document to reduce the export of our state's energy dollars from 66% (nearly $4 billion annually)[1], to 50% by 2023, retaining over $1 billion of economic wealth each year in New Hampshire. This goal can be reached by pursuing the following three strategies:

1. Significantly ramp up energy efficiency and conservation through system wide efficiency investments (customer-side and utility/supplier-side), to reduce overall energy use – following the six strategies detailed within the recently completed VEIC/GDS/Jeffrey Taylor final report entitled "Increasing Energy Efficiency In New Hampshire, Realizing Our Potential" (dated November 15, 2013) including:
   a. State & Local Governments Lead-by-Example
   b. Expand & Enhance the CORE Programs
   c. Enable Behind-the-Meter Investments
   d. Implement Roadmap to 90% Code Compliance
   e. Track, Report, Benchmark & Promote Energy Efficiency
   f. Accelerate & Scale-up Private Investment Activity;
2. Replace imported fossil fuel use with locally produced renewable energy, with an emphasis on:
   a. Distributed generation
   b. Utility-scale generation
   c. Thermal and electric fuel switching for heating, cooling, and transportation needs; and,
3. Unleash the private market to finance the infrastructure by minimizing policy risk, sending clear market signals, and better leveraging our minimal available public funds.

Thanks for your consideration,

Scott M. Albert, Principal & Northeast Region Manager

[1] Vermont Energy Investment Corporation et al. September 30, 2011. *Independent Study of Energy Policy Issues.*

Dear Director Hatfield and Members of the Energy Advisory Council,

I encourage you to set a goal in state energy strategy to reduce exports of our energy dollars from 66% (almost $4 billion annually!), to 50% by 2023. This relatively minor and attainable reduction will create over $1 billion of economic wealth each year in our state. While there are lots of ways to reach this goal, here at the Green Alliance, we would like to suggest some strategies that we feel can work:

A. A serious increase of energy efficiency and conservation via system-wide efficiency investments (from both the consumers and the utilities).

B. An aggressive approach to use locally produced renewable energy, such as distributed generation, utility-scale generation and thermal and electric fuel switching for heating, cooling, and transportation to replace imported fossil fuel use/reliance.

C. Stimulate and encourage the private market to finance the infrastructure by minimizing policy risk, sending clear market signals, and better leveraging our minimal available public funds.

The Green Alliance represents over 100 green-leaning NH businesses and almost 4,000 green-minded NH residents. We hope you will consider this clear message sent from our community of citizens and entrepreneurs that believes that ultimate economic growth lies in growing our local green economies.

Sarah Brown
Director, Green Alliance

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24 July 2014

The New Hampshire Division of Historical Resources supports the recommendations of the State Energy Strategy as part of building a sustainable future for our state. We support the adoption of newer versions of the International Energy Conservation Code and the International Existing Building Code. Beyond energy conservation, both offer appropriate pathways for compliance *and* energy reduction within an historic preservation project, including performance-based metrics which may be more compatible with preservation standards.

We also support small-scale hydroelectric power generation as it has provided local, sustainable, and renewable energy throughout the history of our state and the development of its economy. While other renewable energy installations may be perceived as at odds with historic preservation goals, consultation between energy professionals and preservation professions often find appropriate solutions that meet both goals, even within historic districts. Net-metering may also offer a way for historic neighborhoods to benefit from renewable energy installations sited away from sensitive historic buildings.

The smart growth principles outlined in the strategy generally follow traditional New Hampshire development patterns. Smart growth initiatives would promote reinvestment in downtowns and village centers with existing infrastructure and embodied energy in both buildings and infrasturcture while also protecting historic residential neighborhoods and agricultural landscapes by avoiding impacts to them.

We would like to offer that passive methods of energy conservation are built in to many historic New Hampshire buildings, many of which pre-date modern building systems. These passive conservation features often rely on occupant knowledge and training, but may offer substantial savings in energy if used properly. Additionally, some of these methods (building orientation, fenestration patterns designed for natural lighting and cross-ventilation, and shade tree planting) could be used today for new construction to avoid energy use.

Historic preservation, energy conservation, and renewable energy installations are all vital to economic development and quality of life in New Hampshire. The Division of Historical Resources and the preservation community look forward to partnering with OEP and other agencies and partners to be part of the conversation about how to move New Hampshire towards a more sustainable future.

The Jordan Institute

July 23, 2014

Meredith Hatfield, Director
New Hampshire Office of Energy and Planning
Johnson Hall, 107 Pleasant Street
Concord, NH 03301

Dear Ms. Hatfield,

New Hampshire's next decade is going to pass quickly, with myriad opportunities to adopt and implement policy changes that will dramatically affect our future. Most notably, a comprehensive State Energy Strategy can become a touchstone to guide us through this period. The Jordan Institute is pleased to provide the following comments on the 2014 State Energy Strategy (Strategy) as the Energy Advisory Council (SEAC), the New Hampshire Office of Energy and Planning (OEP), and the selected consultant, Navigant, put the final touches on this important analysis and guidance.

The Jordan Institute, a non-profit organization founded in 1995 and based in Concord, advances public, environmental, and economic health by improving energy performance and resiliency in how buildings are designed, built, renovated, operated, and financed. We seek to achieve the most resilient and sustainable quality of life possible by transforming the energy and built landscape in our region.

Jordan Institute has participated in the majority of SEAC meetings, the public meeting in Plymouth, and provided comments throughout the process. While we can imagine the energy-efficient and sustainable picture painted for us through the Vision exercise, and we certainly applaud the direction the consultant takes us, we are quite concerned about the dearth of concrete guidance on how we will achieve this outcome. Indeed, certain overarching policy, cultural, and political barriers may undermine these efforts, yet they are not acknowledged in the Strategy. While this Strategy is not the place to debate New Hampshire's two-year election cycle, it is without question a variable that greatly affects continuity in public policy and energy program design. Without strong, consistent, outspoken leadership from both the Executive and Legislative branches, New Hampshire will continue to import fuel for electricity, heating, and transportation and export energy dollars that could otherwise build and strengthen our economy and physical infrastructure. Moreover, the model of how we generate and use energy is in transition, with centralized systems being replaced by distributed and more local solutions. Business As

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Usual will soon become very expensive and outdated if we do not adapt and evolve in the near term. The Strategy provides a unique opportunity to provide this guidance for our next steps.

The baseline Business As Usual analysis is a crucial component of this process; Jordan Institute is not surprised that New Hampshire is off target for achieving fundamental energy goals – most demonstrably those highlighted in the Climate Action Plan and targets set in the Renewable Portfolio Standard. This point affirms our concerns that systemically we need to make significant changes in the near term to both get back on track and to reposition ourselves to achieve our longer-term objectives. Furthermore, we need to develop robust yet achievable metrics and milestones to keep us on target. These were noticeably absent from the Strategy. Without such goals and leadership from the Executive and Legislative branches, our Business As Usual trajectories shall continue flattening, in effect, sending us backward, using more fossil fuels, exporting what could be local investment, and undermining what small efforts we do make to strive for a more energy-efficient and resilient economy. New Hampshire's legislature must adopt safeguards to ensure that dedicated funds are used for their intended purposes. Although tempting, short-term and feel-good "solutions" undermine long-term challenging goals, and reallocating funds raised through policy tools such as RGGI and RPS to the general fund are very detrimental to our long-term resiliency as a state.

It is important to acknowledge New Hampshire's place within the region. We are not positioned to dictate regional goals or efforts for the electricity grid, natural gas expansion, fuel mixes for vehicles or thermal use, or expanded rail. Nevertheless, we must participate in the development of these policies and stand tall for the best long-term interests of New Hampshire, and not just short-term anticipated cost savings. Like all states, New Hampshire has diverse priorities driven by businesses, municipalities, residents. Yet, unlike other states, we have not successfully brought these sectors together to recognize and embrace the synergy that expanded energy efficiency and renewable energy development can provide, creating a win-win-win scenario. Other states and regions have adopted and implemented robust energy policies, stretch energy codes and goals, and have vibrant economies that are well positioned for future energy challenges. We continue to be vulnerable to peaking energy demand, extreme weather, and volatile energy pricing and availability.

The Strategy should recommend that New Hampshire's Legislature rescind its policy to rebate a large portion of RGGI proceeds to ratepayers. These funds can instead be leveraged to create sustainable solutions available statewide. We agree with the Strategy's recommendation that New Hampshire's Legislature should re-tune the Renewable Portfolio Standard. For the near-term, they should allow the PUC to adjust the Alternate Compliance Payments (ACP) so they align with regional ACP values and market dynamics. In the long term, New Hampshire's Legislature should develop new goals to further expand our Renewable Portfolio Standard. Many states are stretching for 80% of their electricity portfolio to come from renewable energy by 2050 and this seems quite achievable. In fact, national goals are moving in just that direction and some communities are making plans to be net-zero energy use or net-zero carbon in coming decades. By combining robust energy efficiency improvements and renewable energy projects, our economy can continue to grow while using less energy - further empowering us, and making us less vulnerable to the dynamics of fossil-fuel costs and availability.

Systemically, we need to adopt policies that keep us current and competitive. For example, the Strategy should highlight the need to adopt building code updates on their three-year cycle so that new construction and major renovations employ standards that are recognized nationally as baseline. We are hurting ourselves long term if we continue to let new construction projects use old technologies, techniques, and materials. The town of Durham consistently adopts updated model codes and enforces them. Contractors and designers comply and new construction is robust. The nagging problem of compliance with these codes and standards also needs to be solved for many municipalities. Municipalities concerned about code compliance and unfunded mandates from the State – and protected from such mandates in New Hampshire's State Constitution, Article 28-A – will be supported if a stable funding source is dedicated to create a Building Code Ambassador program. Such a program would provide non-judgmental technical assistance, education, and resources for building professionals and code officials. Such an investment will pay significant long-term dividends. Funding this program from RGGI auction proceeds that are currently returned to ratepayers would be an excellent solution.

The Strategy did touch on the need for technical assistance but did not provide much guidance or detail in what is needed or how it should be delivered. Jordan Institute feels strongly that this oversight needs to be remedied in the Strategy. Technical assistance and informational resources – for home owners, business owners, contractors and other building professionals, policy makers, and others – provided by an independent, consistently funded, accessible, and technically savvy source is vital for our transition to a more energy-efficient and resilient future. Currently, technical assistance is provided in a haphazard, inconsistent, and self-serving way. Those who know where to find information or funding, often do so, but not always or consistently. Those who don't know where to start, often are misinformed or do not pursue energy projects. State agencies are not funded to provide this information; non-profit organizations cannot rely on grants or philanthropy to provide consistent resources. New Hampshire's regulated utilities provide some of this work and are capable of providing assistance as long as it relates to their energy programs. However, there is no central House that can competently and consistently field questions, connect consumers to solutions, or provide other technical assistance. This vacuum needs to be filled in the near term. Similar to the Building Code Ambassador program, funding from RGGI auction proceeds that are currently returned to ratepayers would be a viable solution.

The Strategy should also be bolder in its recommendations regarding the State leading by example. Currently approximately $250,000 is allocated each year for energy efficiency work in State-owned buildings. This paltry budget line is dwarfed by the estimated $50,000,000 (FIFTY MILLION DOLLARS) in projects suggested by agency personnel for more than 500 buildings. In many cases, energy-efficiency projects pay for themselves in short order. By not addressing the wasted heat and electricity in our public buildings, the State is relying on taxpayers to continually pay for energy. Further, the State should adopt a least-cost procurement policy for energy for State buildings and budget funding to start such an effort. As fleet vehicles owned by the State are replaced, hybrid and alternative fuels should be specified and purchased. Electric vehicle charging stations should be available on State properties – State-owned offices, parks, rest areas, and other locations for fleet vehicles, State employees, and the public. The Strategy should recommend all of these cost-saving solutions for near-term adoption.

New Hampshire's regulated utilities will be very involved in energy policy implementation going forward. As such, Jordan Institute looks forward to intervening on dockets related to rate design, time-of-use pricing and metering, decoupling profits from energy sales, least-cost energy procurement, grid modernization, development of more rigorous energy-savings goals, and the continuation of the CORE energy efficiency programs. Developing a comprehensive plan on how these modern utility policies interrelate and support each other will strengthen New Hampshire's economy, stabilize rates, and provide improved reliability to consumers.

Finally, it is important to recognize that while natural gas is considered inexpensive in many parts of the country, it will always be imported and volatile – price and availability wise – in New Hampshire. Jordan Institute acknowledges the temptation to invest in infrastructure in the short-term but strongly advises against being enticed. Some projections anticipate that natural gas availability will peak in a decade or two, but much of the infrastructure – pipelines, generating plants, and boilers – have expected lifetimes of forty or more years. A bridge fuel that will not be available in the coming years is frankly a bridge to nowhere. Additionally, natural gas infrastructure is prone to leaks which exacerbate greenhouse gas emission effects related to climate change and explosions. While we know that natural gas infrastructure will be built in the near term, we do strongly recommend that those investments also consider long-term availability, transition to biogases, and targeted priority uses.

We were delighted to see such attention to innovative financing solutions for the private investment in energy efficiency and renewable energy projects. This is an area that the Jordan Institute has been keenly interested in over the last few years. We are now developing the launch of a program – without public funds – specifically targeted at privately owned commercial buildings. Called C-PACE, for Property Assessed Clean Energy financing of Commercial buildings, our program will connect privately owned building owners with private financing, and tie loans to buildings not owners, through special assessments in the property tax assessment process. We anticipate first projects breaking ground in the coming months. While our focus is primarily on privately owned commercial buildings, we recognize that financing for this work in other sectors is also crucial.

This is an exciting time for New Hampshire as we envision our next steps in energy policy and direction. The Jordan Institute is both hopeful and optimistic that the guidance provided in the final Strategy will be adopted and implemented. Thank you very much for this opportunity to provide comments on the finalization of New Hampshire's State Energy Strategy.

Most sincerely,

Laura Richardson
Executive Director

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July 21, 2014

Director Meredith Hatfield
NH Office of Energy and Planning
Concord, NH 03301

Dear Director Hatfield and Members of the Energy Advisory Council:

I greatly appreciate your hard work in advancing a clean energy vision for New Hampshire. The National Wildlife Federation (NWF) has over 8,000 members and an additional 10,000 subscribers to our publications, such as *Ranger Rick* in New Hampshire. We are proud to also have a wonderful state affiliate, New Hampshire Audubon which is celebrating its 100th Anniversary this year in protecting wildlife and connecting people to nature. NWF members know that in order to protect wildlife and ensure a conservation legacy for future generations, we need a clean energy future.

NWF joins many state organizations in urging you to set a goal in the state energy strategy to reduce the export of our energy dollars from 66% (nearly $4 billion annually)[1], to 50% by 2023, retaining over $1 billion of economic wealth each year in New Hampshire. This goal can be reached by pursuing the following three strategies:

1. Significantly ramp up energy efficiency and conservation through system wide efficiency investments (customer-side and utility/supplier-side), to reduce overall energy use;
2. Replace imported fossil fuel use with locally produced renewable energy, with an emphasis on:
    a. distributed generation
    b. utility-scale generation
    c. thermal and electric fuel switching for heating, cooling, and transportation needs; and,
3. Unleash the private market to finance the infrastructure by minimizing policy risk, sending clear market signals, and better leveraging our minimal available public funds.

Respectfully submitted,

Curtis Fisher
Northeast Regional Executive Director
National Wildlife Federation
149 State Street
Montpelier, VT 05602

[1] Vermont Energy Investment Corporation et al. September 30, 2011. *Independent Study of Energy Policy Issues.*

Comments of Northeast Energy Efficiency Partnerships (NEEP)
New Hampshire Draft Energy Strategy

July 24, 2014

Meredith Hatfield, Director
Office of Energy and Planning
Johnson Hall
107 Pleasant Street
Concord, NH 03301

Dear Ms. Hatfield,

On behalf of Northeast Energy Efficiency Partnerships (NEEP)[1], please accept these comments regarding the May 2014 draft of the New Hampshire Energy Strategy. Due to the nature of our work, these comments are focused on energy efficiency in buildings and grid modernization.

As you know, NEEP is a regional non-profit organization that works to accelerate energy efficiency in homes, buildings and industry across the Northeast and Mid-Atlantic states. Our Policy Outreach and Analysis group serves as an information resource for policymakers, advocates and program administrators to support the adoption and implementation of public policies and programs that advance energy efficiency.

NEEP has long encouraged New Hampshire to take concrete steps toward creating policies that will enable the state's businesses, communities, and residents to do far more to harness the power of cost-effective energy efficiency. Our organization has dedicated considerable time and resources over the past five years to work with state agencies, support the efforts of legislators, collaborate with advocacy partners and understand the perspectives of utility program administrators in order to expand efficiency as a first order resource in New Hampshire.

We have made no fewer than three presentations to the Energy Efficiency and Sustainable Energy Board on the value of efficiency, regional best practices, and why New Hampshire needs a policy platform putting efficiency first, and we are regular participants in the monthly EESE board meetings.

We have testified before the legislature a number of times to make this case, commenting in support of SB 323 in 2010, SB 65 in 2013, and HB 1129 this year. We have offered orientation on energy efficiency policy issues before the House Science Technology and Energy Committee.

NEEP worked to inform the energy policy review conducted by VEIC in 2012, and to support and inform VEIC's 2013 report on the feasibility of creating an energy efficiency resource standard — a move to put

[1] These comments are solely the views of NEEP staff, and do not represent the views of NEEP's sponsors or board of directors.

New Hampshire in line with some 22 other states. Further, we've spent considerable time with Public Utility Commission staff to provide input on how an EERS would look for New Hampshire, and what the barriers to implementation might be.

THE DRAFT ENERGY STRATEGY

In 2013, the legislature passed yet another study bill: this one to develop a state energy strategy,[2] pursuant to SB 191.[3] Dedicated legislators, state employees, consultants and interested parties have devoted considerable time to this process in recent months. However, with a relatively modest budget and many similar studies recently completed, we wondered what new and groundbreaking would be found in the strategy.

While the Navigant report has presented useful information regarding cost-effective opportunities to reduce New Hampshire's reliance on fossil fuels for meeting its energy needs, we see little that is new, compelling, or specific enough on what the state needs to do to see this "Vision" become reality. Figure 5.5, Energy Efficiency Strategy Recommendations[4] is extremely brief and does not begin to encompass the findings and recommendations of prior studies, such as those conducted by VEIC. These are limited strategies to meet the broad vision laid forth on page 41 on the report, with a passing mention of the lack of a clearly articulated energy policy.

We found the report lacking, especially compared to a broad and deep comprehensive analysis undertaken in Connecticut that some in New Hampshire held as a model.[5] Not only did that state have more resources and a more robust stakeholder input process, it had the vision and support of Connecticut's governor, and it included firm policy recommendations building on efforts already underway across government and ratepayer-funded efficiency programs.

Further, the Connecticut Comprehensive Energy Strategy included next steps for implementation and performance development[6] as a means of keeping the state on track. From what we see over the past year and a half, this has been a living document in Connecticut — used to keep agencies and program administrators accountable for progress. We have not seen this level of detail or planning in the New Hampshire draft strategy, and hope that the State Energy Council will work with Navigant to include such information in the final version.

We note that VEIC, in its two recent reports for New Hampshire, had already undertaken extensive work to layout the challenges and possible solutions for the state to move forward on the cleanest, least-cost energy resource. The final Strategy Energy Strategy should provide concrete recommendations regarding energy efficiency policy that the legislature, possibly through its EERS study pursuant to HB

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[2] Draft NH Energy Strategy: http://www.nh.gov/oep/energy/programs/SB191.htm
[3] http://www.gencourt.state.nh.us/legislation/2013/SB0191.html
[4] Page 52 of the draft strategy
[5] Connecticut Comprehensive Energy Strategy http://www.ct.gov/deep/cwp/view.asp?a=4405&q=500752&deepNav_GID=2121
[6] An overview in the executive summary:
http://www.ct.gov/deep/lib/deep/energy/cep/2013_ces_executive_summary_final.pdf

1129 (if that bill is signed into law), and the Public Utilities Commission, using its own authority, can take to advance energy efficiency resources through rate redesign, building energy codes, building energy labelling, new private financing tools, and community engagement.

Similarly, the grid modernization section was very much a light touch, only outlining some of the challenges faced by the state and its neighbors in how to create a regulatory framework and power grid that will support the realities of the very near future. These include: increased distributed generation and the need to accommodate two-way power flow, building resiliency in the face of extreme weather and cyber-attacks, customer participation, use and sharing of more real-time data, technology compatibility, and how to leverage market actors to support this new framework.

We expect that New Hampshire has been looking at the work of Massachusetts in its recent Grid Modernization[7] docket and New York's sweeping Reforming the Energy Vision proceeding, currently underway.[8] NEEP has been participating in both of these proceedings, and would be happy to share our insights with OEP as New Hampshire considers how to modernize its own electricity distribution system.

NEED FOR STRONGER GOALS IN THE FINAL STRATEGY

NEEP concurs with this concluding statement in the comments submitted to your office by the EESE Board:

> "The State Energy Strategy needs to move us forward with clear and specific recommendations that address the State's critical energy issues. The current draft Strategy fails to successfully leverage prior analysis, previous studies and the consultant's extensive knowledge of best practices and successful paradigms from other jurisdictions. The Strategy should clearly define a course of action, starting in 2015, which maximizes the State's energy potential and ensures our competitiveness in the long run."[9]

We also support the request of the New Hampshire Sustainable Energy Association for the state to include a goal in the final state energy strategy to reduce the export of energy dollars from 66 percent to 50 percent by 2023, which would add over $1 billion to the state's economy each year. This goal can be reached by pursuing the following three strategies, as outlined by NHSEA:

1. Significantly ramp up energy efficiency and conservation through system wide efficiency investments (customer-side and utility/supplier-side) to reduce overall energy use — [with a policy making efficiency a first order resource, NEEP would add];

2. Replace imported fossil fuel use with locally produced renewable energy, with an emphasis on:
   a. distributed generation
   b. utility-scale generation
   c. thermal and electric fuel switching for heating, cooling, and transportation needs; and,

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[7] http://www.mass.gov/eea/energy-utilities-clean-tech/electric-power/grid-mod/grid-modernization.html

[8] http://www3.dps.ny.gov/W/PSCWeb.nsf/All/26BE8A93967E604785257CC40066B91A?OpenDocument

[9] ESSE Board letter on the draft strategy, pg. 6: http://www.puc.nh.gov/EESE%20Board/Meetings/2014/20140718Mtg/07-21-14%20State%20Energy%20Strategy%20Final%20Letter.pdf

3. Unleash the private market to finance the infrastructure by minimizing policy risk, sending clear market signals, and better leveraging our minimal available public funds.

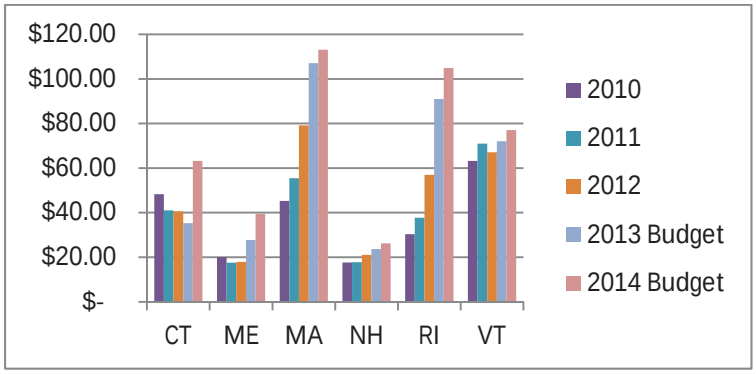
LACK OF POLICY FRAMEWORK HINDERS PROGRESS

Nine neighboring states have a policy that involves pursuing all cost-effective energy efficiency resources, which generally cost significantly less than traditional energy supply options.[10] New Hampshire today has good but far too modest energy savings plans in terms of what is possible, and cost-effective. As the Strategy makes clear, meaningful energy savings are being left on the table under the existing CORE programs.

As we have said in the past, the greatest obstacle to capturing efficiency as a first-order resource is not technical potential or regulatory constraint, but the lack of a policy framework. Historically, New Hampshire has the lowest per capita investment level of any New England state — around a third or less of leading states like Rhode Island, Massachusetts, Vermont and now Connecticut. Maine has also committed to increase its energy efficiency investments this year.[11] Absent a policy framework that endorses greater investments in energy efficiency, New Hampshire ratepayers may be left spending more on electricity and natural gas that need be.

Comparison of Ratepayer Energy Efficiency Investments

Per capita gas & electric program spending[12]



[10] These states include Connecticut, Delaware, Maine, Maryland, Massachusetts, New York, Pennsylvania, Rhode Island and Vermont. For an illustrative map, see Vermont Energy Investment Corporation, "Increasing Energy Efficiency in New Hampshire: Realizing Our Potential," November 15, 2013, p. 27, http://www.nh.gov/oep/resource-library/energy/documents/nh_eers_study2013-11-13.pdf.

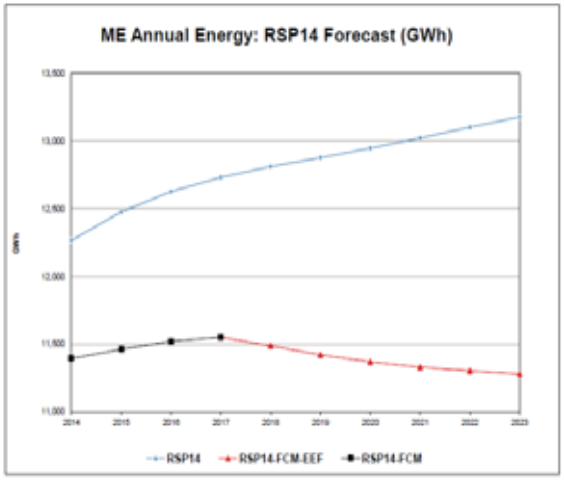
[11] Maine Omnibus Energy Bill, "An Act to Reduce Energy Costs, Increase Energy Efficiency, Promote Electric System Reliability and Protect the Environment," LD 1559. For a summary of the energy efficiency provisions, see Environment Northeast, "Maine Passes Omnibus Energy Bill," p. 1, http://www.env-ne.org/public/resources/ENEOmnibusbillsummary_06272013F.pdf.

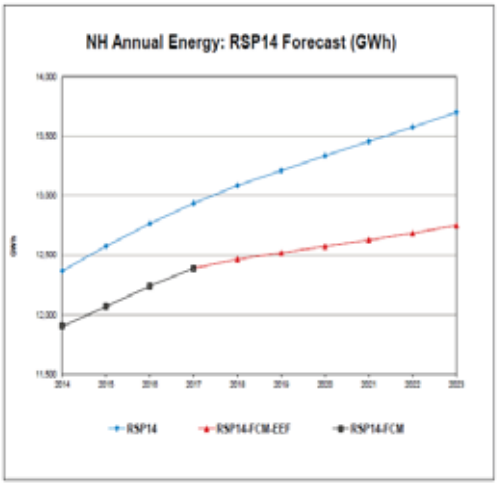
[12] Expenditures include all electric and natural gas ratepayer funding and funding from RGGI and wholesale markets like the Forward Capacity Market. It does not include federal funding from the American Recovery and Reinvestment Act (ARRA) and the Weatherization Assistance Program (WAP) or any customer contributions. Data is taken from state annual efficiency reports available through REED database. 2010 through 2012 is year-end reported data while 2013 and 2014 are budgeted figures that are subject to change.

We also think it is worth noting that these planned investments throughout the region will make a difference in future state energy requirements. According to ISO-New England, the planned energy efficiency investments in our region will significantly curb peak demand and keep electric load growth flat through 2023. These reductions have contributed to $420 million savings from deferred transmission upgrades, which accrue to all electricity customers in New Hampshire. [13]

The final Energy Strategy should also note, however, that ISO-NE's forecast shows that New Hampshire will not see benefits of neighboring states with stronger energy efficiency programs. Maine, for example, should see their electricity loads fall significantly, while states with lower levels of investment, like New Hampshire, will see their energy load continue to rise (see the figures below).[14]

From the ISO New-England 2014 Energy-Efficiency Forecast





CONCLUSION

The draft energy strategy is a good start, and yet another study articulating the need to capture more energy efficiency as part of a forward-looking mix of renewable energy, distributed generation, electric cars and thermal alternatives.

From NEEP's vantage point, the most important next step for New Hampshire will be to find the political will to expand efficiency, grid modernization and clean energy investments, while maintaining economic viability of the regulated utilities to perform their core function of delivering affordable reliable energy, enhancing their role as energy solution providers, and welcoming ever more innovative market actors to offer complementary services and products.

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[13] ISO-New England, "2013 Regional System Plan: Executive Summary," February 25, 2014, p. 3, http://www.iso-ne.com/trans/rsp/2013/2013_rsp.pdf.

[14] ISO-New England, "Final 2014 Energy Efficiency Forecast, 2018-2023," May 1, 2014, slides 62 and 68.

It seems it is only a matter of time until New Hampshire will shift more of its energy dollars to cleaner, more cost-effective energy efficiency. Unfortunately, each year that passes without the political leadership to change the state's energy mix means a greater percentage of home and business budgets being spent on heat and electricity, more energy dollars flowing out of state, and more needless waste and pollution— which is hardly the *New Hampshire Way*.

We hope that the legislature, the governor, and members of OEP and the PUC will use the opportunity provided by the State Energy Strategy to work together now to create a sustainable framework to greatly expand energy efficiency — for the benefit of the state's consumers, businesses, economy and environmental quality. As ever, NEEP stands ready to serve as a resource in any way we can.

Sincerely,

Natalie Hildt Treat
Senior Manager, Public Policy Outreach
Northeast Energy Efficiency Partnerships
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July 23, 2014

NH Office of Energy and Planning
C/o of Brandy.Chambers@nh.gov

Re: NHFB Comments on Draft Energy Strategy Document

New Hampshire Farm Bureau (NHFB) has long-standing policy supporting the development of renewable energy and the use of energy efficiency measures to reduce our dependency on fossil fuel. NHFB policy also supports the availability of low interest energy conservation loans, the development of biofuel sources and products, smart grid infrastructure and net metering options. We are of the challenges encouraged where these are addressed in the draft document. We also note and support the recognition in the draft of the transportation energy challenges faced by rural residents.

We believe the draft document is missing the following:

State law provides general guidance for the state's energy policies. Key laws and constitutional requirements should be included under "Plans & Policies" sections in the document, particularly RSA 378:37 which requires we ensure the "lowest reasonable cost while providing for the reliability and diversity of energy sources; the protection of the safety and health of the citizens, the physical environment of the state, and the future supplies of nonrenewable resources." RSA 374-F:3 sets forth several broad public policy goals for electric utilities. These principles call for full and fair competition, benefits for all consumers, protection of low-income consumers, environmental improvement, increased commitment to renewable energy resources, and investments and incentives for energy efficiency. Article 6-a in our State Constitution restricts the use of certain revenues to our highways. We believe including these in the strategy document are particularly important to all of us as consumers.

A more specific list of the currently installed in-state power generation capacity, to include the wood-fired power plants, and options for keeping these facilities operating.

More specifics on net metering options and a look at these against feed-in tariff options.

A section on addressing energy security issues for the state.

In closing, we wish to address our support for comments made at the Portsmouth public meeting which voiced the need for predictability and stability in programming and law in order to attract the investment required to move forward in a real meaningful way. We would like to see this clearly addressed in the strategy document.

Submitted on behalf of NHFB,

Robert Johnson, II, Policy Director

Brief Comments on the New Hampshire Draft State Energy Plan

Michael E. Hachey, Vice President Regulatory Affairs and Compliance
TransCanada Power Marketing Ltd.

July 25, 2014

The New Hampshire State Energy Plan must address the fact that, at present, New Hampshire's retail electric rates are among the highest in the country. Electric rates are critically important to the industrial sector and lower income families and individuals. They contribute to health care costs, as hospitals are major electric consumers. They also drive education and municipal costs, as colleges and local schools are also significant electric consumers.

A recent survey of large manufacturers in Massachusetts [1] found that the number one reason manufacturers would consider leaving the state is the prospect of higher energy costs. It's reasonable to believe that the same would be true for New Hampshire.

As shown on Chart 1, Massachusetts and New Hampshire electric rates are very similar in the national ranking. Both states will see cost increases from regional transmission expense and the tightening of the Regional Greenhouse Gas Initiative (RGGI) cap. Chart 2 shows the remarkable growth in the region's transmission costs, from about 0.3cents per kWh through the early 2000's to over 2 cents per kWh by 2016. RGGI itself expects that the tightened cap will increase CO_2 allowance costs to $10 per metric ton by 2020, or a cost increase to consumers of about 0.4 cents/kWh.

The point of course is that any energy strategy adopted in New Hampshire must first ask the question: will this strategy drive consumer costs up and further decrease New Hampshire's ability to compete economically, or will it drive costs down, thereby encouraging existing businesses to expand and attract new business?

The Draft State Energy Strategy lacks basic tests that the private sector would expect any suggested strategy to meet. Tough minded, no-nonsense economic tests must be developed and administered to any policy recommendations. New Hampshire's citizens are hurt when job losses are incurred. Low and fixed income individuals are hurt when a larger share of their budgets must be directed to utility bills.

Environmental issues arise most often when a cost focus is stressed. What is interesting is that New England's electric sector has made tremendous strides in environmental improvement simply by allowing competitive entry in the electric sectors. Chart 3 shows the substantial decrease in electric sector SO_2, NO_x, and CO_2 emissions in the last decade, driven by entry of highly efficient, natural gas-fired combined cycle generating units in the New England generator fleet. Chart 4 shows a comparison of CO_2 emissions between New England's electric sector and other regions of the country. Notably, the rate of CO_2 emissions in New England, expressed in CO_2/MWH, is second lowest in the country. The implication of this fact is that expanding existing and attracting new manufacturing in New Hampshire will likely lower carbon emissions versus having these facilities locate elsewhere.

Thank you for the opportunity to submit these comments.

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[1] Source: Dukakis Center for Urban and Regional Policy
Staying Power II, a Report Card on Manufacturing In Massachusetts, September 2012

Chart 3

New England Generation Emission Reductions

Year	NOx	SO_2 (kTons)	CO_2
2001	60	200	53,000
2011	25	57	47,000
Emission Reduction	58%	71%	11%

Source: ISO New England

TransCanada

Chart 4

CO2 Production by Electric Generation – U.S.

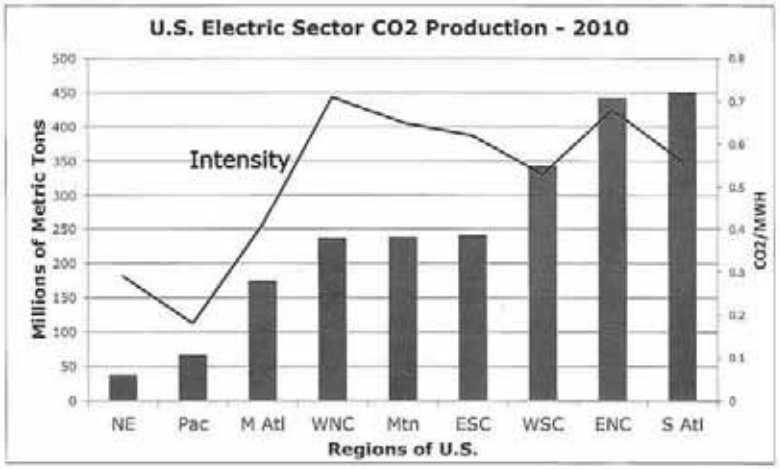

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Chart 1

Comm/Ind Rates – Top 10 States in 2012

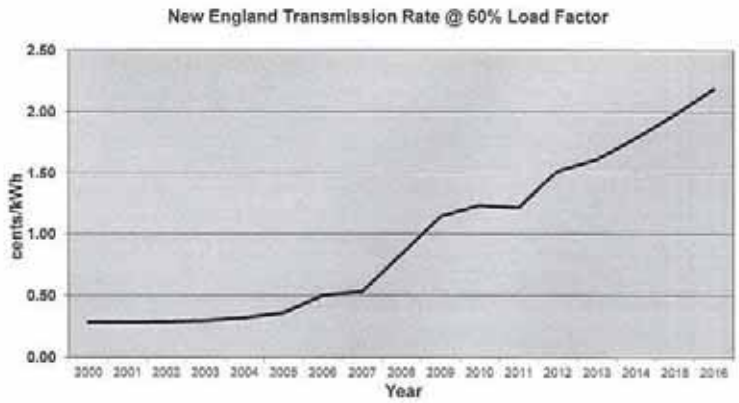
	State	¢/kWh
1	HI	32.68
2	AK	15.42
3	CT	14.28
4	NY	13.82
5	MA	13.44
6	***NH***	***12.91***
7	CA	12.81
8	VT	12.51
9	NJ	12.45
10	RI	11.80
12	***ME***	***9.99***

Source: US Energy Information Agency

TransCanada

Chart 2

Growth in NE Transmission Rates



TransCanada

Seacoast Anti-Pollution League

Helping protect our seacoast since 1969
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July 25th, 2014

Meredith Hatfield, Director
NH Office of Energy and Planning
Concord, NH

Re: Draft NH Energy Strategy

On behalf of Seacoast Anti-Pollution League, I would like to submit the following comments regarding your draft NH Energy Strategy. In general, we support a strong, aggressive Strategy that emphasizes great improvements in efficiency and renewable energy development, with the goal of transitioning to a truly sustainable energy system. While the draft claims to "describe an ideal energy future for New Hampshire" and includes many good ideas and options for reducing energy use around the state and encouraging renewable energy, it lacks any sense of urgency regarding climate disruption or ending our reliance on fossil fuels and increasingly dangerous nuclear power.

As our long-time and current focus is mostly concerned with safe/clean electric power, our further comments will be limited to electricity/renewable power parts of the Strategy.

Regarding electric power goals/vision, the Strategy simply settles on the existing commitment of 25 percent renewable generation by 2025, despite the fact that we are already more than half way there - and of course that is a long way from where we need to be to adequately address climate disruption or energy security. We think the Strategy should treat the "25% by 2025" renewables goal as a starting point/minimum, not as the best we can do.

We would like the Strategy to aim for maximization of all available energy efficiency and renewable energy development opportunities, while minimizing existing obstacles to individual and utility-scale renewables development. The Strategy should also give more emphasis to climate threats as well as climate disruption prevention goals (ie., elimination of coal, phase-out of other fossil fuels) and the broader goal of energy sustainability in its "vision" section.

In the "baseline forecast" section, we urge you not assume that the Seabrook nuclear plant gets re-licensed and continues operation through 2033, or at least to model the situation if it doesn't – as required by SB 191, section I(b). Current concerns over concrete degradation in the plant foundations as well as nuclear power electricity market instability could prove problematic for Seabrook's future viability beyond or even prior to 2030. Also, recent actions by the NH Commission on Decommissioning Seabrook do not reflect a re-licensing assumption, so neither should OEP.

Similarly, you should not just assume that the State's coal plants will continue to operate throughout this period. Divestment/PUC action (as directed by HB 1602) could change that, which should be pointed out somewhere, or at least be modeled in the Strategy – again, as required by SB 191.

In particular, we think the Strategy should give more emphasis to offshore wind as a significant potential power source. The draft text in this regard provides a concise if somewhat discouraging summary of the current state of affairs with offshore wind, but it is a far cry from conclusions of the 2009 Maine Ocean Energy Task Force report – that their state could feasibly construct 5000 MW of offshore wind power capacity by 2030. Similarly, Massachusetts has a goal of 2000 MW of overall wind by 2020 – why shouldn't New Hampshire set a commensurate goal to aim for?

More specifically, we think the Strategy should not limit its analysis to the "Cape Wind" experience – a better example may be the Block Island 30 MW Project off RI, due to be installed by 2015, which hasn't encountered the stumbling blocks that Cape Wind has. It's worth mentioning too that a 30 MW offshore floating platform wind project in Oregon recently got DOE funding (while Maine didn't), and is due to be up and running by 2017. Be sure also to update your text to include the passage of the HB 1312 offshore wind/ocean technology study bill, and follow-up to include the results of that study in required updates to the Strategy.

Additionally, the short length of our coastline is too often used to dismiss New Hampshire's potential to take advantage of offshore resources. The more relevant figure is the offshore territory – within NH waters as well as federal waters in proximity to NH-based facilities and grid connections. We trust the legislative study committee report will flesh this out in more detail, but it's worth noting our deepwater port facilities and and convenient grid access in Portsmouth and Seabrook.

Relatedly, it would be worth mentioning several plans for offshore power lines in/around NH (in addition – or in competition – to Northern Pass) recently presented to NE ISO, which could positively affect offshore wind development, and make “high cost of...transmission infrastructure” (pg. 62) less of an issue. Again, “existing and proposed electricity... transmission facilities” are required to be included in the Strategy by HB 191, section I.(b).

Graphs/charts on potential impacts of suggested changes on power generation percentages and future CO2 emissions would also be most helpful here. After all, a “vision” should involve visuals – none along these lines were evident in the draft Strategy. As another example, where are we *now* with renewables use? – a pie chart would help. People are going to look at graphs more than the text, and the Strategy would benefit from an overall perspective incorporated in several graphics.

Overall, we want a strategy that gets us where we need to be in 10-20 years and doesn't settle for existing limited goals. In the face of continued denial and manipulation of public opinion by the fossil fuel industry and their supporters, the Strategy should be forthright about the threat of climate disruption and benefits of addressing it, as well as the challenges <u>and</u> opportunities we face in building a sustainable energy system for the Granite State.

Please let me know if you have any questions or comments on these suggestions. We look forward to final publication of the Strategy.

Sincerely,

Doug Bogen
Executive Director
Seacoast Anti-Pollution League

July 25, 2014
E-mail filing
brandy.chambers@nh.gov

Re: AMC's comments on the New Hampshire State Draft Energy Strategy (May 1, 2014)

Meredith Hatfield, Director
NH Office of Energy and Development
c/o Brandy Chambers, Energy Analyst
Governor Hugh J. Gallen State Office Park
Johnson Hall, 3rd Floor
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Concord, NH 03301

Dear Meredith,

AMC Background: As a brief organizational background, the Appalachian Mountain Club's mission is "*to promote the protection, enjoyment and understanding of the mountains, forest, waters and trails of the Appalachian region*." About 10% of AMC's 100,000 members and supporters are NH Chapter members. AMC has been a lead research organization on the impacts of greenhouse gas and air pollutants on NH's mountains and understands the direct relationship of energy generation with these pollutants. AMC has been an active participant in wind energy and transmission corridor siting and hydroelectric relicensing in the State. AMC has set a 80% reduction in GHG emissions by 2050 goal and knows how difficult, but not impossible, that will be. Human energy needs have a major environmental footprint and there are few or no energy sources, other than the negawatt, that are 100% environmentally benign, be it renewable or fossil fuel. AMC has an energy policy that includes not subordinating the protection of important remaining open spaces in the efforts to diminish greenhouse gas and other air pollutant emissions, or in meeting energy generation and transmission needs. Of concern is that many of today's larger scale energy and transmission projects in NH directly conflict with other state goals to preserve and protect the diminishing but economically very important open spaces in NH.

Draft State Energy Strategy Overview: AMC appreciates the effort by the advisory council, OEP and participating public that has gone into the *draft State Energy Strategy*. The strategy appropriately identifies that NH is neither an isolated energy island nor of sufficient political size or economic clout to unilaterally dictate the outcome of regional and national energy strategies. It appropriately focuses on strategies that are within NH's direct sphere of influence. Refreshing about the *draft State Energy Strategy*, like the approach the NY ISO is advancing, is that it correctly acknowledges that a tweaked BAU models would mire NH in the past. The monolithic regulated utility model of centralized electric production and distribution is in rapid decline and in need of replacement. Transformative technological and economic changes in the energy sector are already ongoing, not theoretical any longer. Many of the

broad concepts advanced by the *draft State Energy Strategy* are within grasp, would decrease energy's environmental footprint, and would make NH economically more competitive and energy self-sufficient.

AMC strongly supports the following conceptual strategies outlined as both pragmatic and most appropriate, including but not limited to:

- Demand response incentives to more cost effectively address peak demand
- Energy efficiency (where NH has one of the lowest ratings in the US and the most to gain with the greatest cost savings)
- Distributed energy generation, particularly solar PV that is well matched with diurnal energy demand in the highest energy demand months of the year – summer
- Heat pumps (air and ground) – new technologies for air heat pumps have greatly expanded their utility in NH
- Net metering including group net metering
- Smart and micro grids, real time data, etc. to better connect users with their actual energy costs
- Co-generation (unfortunately thermal pollution from NH nuclear, fossil fuel and biomass electric generation facilities is still a problem and is not captured as a resource, knowing heat is such a valuable and expensive energy commodity.
- Pricing structures in the electric energy, vehicle miles driven, etc. that reward conservation over consumption
- Energy storage where major technological breakthroughs are happening (the 1 MW storage battery is currently in use in CA, Seabrook has a 1.5 MW compressed gas unit, etc.)
- High efficiency vehicle standards (it is ironic and sad that NH is the only state in NE that has not adopted the CA Low emission Vehicle Standard and along w/ ME the CA ZEV, yet benefits from them)
- Vehicle electric charging infrastructure
- Better infrastructure that encourages human powered transportation, e.g. Smart growth w/ bike paths, walk to school, work, communities, etc.

These are tools that can maintain and increase the quality of living, improve and be a driver in the State's economy, better protect NH's remaining open spaces and natural resources and reduce GHG and air pollutant emissions.

<u>AMC's recommendations for consideration in the Final Energy Strategy</u>:

A. *Provide a more instructive set of current legislative, regulatory, economic and educational challenges that exists and outline which need revision or be brought into existence if NH is going to meet the bold 2025 NH energy vision in the document.*

One could critique the assumptions in the *draft State Energy Strategy* and argue their validity, accuracy, how they should be changed and so forth. Some critics may play that card. But such a minutia exercise would lose the overall needed emphasis on next action steps to achieve the 2025 vision outlined. The vision outlined for NH's energy environment in 2025 moves well past a status quo approach, is truly visionary, desirable and doable. But the strategy roadmap in this draft on getting there is barebones.

Absent clearer 'action steps' for consideration, NH's Energy Strategy could quickly become a dust collector on the shelf and fail to meets its potential role as an effective catalyst. A more defined descriptive pathway on existing regulatory and legislative roadblocks that need to be resolved; what new legislation and funding needs should be given credence; what revisions to taxes, rate structures and other economic tools could provide needed incentives, what improved information portals are needed to overcome public educational hurdles, where can State government best lead by example, etc. would greatly elevate the usefulness of this Energy Strategy.

The "*strategies for achieving the vision*" subsections are extremely brief, in many cases but a short paragraph with a bulleted table. As an example, the document identifies that energy efficiency at both the residential and commercial level offers opportunities for substantive changes in energy generation needs, is one of the most cost effective tools, reduces the fuel diversity challenge, and has nil negative environmental impacts. To overcome the status quo, where energy efficiency is a lagging giant, a table that simplistically suggests ideas like "rate design" is to barebones. Providing better and applicable examples, references, case studies from elsewhere that are linked to this Tables bullets is recommended.

Other examples where specific guidance could be enhanced is how state government could better lead by example. The state should pursue all available energy efficiency, renewable energy opportunities, and fleet improvements (electric vehicles, etc.). Examples in other states could be replicated in New Hampshire, e.g. solicitations to invite proposals for renewable energy projects on available public building space and parking lots that could possibly be built/leased for the same or less than the state is currently paying for that energy. This is already happening at the town level.

More substance could be presented on specific approaches and examples to overcome the BAU price structures which favor the design and construction of very expensive energy generation and transmission infrastructure to meet peak demand, yet overall this expensive infrastructure operates at low capacity factors. Few industries can justify intensive capital projects that are utilized at overall 30-60 % capacity factor ranges and energy generation and transmission infrastructure should be no different. Yet current energy price structures reward such outcomes at rate payers' expense. Providing more NH specific substance to strategies like demand response, uncoupling utility rate structures from quantity sold, inverse rate structures where the more one's energy uses increases - the greater the cost per unit energy, would be useful. Specific ideas like opening up a docket at the PUC on grid modernization, finishing the divestiture process, and implementing decoupling are more concrete actions that should be presented. This is a necessary step if consumers are to be empowered to produce and control their energy costs and grid modernization and smart grids are to realistically take place.

NH's energy future should include an educated public whose decisions are based on full knowledge of the true costs and benefits of their energy and transportation options. This requires a close collaboration between suppliers and educated consumers. Tools for the public to obtain such information today are mostly passive outreach efforts, sparse, elementary and disjunct. A blueprint for an active education outreach campaign that outlines essential information needs, information portals, etc. with successful models from other states would greatly benefit this strategy.

B. *Provide suggested timelines and specific goals needed if NH is going to meet the bold 2025 NH energy vision in the document.* NH's envisioned energy environment by 2025 is articulated and some of the opportunities to achieve it are briefly presented. But absent is a suggested set of specific goals and timeline to measure needed progress. AMC recommends that specific goals be incorporated into NH's Energy Strategy, e.g. using Figure 4.4 as a template, NH's goal by 2025 is to achieve 100% of the economically justified "achievable energy savings" and 75% of the "technically achievable energy savings" in BBBtu. Then list out suggested intermediate goal timelines, the barriers to achieving this goal and the tools for consideration to overcome them. Exemplary tools could include developing a public-private authority to coordinate financing of clean energy resources and efficiency investments, conceptually similar to what Connecticut, New York, New Jersey, and other states have done, but with fewer public dollars. This type of entity might better coordinate and offer financing and loan opportunities, coordinate project finance, and could leverage directly from existing policies and funds.

Thank you for your consideration and AMC looks forward to working with the State in implementing this strategy.

Sincerely,

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cc: Susan Arnold, AMC

AUTO ALLIANCE
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TO: Office of Energy & Planning
Department of Environmental Services

FROM: Laura Dooley
Director, State Affairs
Alliance of Automobile Manufacturers

DATE: July 25, 2014

RE: Comments on the Draft New Hampshire State Energy Strategy

The Alliance of Automobile Manufacturers (Alliance) – a trade association of 12 passenger car and light truck manufacturers – submits the following comments with respect to the transportation related policy evaluation and strategy recommendations included in the draft New Hampshire State Energy Strategy. Specifically, the Alliance opposes the recommendation that New Hampshire adopt the California Low Emission Vehicle program, or CA LEV.

As prepared by Navigant Consulting, Inc., the premise presented in the draft strategy is that "…the cost to adopt CA LEV is particularly low, with many benefits…(page 77)." The Alliance fundamentally disagrees with this premise and counters that the cost to support the adoption of this public policy is significant to automobile manufacturers, dealers, consumers and the state, and there is no incremental environmental benefit associated with its implementation.

Understanding CA LEV and the ZEV Mandate

CA LEV is a series of standards which regulate criteria and evaporative emissions, greenhouse gas emissions (i.e. fuel efficiency), and the type of motor vehicles sold in participating states. Specifically, CA LEV is comprised of three sections – LEV III, the ZEV Mandate, and greenhouse gas emissions standards (commonly referred to as AB 1493 or the Pavley standards).

- **Greenhouse Gas Emissions Standards (AB 1493 or Pavley Standards)** – AB 1493 regulates carbon dioxide and other greenhouse gas emissions.

- **Low Emission Vehicle Standard (LEV III)** – LEV III regulates smog and ozone forming, or criteria emissions such as exhaust PM, NOx, exhaust and evaporative volatile organic compounds (VOCs), carbon monoxide, and air toxics.

- **The Zero Emission Vehicle Mandate (ZEV Mandate) -** The ZEV Mandate is a battery-electric (BEV), plug-in hybrid electric (PHEV), and hydrogen fuel cell (FCV) vehicle mandate intended to force the commercialization of these technologies and to reduce criteria and greenhouse gas emissions.

Section 177 of the Federal Clean Air Act allows states to follow either the federal or the California program regulating motor vehicle emissions. The California program is designed by California legislators and regulators. States electing to participate in CA LEV effectively cede authority to California's Air Resources Board (CARB) and tie themselves to all future changes that CARB makes to these regulations as states must maintain identical standards to California within the those sections adopted. Today, 13 states including California are CA LEV states [CA, CT, DE, MA, ME, MD, NJ, NY, OR, PA, RI, VT and WA].

The U.S. EPA has deemed the ZEV Mandate severable from the other two provisions of CA LEV. The decision to adopt CA LEV without the ZEV Mandate has precedence. Delaware, Washington, and Pennsylvania have all done so.

Significant changes to both CA LEV and its corresponding federal programs have occurred over the last several years and are outlined below. The Alliance believes that these developments support the Alliance's position that the adoption of CA LEV by states is duplicative and unnecessary as CA LEV does not provide any additional environmental benefits.

Harmonization of California and Federal Emissions Standards

On May 19, 2009 President Obama announced a National Program on greenhouse gas emissions and fuel economy that bridged the California and federal requirements, beginning in model year 2012 (January 2, 2011). This nationwide program calls for a 54.5 mile per gallon fleet average by 2025. To meet these standards, automotive manufacturers will need to sell highly efficient vehicles in every state. Although not mandated, the sale of electric vehicles in every state is a critical component of the industry's efforts to meet these requirements.

The creation of the National Program was the first major development in the harmonization of the California and federal standards. California amended its greenhouse gas regulations to specify that manufacturers that comply with the National Program are compliant with California's greenhouse gas emissions standards for model years 2012 – 2025. Harmonization of these formerly competing standards makes a state's participation in CA LEV's greenhouse gas provisions duplicative and unnecessary.

Smog and ozone forming, or criteria emissions from new vehicles have dropped by about 99% since these emissions were first regulated. In 2012, CARB adopted updated "LEV III" Low Emission Vehicle Standards requiring that the various pollutants which contribute to smog be reduced by another 70% or more by model year 2025. This year U.S. EPA adopted the Tier 3 Rule, which starts in 2017, to match the emission standards required under LEV III. EPA noted that Tier 3 rules are intended "to harmonize with California's Low Emission Vehicle [LEV] program, thus creating a federal vehicle emissions program that would allow automakers to sell the **same vehicles in all 50 states**." Thus, both the criteria pollutant program and the greenhouse gas program are now, for all practical purposes, a single national program providing the same environmental benefit across all 50 states.

Although the adoption of CA LEV is often painted as an effort to "clean the air," that view misrepresents the benefits CA LEV provides. The air quality benefits under the Tier 2 and LEV II programs were already nearly identical; there was no measureable environmental benefit attributable to LEV II over Tier 2. The harmonization of Tier 3 and LEV III will ensure the benefits associated with these programs are identical.

With the harmonization of the criteria and greenhouse gas emissions provisions, several states have moved away from CA LEV. Once the National Program on greenhouse gas and fuel economy was in place, Arizona repealed the entire CA LEV program from its regulations.

New Mexico recently repealed its CA LEV regulations as well. Initially, with the development of the National Program on greenhouse gas and fuel economy, New Mexico suspended its implementation of the CA LEV regulations. However, with the additional harmonization of Tier 3/LEV III, New Mexico took the final step to repeal CA LEV.

Finally, while Washington, D.C. adopted the CA LEV program through legislation, implementation of the program was suspended indefinitely with the development of the National Program.

The actions taken by New Mexico, Arizona, and Washington, D.C. resulted in no environmental harm to these states. The harmonization of the California and federal programs on criteria emissions, as well as on greenhouse gas emissions and fuel economy, ensure that the entire nation benefits equally from these advanced programs.

ZEV Mandate – All Cost, No Benefit

With the National Program on fuel economy and greenhouse gas emissions in place and the near-term harmonization of LEV III and Tier 3 emissions regulations, the ZEV Mandate remains the outstanding provision of CA LEV.

What distinguishes the ZEV Mandate from LEV III and Tier 3 is that the ZEV Mandate is a market-based program, i.e., its success depends not on what automakers are able to produce, but on what consumers in the state are willing to purchase. The ZEV Mandate requires that specific percentages of new vehicles sold within a state consist of BEV, FCV, and PHEVs. It calls for approximately three percent of each participating state's new vehicle sales be BEV, FCV, or PHEVs in 2018. By 2025, the mandate is approximately 15%, of which approximately five percent can be PHEVs and the remaining 10% must be BEVs or FCVs.

New Hampshire's 2013 sales data shows that the new vehicle market consisted of approximately 0.12% BEVs and 0.23% PHEVs. In order to meet the ZEV Mandate requirements for 2018, New Hampshire consumers would need to purchase BEVs and PHEVs at about *10 times the rate* they are currently purchasing them today. To meet the 2025 ZEV Mandate requirements, New Hampshire consumers would need to purchase these vehicles at approximately *50 times the rate* of today.

As a point of comparison, hybrid vehicles – a technology that has been on the market for over a decade, and unlike ZEV technologies, requires absolutely no change in consumer behavior – still only penetrates the market at approximately 3.0% nation-wide.

Regardless of the percentages established in the ZEV Mandate, the provision actually provides no additional environmental gains to the criteria and greenhouse gas emissions programs. This is because the greenhouse gas and criteria emissions programs are controlled by very stringent fleet averages which take into account every vehicle delivered for sale, including ZEVs. A state's additional requirement that zero emission vehicles be sold in certain percentages (i.e. the ZEV Mandate) will ultimately be balanced by the remainder of vehicles to meet the fleet averages required under the greenhouse gas and criteria emissions standards. These fleet averages are the same regardless of whether a state has the ZEV Mandate or not.

While there is *no measureable environmental benefit* associated with the ZEV Mandate, it remains the *most expensive regulation* in the history of CARB. The latest CARB figures estimate that this regulation may cost over $14 billion in incremental costs alone. As a point of comparison for what New Hampshire's costs may be, California suggests the incremental costs in Maine will reach approximately $93 million annually by 2025.

California estimates that in 2016, a BEV75 (battery electric vehicle with a 75 mile range) will cost $17,562 more than a comparable gasoline vehicle. This cost will ultimately be shared by manufacturers, dealers, consumers, and the state. California currently offers consumers significant financial incentives, parking incentives, free electricity, free home chargers and installation, and HOV lane access to make purchasing a BEV more attractive. Currently, to the best of the Alliance's knowledge, New Hampshire offers no incentives for ZEVs.

Not only are the market quotas established by the ZEV Mandate unreasonable, but the infrastructure necessary to support three to 15% of the new vehicle fleet as ZEVs is not in place in New Hampshire, or arguably any other state. California has invested more than $120 million in electric charging stations alone. With respect to hydrogen infrastructure, California has already invested nearly $40 million, with an additional $100 million already appropriated. However, even with these significant investments by California, the feasibility of the ZEV Mandate is still in question.

Extended Warranty Provisions

The draft strategy plan suggests that one of the reasons to adopt CA LEV is to provide consumers with an extended emission system warranty on vehicles. The reference is to a provision in the ZEV Mandate regulations that will be modified in model year 2018.[1] This extended warranty provides a 15-year/150,000 warranty on qualifying vehicles. Beginning in model year 2018, this extended warranty is only applicable to vehicles classified as "transitional or TZEVs," which are essentially plug-in hybrids. As outlined above, in New Hampshire's current market this would only apply to approximately 0.23% of vehicles sold. Under the 2018 – 2025 mandated numbers, the extended warranty would apply to 5% of the vehicles sold in New Hampshire.

This benefit comes at the substantial costs associated with the ZEV Mandate, and its limited application does not justify its adoption.

The warranty provision has been met with significant opposition from independent repair shops in other states. Independent repair shops in Arizona, Oregon, Pennsylvania, New Mexico, and Washington opposed the adoption of the ZEV Mandate, specifically the extended warranty. Of those states, neither Pennsylvania nor Washington adopted the ZEV mandate, while Arizona and Oregon specifically removed the warranty requirements from their ZEV regulations. Of these states where the extended warranty was actively opposed, only New Mexico adopted the ZEV program with the extended warranty intact, but, as noted earlier, subsequently repealed its CA LEV program altogether.

[1] Due to the federal Clean Air Act requirement that states allow two full model years in lead time before implementing CA LEV, the earliest that New Hampshire could implement the program would be model year 2018, assuming the program was formally adopted before January 1, 2015.

Conclusion

The Alliance and its member companies strongly support the development, production, and sale of zero emission vehicles and are eager to work with New Hampshire on building consumer acceptance of these advanced technologies outside of a technology mandate.

The industry believes the path to consumer acceptance is not mandating sales, but creating appropriate market signals to customers that include incentivizing technology and building a supporting infrastructure. 2013 sales data supports this assertion. In a ranking of states by the percentage of ZEVs sold in 2013, only five of the top 10 states are ZEV Mandate states. More specifically, in a ranking of states by the percentage of BEVs sold in 2013, only three of the top 10 states are ZEV Mandate states.

Top 10 ZEV Sales States	Top 10 BEV Sales States
California*	Washington
Washington	California*
Hawaii	Hawaii
Oregon*	Georgia
Georgia	Oregon*
Vermont*	Colorado
Connecticut*	Utah
Colorado	Illinois
Washington, D.C.	Connecticut*
Massachusetts*	Tennessee

The Alliance strongly recommends the Office of Energy and Planning remove any references to CA LEV or the ZEV Mandate before finalizing the New Hampshire State Energy Strategy. Thank you for your consideration of our comments.

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NECEC Response to New Hampshire Draft State Energy Strategy

July 2014

The New England Clean Energy Council (NECEC) respectfully offers these comments on the Draft New Hampshire State Energy Strategy for the Office of Energy and Planning's consideration. NECEC is the lead voice for hundreds of clean energy companies across New England, influencing the energy policy agenda and growing the clean energy economy. NECEC's mission is to accelerate New England's clean energy economy to global leadership by building an active community of stakeholders and a world-class cluster of clean energy companies. NECEC is the only organization in New England that covers all of the clean energy market segments, representing the business perspectives of investors and clean energy companies across every stage of development. Council members span the broad spectrum of the clean energy industry, including energy efficiency, demand response, renewable energy, combined heat and power, energy storage, fuel cells and advanced and "smart" technologies. Our members also include venture investors, major financial institutions, universities, industry associations, utilities, labor and large commercial end users. NECEC works with the New Hampshire Sustainable Energy Association in New Hampshire, where many of our members are operating and investing, and more are interested in doing so.

INTRODUCTION

New Hampshire is at a pivotal point as it develops a long-term energy strategy. Given the changing economics of energy production, proliferation of distributed energy resources, anticipated environmental regulatory requirements, and customer expectations and needs for resilient, reliable, safe and affordable energy produces and services, New Hampshire should take the opportunity to explore a transition to a clean energy future and the economic development benefits it can bring to the state. .The New Hampshire Draft State Energy Strategy is a laudable step toward achieving that goal. While the following issues and areas are addressed to some extent in the Draft State Energy Strategy, NECEC offers these comments to identify critical elements that should be included and addressed in a long-term plan for the clean energy future of the State of New Hampshire.

New England has seen notable clean energy progress in the last half dozen years with more than double the amount of renewable energy from wind, solar, biomass and other renewables, and nation-leading progress in energy efficiency. Yet New Hampshire is still in very early stages of a transition to a clean energy-based economy with only about 5 percent of the state's net electricity generation coming from Class 1 renewable resources last year[1]. While energy efficiency has the potential to bend the demand curve leading to a lowering of energy bills and the avoidance of capital investments in new generation and transmission, our efficiency investments are not even capturing the tip of the iceberg each year. The New England region is just beginning to develop a world-class industry that creates clean energy technologies, products and services to serve a rapidly growing global clean energy market. If fostered and supported, this sector can continue to thrive not only in surrounding states, but in New Hampshire as well, creating more clean energy jobs that range from the development and manufacturing of innovative clean energy technologies to be deployed throughout the world, to on-the-ground use of renewable energy and energy efficiency that saves energy consumers money throughout the state and larger region.

New Hampshire needs strong goals and guidelines that emphasize clean energy and policies that support its continued growth and positive contributions to the region's economy, energy system and

[1] ISO New England , *New Hampshire 2013-2014 State Profile*

environment. The New Hampshire State Energy Strategy should encourage leaders to make a commitment to evolving policies that enable energy markets to drive innovation, scale clean energy in a cost-effective manner and advance the state to a 21st century energy system. The State Energy Strategy should focus on major clean energy issues, namely **Renewable Energy, Energy Efficiency, Innovation, the 21st Century Electricity System, and Carbon Reductions.** Moreover, it should suggest policies that will grow New Hampshire's clean energy economy to a position of leadership and advance the state on its path to a clean energy future that creates a more sustainable and resilient economy, drives job growth, and protects the environment. It is essential that New Hampshire's State Energy Strategy acknowledge and stress the importance of the following:

- **Renewable Energy:** Renewable energy is New Hampshire's only indigenous energy resource and is becoming increasingly cost-effective as markets have grown. The New Hampshire State Energy Strategy should stress the importance of consistent policies that extend and expand standards, renewable credits, financing mechanisms, competitive procurement structures, as well as support for large projects, community-scale, distributed generation and new technologies, to increase renewable energy and related companies and jobs.
- **Energy Efficiency:** Energy efficiency is our least cost energy resource. The New Hampshire State Energy Strategy should support policies that create and grow market opportunities for energy efficiency, expand codes and disclosures that accelerate building efficiency investments, expand programs for deeper building retrofits and adoption of new technologies, and consider new "green bank" and PACE (property assessed clean energy) financing models to lower capital costs and accelerate return on energy efficiency investment.
- **Innovation:** The State Energy Strategy should recommend creating and expanding policies and programs to support innovation, entrepreneurial development and market acceleration for next generation clean energy technologies and innovative business models.
- **21st Century Electricity System:** The Strategy should encourage policies that will foster the creation of a modernized electric grid, with two-way information and power flows, that can link and serve as a platform for both centralized power plants and customer-sited distributed generation, while enabling demand reduction, and new innovations and energy services.
- **Carbon Reduction:** The New Hampshire State Energy Strategy should emphasize the importance of staying in and strengthening the Regional Green House Gas Initiative, exploring options to expand RGGI to other states and other sectors of the economy, and developing policies and roadmaps for natural gas to be a bridge, not a barrier, to a long-term low-carbon economy. New Hampshire's participation in RGGI to date is delivering $100 million in net benefits to the state's energy consumers[2].

Renewable Energy

New England, and by extension New Hampshire, is at the end of the energy pipeline and sends billions of dollars outside the regional economy each year to pay for imported fossil fuels for electricity and transportation, making the region vulnerable to high and volatile energy prices. Diversifying the state's energy supply with renewable energy is a key way New Hampshire can keep its energy dollars in the state and region, and the most efficient way to allow energy consumers to secure the stable energy prices that aren't subject to price volatility, needed to grow our economy and to clean our environment.

Over the last decade, the region's electric grid has shifted from one predominantly fueled by oil, coal and nuclear to one fueled by natural gas. With nearly 50 percent of our energy coming from natural gas[3], the region is exposed to significant price volatility and seasonal supply constraints. Natural gas cannot become a larger part of the mix without increasing our vulnerability. To meet our long-term GHG

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[2] The Analysis Group, *The Economic Impacts of the Regional Greenhouse Gas Initiative on Ten Northeast and Mid-Atlantic States*
[3] ISO-NE, *2014 Regional Electricity Outlook*

reduction goals and continue to scale the value and competitiveness of renewables, gas fired generation as a percentage of the mix needs to be reduced over the long term by adding a diverse array of renewables and other non-emitting resources to the region's and New Hampshire's energy supply.

The good news it is that the amount of renewable energy powering our region has been steadily growing, due in large part to forward-thinking public policy and increasingly innovative and competitive energy markets that are driving distributed generation, as well as large utility scale renewable energy power plants. These market signals and increasingly competitive procurement mechanisms have contributed to double-digit annual cost declines for renewables, with onshore wind already becoming competitive with other forms of generation. It is expected that by 2020, 15 percent of the region's energy will come from renewable sources and hydro. However, many of New Hampshire's current renewable energy policies, standards and programs, which were designed to achieve 2025 goals, are in need of extension and expansion. The New Hampshire State Energy Strategy should encourage policies to drive the development of renewable energy beyond 2025, and must prioritize the next major clean energy transition in the 2025 to 2030 timeframe with the following policy suggestions:

- Expand the state's Renewable Portfolio Standard by an accelerating annual rate, and extend it past 2030
- Commit to supporting programs that spur onshore renewable energy deployment, such as competitive solicitations, Long Term Contracting, Renewable Energy Credits, bulk community-buying programs such as "solarize," new financing structures that lower capital cost and financing terms, and growing private sector competition combine to drive down the cost of renewable energy for consumers.
- Implement innovative policies to spur the same shifts for the region's largest energy resource—offshore wind. With five to ten gigawatts of potential energy resources, offshore wind is truly New England's ticket to mastering its energy future and achieving a carbon free economy. New Hampshire State Energy Strategy should encourage cooperation with other New England states to create a roadmap that lays out policies and programs that create markets for offshore wind to achieve grid parity by 2030.

Energy Efficiency

Energy efficiency is the easiest, cleanest and cheapest way to reduce New Hampshire's energy needs, save energy consumers money, and create local jobs. The combination of old housing stock and high energy prices compared to the rest of the country makes energy efficiency a no brainer for the state. The New England's nation-leading energy efficiency policies have spurred more than $3.3 billion in energy efficiency investments. This investment is expected to deliver $19.5 billion dollars in economic benefits, and billions of dollars that will recirculate into the New England economy.[4] Despite such achievements, the region and New Hampshire have just barely begun to tap the potential of energy efficiency.

The New Hampshire State Energy strategy should make pursuing all cost-effective energy efficiency a policy priority. It should stress the importance of applying innovative approaches to drive energy efficiency adoption, embracing new technologies, financing mechanisms and business models that can open the door to broader and deeper impact energy efficiency projects that scale across neighborhoods, communities and municipalities. In addition, the New Hampshire State Energy Strategy should encourage the following policies to create and promote more market opportunities for energy efficiency, while educating homeowners, building owners and businesses about energy efficiency and its associated economic and environmental benefits.

[4] ENE, *Energy Vision*

- Set a standard to reduce system peak energy
- Establish Home Energy Ratings, which would be disclosed before the sale of any home and Building Energy Reporting and Disclosure Ordinances, requiring larger buildings to report annual energy and water use, and update and enforce compliance with more stringent building energy codes
- Accelerate the introduction of new technologies, models and projects into energy efficiency markets, such as treating voltage optimization[5] and combined heat and power (CHP) as an energy efficiency resource, expanding deep energy retrofits, and supporting investments in next generation building controls.

To further expand energy efficiency, the New Hampshire State Energy Strategy should explore innovative "green bank" financing programs, similar to those in Connecticut and New York, that utilize public/private structures to lower financing costs and offer long-term repayments to enable deep energy efficiency projects (often combined with onsite renewable generation) that pay for themselves from day one. New Hampshire has begun this process with recent legislation to expand its nascent PACE program.

Clean Energy Innovation and Regional Competitiveness

New England's clean energy researchers, entrepreneurs, engineers, business executives, labor and investors are driving economic growth, stimulating creation of new jobs and businesses, and helping create a cleaner energy system as they develop new and innovative clean technologies. The new innovations being developed by the region's leading entrepreneurs can not only keep New England and New Hampshire on a clean energy path but can also solve some of the world's greatest energy challenges. With its density of academic and research institutions, and with one of the leading innovation economies in the entire world, New England will always attract talented business people who want to start companies in the region. New Hampshire will benefit greatly from attracting these entrepreneurs to the state specifically. With these innovation resources as a solid foundation, there are numerous steps the New Hampshire State Energy Strategy can take to further and foster clean energy research and entrepreneurship to ensure that innovative clean energy companies start, grow and stay in the state.

Clean energy innovation and company growth mirrors many aspects of other innovation sectors that have been strong parts of the New England economy, including information technology and life sciences. The region's states have played a variety of roles to support growth of these industries, and to address funding, siting and institutional barriers to regional growth. Clean energy innovations have particular challenges that need the public and private sectors to take a combination of actions. The private sector in New Hampshire needs to lead with entrepreneurs and investors taking appropriate private sector risks, and the state's public sector needs to provide additional support and market structure assistance at two stages:

1) Initial seed funding and access to technical and venture development assistance to enable technical and business proofs of concept that are often a prerequisite for private investment; and even more so
2) Partnership and funding at pilot / demonstration and early commercial scale-up – a stage only partially supported by private capital, and where ventures look for sites to deploy and scale their company in close proximity to partnerships and markets.

The New Hampshire State Energy Strategy should strongly encourage the creation and expansion of policies and programs to support innovation, entrepreneurial development and market acceleration for next generation technologies. This can be done through the creation of an economic development agency or state clean energy center (similar to the Massachusetts Clean Energy Center), whose sole

mission is to expand the clean energy economy and provide support for clean energy innovation. Such an entity should support:

- Programs that fund research and early-stage company milestones: Grant and/or investment programs for incubators, accelerators and individual clean energy companies at formation, seed and early stages to solve the financing and venture assistance gap.
- Programs and mechanisms that support pilot / demonstration / site assessment / manufacturing projects: These include a variety of economic development tools such as tax treatment and special development zones; competitive opportunities for partial public sector funding for pilot, demonstration and first-of-a-kind projects and manufacturing investments; as well as regulatory changes that enable utilities and other major companies to invest in pilot and demonstration projects for promising new cleantech technologies.
- State subsidized internship programs: Provide stipends for companies to hire summer interns, are an example of a low-cost, high-impact way to support cleantech startups, while building a stronger more experienced clean energy workforce and keeping talent in the state.
- "Leading by Example" Early Adopter programs that involve State agencies and assets, and also provides State assistance to municipalities, colleges, universities and others to be first customers for new cleantech innovations.

Advance a 21st Century Electricity System

New England and New Hampshire have one of the most reliable electric grids in the world, but it was built on a model of large, centralized, fossil fuel power plants and one-way power flows across a network that lacks the ability to send real-time information to the grid operator, or real-time market signals to consumers to use energy more effectively. In recent decades the use of new clean energy technologies has fundamentally changed the energy landscape. Today, consumers are increasingly asking for more control over their energy use, sources and costs and are installing "distributed" (rather than centralized) energy resources, such as rooftop solar, energy efficiency and demand response. In addition, more large-scale renewable energy generation, which operates intermittently, is replacing dispatchable fossil fuel power plants. While renewable energy and efficiency are experiencing accelerating growth and delivering benefits across the region, this dramatic shift has exposed significant limitations of our current electricity grid, with little two-way communications capability and real-time network management to effectively integrate distributed and renewable generators and changing patterns of usage.

Looking ahead to 2025, we may see 10 times the number of households with solar PV and other distributed generation technologies. There could be hundreds of thousands of electric vehicles plugging into the grid to recharge and integrate into home and neighborhood micro-grids. And there will be new technologies we cannot even imagine today. These smarter homes, appliances and buildings, as well as the potential for neighborhood and campus micro-grid systems will effectively change our electricity system from the historical centralized generation model, to a distributed network of smart local sub-networks, real-time information and communication, supported by pricing signals that help efficiently balance supply and demand.

The Northeast and the nation are just starting to consider the changes that need to take place in our electricity system to respond to the changing demands of customers and the innovative new technologies being deployed on the grid. Efforts to develop a modern, 21st century electric grid are underway in Massachusetts and New York and should be a key policy priority in New Hampshire. This effort will require changes to the regulatory framework that oversees utility investments in infrastructure, new roles for utilities as a platform and partners to clean energy products and services, all unleashing more innovation and competition to provide valuable new energy services to consumers. This modern system must include utilities and the clean energy industry working together to provide access to energy data and deliver innovation and new ways of meeting customer needs.

The discussion on the role of utilities and our electricity system has begun with how to integrate increasing amounts of distributed generation and demand side resources, reduce outages, improve efficiency and increase resiliency. This effort is also looking ahead to how to create and transition to a 21st century electricity system that will enable a cleaner, more reliable and resilient electric grid that will strengthen the New Hampshire economy and society. This transition is still in the early stages. It will need the political leadership of the state administrations as well as guidance from the State Energy Strategy to ensure a successful outcome.

The New Hampshire State Energy Strategy should underscore advancing modernization of the electricity system by promoting the following principles:

- Openness to innovations that enhance customer choice and control.
- Integration of renewables, energy efficiency, demand response, energy storage, and a host of new technologies through a more intelligent and dynamic grid in order to capture their full benefits for customers.
- Evolution of the role of utilities to become platform managers of an efficient, smart and cleaner grid that enables cost-effective energy services for customers from a variety of service providers, including third-parties.
- A utility regulatory framework that is forward-looking, performance-based, transparent and encourages planning and investment that will drive the efficiencies, innovation and the resiliency that a growing economy needs.
- Investment in the distribution grid infrastructure and integration services that become enablers to increasing levels of renewables, storage, micro grids, and grid-connected smart resources, and new technologies that are not yet part of today's energy system.
- Engagement of a broad group of stakeholders to educate, inform and garner support for the framework and investment needed to create a robust, resilient efficient and clean energy system.

Carbon Reductions

From 2000 to 2010, New England saw regional carbon emissions drop 12 percent, due largely to the increase in cleaner energy generation, such as natural gas and renewables, and energy efficiency.[6] This reduction in carbon emissions, accelerated from 2009 to the present due in part to the region's participation in the nine-state Regional Greenhouse Gas Initiative (RGGI)–the nation's first market-based regulatory program to reduce greenhouse gas emissions. The region's carbon emissions drop has been accompanied by economic growth and a decline in energy costs, proving that reducing carbon emissions is also good for economic growth and the region's effort to rebuild its economy on clean energy. In fact, from 2000 to 2010, the economies of the ten Northeast states participating in RGGI grew twice as fast per capita as other states while per capita carbon dioxide emissions declined 25 percent faster. Recent data shows that a steady drop in electricity prices has accompanied reductions in the region's carbon emissions. [7]

These gains are evidence that New England and New Hampshire leadership should commit to supporting RGGI and look for opportunities to promote RGGI's expansion to other states and other sectors of the economy. The New England and New Hampshire can reduce the environmental impact of the region's electricity system by committing to supporting and continuing to strengthen RGGI. This regional initiative has provided New Hampshire with more than $1.617 million in economic value, directly

[6] ENE, *Climate Vision 2020*
[7] ENE, *The Regional Greenhouse Gas Initiative: Performance To-Date and the Path Ahead*

created over 458 jobs, and has saved customers more than $100 million on electricity, natural gas, and heating oil bills so far.[8] These results have taken place largely because most RGGI funds have been directed to energy efficiency programs. It is vital to the growth of the state's economy that the New Hampshire State Energy Strategy supports maintaining this mechanism.

New England's foresight in establishing RGGI puts the region ahead of others for compliance with the US Environmental Protection Agency's (EPA) 111 (d) rules, which will require states to adopt initiatives to limit carbon emissions from existing power plants. As leaders of this unique regional cap and trade program, New Hampshire should join the other New England states in actively promoting RGGI's benefits and value to other states, seeking to expand RGGI where appropriate beyond the current nine states. Expansion of RGGI to other states could create a larger and more efficient market for trading, and lower costs for GHG reduction compliance within the state and the region as a whole.

The New Hampshire State Energy Strategy should also encourage the development of State and regional roadmaps, policies, standards and market mechanisms to ensure that all aspects of our energy system become cleaner and a driver for our transition to a robust, reliable and secure clean energy economy. While a number of states have global warming GHG reduction targets and are considering other state mechanisms such as a carbon tax, participating in a broad-based regional price on carbon provides a significantly more valuable market signal and opportunity to invest in the most cost-effective emissions reductions measures, as well as encourage a cleaner energy system, and should therefore be supported by the New Hampshire State Energy Strategy.

While natural gas has played a major role in reducing carbon emissions from electricity generation, the region risks becoming over dependent on it as a single source of energy. As New England faces the retirement of about 25 percent of its electric grid's current generating capacity[9] (coal, oil, nuclear), it will need to look to new and cleaner sources of energy to power its future. Natural gas will continue to have a role to play but New Hampshire should support New England in discussing policies and standards to ensure that all aspects of our energy system, including natural gas, become cleaner for a robust and reliable clean energy future at the end of the "natural gas bridge." The New Hampshire State Energy Strategy should support the establishment of a roadmap for the retrofitting of fossil fuel plants with carbon capture and sequestration technologies or other technology and/or fuel changes that reduce GHG emissions over time.

Conclusion

New Hampshire has a unique opportunity to empower its communities and industries to fundamentally shift to a clean energy economy, driving this effort by ushering in new policies to further clean energy innovation, company growth and regional markets for new energy innovations and services, as well as the deployment of renewables throughout the state's electricity system. However, New Hampshire must also act regionally and collaborate with public officials throughout the region on issues like transmission, procurement from large renewable projects and clean energy imports, 21st century electricity system structures, state-wide support to innovation and entrepreneurship, common financing structures that engage the efficiency of capital markets, and other efforts to drive clean energy growth in the state. Further, the New Hampshire Draft State Energy Strategy should encourage state partnership with the clean energy companies that have added to the region's economic growth in the last decade, and those new cleantech ventures that bring promise of new solutions, ensuring that the industry is championed, engaged and represented as efforts to clean and modernize our energy system move forward.

[8] The Analysis Group, *The Economic Impacts of the Regional Greenhouse Gas Initiative on Ten Northeast and Mid-Atlantic States*
[9] ISO-New England

There is no doubt that New England is on the right path to a clean energy future but there is still much work to be done and important steps—both near term and long term—that the New Hampshire State Energy Strategy must address to ensure the state, and by extension the region, remains on this path.

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July 25, 2014

By Email

Meredith Hatfield, Director
NH Office of Energy & Planning
Gov. Hugh J. Gallen State Office Park
107 Pleasant Street
Concord, NH 03301

RE: Comments on the May 1, 2014 Draft Energy Strategy

Dear Director Hatfield:

The following comments on the May 1, 2014 draft New Hampshire Energy Strategy are submitted on behalf of Bridgewater Power Company, L.P., Pinetree Power, Inc., Pinetree Power-Tamworth, Inc., Springfield Power LLC, DG Whitefield LLC, and Indeck Energy - Alexandria, LLC (collectively referred to as the "Companies").

Each of the Companies owns and operates a wood-fired electric generating facility of less than 25 MWs located in-state. These facilities first became operational in the mid 1980's. Each facility has approximately 20 employees and based on a study undertaken by the New Hampshire Timberland Owners Association more than 400 individuals are employed in wood fuel procurement for the facilities. Each of the facilities sells its electrical output under short term contracts or in the ISO-NE day-ahead or real-time market. The facilities sell their renewable energy certificates ("RECs") in the renewable portfolio standard ("RPS") markets created by a number of New England States.

The Companies appreciate the opportunity to comment on the draft strategy as it pertains to the RPS and inform the Office of Energy and Planning and the advisory council of the significant role alternative compliance payment ("ACP") rates play in determining the amount of REC supply to the New Hampshire renewable portfolio standard ("NHRPS").

In the draft strategy the advisory council draft vision for renewable power generation in 2025 is described as including "further development of diverse renewable power generation assets [to help]…New Hampshire achieve its renewable portfolio standard target level." Draft Strategy at 59. The draft strategy's focus in the renewables area is on the development of additional resources to assist in achieving the draft vision. In furtherance of that vision the strategy concludes that the future use of biomass as a fuel be directed toward combined heat and power applications. It notes that "[a]dditional biomass capacity for electric only power generation is not recommended as a strategy for expanding renewable power generation." Draft Strategy at 61. The draft strategy does not explicitly address the contribution that existing facilities, such as those owned by the

Companies, could provide to assist in achieving the vision and what policy changes can be made to help realize that contribution. The Companies recommend that the strategy also promote the retention of existing renewables. This is particularly important given the actions of other states, discussed below, to reduce the amount of biomass in their RPS programs. Retention of existing renewables and increasing REC sales into the NHRPS can best be accomplished by addressing the ACP issues raised below.

The draft strategy for renewable power generation identifies "inadequate/improperly structured RPS, REC Prices, and ACP means renewables get built in NH to meet RPS out of state" as the "challenges/barriers" to achieving the 2025 renewables vision. Draft Strategy, Figure 5-11 at 64. The strategy recommendation made to address this "challenge/barrier" calls for an investigation of "whether the RPS targets and ACPs for each source are aligned with the economic potential of that source." Id.

The Companies maintain that the primary reason RECs are sold into the RPS programs of other states is not due to the assumption that the NHRPS may be "improperly structured". While the draft strategy does not clarify what it means by the reference to an improperly structured RPS, it bears noting that the NHRPS is similar in structure to, for example, the Massachusetts RPS. Both New Hampshire and Massachusetts use an ACP to create REC prices. Both require that a percentage of the retail load be from renewable power as evidenced by the purchase of RECs. Both use a multiple class system to target the type and amount of renewables each state seeks in its RPS. The NHRPS uses a four class system to create its desired mix of renewables. The Massachusetts RPS also uses a multiple class system comprised of a class I for new renewables, two classes of solar, and two classes of existing renewables: waste to energy and pre-1988 renewables.

The primary reason RECs are sold into RPS programs of other states is due to the level of ACP rates in the NHRPS and the effect those rates have on the REC price as compared to the ACP rate and resulting REC prices available in other state programs. For example, an ACP of $31 means that, regardless of supply scarcity, RECs can never sell for more than that ceiling price. If a REC seller can sell into another state's RPS with a $55 ACP, it will do so provided that ACP produces REC prices greater than those obtainable in the $31 ACP market. This is the situation today in the NHRPS class III market.

The Companies recommend that the final strategy identify the ACP rate policies and differentials as the prime "challenge/barrier" to achieving the renewables vision and delete the reference to "improperly structured RPS" as a "challenge/barrier". They also recommend that the final strategy contain a RPS ACP summary to illuminate the policy issues that result in REC sales into markets other than the New Hampshire REC market by existing renewables, such as those owned by the Companies, and new renewables.

The salient points in such a policy summary should include the following:

1. The original enactment of the NHRPS in 2007 set the class I ACP at $57.12. This was significant because that ACP was the same as the class I ACP in the Massachusetts RPS at the time and above the class I Connecticut ACP of $55. Generally, facilities qualifying in the class I NHRPS would also qualify in the class I Connecticut and Massachusetts RPS. The similarity in ACP rates allowed REC sellers to view these state programs more like a regional market. In the 2012

legislative session, the NHRPS class I ACP was adjusted such that it no longer would equal or track the Massachusetts class I ACP.

2. The original NHRPS class III ACP applicable to biomass and methane gas facilities that began operations prior to January 1, 2006 was $28. The 2014 ACP rate is $31.93. In the 2013 legislative session the NHRPS class III ACP was increased for the period 2015 to 2017 to $45. The ACP reverts to the original lower ACP methodology in 2018. The ACP in 2015 to 2017, however, remains below the Connecticut class I ACP of $55.

3. Eligible facilities in the Connecticut class I RPS include biomass generation facilities that meet a NOx emission standard that is the same as the NHRPS class III standard. The Connecticut class I RPS does not base eligibility on the year of facility initial operations. Thus, biomass facilities eligible in the $31 ACP class III NHRPS can also be eligible in the $55 ACP class I Connecticut RPS.

4. Certain states have acted to reduce the amount of out-of-state biomass generation in their RPS programs. In its 2013 legislative session Connecticut enacted Public Act 13-303 which makes significant changes to its RPS. Those changes include the preparation of a plan to phase-down the value of RECs obtained from class I existing biomass facilities. This phase-down is to be effective January 1, 2015. Depending on the level of phase-down, the plan could affect the market choices for class III NHRPS biomass. The Massachusetts Class II RPS is not a viable market given its historically low ACPs. Its 2014 ACP is $27.16.

A number of observations can be drawn from the forgoing points. First, the RPS is a regional market and facilities eligible in one state's RPS can also be eligible in another state's RPS. This is the case for many class I RPS programs and is the case for NHRPS class III and Connecticut class I. Generally, this breath of market enhances demand for RECs and helps to increase REC supply if REC prices are comparable in the market.

Second, the regional market can produce a shortage of RECs in any particular state market if the REC sellers perceive an ACP rate differential that will produce higher REC prices in another state, assuming adequate demand. This is particularly true in the case of NHRPS class III biomass facilities both at time of passage of the NHRPS and today. Many of those facilities qualify under the Connecticut class I RPS and sell RECs into that market because of the $23 REC price disparity arising from the $55 Connecticut ACP and the CPI adjusted 2014 NHRPS ACP of $31.93. The Connecticut RPS demand has been great enough to accommodate the Companies' facilities at a higher REC price. In effect, the $23 ACP differential creates a shortage in the supply for NHRPS class III.

A similar REC disparity may be occurring for those facilities that qualify in the NHRPS class I and the Massachusetts RPS class I. The ACPs under those programs started at the same rate but have now diverged. The CPI adjusted 2014 NHRPS class I ACP is $55.37 and the Massachusetts class I ACP is $66.16. Assuming adequate class I Massachusetts RPS demand and that an $11 ACP differential produces a REC disparity, facilities selling into a spot or short term REC market may favor the Massachusetts class I market over the NHRPS class I market.

Third, the passage of Public Act 13-303 by the Connecticut legislature creates uncertainty in future REC prices in Connecticut for biomass facilities. This fact also creates uncertainty in the supply of RECs in the NHRPS class III over time. Depending on the depth of Connecticut's reduction in the value of biomass RECs and the timing of the reduction, REC supply may increase in the class III NHRPS in the 2015 to 2017 timeframe. Class III NHRPS REC supply in 2018 and beyond is uncertain due to the revision to an ACP methodology that produces significantly lower class III ACP rates.

Fourth, assuming adequate REC demand, ACP rates determine REC supply into the various state RPS programs. Stated another way, increasing the price of a non-scarce good will produce more of that good. A variation of this point is implicit in the Connecticut phase-down and the Massachusetts class II RPS ACP rate. There, the policy is "paying less for a good will reduce the amount of the good supplied". Thus, if New Hampshire's strategy is to support existing biomass and increase NHRPS REC sales, then the final strategy should address the need for adequate and competitive ACP rates.

The New Hampshire Public Utilities Commission implicitly recognized many of these points in a recent docket, DE 14-104, Electric Renewable Portfolio Standard involving adjustments to the NHRPS purchase percentages in RSA 362-F:3. In adjusting the purchase percentage for class III, the Commission stated:

Several commenters stated that the underlying issue is that New Hampshire's Class III RECs are being sold almost exclusively into other states where ACP levels, as well REC prices, are higher. Therefore, to address the root cause of the Class III REC shortfall, the General Court may wish to explore the possibility of synchronizing the Class III ACP price with those of Connecticut and Massachusetts. Order 25,674 at 10 (June 3, 2014).

The Companies agree that the "root cause" of class III sales into other states is the lack of synchronizing the class III ACP with those of other jurisdictions and recommend that the final strategy include the Commission's statement as a recommendation.

Respectfully submitted on behalf of:

BRIDGEWATER POWER COMPANY, L.P.
PINETREE POWER, INC.,
PINETREE POWER-TAMWORTH, INC.,
SPRINGFIELD POWER LLC,
DG WHITEFIELD LLC, and
INDECK ENERGY – ALEXANDRIA, LLC

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NORTHEAST ELECTROCHEMICAL ENERGY STORAGE CLUSTER

In the Matter of:

NEW HAMPSHIRE STATE ENERGY STRATEGY DRAFT

RESPONSE TO REQUEST FOR PUBLIC COMMENTS FROM THE NORTHEAST ELECTROCHEMICAL ENERGY STORAGE CLUSTER

JULY 25, 2014

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RESPONSE TO REQUEST FOR
PUBLIC COMMENTS

The Northeast Electrochemical Energy Storage Cluster (NEESC) appreciates the opportunity to comment on "New Hampshire's State Energy Strategy." We are in agreement with the draft Strategy that energy sources, energy price/cost, emissions, and load data are appropriate and should be a focal point for the state Strategy. However, we suggest that economic impact information, jobs, and New Hampshire's energy industry information should also be included to define synergistic opportunities to advance energy reliability, environmental protection, and economic development in the state and region. This information may be important as New Hampshire seeks to develop economic opportunities with industries that can produce energy technology and manage environmental resources.

Consistent with this comment to include economic impact and energy industry information, we respectfully suggest that information on the hydrogen and fuel cell industry be included as a potential solution to meet goals for energy reliability, environmental performance, and economic development/job creation in the State of New Hampshire.

The hydrogen and fuel cell industry is well suited in New Hampshire and the Northeast region (ME, NH, VT, MA, RI, CT, NY, & NJ) to grow and provide synergistic value to the State of New Hampshire. As shown in Table 1, hydrogen and fuel cell technology provides significant opportunities for job creation and economic development. Realizing over $7.8 million in revenue and investment in 2011, the hydrogen and fuel cell industry in New Hampshire is estimated to have contributed approximately $429,000 in state and local tax revenue, and over $8.5 million in gross state product. Currently, there are at least 25 New Hampshire companies that are part of the growing hydrogen and fuel cell industry supply chain in the Northeast region. If newer/emerging hydrogen and fuel cell technology were to gain an increased market share, the number of companies and employment for the industry could grow substantially.

Table 1 – NH Hydrogen Fuel Cell Economic Data[1]

Supply Chain Members	**25**
Indirect Rev ($M)	**7.81**
Indirect Jobs	**35**
Indirect Labor Income ($M)	**2.40**
Induced Revenue ($M)	**2.89**
Induced Jobs	**22**
Induced Labor Income ($M)	**.987**
Total Revenue ($M)	**10.70**
Total Jobs	**56**
Total Labor Income ($M)	**3.38**
State & Local Tax Revenue ($M)	**.429**
Gross State Product ($M)	**8.54**

Hydrogen and fuel cell technology also provides an opportunity for New Hampshire to more fully utilize its renewable energy industry using hydrogen and fuel cells transportation, energy storage, and use at end

[1] Northeast Electrochemical Energy Storage Cluster (NEESC); "Roadmap Monographs;" New Hampshire Monograph; https://www.dropbox.com/s/jzyjmuopyie745c/NH2_March2013.pdf; March 2013

user sites. Such use could make New Hampshire a showcase for renewable energy while reducing greenhouse gas (GHG) emissions as new jobs are created. Hydrogen and fuel cell technology can also provide an opportunity to increase New Hampshire's use of indigenous fuels and generation at end user sites. This configuration will increase local end user reliability which is of high value for businesses and industry, and will also be cleaner with less GHG emissions.

We appreciate the opportunity to provide these brief comments and are available to help integrate this information into the Strategy. We are also in the process of updating the attached 2012 New Hampshire Hydrogen and Fuel Cell Development Plan for 2015 and would be pleased to integrate our work with your Strategy. The Hydrogen and Fuel Cell "Roadmap" Development Plans are supported by the U.S. Department of Energy (DOE) and Small Business Administration (SBA), to advance the regional deployment of hydrogen and fuel cell technology to meet U.S. goals for clean and reliable energy with economic development and job creation.

Please contact me directly if I can be of further assistance or to present directly to the State of New Hampshire.

Date: July 25, 2014

Respectfully Submitted

Joel M. Rinebold
Administrator

The Northeast Electrochemical Energy Storage Cluster (NEESC) is a network of industry, academic, government and non-governmental leaders working together to help businesses provide energy storage solutions. The cluster is focused on businesses that provide the innovative development, production, promotion and deployment of hydrogen fuels and fuel cells to meet the pressing demand for energy storage solutions. The cluster spans an area in the northeastern United States from New Jersey to Maine. Its formal organization is funded by the US Small Business Administration's Regional Cluster Initiative. NEESC is administered by the Connecticut Center for Advanced Technology, Inc. (CCAT) and its local state partners: New Energy New York (NENY), Clean Energy States Alliance (CESA), the Maine Hydrogen Energy Center (HEC), and the Massachusetts Hydrogen and Fuel Cell Stakeholders (MHFCH).

- Attachment A – 2012 New Hampshire Hydrogen and Fuel Cell Development Plan
- Attachment B – 2013 New Hampshire State "Monograph"

Attachments can be obtained by contacting OEP.

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Comments of the Office of Consumer Advocate
on the Draft New Hampshire State Energy Strategy

July 25, 2014

The Office of Consumer Advocate (OCA) appreciates the opportunity to provide comments on the draft New Hampshire State Energy Strategy (Energy Strategy) dated May 1, 2014. Due to the comprehensive scope of the Strategy, the OCA chose to focus on a single aspect of New Hampshire's energy future. To accomplish many of the goals articulated in the Energy Strategy, the state needs to increase the capability of its electric grid infrastructure. Such a process may be incorporated into the draft Energy Strategy as described below in Section I. Sections II and III provide definitions of Smart Grid terminology and a history of Smart Grid development and deployment.

I. Summary and Recommendation

A. Summary

The draft Energy Strategy expresses visionary and challenging goals. A significant number of these goals rely on Smart Grid capabilities that are not yet established in New Hampshire. These include[1]:

1. consumer empowerment;
2. consumers managing their energy use;
3. consumers taking full advantage of information and market mechanisms;
4. increased self-reliance of consumers; and
5. a more resilient energy system.

The draft Energy Strategy also discusses key factors (Figure 3-3 p 23) which rely on advanced technologies, including Smart Grid. Smart Grid technologies are required if these factors are to scale to significant levels over the next 10 years, as projected. To enable high levels of residential consumer participation, the state's energy infrastructure requires:

6. decentralized control vs. centralized control;
7. distributed generation as part of a renewable mix of resources; and
8. electric vehicles and charging stations as part of alternative modes of transportation.

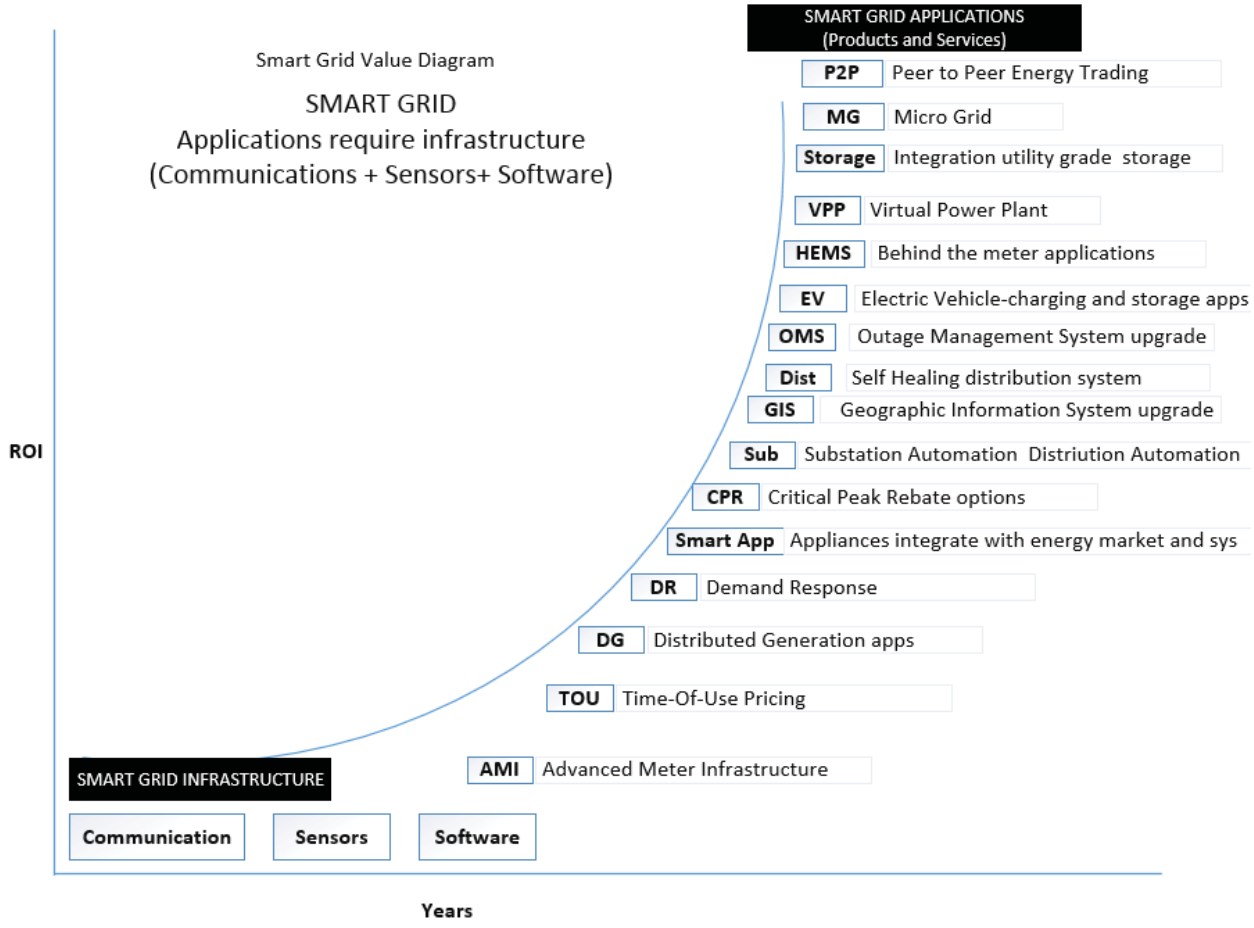
The above eight goals and key factors taken from the draft Energy Strategy are traits of an advanced version 2.0 Smart Grid. Similar goals have been set, and are being achieved by utilities regionally (ME, VT, MA), nationally and globally during Smart Grid's 10 year history here in

[1] See Section 3.3 draft Energy Strategy at p 24.

the United States. [2] These traits are not supported or achieved easily using traditional grid architecture.

Smart Grid delivers new types of benefits using technologies that are complex, highly integrated, automated and event driven. For example customers may choose time of use rate options or to receive utility payments for demand reductions. Customers may benefit from load shifting, Volt/Var regulation, self-healing distribution systems and smart appliances which all require a technologically advanced energy grid.

The "Smart Grid Value Diagram" below depicts the upward sloping nature of a hypothetical set of Smart Grid projects and benefits. The eight goals and key factors above can be mapped directly to specific application boxes on the right side.



The diagram illustrates the process of modernizing New Hampshire's centralized, one- way distribution grid to a more decentralized, two- way advanced grid by adding grid capabilities. The "smart" applications (shown along rising value curve) allow for new approaches to generating and using energy. These new approaches include Distributed Energy Resources

[2] Refer to Section III below "History of Smart Grid In U.S."

(DER), Distribution Automation (DA) and Demand Response (DR). The result of increasing the electric grid's capability is that grid operators and consumers may better manage power.

Smart Grid makes it possible to capture and share information needed to create market incentives that alter behavior and change methods of energy generation and usage. While Return on Investment (ROI) on initial infrastructure investment is low, Smart Grid enables new applications that can potentially reduce transmission and centralized generation investments leading to reduced energy costs.

B. Recommendation

The OCA recommends the Energy Policy recognize the need for an advanced energy infrastructure and include a plan for implementing such capabilities within the state, either through the legislative or regulatory process. The Energy Policy should recommend the state establish a formal Smart Grid Planning Group consisting of appropriate stakeholders (including utilities, businesses, regulatory, legislative, consumer and subject matter experts) to provide for a coordinated planning effort for the state's electric utilities. The planning effort would undertake the following:

1. prioritize the Energy Strategy electric use and generation goals for 2025;
2. define the primary goals and specific functional requirements for each Smart Grid application;
3. identify the Smart Grid Infrastructure needed for each 2025 goal;
4. design a three year plan to build Smart Grid infrastructure;
5. provide strategic support and oversight for implementation of the Smart Grid vision.

II. Smart Grid definitions

Smart Grid is the integration of three core technologies into today's power grid: software, communications, and sensors. For this discussion, the OCA uses the Electric Power Research Institute definition, which states "Smart Grid is a high level concept that infuses information and communications technologies with the electricity grid to increase performance and provide new capabilities. The Smart Grid vision includes the idea that the utility's meters, sensors, control devices, and software applications will be able to exchange information, and do this with sufficient timing and data volume to enable a wide range of applications."[3]

A. Smart Grid Infrastructure

Smart Grid projects fall into two categories – infrastructure and applications. Distribution Domain Diagram 1 (National Institute of Standards and Technology (NIST), reference architecture NISTIRv2 [4]) is an illustration of Smart Grid infrastructure. It shows the complex collections of assets including communications networks (i.e. data lines, routers, firewalls, and network operating systems) and the increasing quantities of network connected

[3] http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000003002002137
[4] NIST Smart Grid Reference Architecture http://www.nist.gov/smartgrid/upload/NIST_Framework_Release_2-0_corr.pdf

smart digital devices (meters, sensors, etc.) Distribution utilities own and operate much of the Smart Grid infrastructure needed to support Smart Grid applications.

B. Smart Grid Applications

Smart Grid applications are built by the utility or third parties. They include well know systems such as Time of Use rates (TOU), Voltage management, Demand Response (DR) and Electric Vehicle (EV) programs. Smart Grid applications run on top of the infrastructure similar to the internet. Therefore it is important that infrastructure is planned and designed with a long term view including application requirements.

Applications and stakeholders are organized into subject matter groups, called domains. These include people operating the systems, plus devices and programs that exchange information and perform tasks. Below is Diagram 1, the "Distribution domain" from NISTIR v2. This diagram shows the integration of the distribution system with four other domains including the Operations domain, Markets domain, Transmission domain, and Customer domain.

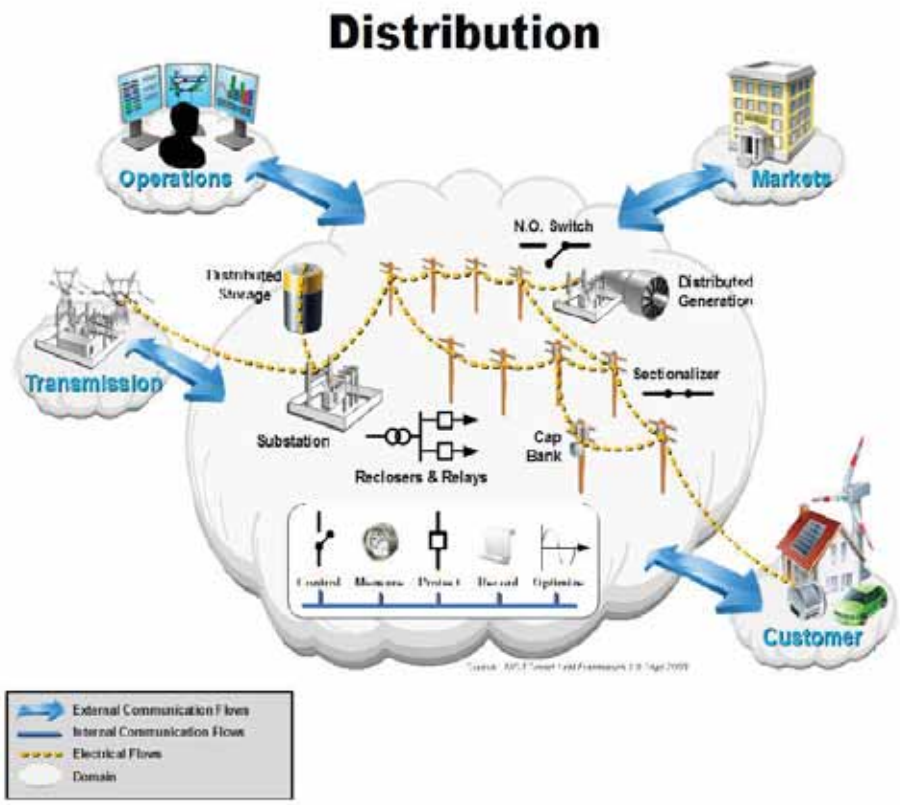


Figure 10-8. Overview of the Distribution Domain

III. Ten Year History of Smart Grid in the United States

Over the past 10 years Smart Grid has been deployed in many contexts throughout the United States. Smart Grid has been litigated in Public Utility Commission dockets, analyzed for costs and benefits, test piloted and recently deployed to varying levels in portions of New England and New Hampshire. Below is a brief history:

2003 "Early Visionary Efforts" - EPRI partnered with The Consortium for Electrical Infrastructure to Support a Digital Society (CEIDS) in a 2003 paper "The Power Delivery System of the Future", by Clark W. Gellings.[5] Page 15 of this research (provided as Exhibit 2 "CEIDS Descriptive Framework") provides a descriptive framework that includes Integrated Energy and Communications System Architecture that enables increases of "efficiency and value of electricity using enabled digital devices."

2004 "Start of Major Collaboration Efforts" Important collaborative efforts begin including formations of the GridWise Alliance.[6] GridWise is a group of utilities, academia, technology firms and investors dedicated to promoting Smart Grid. The Alliance states "The underlying premise of the Smart Grid is that it not only delivers power, but information."

2007 "Federal Legislation" Title XIII of the Energy Independence and Security Act of 2007 (EISA) is enacted. The Smart Grid section launched many activities including the mandate directing NIST to set up a Smart Grid interoperability Framework.[7]

2009 "Begin Large Scale Federally Funded Smart Grid Investments" The American Restructuring and Reinvestment Act (ARRA) was enacted and provided $4 billion in federal funds to finance Smart Grid investments and demonstration projects. These projects are at or near completion today. The status of projects may be tracked on Smartgrid.gov.[8]

2009 "Emergence of Project Planning Maturity Model for Smart Grid" IBM collaborated with Carnegie Mellon University to quantify methods for project planning and measurements of Smart Grid projects. Today the Smart Grid Maturity Model is referenced and maintained by CarnegieMellon Software Engineering Institute.[9]

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[5] http://www.intelligrid.info/IntelliGrid_Architecture/Marketing_IntelliGrid/System_of_the_Future.pdf
[6] http://www.gridwise.org/
[7] http://collaborate.nist.gov/twiki-sggrid/bin/view/SmartGrid/WebHome Smart Grid Collaboration Wiki for Smart Grid Interoperability Standards
[8] https://www.smartgrid.gov/recovery_act/project_information
[9] http://www.sei.cmu.edu/library/assets/brochures/SGMM-1010.pdf "Smart Grid Maturity Model "

2009 - "Federal Priorities Established for Smart Grid" Federal Energy Regulatory Commission (FERC) issues Smart Grid Policy Statement defining eight Priority Areas listed below:
Demand response and consumer energy efficiency
Wide-area situational awareness
Energy storage
Electric transportation
Network communications
Advanced Metering Infrastructure (AMI
Distribution grid management
Cyber security

2009 "Bumps Along the Road" California utility PGE hits technical and public relations issues and challenges associated with its ARRA multi-billion dollar AMI deployment. Utilities can learn from the experiences of early adopters.

2010 "Smart Grid Standards Developed / Priority Gaps Identified" The SGIP facilitates standards development and priority actions such as Meter Upgradability standards[10]. SGIP is composed of 22 different stakeholder groups including utilities, government, consumers and industry.[11]

2010 "State regulatory focus on Smart Grid" The National Association of Regulatory Utility Commissioners (NARUC) formed a Smart Grid Working Group comprised of seven state commissioners with the intent to bring focus to many Smart Grid Issues between stakeholders including industry, regulators, and consumers.

2010 "Smart Grid Planning Model from Early Adopters" California Public Utility Commission (CPUC) approved a common model for designing a Smart Grid Roadmap, providing guidance to future utilities and regulators planning smart grid investments.

2012 "Refinements of Smart Grid Architecture Road Maps Published" NIST undertakes its EISA Title VIII mandate to coordinate development of Smart Grid framework using protocols, models, and standards of information management required to achieve interoperability of smart grid devices and systems. NIST releases version 2.015 "Special Publication 1108R2 NIST Framework and Roadmap for Smart Grid Interoperability Standards" (NISTIR v2). This publication presents the US electric grid as 7 interconnected domains linked by Smart Grid infrastructure. Please refer to Exhibit 3, "NIST 8 Domains".

[10] http://www.nist.gov/smartgrid/priority-actions.cfm
[11] http://www.sgip.org/stakeholder-categories/#sthash.SAr5KMLu.dpbs

2013 "Emergence of Smart Grid Planning Post ARRA Funding" - Massachusetts DPU Order 12-76-A 12 initiates a state-wide Smart Grid planning effort. Independently Owned Utilities (IOU) are mandated to submit a 10 grid modernization plan by June 2014. Planning will cover a range of technologies and use cases (requirements) including meter infrastructure, Outage Management Systems (OMS), appliance communication & control, power quality, conservation & voltage reduction and time varying rates. Other long term objectives are outage reduction, demand optimization, integration of distributed resources and improved asset management.

2014 "Positive Results Reported on Completed ARRA AMI Project" Central Maine Power (CMP) release positive results[13] on completion of their ARRA funded Smart Grid Infrastructure project which included communication network and smart meters. The completed Smart Grid infrastructure enables CMP to consider two potential cost-effective Smart Grid applications - distribution automation and time based rates.

[12] http://www.mass.gov/eea/docs/dpu/electric/12-76-a-order.pdf
[13] https://www.smartgrid.gov/sites/default/files/doc/files/Central%20Maine%20Power%20Case%20Study_0.pdf

SNHPC

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July 25, 2014

Meredith Hatfield, NH Office of Energy and Planning
Johnson Hall, 107 Pleasant St.
Concord, NH 03301

Re: New Hampshire State Energy Strategy – Draft

Dear Ms. Hatfield:

Thank you for the opportunity to review the draft New Hampshire State Energy Strategy. The report fairly summarizes the results of the energy baseline, energy vision, resource potential study, and policy analysis. It moderately addresses the barriers and gaps standing in the way of that vision and puts forth a series of policy recommendations and strategies to address them.

However, there is a significant void in the transportation analysis and policy sections about existing and proposed passenger and freight rail service and their impacts on future energy policies and strategies.

The 2012 New Hampshire State Rail Plan (Rail Plan) identified and evaluated issues and opportunities related to rail transportation in the State. The Rail Plan also discussed the significant changes in the regional transportation system since the Rail Plan was last updated in 2001. Multi-modal services provided by railroads, truckers, air freight and maritime carriers move more products at lower prices to and from the marketplace than was imagined possible 20 years ago. A principal reason for continued, and in some markets expanded use of rail, is that rail is **the most energy efficient** and cost-effective choice for moving goods by land.

Passenger service has changed significantly with the creation of the Amtrak Downeaster intercity passenger rail service connecting Massachusetts and Maine, including three stations in New Hampshire. Additionally, the Amtrak Vermonter and tourist railroads continue to provide passenger service within the State.

As the Metropolitan Planning Organization (MPO) for the 14-municipality Manchester region, the Southern New Hampshire Planning Commission (SNHPC) has been actively involved with the NH Rail Transit Authority and the NH Capitol Corridor Study. Upon reviewing consultants' preliminary efforts to quantify the impacts of this proposed service, SNHPC steadfastly supports the extension of passenger rail to southern New Hampshire, with stops at Manchester-Boston Regional Airport and downtown Manchester. While the NH Capitol Corridor study has not been finalized, it is anticipated there will be strong positive energy, economic and air quality impacts associated with this vital transportation link into the region. In addition to increases in economic and tourism activity, the extension of passenger rail would likely be accompanied by decreases in motor vehicle traffic on area highways, and improve quality of life in the greater Manchester area.

By improving passenger rail infrastructure, freight rail is also improved, making it more energy efficient and economically beneficial for businesses in the state. In summary, if the draft New Hampshire State Energy Strategy is to be valid, it needs to incorporate the both passenger and freight rail into the report and its policies.

If you have any questions, please contact me at your earliest convenience.

Sincerely,

SOUTHERN NEW HAMPSHIRE
PLANNING COMMISSION

David J. Preece, AICP
Executive Director

NESCAUM
www.nescaum.org

Northeast States for Coordinated Air Use Management
89 South Street, Suite 602 Boston, MA 02111
Phone 617-259-2000 Fax 617-742-9162
Arthur N. Marin, Executive Director

July 25, 2014

Meredith Hatfield, Director
Office of Energy and Planning
Johnson Hall
107 Pleasant St.
Concord, NH 03301

Dear Ms. Hatfield:

NESCAUM offers the following response to comments submitted by the Alliance of Auto Manufacturers in a document entitled "California's Low Emission Vehicle Program in New Hampshire," dated 7-8-14 on the public comment website.[1] NESCAUM is the regional association of state air pollution control agencies representing Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont.

1) **"By adopting CA LEV, states' [*sic*] effectively cede authority to California and tie themselves to all future changes California makes to these programs."** While it is true that the California Air Resources Board (CARB) has unique authority to develop and promulgate the LEV regulations, states that choose to adopt and enforce these regulations pursuant to §177 of the U.S. Clean Air Act are free to rescind their CA-LEV rules at any time. Moreover, CARB has historically shown a readiness to engage with states that are implementing the CA-LEV rules (§177 states) when review or revision is warranted. CARB views the §177 states as partners in its efforts to introduce low- and zero-emitting vehicles into the fleet. California's participation in the multi-state ZEV MOU and Action Plan illustrates its commitment to working with and supporting the states in their efforts to ensure the success of the ZEV regulatory program.

2) **"The harmonization of Tier 3 and LEV III will ensure the benefits associated with these programs are identical."** In their current form, the federal tailpipe emission standards are harmonized with CA LEV III. However, there is no guarantee that in the future, EPA will not modify or weaken the rule. CA-LEV states are assured of a regulatory backstop, which presents no additional burden to the manufacturers so long as the federal rules remain harmonized.

3) **"New Hampshire's 2013 sales data shows that the new vehicle market consisted of approximately 0.12% BEVs and 0.23% PHEVs."** Most manufacturers have not made EVs available in New Hampshire, and marketing efforts have been lackluster at best. Nevertheless, sales are increasing dramatically in NH as they are throughout the region. Total NH plug-in vehicle registrations more than doubled from 2012 to 2013 according to data from R.L. Polk. All of these vehicles would have been eligible to earn valuable credits for the manufacturers if NH was a ZEV program state.

NESCAUM Members:
Connecticut Bureau of Air Management, Anne Gobin
Maine Bureau of Air Quality Control, Marc Cone
Massachusetts Bureau of Waste Prevention, Christine Kirby
New Hampshire Air Resources Division, Craig Wright
New Jersey Division of Air Quality, William O'Sullivan
New York Division of Air Resources, David Shaw
Rhode Island Office of Air Resources, Douglas McVay
Vermont Air Polution Control Division, Elaine O'Grady

4) **"New Hampshire consumers would need to embrace and purchase of [*sic*] BEVs, FCVs and PHEVs at a rate that is more than 10 times faster than the public embraced and purchased hybrid vehicles."** This is not a meaningful comparison. Plug-in vehicle (PEV) sales nationally have outpaced hybrid-electric vehicle (HEV) sales in the first four years after market introduction,[2] despite the fact that, as mentioned above, many vehicles have been offered only in limited volumes and markets. Moreover, PEVs are appealing to consumers for a variety of reasons, including very low cost of operation[3] and the ability to re-fuel at home or at the workplace, which are not applicable to conventional HEVs. Finally, it must be noted that the California ZEV regulation contained strong incentives in the early phases for HEV sales. The subsequent commercial success of HEVs (the Toyota Prius is now one of the world's top-selling vehicles) may not have been possible were it not for the ZEV program.

5) **"There is no measurable environmental benefit associated with the ZEV Mandate."** ZEVs produce no tailpipe emissions. Therefore, ZEVs can dramatically reduce roadside and local exposure to smog-forming and other hazardous pollutants. Moreover, total lifecycle pollution is low and getting lower over time as power plants continue to reduce emissions.[4] Finally, ZEVs are necessary to achieve New Hampshire's long-term GHG reduction goals.[5]

6) **"[The ZEV Mandate] remains the most expensive regulation in the history of CARB."** Many ZEV consumers save money overall, and money spent on charging remains largely within the local economy in stark contrast to money spent on gasoline. Nissan and Tesla are making profits from PEV sales.[6,7] Based on PEV registrations to date, manufacturers have missed out on nearly $4M in ZEV credits in NH alone.

7) **"California estimates that in 2016, a BEV75 will cost $17,562 more than a comparable gasoline vehicle."** After the federal tax credit, the 2015 Leaf retails for as low as $21,510.[8] For the above statement to be true, a comparable gasoline vehicle would need to be priced at $4,038. As of May 2014 there were at least nine PEV models available for sale for less than the price of the average new vehicle.[9]

8) "**Currently, to the best of the Alliance's knowledge, New Hampshire offers no incentives for ZEVs."** The multi-state ZEV Program Implementation Task Force has identified incentives as a priority. Since the Action Plan was released, both MA and MD have announced new or expanded incentive programs and the other states are evaluating options for purchase as well as non-monetary incentives, such as HOV lane access, preferential parking, and other measures. If NH adopted the ZEV program, it would be eligible to join the multi-state governors' MOU[10] and Action Plan, and thereby take advantage of the best practices and policy recommendations that were developed by the ZEV states after close consultation with all of the major automakers, including the Alliance and its members.

9) **"Even with… significant investments by California, the feasibility of the ZEV Mandate is still in question."** ZEVs are not constrained by lack of infrastructure, as most ZEV owners do most of their charging at home. Moreover, the nationwide network of charging stations is extensive and continuing to expand rapidly. There are presently over 20,000 public charging outlets in the US;[11] the ratio of public outlets to vehicles is far higher than for gasoline cars. And, as with incentives, the ZEV Task Force has put infrastructure support and expansion at the top of its list of priorities.

If you have any questions, please feel free to contact me at msolomon@nescaum.org or (617)259-2029. Thank you for the opportunity to assist New Hampshire in its efforts to reduce emissions from its transportation sector.

Sincerely,

Matt Solomon
Transportation Program Manager

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[1] http://www.nh.gov/oep/energy/programs/documents/sb191pc-2014-7-8-alliance-automobile-manufacturers.pdf
[2] http://press.ihs.com/press-release/automotive/electric-car-sales-are-stronger-they-might-seem
[3] http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?productId=000000003002004054
[4] http://www.ucsusa.org/assets/documents/clean_vehicles/electric-car-global-warming-emissions-report.pdf
[5] http://www.arb.ca.gov/regact/2012/zev2012/zevisor.pdf, pES-1
[6] http://www.reuters.com/article/2013/11/20/us-autoshow-nissan-idUSBRE9AJ05Z20131120
[7] http://money.cnn.com/2014/02/19/autos/tesla-earnings/
[8] http://www.nissanusa.com/electric-cars/leaf/
[9] http://www.nescaum.org/topics/zero-emission-vehicles/multi-state-zev-action-plan, p9
[10] http://www.nescaum.org/documents/zev-mou-8-governors-signed-20131024.pdf/
[11] http://www.afdc.energy.gov/

NH CleanTech Council
Response to Draft State Energy Strategy
July 25, 2014

Statement of Need

New Hampshire is not prepared for the energy changes that are already happening. Our aging infrastructure, market mechanisms, and policy uncertainties do not easily invite an energy future based upon maximum efficiency and local renewable resources. NH cannot afford to miss the economic opportunities offered by a robust clean energy economy. All around us, efficiency is being considered as a first-tier resource, utility revenue models are better aligning customer interests with shareholder interests, jobs are flowing to states with stable policies and innovative financing, and businesses are prospering from economic growth opportunities in the clean energy and technology sectors. New Hampshire needs a bold energy strategy that looks decisively to the future and keeps our state competitive by removing policy, regulatory, and market barriers to clean energy investments and the economic wealth that is retained *and* generated by the clean energy sector, both directly and indirectly.

NH needs a competitive ten-year energy strategy built around a measurable goal that will not only direct future energy policy, but will form the foundation for a robust and innovative economic development strategy. NH's energy strategy should be bold, with concrete actionable items, against which progress can be verified and evaluated in the context of a measurable goal. We can't avoid decisions about how to retain our energy wealth, address aging infrastructure, empower consumers and unleash pent-up demand for cleaner and localized fuels, and better control volatile fossil fuel prices. OEP's and Navigant's work have given much baseline data and technical/economic potential data: We know what path we are on. The strategy must also state precisely where we want to be headed, who are the actors that will lead us there, and what are the specific, actionable strategies that will ensure that NH is indeed on that pathway.

While the draft Vision does offer a laudable future and provides critical data and analysis, the NH Clean Tech Council is concerned that without a clear and compelling goal, and specific delegated responsibilities for concrete near-term actions, the strategy will fail to inspire the leadership necessary to make the transformational changes in how NH uses energy, where that energy comes from, and thereby miss significant economic development, public health, and wealth retention opportunities.

Goal

It is important to consider that NH is highly dependent on fossil fuels (as measured in the baseline portion of the draft), importing vast amounts of heating oil, coal, natural gas, propane, and gasoline. In fact,

> *"New Hampshire citizens, businesses, and industries spend over $6 billion on energy each year; two-thirds of these expenditures leave the state entirely to pay for imported fuels. This export of nearly $4 billion dollars is a significant drain on the state economy, equal to nearly 7 percent of annual Gross State Product."*[1]

[1] Vermont Energy Investment Corporation et al. September 30, 2011. *Independent Study of Energy Policy Issues.*

In view of the foregoing, the New Hampshire State Energy Strategy goal should be to reduce the export of energy dollars from 66%, to 50% by 2023, retaining over $1 billion of economic wealth each year in New Hampshire.[2]

This sets a clear and ambitious goal against which progress can be evaluated on an annual basis. It predicates the energy strategy on a goal around which all New Hampshire citizens and businesses can rally. It is easy to understand, compelling, and achievable. It will take substantial investments, in the range of $5-10 billion over the next decade, to retain this level of wealth—a level that will require significant private investment, public policy stability and leverage minimal public dollars, leadership on all levels, and coordination.

Retention of wealth by the reduction in importation of fossils fuel for electricity, heating and transportation will have multiple economic, environmental and societal benefits, including:

- Greater disposable income for NH homeowners and businesses
- Increased energy reliability and decreased price volatility
- Investment of retained wealth in NH-based economic development, including local and renewable energy sources and services
- Reduction in consumption of high carbon intensity fuels with lower carbon intensity fuels and technologies, with associated climate benefits
- Catalyzation of a major economic transformation with significant new job growth

How will NH retain this amount of exported energy dollars over the next ten years? The NHCTC proposes three primary strategies to accomplish this goal:

1. **Significantly ramp up energy efficiency and conservation through system wide efficiency investments (customer-side and utility/supplier-side), to reduce overall energy use;**

2. **Replace imported fossil fuel use with locally produced renewable energy, with an emphasis on:**
    a. **distributed generation**
    b. **utility-scale generation**
    c. **thermal and electric fuel switching for heating, cooling, and transportation needs; and**

3. **Unleash the private market to finance the infrastructure by minimizing policy risk, sending clear market signals, and leveraging available public funds.**

Action

Each of the actions that the NH CleanTech Council will detail herein flow from the economic wealth retention goal—a goal that reinforces the current draft vision— and the three priorities highlighted

[2] With the multiplier effect, for every $1 billion we keep in the state and reinvest, that translates to a larger sum and a positive economic impact; approximately $2-$6 billion in total.

above. *All actions are underscored by the need for ongoing policy stability, support, and consistency that best enables businesses and consumers to plan, invest, and make informed decisions.* The actions described below (and summarized in Table 1.) would retain approximately $1.2 billion per year in the NH economy, require a raw up-front investment of approximately $6.8 billion (this does not include any public—federal or state—incentives), and would give a simple Return on Investment (ROI) of 5.7 years and an Internal Rate of Return (IRR) over ten years of 12%.[3]

Table 1.

Action	Scenario	Unsubsidized Up-Front Investment	Annual Savings (energy only)
Efficiency: electric & thermal	715 Million kWh/year savings equivalent*	$ 941,000,000	$ 195,000,000
Solar Electric			
residential/commercial	700 MW	$ 2,625,000,000	$ 176,400,000
utility-scale	400 MW	$ 1,200,000,000	$ 72,000,000
Wind	300 MW	$ 600,000,000	$ 61,200,000
Biomass thermal fuel switching (from heating oil to wood pellets)			
residential equivalent (bulk)	10 % conversion from heating oil	$ 375,000,000	$ 30,718,000
Transportation fuel efficiency (electric vehicle and hybrid conversions)	average fuel economy - from ~19/mpg to 47 mpg**	$ 1,100,000,000	$ 664,501,680
TOTAL		**$ 6,841,000,000**	**$ 1,199,819,680**

*From 2013 GDS EERS study

**From Navigant BAU and RP Studies - 28 MPG increase in fuel economy is the economic potential for Light Duty Vehicles

1. **Energy Efficiency Resource Standard:** NH has extensively studied the value of increasing investments in energy efficiency through having a clearly stated goal for efficiency. The energy strategy needs to clearly and coherently state that a strong energy efficiency resource standard, aka, buying efficiency and demand reductions that are cheaper than generation supply, is a primary policy measure that should be implemented in the immediate term. As detailed in a 2013 OEP directed study, an EERS that saves consumers $195 million per year requires an approximate investment of $914 million and generate 2,300 jobs, ultimately saving consumers $1.95 billion over ten years.

2. **Private-Public Financing**: Create a path to consolidate, maximize, and securitize limited public funding in order to bridge the transition to mainstream private financing.
    a. Clean Energy Finance Authority. Without creating a new state entity or expanding public dollars for capitalization, NH could enable a public-private authority to coordinate financing of clean energy resources and efficiency investments, conceptually similar to

[3] These approaches will generate demand savings but we have not included those here to clarify and simplify this approach. They will also transfer some annual costs from liquid fuels to electricity usage.

what Connecticut, New York, New Jersey, and other states have done, but with fewer public dollars.

3. **Fuel switching**: NH should move away from imported heating oil toward local renewable thermal fuels.
    a. Thermal: As detailed in Navigant's Resource Potential Study, there is significant economic potential to fuel switch from heating oil to biomass, bioheat, geothermal, and solar coupled with heat pumps, as well as some natural gas conversions where main lines already exist, particularly for the development of gas or biomass-fired cogeneration (CHP) resources. Focusing on the primary goal of wealth retention however, converting 10% of the 250,000 homes that currently use heating oil to use wood pellets would save consumers nearly $30.8 million dollars annually, requiring an initial investment of about $375 million dollars. Additional savings may be realized by industrial and commercial customers switching directly to biomass.

    b. Electric: Strengthened RPS and competitive NH REC price signals, e.g. raising the ACP levels to match regional ACP levels around New England.
        i. Solar photovoltaic costs have fallen nearly 75% since 2008, in part due to aggressive deployment policies in other states and countries, and from which New Hampshire can now benefit at much lower investment levels and creative financing mechanisms.[4] NH should pursue the large economic and technical potential of solar energy that is highlighted in the resource potential study, though a strengthened RPS, through public-private financing mechanisms, through expanded net metering or solar valuation tariffs, the active deployment of RSA 374-G, and through model zoning and permitting ordinances. Deploying 700 MW of distributed solar electric resources would require approximately $2.6 billion in investment capital, and save consumers $176 million annually in forgone electricity bill costs and grid value. The grid value to both consumers and the electrical system include decreased wholesale demand during peak coincident times and other reduced transmission and distribution needs, estimated by some to be a value of anywhere from 5-16 cents per kWh.[5] Deploying 400 MW of utility-scale solar would require an investment of approximately $1.2 billion and could retain approximately $72 million annually in the NH economy.
        ii. Supporting a healthy mix of utility-scale and customer-sited wind and renewable thermal, as well as environmentally-benign small scale hydroelectric resources, are also all critical to meeting the RPS targets. Deploying approximately 300 MW of wind resources over the next ten years is achievable given current installed costs, reasonable and deployable siting guidelines, finance and tax structures, environmental regulations, and the resource potential. 300 MW of new community-scale and utility-scale wind would require a private investment of

[4] 2 Bazilian et al. (2013); GTM Research and Solar Energy Industries Association (2012)
[5] For example, see *Minnesota Value of Solar: Methodology and Valuation*, here.

approximately $600 million and would save NH customers at least $61.2 million annually in electric energy costs.

4. **Smart transportation:** Electric Vehicle and charging infrastructure: NH is the only northeastern state that has not yet adopted the California Low or Zero Emissions Standard. This has compromised the state's ability to purchase hybrid electric and electric vehicles through lower availability and lower vehicle warranties. NH should adopt these nationally recognized standards, and by doing so, increase our average light duty vehicle fuel economy from an average of 19 miles per gallon (mpg) to an average of 47 mpg. This fuel economy gain alone, if half of the expected rate of turnover of light duty vehicle fleet was replaced with vehicles that realize this fuel efficiency gain, would save approximately $665 million per year on reduced gasoline purchases and would require an approximate $1.1 billion investment in vehicle replacements. Investments in charging infrastructure need to match the increase in electric vehicle ridership, both for residents and tourists, and to accommodate the flow of electricity to (and potentially from) these vehicles within our electric system.

5. **Revising the traditional utility business model, coupled with grid modernization efforts**: NH distribution utilities (including PSNH, with the assumption that they will likely divest in their remaining generation in the near future) should begin the transition to a new utility business model—one that is based upon better aligned incentives for both utilities and customers; one where the utility can continue to provide reliable power while better able to act as a full energy service provider, a smart system integrator, and better enable customers to use less overall and diversify their resources to renewable energy. A new utility model should be based on the careful implementation of some, or all, of the following:

    a. Decoupling and/or performance-based rate-making
    b. Time variable rate design (energy and demand charges)
    c. Smart grid investments: customer-facing and utility-side grid modernization investments
    d. Distributed generation accommodation and valuation: improved consumer empowerment whereby the utility acts as a service provider/enabler to customer-sited generation and conservation investments.
    e. Energy infrastructure investment incentives to support the interconnection of in-state renewable energy resources, both distributed generation, storage, and utility-scale generation.

Conclusion

The strategies above must be underscored and realized through strong leadership and management, and given a sense of immediacy by adoption of an ambitious *action* strategy. The strategy and the resulting actions must implicitly and explicitly create impacts that prove as resilient as possible through each biennial political shift. We recommend the following operational strategy for the first two years of the ten year strategy, which includes a legislative agenda, executive orders and private market action.

- Establish an Energy Efficiency Resource Standard, including the necessary regulatory pieces for decoupling, time-based rates, and grid modernization efforts that complement the full deployment of distributed resources.
- RPS housekeeping legislation to bring ACP rates up to comparable levels with the rest of the New England ISO-NEPOOL GIS territory, which would allow REC prices to send the appropriate

market signals, incent new generation, and thereby decrease the use of ACPs for RPS compliance.

- Executive and legislative leadership to support using 2014 new REF funds (beyond the allocated PUC budget of approximately $8 million) to enable a Clean Energy Finance Authority and private sector coordination/investment participation therein, while continuing to fund successful incentive programs.
- Executive leadership convening finance forums on clean energy financing and investment strategies.
- Legislative action to adopt CA-LEV and CA-ZEV standards.
- PUC-led coordination among DOT, PUC, DES, distribution utilities, and private entities to enable grid modernization efforts and electric vehicle charging infrastructure planning and construction.
- Issue a state-led RFP for projects for utility-invested (374-G) and developer-invested projects through a Governor's order or initiative, with a streamlined approval process for projects that meet a defined criteria list.

Thank you for the opportunity to comment.

Sincerely,

The NH CleanTech Council

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July 25, 2014

Ms. Meredith Hatfield
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Re: **2014 New Hampshire State Energy Strategy Draft**

Dear Ms. Hatfield and the State Energy Advisory Council:

Conservation Law Foundation ("CLF") is pleased to offer comments on the draft New Hampshire State Energy Strategy ("Draft Strategy" or "Draft") (dated May 1, 2014).

CLF is a nonprofit, member-supported organization founded in 1966 with offices in New Hampshire, Maine, Massachusetts, Rhode Island, and Vermont. CLF works alongside other environmental and community-based organizations, and individuals on behalf of its members to address threats to New England's natural resources. CLF has a long history of advocating for clean energy solutions that will preserve our natural resources, build healthy communities, and sustain a vibrant economy. CLF has successfully advocated for greater energy efficiency, renewable energy deployment, accessible and affordable transportation options, and protection from polluting, uneconomic energy sources such as coal and oil-fired power plants, with a particular focus on reducing emissions of carbon pollution that is driving global climate change and contributing to the disruptive warming and extreme weather that New England has experienced in recent years.

General Comments

Senate Bill 191 called for the development of a 10-year energy strategy for New Hampshire under the direction of the State Energy Advisory Council ("the Council") and the Office of Energy and Planning ("OEP"), with assistance from an independent consultant. CLF commends the Council and OEP for approaching this work through an open and transparent public process, with many opportunities for stakeholder input and feedback. We also acknowledge the challenges of preparing a complete strategy and supporting analytical information with the project's limited budget and tight timeframe.

In general, CLF supports the direction of the Draft Strategy. By defining an energy vision for New Hampshire and discussing key policy options to achieve that vision, the Draft Strategy appropriately seeks to realize the economic and environmental benefits of increased energy efficiency measures, lesser use of imported fossil fuels, and greater deployment of low-carbon,

distributed, and resilient energy sources. CLF particularly commends the Draft Strategy's strong emphasis on energy efficiency, which, as the Draft acknowledges, is New Hampshire's "cheapest, cleanest, and most plentiful resource."

Despite these strengths, the Draft Strategy has significant shortcomings that should be addressed in the final State Energy Strategy to be released later this year. In particular, the Draft Strategy, if finalized in or approximately in its current form, fails to seize an extraordinary opportunity. With this process, OEP and the Council have the chance to show needed leadership at a time of rapid transformation and disruption in New England's energy sector. In this regard, we share the concerns and recommend the proposed direction reflected in the coalition letter signed by representatives of the New Hampshire clean energy and environmental communities (including CLF), as well as the comments of the New Hampshire Clean Tech Council. CLF fully expects that the ambitious goal urged in those comments—reducing the use of imported fossil fuels and energy resources by $1 billion per year by 2025—is achievable and would provide a bold, organizing focus for the strategy. It deserves serious consideration by OEP and the Council for all the reasons discussed in those submissions.

A second overarching concern is that the Draft Strategy fails to provide direct and meaningful analysis and recommendations focused on New Hampshire's role in the meeting the challenge of addressing global climate change in the energy and transportation sectors. In this regard, the Draft Strategy fails to build off the much deliberated platform of the New Hampshire Climate Action Plan completed in 2009. While the Draft is oriented toward strategies that will be crucial in addressing climate change, like efficiency, distributed generation, grid modernization, and reducing vehicle-miles-traveled, it does very little to compare the quantitative climate benefits of such efforts and its specific policy recommendations or to define how its vision will help New Hampshire and the surrounding regional energy system meet short and long-term greenhouse gas emission goals that are dictated by science.

CLF's more detailed comments below focus on key omissions and deficiencies in the following areas: energy efficiency, grid modernization, renewable energy, alternative fuels, transportation, and clean transportation fuels and vehicles.

While CLF is limiting its specific comments to these issues, CLF notes that a number of other consequential energy issues facing the state are not meaningfully addressed in the Draft Strategy. These include the environmental and economic impacts and future of the state's coal-fired power plants, the New England Governors' regional energy infrastructure initiative, and energy facility siting. OEP and the Council should carefully consider the implications of failing to include in the strategy any analysis and policy recommendations relative to these vital issues.

Energy Efficiency

Building on the substantial recent analyses and reports commissioned by OEP, the Public Utilities Commission, and the Energy Efficiency and Sustainable Energy Board, the Draft Strategy places a special focus on the promise of greatly increasing the availability and implementation of thermal and electric energy efficiency measures in New Hampshire buildings. Greater energy efficiency will lead to economic and environmental benefits for all New Hampshire citizens and the environment. To achieve this objective, the Draft Strategy presents a set of worthy policy options on this issue. In particular, the Draft Strategy appropriately recognizes the opportunity to catalyze private investment and the need for redesign of existing utility energy efficiency programs to remove the inherent disincentive for utility companies to promote energy efficiency when such measures result in reduced utility energy sales and revenues. As New Hampshire lags behind the other New England states in capturing cost-effective energy efficiency, treating energy efficiency as a first-order energy resource should remain a keystone priority in the final strategy document.

For these reasons, the Draft Strategy's discussion of energy efficiency is its strongest section. There are, however, ample opportunities to improve the Draft Strategy's resource potential information, which appears to lean heavily on and extrapolate from outdated information and seems not to incorporate data from such key sources as ISO-NE's Energy Efficiency Forecast. In addition, the Draft Strategy fails to provide a robust assessment and prioritization of the policies that would enable New Hampshire to achieve the document's 2025 vision, despite lengthy descriptions of policy options.

Grid Modernization

The Draft Strategy appropriately recognizes that New Hampshire has yet to take significant steps toward modernizing the electric grid, a process that could facilitate customer empowerment, lower peak and annual energy demand, reduce energy costs, and improve electric reliability. Unfortunately, the document fails to provide a full accounting of the potential costs and benefits of grid modernization, with the apparent expectation that such work should move forward in a docket at the Public Utilities Commission. As in other sections of the document, the discussion collects descriptions of potential programs and resources, with some references to related New Hampshire efforts, but without a comprehensive assessment of relative importance, quantitative approaches to measuring potential impacts, or clear policy direction. While some examples of policy and regulatory changes are identified, the document is particularly weak in failing to *evaluate* grid modernization efforts in other states and countries that may be suitable for consideration and implementation in New Hampshire.

Renewable Energy

The Draft Strategy emphasizes certain opportunities in New Hampshire for further deployment of renewable energy, especially commercial and residential solar. There are undeniable benefits for the state's economy and natural resources when residents, businesses, municipalities, state government, and developers can fully pursue the state's abundant opportunities to utilize indigenous renewable energy resources. A sustained and predictable commitment to renewables is essential to meet the state's energy needs, achieve statutory Renewable Portfolio Standard goals, advance the state's economic vitality, and reduce carbon pollution. Moreover, these technologies help avoid the demonstrable public health and environmental costs and externalities that are not reflected in market prices for fossil energy.

In this context, the Draft Strategy's discussion of renewable energy potential and policies is disappointing. For many resources, there are ample but highly impressionistic references to "challenges" that are obstacles to broader deployment in New Hampshire. Given these supposed challenges, resources with abundant potential—such as biogas and on- and off-shore wind power—are de-emphasized as elements of the Draft Strategy.

While at odds with the Draft Strategy's vision, this direction appears grounded in Navigant's resource potential study, generic observations about technological characteristics, and very little rigorous analysis specific to New Hampshire, despite clear public policy support and mandates, a growing renewable energy industry, and a compelling economic and environmental case for accelerating renewable deployment. Indeed, the Draft Strategy appears to suggest *weakening* the state's Renewable Portfolio Standard goals in light of Navigant's economic potential findings—the opposite of the draft vision's aspiration to achieve those goals as reflected in current law. CLF does not believe that Navigant's resource potential findings are sufficiently reliable or robust to support such a policy reversal. OEP and the Council should recraft the strategy document to assess and emphasize the most promising approaches and additional policies that will allow the state to achieve its renewable energy goals.

Alternative Fuels

New Hampshire does not have any fossil fuel resources of its own and therefore is highly dependent on importing such fuels to meet its energy needs. Alternative fuels offer New Hampshire an opportunity to be an active player in its fuel production, helping keep energy dollars in the state while reducing air emissions, avoiding fuel transportation costs, and dampening price volatility. Given New Hampshire's cold winters, the Draft Strategy constructively focuses on expanding opportunities for residents and businesses to take advantage of alternatives to fuel oil, propane,

and natural gas that are cleaner, locally sourced, or more cost effective, such as heat pumps, thermal biomass, and solar thermal for water and space heating applications. CLF strongly supports this emphasis; however, the strategy's policy recommendations on this issue are noticeably weak and do not reflect a pathway to substantially greater customer adoption.

The Draft Strategy's focus on fuel switching to natural gas is not as well-grounded as its emphasis on other alternative fuels. While such switching may have benefits in some circumstances, numerous limitations preclude a more prominent role for natural gas service. The final strategy should more clearly identify the environmental downsides of natural gas and the risks of overinvestment in infrastructure to import fossil fuels from (and export New Hampshire wealth to) sources outside New Hampshire and New England. OEP and the Council should consider including in the final strategy references to the climate and economic risks of natural gas and should eliminate or moderate the Draft's policy recommendation favoring fuel switching along main lines.

Transportation

CLF commends the Draft Strategy's recognition of the important role of transportation relative to developing and implementing a statewide energy strategy. We particularly support the Draft Strategy's recognition of the need to reduce vehicle miles traveled ("VMT") as a critical means of reducing long-term, rising energy costs for New Hampshire citizens. The Draft has identified important policy options for transportation: namely, fuel economy, electric vehicles, natural gas vehicles, mass transit options, smart growth strategies, and pricing programs to reduce VMT. Unfortunately, the Draft Strategy's transportation section shares the same shortcomings that plague other sections, such as failing to acknowledge existing policies and plans, and downplaying the benefits of certain investments and policies.

Oddly, the Draft fails to address the NH Department of Transportation's Long Range Statewide Transportation Plan, which, *inter alia*, acknowledges the need for a more diversified transportation system, and the New Hampshire Climate Action Plan, which contains significant recommendations (and related analyses) regarding strategies to reduce VMT. With respect to smart growth planning, the Draft Strategy fails to recognize an important statewide planning process currently underway in New Hampshire: Granite State Future, which is an ambitious effort funded with generous support from the U.S. Department of Housing & Urban Development and the U.S. Environmental Protection Agency, and administered by the Nashua Regional Planning Commission.

The Draft Strategy both understates the many economic and other benefits that would accrue to New Hampshire and its citizens from public transit systems and fails to identify the key barrier that

must be overcome to realize those benefits: greater funding commitments. When finalized, the strategy should explicitly reference the many co-benefits of a transit system that is well integrated into communities, including enhanced access to jobs and services for New Hampshire citizens, the ability for families to avoid the high cost of vehicle ownership, greater mobility for young people and our growing elderly population, and economic development leading to more efficient, vibrant city and town centers, especially when linked with land use policies and efforts to promote compact, walkable communities. The final strategy should also acknowledge *the* critical challenge/barrier to expanding public transit: wholly inadequate state funding. State leadership and a greater state-level funding commitment to transit will be essential to meaningfully improving mass transit. In addition to addressing the larger funding challenges, the final strategy should recognize – and recommend – advancement of a robust transit strategy for central/southern New Hampshire through the Capitol Corridor rail study, which is currently underway, and which addresses New Hampshire's single greatest transit need.

With respect to reducing VMT, the Draft Strategy presents impressive estimates of potential reductions but downplays the economic viability of achieving them. The Draft fails to highlight the VMT reductions that could be achieved through greater investment in transit and pricing policies, to reduce long-distance single-occupant-vehicle commuting and VMT more generally. With respect to VMT pricing programs in particular, CLF disagrees with the Draft's cursory dismissal of such programs. There are viable areas with heavy commuter demand and the transit options necessary to accompany VMT pricing programs such as peak-hour tolling, including the I-93 corridor between Manchester and Boston and the Route 3 corridor south of Nashua.

Clean Transportation Fuels and Vehicles

New Hampshire lags behind the other New England states in taking steps to reduce the use of petroleum products as transportation fuels. Given the extent of New Hampshire's reliance on volatilely-priced imported gasoline and diesel fuels and those fuels' overwhelming contribution to New Hampshire's greenhouse gas and air pollutant emissions, there is a strong economic and environmental case for encouraging and incentivizing the development of a market for alternative transportation fuels and vehicles.

In this regard, the Draft Strategy correctly identifies a key opportunity for New Hampshire: to adopt CA-LEV and ZEV vehicle standards. As the Draft points out, moving forward with these policies would incentivize New Hampshire automobile dealers to carry and market vehicles with the lowest tailpipe emissions, including electric and hybrid models, and would allow consumers to receive direct benefits in the form of extended warranties on emissions systems. This recommendation should be retained in the final strategy, with a clearer plan for achieving adoption of the standards.

While adopting the CA-LEV and ZEV standards will help promote electric vehicles to New Hampshire consumers, the Draft Strategy's rejection of other efforts is short-sighted. New Hampshire should chart a much more aggressive course in the final strategy to encourage consumer adoption of electric vehicles. With a growing list of popular and increasingly affordable electric vehicles from various manufacturers, the time is right for New Hampshire to scale up its current work through the Granite States Clean Cities Coalition. The final strategy should call for New Hampshire to pursue a comprehensive plan to catalyze a robust market for these vehicles through a suite of policies and efforts undertaken with the commercial sector: much more rapid deployment of free or low-cost charging infrastructure, purchasing incentives, convenience benefits like preferential parking and reduced tolls, and utility rate designs to reduce charging costs and electric system impacts. Moreover, the final strategy should expand the Draft's focus beyond EVs and natural gas vehicles to include fuel cell and biofuel vehicles, which are increasingly economic options for fleet applications.

Finally, the Draft Strategy is silent on a crucial issue regarding New Hampshire's transportation fuel supply: its carbon intensity. With the potential that New Hampshire and New England will import increasing quantities of carbon-intense tar sands oil in the coming years, the strategy should recommend that New Hampshire support the NESCAUM process underway to track the carbon intensity of fuels and explore policy options for preventing or limiting increases in the lifecycle greenhouse gas emissions associated with New Hampshire's transportation sector, such as an anti-backsliding standard. These efforts could help further promote the development and use of alternatives to gasoline and diesel fuel, including electric vehicles and biofuels.

* * *

CLF appreciates the opportunity to comment on the Draft Strategy, and we would be pleased to answer any questions about this submission. CLF looks forward to working with OEP and other stakeholders on implementation after the strategy is finalized this fall.

Sincerely,

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These comments were prepared with the assistance of CLF Cavers intern Ben Gustafson.

July 25, 2014

Meredith Hatfield
Director, New Hampshire Office of Energy and Planning
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Concord, NH 03301

Dear Director Hatfield and members of the New Hampshire Energy Advisory Council:

Thank you for this opportunity to participate in the creation of the state's long term energy strategy. We appreciate the open and public process that the Office of Energy and Planning and the Energy Advisory Council have undertaken in order develop the initial draft of the energy strategy. All of the signatories of this letter attended meetings of the Energy Council, the public sessions held throughout the state, or have been part of the overall energy discussion in the state. We have found these open dialogues helpful and informative and hope that they will continue as the Energy Strategy is finalized and implemented.

It is clear that New Hampshire is facing an imminent and extraordinary transition in where our energy comes from, and how we use it. Through a bold, coherent, and goal-setting strategy, New Hampshire citizens, business leaders, policymakers, and energy stakeholders can guide this transition in a way that strengthens our state's economy, protects public health and our climate, and ensures the conservation of our natural resources. A truly transformative energy strategy must be rooted in fundamental principles, to which a broad group of citizens, businesses, policymakers and stakeholders can subscribe. Policies, regulation, and politics must be rooted in stability, consistency, and goals against which private sector activity can plan, invest, and the state can measure progress. The draft strategy must not miss this opportunity to outline concise action and goals that will enable NH to proactive determine its energy future in the coming decade, and beyond.

In the coming biennium, we will have the near-term opportunity to shape this energy future through strategic planning, legislative and regulatory reforms, leadership by example, and engagement of private capital to create sustainable economic opportunity. These are some of the near-term initiatives and opportunities that the NH state energy strategy should include in its final document. We strongly emphasize that the strategy set a goal(s) and be actionable, and operational. It must enable policy-makers, businesses, and individuals to plan for the future, foster economic development, and protect public health and the environment.

In terms of presentation, we believe that to be effective, the Energy Strategy needs to be an easily accessible document that allows citizens, businesses, elected officials and regulators to understand the challenges facing the state and the goals and objectives to move forward. Unfortunately, while the draft document contains much useful information, it is not one that would be easy for the general public to understand and see their role in moving the state forward. We believe that this is a missed opportunity.

The final version of the state energy strategy should contain at a minimum an executive summary that outlines the key messages and findings in language that is clear and understandable. It would be beneficial if the final document presented recommended actions in a manner where a reader could get an understanding of the different pieces at a glance, and if interested or compelled, find additional information and resources in the longer companion strategy. Finally, it would be helpful if the recommendations contained in the strategy were prioritized in some manner, so that readers can better understand how the strategy moves the state from where we are today to the vision articulated in the draft documents.

Substantively, we find confusing the plan's silence on the recent high profile discussions in the region regarding natural gas and electric transmission infrastructure. The Governor has indicated her willingness to work with the other New England states regarding the development and financing of this additional infrastructure. To date, this initiative and its potential long-term environmental, economic and future energy development impacts have neither been vetted as part of the Energy Strategy process nor clearly assessed in any analysis reflected in the draft document. Indeed, the thrust of the initiative—billions of dollars in customer-subsidized fossil fuel and imported energy transmission—is at odds with the vision contained in the draft strategy. If New Hampshire is to pursue this regional initiative, it must only be after a robust public discussion and reconciliation with the draft strategy's vision, which emerged from a legitimate public process.

A confluence of threats and opportunities points to the urgent need for a coherent, goal-setting, and bold state energy strategy now. They include:

- Widespread awareness that New Hampshire's heavy dependency on imported fossil fuels threatens our energy security and results in the export of hundreds of millions in energy wealth annually.
- Increasing recognition that the monolithic regulated utility model of centralized electric production and distribution is in rapid decline and will be replaced.
- A transition from public finance and subsidy to innovative private finance and risk capital intent on building a new energy future, and an urgent need for regulatory reform to accelerate the deployment of this capital.
- The widespread recognition that New Hampshire is falling well behind northeastern states with whom we compete and coexist most directly in the deployment of energy efficiency, renewable energy and distributed energy, alternative vehicle and transportation options, and smart grid technologies.
- The increasing need to reasonably assert New Hampshire's interests, within an acknowledged regional and interconnected economic and energy system, in the siting of energy infrastructure.

Goal and Guiding Principles

NH exports nearly $4 billion each year to pay for fossil fuel-based energy. This export of wealth is a significant drain on the state economy, equal to nearly 7% of our annual Gross State Product.[1] New Hampshire is not prepared for the energy changes that already are happening. Our state must take comprehensive action now to transition to a new energy system that retains the wealth of our people, is more local, more reliable, more secure, less harmful to our environment, and is also cost-effective. The energy strategy should clearly articulate guiding principles in the document for such a transition:

Valuable. *Keeping local dollars local.* Our energy choices must emphasize local sources and local circulation of energy dollars to produce the greatest stability, predictability, and security for our citizens and our communities. Our energy choices should contribute to sustainable economic growth and community development.

Smart. *Informed consumer empowerment.* Our energy future must be built on the best and most efficient technology, by people who make decisions based on full knowledge of the true costs and benefits of their options. This will include a close collaboration between suppliers and consumers.

Clean. *Clean, distributed resources*. Our energy future must be based on low-carbon, maximum efficiency and local energy choices whose production results in the least life-cycle impact to public health, our natural resources, and our climate.

Our Recommended Action Strategies

We recommend that the state energy strategy set a goal to retain $1 billion annually of exported energy costs to the NH economy. In order to best achieve that goal, NH's strategy should prioritize the following:

A. **Energy Efficiency & Fuel Switching**. NH will minimize waste and maximize efficiency through a goal or a standard to purchase and deploy all achievable and cost-effective efficiency.
NH has extensively studied the value of increasing investments in energy efficiency through the establishment of a clearly stated goal for efficiency. The energy strategy should clearly and coherently state that buying efficiency and demand reductions where doing so is less than the cost of new supply or transmission through a strong energy efficiency resource standard (EERS) is a primary policy measure that should be implemented in the immediate term. As detailed in a 2013 OEP directed study, an EERS that saves consumers $195 million per year requires an approximate investment of $914 million and generate 2,300 jobs, ultimately saving consumers $1.95 billion over ten years.

NH's only indigenous resources are renewable ones: biomass, solar, hydro, wind, tidal, and geothermal sources. As shown in the resource potential study, we have an enormous opportunity to switch away from heating oil, coal, and other imported fuels and generate homegrown energy for heating, cooling, and power. NH should prioritize the commercial and

[1] Vermont Energy Investment Corporation et al. September 30, 2011. *Independent Study of Energy Policy Issues.*

residential fuel switch from heating oil, kerosene, and propane to sustainably harvested biomass fuels. NH should also prioritize the economic deployment of renewable resources for power generation, particularly at the distributed level.

B. **Creative Finance.** NH will enable an existing authority to better coordinate and/or consolidate existing public energy funds, to better leverage and deploy private funds into the state. By establishing/enabling a Clean Energy Finance Authority, NH could enable a public-private authority to better expand financing for renewable energy resources and efficiency investments. There are great examples to learn from in other states such as Connecticut, New York, New Jersey. This type of entity could offer financing and loan opportunities through credit enhancements, and could leverage directly from, and coordinate with, our existing policies and funds, including C-PACE, the Renewable Energy Fund, Regional Greenhouse Gas Initiative (RGGI), and others.

New Hampshire would also benefit from corrected REC price signals within our RPS, namely through the level of the ACP; this would serve to better synchronize the regional prices for RECs in the ISO-NE region. NH has lost three years, and significant market stability, from the unplanned cut in ACP levels in 2011. In order to aggressively pursue fuel diversity in both the electric and thermal sectors, the new thermal carve-out within Class I should be well-supported through the stability of REC prices (and therefore ACP levels), demand for the RECs themselves, and clarity in the rules governing thermal RECs.

C. **New Utility Model and Grid Modernization.** Maximizing efficiency, upgrading our infrastructure, and empowering consumers to produce and control their energy costs and sources will require a reform of the traditional utility business model so that all stakeholder interests are aligned—consumer and shareholders alike. NH distribution utilities (including PSNH, with the assumption that they will likely divest in their remaining generation in the relatively near future) should begin the transition to a new utility business model—one that is based upon better aligned incentives for both utilities and customers; one where the utility can better act as a full energy service provider, a smart system integrator, and better enable customers to use less overall and diversify their resources to on-site renewable energy. The strategy should include concrete steps to begin this transition in a manner that does not compromise reliability or market stability. Opening a docket at the PUC on grid modernization, finishing the divestiture process, and implementing decoupling and rate re-design are all actions that should be pursued.

D. **State Government.** NH state government should lead by example, enable greater innovation, training, and marketing. As an example of advanced leadership, separating the Office of Energy and Planning from the Governor's office should be considered to enable proactive policy development that is buffered from political cycles. In order to lead by example, the state should pursue all available energy efficiency, renewable energy opportunities, and fleet improvements (electric vehicles, etc.). Examples that are occurring in other states and could be replicated in New Hampshire include solicitations to invite proposals for renewable energy and efficiency projects on all available public buildings and land that could be built/leased for the same or less than the state is currently paying for that energy. The City of Manchester has recently done this for solar electric energy, as an example.

E. **Technical Assistance, Regulation, and Communications.** NH individuals, towns, schools, and businesses need trusted and greater amounts of technical assistance, education, and communications for energy projects and decision-making. Many of these entities have conducted audits that indicate viable energy efficiency or renewable energy projects, but are unable to move the project forward. We need a mechanism for these entities to vet projects, connect them to financing, and to have the market reflect the true value of those investments to the property value. We need real estate, lenders, and builders alike to recognize the value of energy savings, and the state must take leadership toward establishing, encouraging, and/or communicating enforceable standards on energy codes, real estate metrics, and technical assistance that will better enable the private market to finance and value energy-saving projects.

Additionally, pursuit of community energy systems—solar, wind, biomass, and CHP-based—are increasingly viable and attractive in NH. Supporting commercial-scale opportunities through viable group net metering policies, municipal technical assistance, adequate financing, and utility cooperation will enhance our economy through increased local investments, consumer control, job development, and environmental stewardship. Additionally, RSA 374-G could be streamlined in a manner that minimizes both ratepayer, developer, and utility risk of undertaking the PUC process for project approval if a clear set of advanced criteria is set, and so, if met, the project would be approved in a non-adjudicatory fashion.

We thank you for this opportunity to comment and strongly urge that you adopt a strong quantitative goal—to retain $1 billion per year in energy dollars within the state-- as well as these concrete actionable strategies, in the final ten year NH state energy strategy.

Signed,

Kate Epsen, NHSEA

Susan Arnold, The Appalachian Mountain Club

Jim O'Brien, The Nature Conservancy

Christophe Courchesne, Conservation Law Foundation

Roger Stephenson, Union of Concerned Scientists

Theresa Swanick, NH Local Energy Work Group

Charlie Niebling, Innovative Natural Resource Solutions

Clay Mitchell, Revolution Energy

Will Abbott, Society for the Protection of NH Forests

Fuel Cell & Hydrogen Energy Association

Comments of the Fuel Cell and Hydrogen Energy Association on the New Hampshire State Energy Strategy

July, 25 2014

Introduction

On behalf of the members of the Fuel Cell and Hydrogen Energy Association (FCHEA), we appreciate the opportunity to comment on the *New Hampshire State Energy Strategy*.

Fuel cells are a unique set of clean, efficient, and fuel flexible technologies being placed in service for stationary power generation, backup power, on-road vehicles, and material handling equipment.

Our association applauds the state for crafting a plan that takes into consideration current rules and policies, while looking ahead toward reaching certain aspirational goals.

Overview

After reviewing the proposal, we are disappointed to see that fuel cells for all applications (stationary, industrial and transportation) were overlooked in this version of the energy strategy.

Fuel cells are being successfully deployed in many markets throughout the United States and New England, and are embraced by states and regions interested in lowering greenhouse gas emissions, and improving overall resiliency and efficiency.

The following comments highlight capabilities that fuel cells can provide for stationary power generation, transportation applications, and industrial facilities. We hope this will prompt policymakers to adopt a more robust set of recommendations that includes fuel cells.

Doing so will help the state achieve the stated goals outlined in this strategy document of improving *Energy Efficiency*, *Grid Modernization*, *Renewable Power Generation*, *Fuel Choice and Availability*, and *Transportation Options*.

Fuel cells are also included in the state Renewable Portfolio Standard, and a wider adoption of the technology will help achieve the goals outlined by that policy.

Fuel Cells for Stationary Power Generation

Stationary fuel cells generate electricity through an electrochemical reaction, not combustion, providing clean, efficient, and reliable off-grid power to homes, businesses, telecommunications networks, utilities, and others.

Unlike combustion-based power generation, stationary fuel cells provide virtually emission-free power. Fuel cells do not produce particulate pollutants, unburned hydrocarbons, or the gases that produce acid rain. They emit less carbon dioxide than other, less efficient technologies, and when using fuel generated from renewable sources such as biomass, fuel cells are completely carbon neutral[1].

Data also demonstrates that stationary fuel cells create less than one ounce of pollution per 1,000 kW-hours of electricity operating at 80 percent efficiency[2]. Comparatively, traditional combustion systems create 25 pounds of pollutants for the same amount of electricity.

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[1] Procuring Fuel Cells for Stationary Power: A Guide for Federal Facility Decision Makers. http://www1.eere.energy.gov/hydrogenandfuelcells/pdfs/fed_facility_guide_fc_chp.pdf

[2] Fuel Cells 2000 – Fuel Cell Benefits - http://www.fuelcells.org/base.cgim?template=benefits

Some stationary fuel cells can be configured as combined heat and power systems (CHP), which can reduce energy costs for some building owners by 20-40 percent and can increase system efficiency above 85 percent[3].

Since resiliency is a growing concern for property owners and utilities, stationary fuel cells are an appealing option since they connect directly to our nation's natural gas infrastructure, providing uninterrupted power to critical facilities, even when grid power is unavailable.

In the wake of Super Storm Sandy and other extreme weather events, distributed fuel cell generation has proven to be a resilient and efficient alternative to grid-reliant electricity, both in primary and backup power capacities.

As a participant in the Regional Greenhouse Gas Initiative (RGGI), New Hampshire's commitment to fuel cell technology will help ensure the state meets its CO_2 emission reduction goals. Greater embrace of fuel cells can also meet the state's Renewable Portfolio Standard (RPS) through a fuel cell CHP system, generation of hydrogen from biomass fuels or landfill gases, and/or utilizing a renewable fuel in a fuel cell.

Furthermore, neighboring states have recognized fuel cells for their ability to reduce emissions and modernize the grid. The Massachusetts Electric Grid Stakeholder Working Group issued a report[4] recommending, among other options, fuel cells to achieve grid modernization.

Finally, stationary fuel cells can augment the production of hydrogen for fuel cell electric vehicles (FCEVs), which will be discussed later in this document.

Fuel cells for Backup Power

Fuel cells for backup power provide emergency, auxiliary or peak shaving power, to various installations, including office buildings, hospitals, and critical infrastructure. Currently, most buildings that require backup power use inefficient combustion powered generators. A switch to fuel cells for backup power will reduce energy consumption, maintenance costs, and provide end-users measurable progress in cutting their greenhouse gas emissions.

Fuel cells for backup power are durable and require low levels of maintenance since they have few moving parts. In fact, when properly configured, backup fuel cell systems can achieve up to 99.9999% reliability, meaning that these systems will experience less than one minute of down time in a six year period.

Telecommunications companies have adopted fuel cells for backup power as a way to protect public safety and provide service during severe weather.

After Hurricane Irene in 2011, one fuel cell manufacturer reported that 56 of its systems, owned by Sprint, provided backup power throughout the entire storm. Forty-five of those sites experienced grid power outages in excess of six hours with fuel cells providing a total of 725 hours of continuous power. Average duration per site was 16 hours, with the maximum single outage duration being 50 hours.

In 2012, before Hurricane Sandy ravaged the east coast, the storm hit the Bahamas. Backup power provided by 17 fuel cells on the islands powered cell towers that allowed the Bahamas Telecommunications Company to maintain service, making it possible to contact first responders. The fuel cells provided power for 700 straight hours.

[3] Fuel Cells 2000 – Fuel Cell Benefits http://www.fuelcells.org/base.cgim?template=benefits

[4] Massachusetts Electric Grid Modernization Stakeholder Working Group Process: Report to the Department of Public Utilities from the Steering Committee -July 2, 2013 - Page 9 - http://www.mass.gov/eea/docs/dpu/electric/grid-mod/ma-grid-mod-working-group-report-07-02-2013.pdf

Fuel Cell Electric Vehicles

FCHEA believes fuel cell electric vehicles (FCEVs) will play a major role in America's transportation future, however, we strongly caution against adopting the Zero Emission Vehicle mandate. More importantly, as major automakers begin introducing FCEVs to the market, we believe it will be crucial that states like New Hampshire make a strong commitment to hydrogen infrastructure.

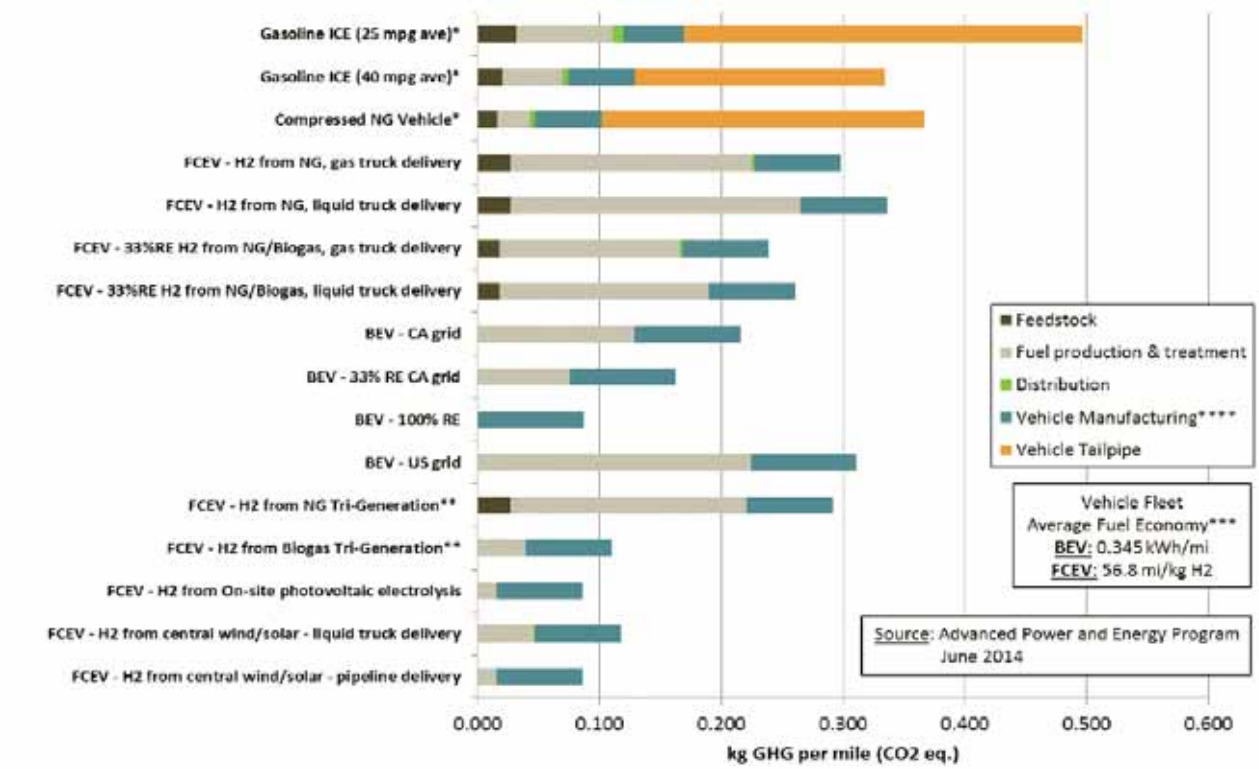
Recently, the Northeast States for Coordinated Air Use Management (NESCAUM), of which New Hampshire is a member, joined H2USA, the public private collaboration co-founded by the Department of Energy and private industry. This partnership is dedicated to fostering hydrogen infrastructure nationwide by providing consumers with a refueling network and ensuring the viability of FCEVs alongside other alternative fuel vehicles.

On page 25 of the *State Energy Strategy*, the plan seeks to '*embrac[e] a diverse and interconnected set of energy solutions, these systems promote the self-reliance of both individual communities and New Hampshire as a whole*'.

Because hydrogen can be derived from a variety of renewable and non-renewable resources, ignoring hydrogen in the vehicle recommendations works against the mission of diversity, interconnectedness, and self-reliance.

Furthermore, by limiting the focus of this strategy document to battery-electric and hybrid vehicles, the current draft ignores the direction that automobile manufacturers are going to electrify vehicles, thereby limiting vehicle options for New Hampshire residents.

In terms of reducing carbon emissions, a well-to-wheel assessment by the University of California Irvine (below) shows that FCEVs are the most effective way to reduce greenhouse carbon emissions. Mid-size FCEVs using hydrogen generated from natural gas reduce CO_2 emissions by more than 50 percent compared to gasoline powered vehicles. When using hydrogen generated from solar or wind electrolysis, total lifecycle CO_2 emissions are eliminated. Hydrogen can also be derived from biogases and other waste products in a process that captures naturally occurring methane and converts it into hydrogen.



Fuel Cells for Material Handling Equipment for Reducing Demand on the Grid and Reducing Pollution

Companies and industrial facilities across the country are beginning to convert their material handling equipment (forklifts and tow tractors) from battery to fuel cell powered vehicles as a way to save money through decreased energy consumption.

Since power companies frequently charge industrial customers a premium to account for peak capacity that these facilities need, there is a tremendous opportunity for businesses to save money and conserve energy (use of battery powered forklifts over an average three-shift schedule requires 1.6 million kW/h of electricity[5]).

Currently, more than 40 industrial sites across the United States and New England have replaced their material handling equipment with fuel cell technology, with more conversions expected.

Finally, companies that have adopted fuel cell material handling equipment have calculated that they have the potential to reduce greenhouse gas emissions by 70-80 percent[6], compared to battery material handling equipment charged from the grid.

Closing

New Hampshire should support fuel cells and hydrogen as part of a diverse renewable energy portfolio, as it did when crafting the RPS.

By embracing these technologies in a true "all-of-the-above" approach, New Hampshire can not only ensure a clean and resilient energy future while meeting emission reduction goals, but provide its residents with options that offer them the best solutions.

Should you have additional questions or require additional information, please contact Bud DeFlaviis at 202-261-1335, or by email at bdeflaviis@fchea.org.

[5] Plug Power - Fuel Cells: A Smart Purchase For Your Greenfield or Brownfield Facility
http://www.plugpower.com/Libraries/Documentation_and_Literature/Whitepaper_Fuel_Cells_A_Smart_Decision.sflb.ashx
[6] Plug Power Brochure – Debunking Hydrogen Fuel Cell Myths - GenDrive System
http://www.plugpower.com/Libraries/Documentation_and_Literature/Whitepaper_Debunking_Hydrogen_Fuel_Cell_Myths.sflb.ashx

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A Northeast Utilities Company

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William J. Quinlan
President and Chief Operating Officer

July 25, 2014

Meredith Hatfield, Director
New Hampshire Office of Energy & Planning
Gov. Hugh J. Gallen State Office Park
107 Pleasant Street
Concord, New Hampshire 03301

Re: New Hampshire Energy Strategy

Dear Meredith:

I am writing in response to your request for comments on the New Hampshire State Energy Strategy draft document, dated May 1, 2014, prepared by Navigant Consulting. Public Service of New Hampshire (PSNH) appreciates the opportunity to be involved in the ongoing process that is leading towards the development of an energy strategy for the State of New Hampshire.

We recognize the future economic well-being of New Hampshire depends upon a comprehensive, long-term energy strategy. As a result of advancements in technology and fuel supply, it is truly an exciting time to be in the energy business. Our goal is to be the most respected energy company in the region and to deliver outstanding reliability and superior service to our customers. To accomplish these objectives we intend to pursue transformational change through innovation.

PSNH is already fully engaged in meeting New Hampshire's energy needs by leading the implementation of quality energy efficiency programs, making the investments to enable a more modern grid, and enabling the integration of clean energy resources to our energy system. We are also actively pursuing opportunities to enhance the service to our customers as we move into the future. PSNH hopes to be a partner in the implementation of New Hampshire's State Energy Strategy as we together strive for a successful energy future for our state.

After reviewing the document prepared by Navigant Consulting and participating in the process, we think it is important to first share our views on the energy challenges we see in the region, and then we will provide our specific views and recommendations on the different elements of the draft document.

Regional Challenges

The New England region faces several energy supply challenges that we believe need to be addressed in order to set the foundation for the critical energy policies that New Hampshire wishes to implement through this long-term energy strategy.

On the generation front, the region has undergone a major change, as the production of energy from traditional fossil fuels, such as coal and oil, has generally transitioned to natural gas. In 2000, natural gas comprised 15 percent of the region's generation output. Today natural gas has risen to be about half the generation output. This substantial shift has occurred without corresponding investments in natural gas delivery infrastructure. With 3,000 MW of reduced capacity occurring over the next several years and another 5,000 MW of generation projected by ISO-NE to potentially retire in the foreseeable future, the situation will become even more precarious in the coming years. Most of that generation is expected to be replaced with natural gas units, further increasing our region's dependence on natural gas.

The past winter weather exposed these weaknesses in New England's gas infrastructure, generating capacity and reliability. Gas infrastructure constraints, coupled with high oil prices, led to incredible market price pressure and volatility. In total, the energy market value for the winter of 2013-2014 was more than $6.8 billion, which is up from an average of $2.8 billion during the previous three winters. We believe that approximately $3 billion of this increase can be directly attributed to pipeline constraints. This occurred when over 10,000 megawatts of the region's most efficient power plants sat idle without gas supply. In essence, New England almost "ran out of gas" for power generation. If not for our non-gas burning facilities, ISO-NE and New Hampshire would likely have faced energy supply curtailments. The implementation of ISO-NE's "oil storage" program kept the lights on with oil running in merit versus the high cost of natural gas. But the cost to our customers and to our regional economy was significant and we feel this problem is highly likely to be repeated in upcoming winter periods.

As power plants retire and production shifts, we will need to substantially reinforce our transmission grid to eliminate bottlenecks and price congestion. Remaining fossil fuel facilities will play a critical back-up role providing fuel diversity and competitive pricing. In addition, as part of the Regional Greenhouse Gas Initiative (RGGI), New England states have implemented a set of aggressive greenhouse gas emission reduction goals, and have aggressive renewable portfolio standard targets. These goals will lead to greater investments in clean energy generation, but the output of this generation will need to be connected to the load centers where it is going to be consumed.

Important opportunities to address these challenges include importing low-cost clean hydro power from Canada and developing northern New England's economic renewable power potential. Both of these opportunities will require significant transmission investment that falls outside of our traditional regional, reliability-based tariffs. These efforts will assist the region and New Hampshire in meeting stricter environmental regulations, and achieving the shared objective of reducing greenhouse gas emissions.

As a result, we support the New England States Committee on Electricity (NESCOE) initiative, which seeks to bring between 1,200 to 3,600 of clean renewable energy into the region through a combination of transmission and long-term contracts. The NESCOE initiative also calls for expanding the region's natural gas capacity. Although it is the fuel of choice for the region, we have not seen gas transmission capacity, other than LNG based imports added, in more than 20 years in New England. We need to address this situation as it keeps our most efficient capacity off line in the winter and adds potentially $3 billion in inefficiency costs to our customers' bills and increases reliability risks.

We also believe that the remaining power generation facilities in the region are needed to assist in getting to a new future state. The New Hampshire Energy Strategy focuses appropriately on new initiatives for bulk power supply – gas fired generation, renewable energy facilities, and clean energy from out of the region. However until these new additions to the New England and New Hampshire

energy supply mix are in place, existing resources should be recognized as an important bridge to the future.

In summary, we believe New Hampshire and the region need to address these immediate challenges in order to set the foundation for a successful long-term energy strategy. We are committed to supporting New Hampshire and the other New England states in pursuing solutions to address these critical issues.

ENERGY EFFICIENCY

Our parent corporation, Northeast Utilities (NU), and its subsidiaries have been on the forefront of providing energy efficiency products and services to customers for many years. PSNH's energy efficiency services team members have been recognized on both the regional and national level for their collaboration and outreach efforts that have allowed them to meet or exceed energy savings goals each year. In Massachusetts, the leadership of NSTAR and WMECO (two of NU's subsidiaries) has propelled the state to the #1 ranking in the United States in energy efficiency by the American Council on Energy Efficiency Economy (ACEEE); and, in Connecticut NU's CL&P subsidiary has led the state to be ranked #5 in the country by ACEEE.

The leadership and results of the programs and services that we have provided are undeniable and significant. In the past three years alone, NU's subsidiaries have delivered approximately $1 billion in energy efficiency portfolio service while creating $4 billion in customer savings and serving 3.8 million customers. The company has completed approximately 180,000 energy audits, weatherized more than 100,000 homes and deployed approximately $180 million in private financing capital. The company's environmental stewardship through these initiatives has resulted in the equivalent of removing 175,000 cars off the road, negated the need to build the equivalent of a 320 MW fossil fuel power plant and delivered the equivalent of building 2,000 MW of solar generation. In 2014 alone, NU companies will drive close to 1 TWH in electric savings for our customers.

PSNH, along with other utilities in New Hampshire, has a successful and proven track record of being able to scale the CORE Programs in a cost effective manner to deliver energy efficiency to customers as demonstrated via partnerships with the New Hampshire Office of Energy and Planning (NHOEP), Community Development Finance Authority (CDFA), Community Action Agencies (CAAs) and the New Hampshire Public Utilities Commission (NHPUC) prudently using System Benefit Charge (SBC), Forward Capacity Market (FCM), American Recovery and Reinvestment Act (ARRA), Department of Energy – Weatherization Assistance Program (DOE-WAP) and Regional Greenhouse Gas Initiative (RGGI) funds. The company has continued to expand education and community involvement in its programs and, importantly, has the ability to leverage larger NU experiences for the benefit of New Hampshire.

As a result of a deep understanding of our customers and markets, PSNH/NU can provide additional benefits to our customers. PSNH can evaluate customer energy usage to target the right services to the right customers with integrated energy solutions that meet their particular needs in a way they can afford. PSNH/NU has assembled an innovative entrepreneurial energy efficiency organization that has the expertise to bring additional benefits to New Hampshire immediately – specifically through:

- engaging key stakeholders and policy makers to support investments in energy efficiency
- driving demand for energy efficiency among customers
- driving the sophistication and scaling of the delivery infrastructure

- simple, yet effective, financing models that leverage local financial institutions

Energy Efficiency Recommendations

Energy efficiency can provide significant benefits to the business, residents and communities in New Hampshire. We believe there are four key areas that need to be incorporated to have an effective economic model for energy efficiency programs and we recommend these be included in the draft energy strategy.

- Program cost recovery coincident with spending, and true up in the subsequent year.
- Full lost revenue recovery on energy efficiency driven savings.
- Performance-based incentives that transform energy efficiency into a sustainable line of business for utilities.
- Low cost financing mechanisms that support customer investment in energy efficiency and leverages local financial institutions.

GRID MODERNIZATION AND AUTOMATION

Customer expectations are changing. Customers today are more dependent on the grid than ever. Our customers need the grid to power electronic devices that allow them to communicate, to entertain, to transact, and to run their small businesses. In this new world, our customers' expectations around reliability, resiliency and automation have increased significantly and we, at PSNH, are working to make the right investments in infrastructure to meet those expectations.

The advent of new control, communications and systems technologies are providing utility companies with numerous opportunities to modernize and automate the grid. PSNH believes that grid modernization and automation is an absolute necessity and is essential to meeting customer's increasing expectations. Overall, PSNH believes that cost effective modernization of the electric distribution system should focus on three primary objectives by deploying technology that allows real time situational awareness: (1) to reduce the frequency of outages; (2) to reduce the effect of outages; and (3) to improve situational awareness to provide greater customer service. These three objectives are beneficial to customers today and the future operating environment.

PSNH and NU are already undertaking important grid modernization and automation investments. We are leaders in the U.S. in efforts to automate our grid to attain a greater awareness of system conditions that provide a higher level of reliability to our customers. PSNH is also focused on system hardening and finding opportunities to reduce the frequency of outages.

For example, to improve service reliability and reduce the extent, frequency and duration of customer outages, PSNH started a pilot in 2012 to test new system, control and communication technologies. PSNH's "self-healing" system pilot combines detection, assessment, decision support and network control to automatically reroute power around outages – limiting households and businesses affected to those closest to the damaged equipment. Customers whose power can't be restored remotely will still see shorter outage times, as the system analyzes the outage cause and immediately dispatches the best resources to fix the problem. PSNH has deployed this system on three circuits affecting approximately 32,000 customers. The project included the installation of automated switches, new communication networks and a new distribution management system. Early results have been impressive, showing a 50 percent improvement in reliability.

We are also making important investments in technologies that are providing us with greater situational awareness to improve our customer facing processes. For example, we have invested in new web-based software to tap a centralized callout and crew management database for deploying crews to restore electric service and trim service restoration times by several minutes. We have also reduced restoration times by upgrading our outage management systems to provide a more efficient and automated method to track the outage restoration process, which also enhances information available to customers.

We believe cost-effective grid modernization and automation investments are important. One element highlighted in the draft strategy as a potential tool is Advanced Metering Infrastructure or AMI. At this time, NU and PSNH believe that a broad-based deployment or a multi-stage roll-out of AMI is not cost-effective. On the cost side, AMI deployments experience a set of high fixed upfront costs beyond the smart meters themselves. Investments in communications, meter data management, billing and other IT systems are required before benefits can be accrued. In addition, there are significant O&M costs required to manage the systems and the data provided by AMI. Cyber-security and data privacy are important considerations at the time of an AMI deployment as well. Finally, there might be other alternatives that could leverage third-party investments in communication technologies (e.g., Nest thermostats) that could provide similar capabilities than AMI at lower costs to our customers.

Several of the benefits that AMI provides require making assumptions about customer behavior that are difficult to quantify. Pilot programs have shown that residential customers who engage in dynamic pricing do shift load in response to price signals and that the response is stronger when linked to smart thermostats. However, there is no consensus on "engagement" levels, and pilot results show very low penetration rates (e.g., in the 2-5 percent range). Commercial and industrial response rates to dynamic pricing are less understood and thus more difficult to predict. Finally, very low utilization of central air conditioning in New Hampshire negates much of the value of dynamic pricing and its impact on peak load reduction in today's markets.

PSNH believes that many more effective grid modernization and automation investments exist, and continue to be developed, that can provide customers with better reliability and lower costs. However in order to fully capitalize on these opportunities, the regulatory model needs to evolve to encourage utilities to make these investments. These investments carry a higher level of uncertainty given the nascent nature of most of the technologies being deployed. Regulatory models that address this uncertainty and incent utilities appropriately could be a catalyst to ensure New Hampshire captures the opportunities provided by new technologies. For example, the existing Reliability Enhancement Program (REP) implemented at PSNH has proven to be a great tool in allowing the company to undertake grid modernization and automation investments. Similar mechanisms exist for system hardening investments in our Connecticut subsidiary and are being considered for grid modernization efforts in Massachusetts.

In summary, PSNH believes that opportunities to modernize the grid in New Hampshire exist. A focus on cost-effective investments, with the proper regulatory model, will allow PSNH and other utilities to make these investments in a timely manner and will lead to greater reliability, lower costs and a more engaged and satisfied customer base.

Grid Modernization and Automation Recommendations

- Develop mechanisms that support increased investments in grid modernization and automation (1) reduce the frequency of outages; (2) reduce the effect of outages; and (3) improve situational awareness to provide greater customer service.

- Establish a recovery mechanism (similar to the REP) to encourage the needed investments in grid modernization and automation that provide benefits to our customers.
- Focus on cos- effective grid modernization and automation investments and question technologies that have high costs and an unclear set of benefits.

RENEWABLE ENERGY

New Hampshire currently hosts approximately 900 MW of renewables (solar PV – 7 MW, biomass – 267 MW, onshore wind – 171 MW, and small hydro – 455 MW) as noted in the draft strategy report. PSNH has a strong history and position in the area of renewable energy and has helped to develop and interconnect a variety of resources. PSNH's overarching 'all of the above' strategy for energy in New Hampshire supports renewable energy as a key ingredient as the state looks to diversify its resources. The company will continue to look for opportunities to provide clean renewable and reliable energy to its customers at the lowest possible cost.

PSNH has supported specific renewable energy projects in New Hampshire including: Lempster Wind, Northern Wood Power at Schiller Station, Burgess Biopower, a solar PV system on our Manchester headquarters building and efficiency upgrades at PSNH hydroelectric stations. New Hampshire in general has seen a healthy amount of new renewable projects including Groton Wind and Granite Reliable Wind, as well as others currently in queue. PSNH is also a strong supporter of the Renewable Portfolio Standard (RPS) program that was enacted in 2008. Since then, PSNH customers have contributed more than $60 million dollars to renewable energy initiatives via the inclusion of RPS compliance costs in electric rates. Included in the $60 million is almost $27 million in contributions to the Renewable Energy Fund (REF). Between 2014 and 2025, PSNH estimates that New Hampshire utilities and energy suppliers will contribute, on behalf of their customers, more than $1 billion related to RPS compliance.

Micro-hydro facilities, small scale solar PV arrays and renewable fuels used at customer facilities or homes are all part of a future energy strategy. They, like all elements of fuel diversity and renewable energy supply, are positive and needed contributions. PSNH is taking steps to support further use of these resources. For example, in collaboration with the New Hampshire Office of Energy Planning (NHOEP), PSNH is an active participant on the US DOE SunShot Solar Rooftop Challenge. PSNH also has taken steps to simplify the interconnection process for customer-sited solar projects and is committed to working with NHOEP to identify and implement additional measures to make this a streamlined process that promotes a safe and reliable electrical system.

PSNH is willing to further investigate ways to help customer-sited Distributed Generation (DG) programs that sensibly fit the long-term vision of New Hampshire's energy future. However, PSNH is also concerned about potential cross subsidization issues associated with net metering rules and is willing to participate in efforts to restructure this incentive mechanism to ensure that all customers pay their fair share of system costs.

PSNH agrees with the Navigant conclusion that RSA 374-G has been underutilized to-date. This statute allows New Hampshire electric utilities to invest in renewable and clean distributed energy resources, recognizing that these resources can increase delivery efficiency, provide energy security and increase fuel diversity. PSNH supports legislative or regulatory action to better define the parameters by which a utility-proposed DG project will be reviewed and approved for cost recovery.

Finally, PSNH supports expanded use of the Renewable Energy Fund (REF). The REF is already used to support various renewable energy grants and programs, and PSNH agrees with efforts to ensure that its funds are made available to additional qualifying projects.

Renewable Energy Action Items

- Implement an "all of the above strategy" that includes renewables as a key element to meet New Hampshire's energy needs.
- Investigate ways to help customer-sited distributed generation programs that make sense for customers, the state and the company as part of New Hampshire's long-term energy vision.
- Identify better incentive mechanisms to support distributed generation to ensure that all customers pay their fair share of system costs.
- Identify an effective process and parameters by which a utility-proposed distributed generation project will be reviewed and approved for cost recovery.
- Expand the use of the REF.

TRANSPORTATION

PSNH and NU recognize that energy expenditures in the transportation sector make up about 46 percent of total energy expenditures in New Hampshire. Increasing consumer access to alternative fuel transportation options, such as electric vehicles and plug-in hybrids, can reduce consumer energy expenditures, reduce greenhouse gas emissions and increase energy independence.

There are more than 15 highway-capable plug-in cars available in the American market from nine major car manufacturers, plus several models of electric motorcycles, utility vans and neighborhood electric vehicles (NEVs). However, not every model is available in New Hampshire. Certain vehicles, such as the Chevrolet Spark EV, are only available in California and selected states that have adopted the California Zero Emissions Vehicle (ZEV) program. Even with limited availability in New Hampshire, customers are increasingly considering electric vehicles (EVs) as a viable transportation alternative, offering a clean, lower-cost fuel option. At the end of 2013, there were more than 600 plug-in EVs registered in New Hampshire.

The draft strategy document describes well the technologies, infrastructure and methods to reduce vehicle miles traveled, while at the same time supporting the needs of residents and the state's economy. This vision could be expanded to also describe the availability of alternative fueled vehicles. Alternative fueled vehicles should be as easy to purchase as conventional vehicles. Automobile dealers, utilities and other businesses can work together to eliminate barriers to consumers interested in driving an electric vehicle. In addition, the message that alternative fueled vehicles will lower consumers' total energy bills could be strengthened.

The draft energy strategy identifies the key elements in a comprehensive transportation strategy, vehicle performance and availability, fueling infrastructure and programs to reduce vehicle miles traveled. As explained in the draft, vehicle standards play a role in advancing the goals of New Hampshire. Consumer

awareness and interest will be important to the success of the transportation vision. According to a new consumer survey from Navigant Research[1], favorability ratings for alternative fuel vehicles remain high, with all three types of vehicles (hybrid, electric, and natural gas) above the 50 percent mark for favorability. Consumer awareness of specific models, however, is still relatively low: 44 percent of the respondents are familiar with the Chevrolet Volt, but less than one-third are familiar with the Nissan Leaf, the Tesla Model S, Ford's C-Max Energi and BMW's i3.

Promoting the availability and effective marketing of all plug-in electric vehicle models is an important priority. Many parties should be engaged in this collaborative effort, including automakers, dealers, Clean Cities programs, associations and utilities. PSNH and NU can provide a valuable link to consumers by acting as a resource for them to learn more about electric vehicles and the infrastructure to fuel them.

The energy strategy should highlight the importance of consumer awareness. While many parties should be included in this effort, PSNH and NU are ready to partner with New Hampshire to collaboratively take on this challenge. Since 2013, we have offered an electric vehicle information center hotline, 855-463-6438, staffed Monday through Friday from 8 a.m. to 5 p.m. with a team of specialists dedicated to providing customers with helpful information about electric vehicles and supporting technology. We also launched a Plug My Ride (http://psnh.plugmyride.org/) resource website to provide our customers with fast access to EV information and resources at any time.

PSNH and NU can collaborate with New Hampshire on off-peak EV charging research. EV charging is unique for a variety factors. Usage characteristics (such as time, rate and location) are flexible and can be shaped with technology and consumer behavior. EVs are parked for long periods of time for overnight charging, and demands on the utility system are low during this time. However, because the EV market is in its early stages and will be driven primarily by customer behavior, it is not possible to address all potential system impact issues at this time.

In the long-term, the prospect of opening up the transportation sector to electricity has the potential to increase kWh sales for EV charging and allow the spread of fixed costs across a larger base of customers. The key to realizing this potential in New Hampshire is to integrate this load into the grid in a cost-effective way, where the cost of utility infrastructure investments are less than the revenues from the sector.

In both the short-term and long-term, however, the utility must ensure that the electric distribution system has sufficient capacity to serve private residential EV charging. The technologies that are currently available and under development hold promise in supporting utility efforts to mitigate grid impacts and provide additional incentives to EV drivers. Utility research and pilot projects can provide valuable insights to guide future direction.

In summary, the draft energy strategy provides a positive vision to move forward. PSNH and NU are prepared to help partner with New Hampshire on increasing consumer awareness of EVs and performing research on off-peak charging alternatives.

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[1] 2013, Navigant Research, Electric Vehicle Consumer Survey Consumer Attitudes, Opinions, and Preferences for Electric Vehicles and EV Charging Stations

Transportation Action Items

- Identify mechanisms for collaboration across multiple stakeholders, including utilities, to promote consumer awareness of the availability and benefits of all models of plug-in electric vehicles.
- Establish mechanisms to determine the best approach for off-peak EV charging in order to integrate this new load into the grid in a cost-effective way, where the cost of utility infrastructure investments are less than the revenues from the sector.
- Support efforts by utilities to mitigate grid impacts from EVs and propose potential rate design methodologies that account for the comprehensive impacts of EV charging to the utilities and customers.

CONCLUSION

PSNH has a long history of partnering with the State of New Hampshire to help improve many areas of the state's economy, and I am appreciative of the opportunity to continue this partnership. I look forward to working with you and the state Energy Advisory Council as you finalize an energy plan that sets New Hampshire on an exciting and well-grounded course to successfully achieve its desired energy future.

Thank you for this opportunity, and I look forward to a continued dialogue.

Sincerely,

William J. Quinlan
President and Chief Operating Officer

NHTOA
NH TIMBERLAND OWNERS ASSOCIATION
Growing Leadership for New Hampshire's Forests

July 25, 2014

Meredith Hatfield, Director via email
NH Office of Energy and Planning
Governor Hugh J. Gallen State Office Park
107 Pleasant Street
Concord, NH 03301

RE: May 1, 2014 Draft New Hampshire State Energy Strategy

Dear Director Hatfield,

The New Hampshire Timberland Owners Association would like to thank you for the opportunity to provide comments on the May 1, 2014 Draft New Hampshire State Energy Strategy.

Founded in 1911, the New Hampshire Timberland Owners Association (NHTOA) is a membership organization representing New Hampshire's timberland owners and all aspects of the forest products industry. The NHTOA's interest in this strategy comes from our member's involvement in New Hampshire's renewable energy markets. NHTOA members grow, harvest and convert biomass (wood chips) into electricity and heat. Important to the facilities that convert the biomass to electricity and heat are New Hampshire's renewable energy laws and policies. And, in recent years more of the NHTOA's members have begun pursuing wind power projects on their property. Like biomass electricity and heat facilities, wind power projects are also impacted by the state's renewable energy laws and policies.

The NHTOA appreciates the time and effort you and your staff put into researching, gathering public input and developing this document. We recognize this is a very complicated issue and we appreciate your work.

The following are a number of specific comments on the draft;

Page 10 - 2.3.2 Electric Sector Key Assumptions
The fourth assumption in the portfolio optimization model (POM) is new transmission capacity will be constructed to provide imported power to New England. The draft report does not identify the volume or type of power the new transmission capacity will provide. The volume and type of power entering New England will have a significant impact on the region's energy portfolio and ultimately energy pricing and policies. The NHTOA requests the final report provide more detail on the volume and type(s) of power (e.g. wind power, natural gas, hydropower, etc.) behind this assumption.

NEW HAMPSHIRE TIMBERLAND OWNERS ASSOCIATION
54 PORTSMOUTH ST., CONCORD, N.H. 03301
PHONE (603) 224-9699 • FAX (603) 225-5898 • WWW.NHTOA.ORG

Page 59 -- 5.3.2 Achieving the Renewable Power Vision
Figure 5-10 provides a summary of the technologies that will help New Hampshire achieve its renewable power vision. This section of the report goes onto discuss the need to expand these technologies. The NHTOA requests this paragraph also state that New Hampshire's renewable energy policies must also promote the retention of existing renewable energy sources. This is consistent with the structure of New Hampshire's renewable energy laws, specifically the class system in the Renewable Portfolio Standard (RPS).

Page 61 -- 5.3.2 Achieving the Renewable Power Vision – Biomass
The NHTOA questions the report's assertion that "… only another 54 MW may be economically justified based on the availability of remaining resources that could be harvested sustainably." In the 2013 report authored by the North Ease State Foresters Association, *The Economic Importance of New Hampshire's Forest-Based Economy*, data from the USDA Forest Service, Forest Inventory and Analysis shows that in 2012 the annual net growth of New Hampshire's forests was 200.4 million cubic feet while at the same time approximately 134.8 million cubic feet was harvested. The net result is a positive net growth of 65.6 million cubic feet. Changes in the region's log markets, biomass markets, pulp wood markets, land ownership patterns and the location(s) and size(s) of a potential biomass power plant(s) complicate this wood availability analysis. The NHTOA believes this assumption is too conservative and is not applicable across the state.

Page 73 -- 5.4.3 Strategies for Achieving the Vision
The NHTOA supports the recommendation in Figure 5-16: Alternative Fuel Choices Strategy Recommendations; "Continue the development of the renewable thermal requirements of the RPS to maintain momentum in adoption of renewable thermal technologies."

In this same paragraph the NHTOA suggests the addition of a strategy to streamline the permitting process for adding new thermal load to an existing biomass power generation facility. Currently, the permitting costs and regulatory exposures (i.e. reopening of air and operating permits) are a significant barrier to any existing biomass power plant seeking to attract a new thermal customer to purchase their excess heat and steam. The NHTOA suggests the PUC review the current permitting and regulatory requirements and recommend ways to streamline them.

Again, I want to thank you for the opportunity to comment on the proposed draft and look forward to seeing the final plan. If you have any questions or wish to discuss this in more detail please contact me.

Sincerely,

Jasen A. Stock
Executive Director

NEW HAMPSHIRE TIMBERLAND OWNERS ASSOCIATION
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New Hampshire Rail Transit Authority

New Hampshire Department of Transportation, PO Box 483, Concord, NH 03302

July 25, 2014

Meredith Hatfield, Director
Office of Energy and Planning
107 Pleasant Street
Concord, NH 03301

Re: Letter of Support for Commuter Rail as a Transportation Alternative

Dear Ms. Hatfield,

I am writing on behalf of the NH Rail Transit Authority (NHRTA). The Authority was established in 2007 by the legislature to oversee the redevelopment of commuter rail service in New Hampshire. The main focus of the Authority at this time is to pursue the resumption of commuter rail service in the Boston to Concord corridor, known as the NH Capitol Corridor. In that regard, I am writing to support the inclusion of passenger rail as an important transportation alternative for the State Energy Strategy.

Passenger rail touches several areas of New Hampshire and contributes to fewer vehicle miles traveled and lower use of fossil fuels. There are five corridors that the Authority is monitoring and studying: the New Hampshire Capitol Corridor (Boston to Concord) Transportation Alternatives Analysis; the Town of Plaistow extension study from Haverhill; the Amtrak line known as the Knowledge Corridor from New Haven to Montreal, passing through Claremont; the Amtrak Downeaster-Boston to Brunswick, Maine, passing through Exeter, Durham and Dover; and Train Hotel, a private initiative projected to travel from Montreal to Portland, Maine through Coos County.

The NH Capitol Corridor is the only rail corridor with a population of 500,000 in the country that is not served by commuter rail. The consultant estimates a daily ridership of at least 3100 passenger to/from New Hampshire. I have attached an addendum outlining the considerable interest and activity surrounding passenger rail in New Hampshire, as well as links to additional information on a few of the projects.

Commuter rails makes valuable contributions to economic develop and job creation and retention. The City of Dover has developed a Transit Oriented Development zone around its train station that has been highly successful. The development in Freeport and Brunswick Maine also demonstrates the willingness of developers and businesses to improve station areas and increase economic activity in the community.

Changing perceptions and desires for lifestyles are important factors that influence young, educated professionals to locate in a particular area. Commuter rail often enhance walkable communities that are a particular attraction.

As you go forward with your review of your draft, I urge you to give consideration of the important impacts passenger rail provides to a viable Energy Strategy for the state.

http://www.nh.gov/dot/programs/nhrta/index.htm
(603) 271-2468

New Hampshire Rail Transit Authority

New Hampshire Department of Transportation, PO Box 483, Concord, NH 03302

Please contact me by phone (494-2579) or email if you wish to pursue this information further.

Sincerely,

Thomas J. Mahon
Chairman

http://www.nh.gov/dot/programs/nhrta/index.htm
(603) 271-2468

New Hampshire Rail Transit Authority

New Hampshire Department of Transportation, PO Box 483, Concord, NH 03302

NHRTA Letter of Support – Addendum

The New Hampshire Capitol Corridor is included as an unfunded priority in the recently adopted State Ten Year Transportation Improvement Program (HB 2014). One of the requirements for the corridor study is a viable financial plan.

State 10 Year Transportation Improvement Plan
http://www.gencourt.state.nh.us/legislation/2014/HB2014.pdf

A $4.1M study of transportation alternatives in this corridor is currently being conducted by a consultant, URS, and the NH Department of Transportation in cooperation with the NHRTA. The study is scheduled to be completed by the end of 2014.

NH Capitol Corridor Alternatives Analysis and Service Development Plan
http://www.nhcapitolcorridor.com/

NHDOT is conducting a similar study for the extension of commuter service from Boston to Plaistow.

Plaistow Commuter Rail Extension Study
http://www.nh.gov/dot/org/aerorailtransit/railandtransit/plaistow-rail-study/index.htm

The Somersworth City Council recently established a Commuter Rail Study Committee to explore extension of commuter service to Somersworth and potentially Rochester.

Using a Federal Transit Authority (FTA) Model (Aggregate Rail Ridership Forecasting Model 2.0) the consultant has made a conservative estimate of up to 3100 boarding per week day on the New Hampshire Capitol Corridor. This estimate does not account for casual and weekend users. The estimate is also twice the reported weekly ridership for the Downeaster.

Northern New England Rail Passenger Authority
http://www.nnepra.com/reports-and-statistics

While the Downeaster is referred to in the First Draft as primarily impacting tourism, the service is receiving additional financial support from the Federal Transit Administration (FTA) for passengers regularly commuting from New Hampshire to Boston.

http://www.nh.gov/dot/programs/nhrta/index.htm
(603) 271-2468

New Hampshire Rail Transit Authority

New Hampshire Department of Transportation, PO Box 483, Concord, NH 03302

NHRTA Letter of Support – Addendum(2)

Two studies conducted by the UNH Survey Center in 2009 and 2013 (conducted for the Nashua Chamber of Commerce) show that at least 68% of NH residents favor commuter rail service as an additional transportation alternative.

Granite State Poll for New Hampshire Rail Transit Authority (2009)
http://www.nh.gov/dot/programs/nhrta/documents/NHRTAFinal1.pdf

The University of New Hampshire's surveys of entering students reveals a growing number of students (over 5%) who cited access to train service to Boston as one reason they selected UNH-Durham. There are estimated to be over 15,000 students attending post-secondary schools in the corridor.

Business and industry leaders point out to us that a commuter rail service is essential to attract and retain young, highly educated employees and promote economic development in the corridor. Another important component of the corridor analysis is the economic impacts of the resumption of service.

The City of Nashua is working diligently to attract and retain young professionals and is taking an active role in support of commuter rail. The city has committed $1.7M to acquire a property on Crown Street that has been identified by the NH Capitol Corridor consultant as a station location.

The cities of Concord, Manchester and Nashua all have developed Transit Oriented Development (TOD) schemes for their downtown areas. The City of Dover has experienced significant development in the area around the station. UNH reports that a growing percentage of students are selecting UNH because of access to rail service to Boston. There are over 15,000 students in the NH Capitol Corridor that could benefit from this service.

http://www.nh.gov/dot/programs/nhrta/index.htm
(603) 271-2468

THE STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION

CHRISTOPHER D. CLEMENT, SR.
COMMISSIONER

JEFF BRILLHART, P.E.
ASSISTANT COMMISSIONER

July 24, 2014

Meredith Hatfield, Director
NH Office of Energy & Planning
Johnson Hall, 3rd Floor
107 Pleasant Street
Concord, NH 03301

RE: NH State Energy Strategy

Dear Ms. Hatfield,

Please consider this letter as a request from the NH Department of Transportation to consider the merits of rail service when finalizing the New Hampshire State Energy Strategy. We believe that rail can provide many positive benefits to the State, such as helping reduce the State's energy use from the transportation sector, providing a more robust transportation network, and helping to enhance the State's tourism network. Based on the aforementioned and numerous other benefits of the State's rail network, we therefore ask that your office consider the contributions of rail within your strategy.

The Department's 2012 State Rail Plan includes information on the environmental impacts of the State's rail system, both freight and passenger, in Section 4.2 "Environmental Impacts of Rail in New Hampshire." Additionally, Section 5.2.2 "Passenger Rail Trends", identified the expansion of passenger rail service along two of the principal corridors in the state as a priority and currently both corridors, Boston to Concord and Haverhill, MA to Plaistow, are being considered in independent feasibility studies. The Rail Plan also provides information on the State's tourist and freight rail services that contribute to the overall vitality of the State.

Again, the Department hopes you will consider the benefits that rail service can provide to the State and its environment when preparing the New Hampshire State Energy Strategy. We would encourage you to review the information contained in the 2012 State Rail Plan and welcome the opportunity to have a more detailed discussion with you about rail services, if deemed necessary. A copy of our State Rail Plan is available online: http://www.nh.gov/dot/org/aerorailtransit/railandtransit/documents/FinalStateRailPlan.pdf.

Sincerely,

Shelley Winters
Administrator
Bureau of Rail & Transit

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July 25, 2014

SUBMITTED VIA BRANDY.CHAMBERS@NH.GOV

Brandy Chambers
New Hampshire Office of Energy and Planning
57 Regional Dr. #3
Concord, NH 03301-8519

To Ms. Chambers:

Re: Draft New Hampshire State Energy Strategy

The Association of Global Automakers, Inc. (Global Automakers)[1] appreciates the opportunity to provide feedback to the New Hampshire Office of Energy & Planning on the draft *New Hampshire State Energy Strategy* ("Strategy").

We understand from the draft Strategy that New Hampshire may consider adoption of the California Low Emission Vehicle (LEV) Program, which includes programs for criteria pollutants, greenhouse gases (GHG), and zero emission vehicles (ZEV). Global Automakers believes that adoption of these programs is not beneficial for New Hampshire, nor necessary, as described below. Rather, we believe that the State should focus its Strategy on creating a marketplace in New Hampshire that will stimulate demand for and use of advanced technology vehicles, including purchase incentives, infrastructure investments, and other efforts to encourage and support the marketplace for a more environmentally friendly and fuel efficient fleet.

Greenhouse Gases, Fuel Economy and Criteria Pollutant Standards; National Benefits Equivalent to California Program

Global Automakers supports a single, harmonized, and national program for GHG and tailpipe emissions and has been actively engaged in promoting harmonization between the U.S. Environmental Protection Agency (EPA), National Highway Traffic Safety Administration (NHTSA), and California Air Resources Board (ARB) on the GHG

[1] The Association of Global Automakers, Inc. represents international motor vehicle manufacturers, original equipment suppliers, and other automotive-related trade associations. Our members' market share of both U.S. sales and production is 40 percent and growing. We work with industry leaders, legislators, regulators, and other stakeholders in the United States to create public policy that improves motor vehicle safety, encourages technological innovation and protects our planet. Our goal is to foster an open and competitive automotive marketplace that encourages investment, job growth, and development of vehicles that can enhance Americans' quality of life. For more information, please visit www.globalautomakers.org.

Association of Global Automakers, Inc. 1050 K Street, NW, Suite 650 • Washington, DC 20001 TEL 202.650.5555 GLOBALAUTOMAKERS.ORG

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and Corporate Average Fuel Economy (CAFE) standards. The One National Program, which allows a manufacturer to produce a single set of vehicles that will comply with the EPA GHG, NHTSA CAFE and ARB GHG standards through the federal programs, will achieve significant GHG reductions from light-duty vehicles through 2025. It nearly doubles new vehicle fuel economy and, in the process, will reduce six billion tons of GHG over the lifetimes of the vehicles, saving more than $1.7 trillion in fuel costs and reducing oil usage by more than two million barrels per day in 2025.[2] These benefits are significant, but they do not come without a cost. EPA, NHTSA and ARB collaborated to develop the One National Program for model years 2012-2025, thereby allowing these benefits to be realized across the nation while also maximizing the effectiveness of the program.

There is no significant environmental benefit associated with New Hampshire adopting California criteria pollutant emissions standards. Criteria pollutant emissions standards between California and the EPA have been closely coordinated and the EPA's newest program, known as Tier 3, will provide equal emissions benefits to the California program, known as LEV III. Both programs achieve a near zero NMOG+NO_X fleet average for new vehicles in model year 2025. The EPA's Tier 3 Program will also require significant reductions in the sulfur content of gasoline, a necessary component for achieving the Tier 3 emission standards. California's program on its own would not have provided the necessary cleaner fuel to New Hampshire without the federal program and would require administrative resources within New Hampshire to implement the program. Therefore, the federal program offers New Hampshire a more complete regulatory program with equivalent emission benefits to California's program.

Given the national benefits of both the GHG/CAFE and the Tier 3 programs, adopting the California LEV program would provide no additional environmental benefits in New Hampshire, but such adoption would require additional State resources that would be necessary to adopt, implement and administer California's programs in your State.

Zero Emission Vehicle Program; Infrastructure, Incentives and Consumer Acceptance are Necessary, Rather than a Mandate

Global Automakers understands that the draft Strategy recommends, in part, the adoption of the California LEV Program because the California Zero Emission Vehicle (ZEV) Program cannot be adopted unless the LEV Program is in place. We are committed to the success of the ZEV technology. Many of our members have been at the forefront of offering advanced technology vehicles, but Global Automakers does not support the ZEV program in its current form because it is a sales mandate. The ZEV Program forces automakers to sell specific technologies, including battery electric, plug-in hybrid electric and fuel cell electric vehicles, at specified volumes on an annual basis. Global Automakers does not support mandates and believes that ZEV technology can only succeed if the marketplace can support and accommodate such sales.

In an ideal situation, we believe that the incentives (financial and non-financial), infrastructure, outreach to consumers and other efforts needed to grow the market for advanced technology vehicles should be in place if a

[2] EPA, *Regulations & Standards: Light-Duty*, www.epa.gov/otaq/climate/regs-light-duty.htm.

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state wants to increase the volume of ZEVs, regardless of a mandate. The One National Program is now the driving force behind technology advancements in the national fleet. But developing a market for ZEVs demands significant commitments, and whether a state adopts the ZEV Program or not, any state that wants an increased volume of ZEVs in its state must commit the resources to develop the ZEV market. For instance, eight of the current ZEV States have developed a Regional Action Plan, which recognizes the responsibility these states have to "accelerate the development of that [ZEV] market."[3] The Action Plan is an important first step, but it will take time and resources to implement. It is not clear from the draft Strategy if New Hampshire is prepared to take on this commitment.

1. *The One National Program undercuts any environmental rationale for a ZEV sales mandate.*

When California adopted the ZEV program in 1990, its rationale was that without this technology-forcing mandate, automakers would not offer ZEVs. While we do not subscribe to this argument, it is clear that auto manufacturers have made significant investments in research and development (R&D) to produce and offer for sale marketable ZEV vehicles. Today, there are battery electric vehicles (BEVs), plug-in hybrid vehicles (PHEVs) and limited offerings of fuel cell electric vehicles (FCEVs). All of the major automakers have announced that more is to come and the number of available ZEV models continues to increase. In addition, the One National Program for GHG and fuel economy is already driving automakers and others to invest substantial additional R&D in ZEV and other advanced technologies of various types. The ZEV program, per se, does not provide additional environmental benefits, because the national GHG/fuel economy standards are based on each manufacturer's fleet average of all vehicles produced in a model year nationwide. The benefits of any extra ZEV production are averaged out across the fleet.

2. *Focusing on what's needed to make your marketplace conducive to ZEVs should be your paramount concern. The State needs to create a marketplace hospitable to ZEVs.*

While automakers continue to face technical challenges with ZEVs, principally bringing down costs, addressing refueling/recharging time constraints, and ensuring adequate driving range, today some of the most significant challenges are related to market readiness, such as weather, topography, consumer preferences, etc. Many states are devoting money, time and other resources to develop their markets.

For instance, California has invested hundreds of millions of dollars in purchase incentives for consumers and for infrastructure development to support BEVs, PHEVs and FCEVs. Additionally, California provides HOV access, subsidized parking and charging, and many other non-monetary incentives that are instrumental in supporting ZEV purchase and use in California. California's efforts to date have been successful in creating the largest ZEV market in the U.S., although ZEVs still make-up only two and a half percent of the vehicles sold in California in 2013. California recognizes that there is still a long path to achieving the 2025 goal of 15.4% of new vehicle sales to be ZEVs and continues to commit the resources necessary to push for that goal.

[3] NESCAUM, "8 State Alliance Releases Plan to Put 3.3 Million Zero-Emission Vehicles on the Road." http://www.nescaum.org/documents/multi-state-zev-action-plan-press-release-5-29-14.pdf/.

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There are also States, such as Washington, Georgia, Colorado, Florida, and Hawaii that, without a ZEV mandate, have been successful in encouraging ZEV sales by offering vehicle incentives and otherwise improving ZEV market readiness in their States.[4] Clearly the ZEV Program is not a requisite for building interest in the technology; a ZEV mandate is not necessary if the right market conditions exist.

Additionally, there are other significant market challenges with the ZEV Program, which as designed, the Program itself does not address. Principal among these are barriers, such as weather, topography, consumer preferences, etc., that may impact the ability of the ZEV Program to succeed. Given New Hampshire's largely rural nature and long, cold winters, the vehicle market tends to favor light trucks and SUVs, mostly all-wheel drive, which are not available as ZEVs. New Hampshire's sales data shows that the new vehicle market consisted of only 0.12% BEVs and 0.26% PHEVs in 2013.[5] New Hampshire's sales are on par with the ZEV sales in contiguous Northeast States that have adopted the ZEV Program, further supporting the position that market development and demand is more influential on ZEV sales than a mandate.

Under the ZEV Program, mandated volumes of BEV sales will start in the Northeast ZEV States with model year 2018.[6] These states have been working with California over the past year on a Regional Action Plan[7] in recognition that much work is needed to support the ZEV Program in those States. Global Automakers has been engaged in this process with these States and California, and we are pleased to see the commitment to prepare the markets. We remain concerned, however, that Northeast States' sales continue to lag in comparison to California sales, and the additional barriers may prove more challenging to overcome than expected.

If the market is ready, and there is sufficient demand for ZEVs, ZEVs will be sold in New Hampshire regardless of the mandate, but New Hampshire must first determine its willingness to devote the resources to market development. New Hampshire's investment in the market must be substantial if it is truly interested in increasing ZEV volumes, and that investment must be even greater if the decision is made to proceed with the ZEV Program.[8]

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[4] New Hampshire also does not currently offer any incentives, as noted in the draft Strategy, page 77.
[5] Compiled from 2013 Polk data.
[6] If New Hampshire were to proceed with the ZEV mandate, it is important to note that Section 177 of the Clean Air Act requires a minimum of two years lead time before the California LEV Program can be implemented in another state. Assuming New Hampshire must go through the legislative process in 2015, followed by rulemaking process in 2016-2017, and then add an additional two years lead, the earliest New Hampshire could adopt the California LEV and ZEV Programs is model year 2020. Since the ZEV mandates requirements increase each year, model year 2020 standards would be even more challenging for automakers to comply with, particularly if the New Hampshire market is not ready.
[7] NESCAUM, *Regional Action Plan*. May 29, 2014, http://www.nescaum.org/topics/zero-emission-vehicles.
[8] If the decision were made to adopt the ZEV Program, then New Hampshire must be willing to sign onto the Action Plan and take on the responsibility to support the ZEV volumes required under the Program. Furthermore, the Action Plan is only a beginning step in developing the market, and on its own, does not guarantee the mandate can be met. Additional resources and actions beyond the Action Plan will be necessary.

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Global Automakers recommends that New Hampshire refocus its draft Strategy on a plan for the development of a robust ZEV market, including determining the necessary incentives, infrastructure, codes and standards, state resources, etc., to encourage and support market readiness for ZEVs. For instance, the draft Strategy mentions mandated procurements for state fleet vehicles. Global Automakers strongly supports this idea, because it provides certainty of market, infrastructure and user. Global Automakers would be pleased to work with New Hampshire in developing a State-specific market-based strategy to encourage and grow ZEVs in the State.

Conclusion

In summary, Global Automakers has supported the national environmental and energy benefits of the GHG/CAFE and criteria pollutant standards, which will benefit New Hampshire. We also continue to support the success of ZEV technology and believe that for ZEVs to be a success, a robust market development strategy must be in place. Therefore, Global Automakers strongly recommends that New Hampshire remove any reference to the California LEV or ZEV Programs in its Strategy and instead include a detailed plan to develop and encourage the market for ZEVs, including incentives, infrastructure, and addressing market barriers, as part of the final Strategy.

Thank you for your consideration of our comments. If you have any additional questions regarding our comments, I can be reached at (202) 650-5559 or jrege@globalautomakers.org.

Sincerely,

Julia M. Rege
Senior Manager, Environment & Energy

ENE Comments To The New Hampshire State Energy Advisory Council On the Draft State Energy Strategy

July 25, 2014

ENE (Environment Northeast) is a non-profit clean energy research and policy organization headquartered in Maine with offices in New England and Canada. We appreciate the opportunity to participate in the stakeholder process and to provide written comments to the State Energy Advisory Council ("the Council") and Navigant Consulting, Inc. ("Navigant") regarding the draft state energy strategy.

The Council and Navigant have succeeded in producing a compelling energy vision, detailed baseline modeling and synthesizing stakeholder input on policy priorities for the state. The resulting draft energy strategy for the state includes many of the necessary actions to transform New Hampshire's energy future. However, there is lack of focus on clear, specific and achievable outcomes over the next 10 years. Some of this lack of specificity is due to a lack of concrete objectives in the draft energy vision, which was discussed when it was initially presented but never remedied. We believe it is important to have clear outcomes in a 10 year strategy and a timeframe that lends itself to achievable goals. We would like to see the Advisory Council and the Office of Energy Planning take the next step of elaborating on the specific actions that will be taken over the next 10 years.

The New Hampshire State Energy Strategy can serve as a valuable policy and planning tool, and the requirement to revise the Strategy every three years affords policymakers the opportunity to constantly evaluate progress and reassess strategic choices, as well as refine and expand methodologies. Building off of this positive base, we provide comments below on the specific sections related to energy efficiency, grid modernization, renewable energy, fuel choice and transportation policies.

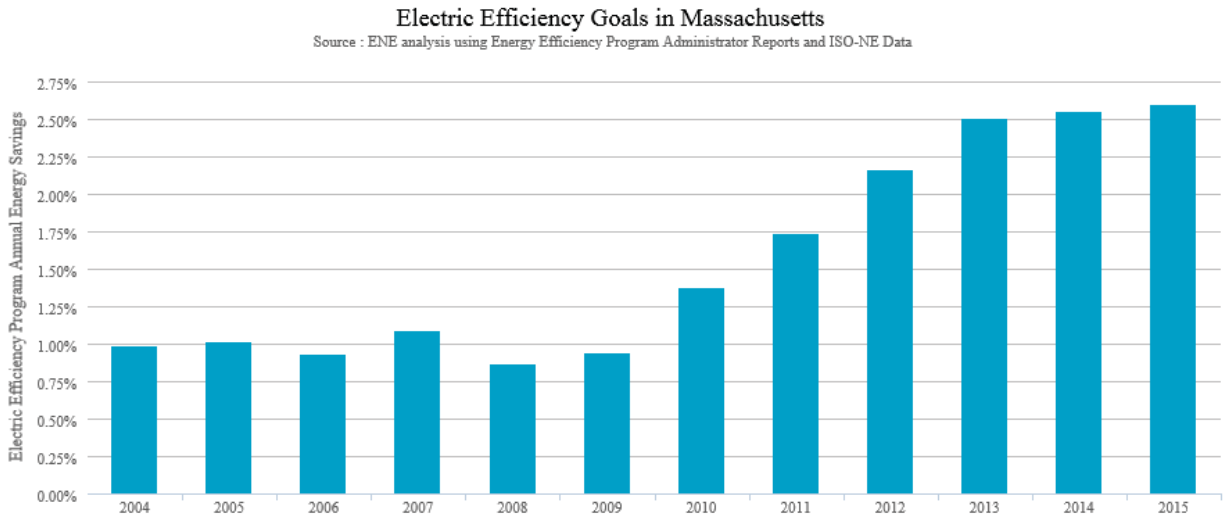
Energy Efficiency

Expanding energy efficiency for all fuels – electric, gas, and oil customers – will deliver multiple benefits to New Hampshire. Strategic investments in energy efficiency help reduce consumer and business energy costs while avoiding greenhouse gas emissions. In addition to lower energy bills, reduced energy demand means less money leaving the state to import carbon-intensive fossil fuels. Energy efficiency investments generate significant local economic benefits, including increased Gross State Product and thousands of new jobs.[1]

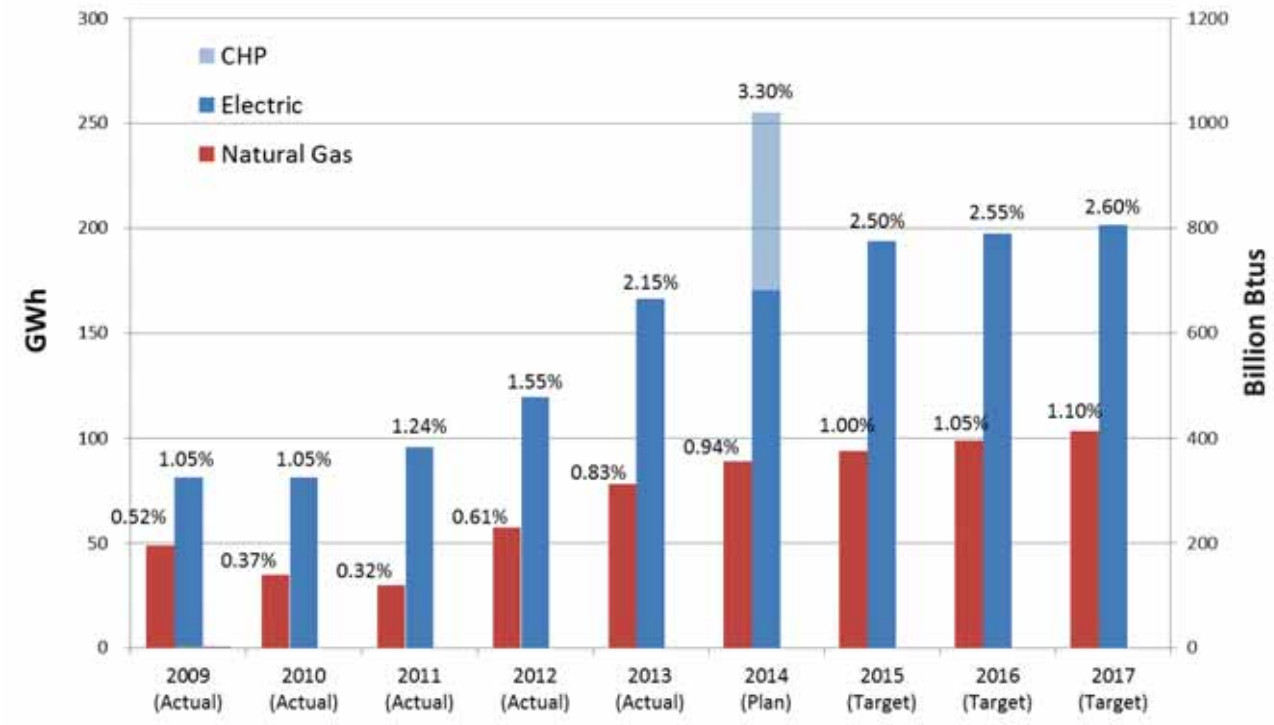
New Hampshire should adopt multi-year energy savings targets, as a percent of annual sales, for the utilities' customer energy efficiency programs. Electric and natural gas savings targets should be established on a statewide basis, and subject to approval by the Public Utilities Commission (PUC). Utility program administrators would be required to meet the targets. Multi-year targets provide greater market certainty for sustained energy efficiency investments. The following charts depict the multi-year energy savings goals in place in Massachusetts and Rhode Island for electricity, natural gas, and combined heat and power (CHP).

[1] http://www.env-ne.org/resources/open/p/id/964

Massachusetts Electric Energy Savings Targets[2]



Rhode Island Electric, Natural Gas, and CHP Energy Savings Targets[3]



[2] http://eneclimatevision.org/policy-successes/energy-efficiency-investments

[3] "2015-2017 Savings Targets Recommendations" presentation by the Rhode Island Energy Efficiency & Resource Management Council, Rhode Island Public Utilities Commission Technical Session, February 25, 2014.

Multi-year targets should be complemented by a requirement for utilities to procure all cost-effective energy efficiency that is less expensive than supply. Energy efficiency investments deliver real energy savings that can displace generation from supply-side resources. An all cost-effective efficiency requirement would require a utility to consider all available energy resources, including energy efficiency, and to invest in efficiency whenever it is cheaper than traditional supply. Energy efficiency can also play an important role in addressing grid reliability and high fuel prices. Regional electricity prices closely track natural gas prices, thus escalating natural gas prices and pipeline constraints affect both electric and natural gas customers. Energy efficiency is a resource that can be quickly deployed to reduce system price and reliability challenges, and can be targeted to specific geographic areas to defer expensive system upgrades and lessen seasonal peaks.

Financing mechanisms should not be considered standalone alternatives to comprehensive energy efficiency programming. Property Assessed Clean Energy (PACE) funding, revolving loan programs, and other financing vehicles are a complementary element of comprehensive energy efficiency programs. Financing alone will not capture all cost-effective energy efficiency, and will not deliver the same results as well-designed energy efficiency programs.

ENE supports increasing the range of financing options available to support efficiency programs, but cautions against immediately establishing a "Green Bank" in New Hampshire. These types of institutions are still in their infancy and in states larger than New Hampshire. There are many examples of energy efficiency financing programs that utilize private capital at competitive rates without the administrative expense of establishing a new entity. The residential HEAT loan in Massachusetts had a loan volume of over $88 million dollars last year, supporting home energy retrofits in that state. While marketed under a single brand by the MassSAVE efficiency programs, the loans servicing and capital is provided by over 50 local banks and credit unions. The Small Business Energy Advantage loan program in Connecticut has offered on-bill loans for many years, which have improved the uptake of energy efficiency measures for smaller customers. While traditionally funded with utility capital, the program is currently transitioning to a single private capital source with a lower interest rate, while still maintaining the desirable use of utility bill payment history for qualification and on-bill repayment features. New Hampshire should monitor the progress of the handful of nascent green banks around the country as they develop to discern the ultimate costs and benefits of such an approach as they emerge.

ENE recommends establishing a stakeholder council to oversee and guide the development of statewide energy savings targets, and ensure the program administrators are pursuing all cost-effective energy efficiency that is cheaper than supply. The stakeholder council would not diminish the authority of the PUC, but would rather serve as an advisory body throughout the planning and implementation phases. The stakeholder council would include key parties who are engaged in energy policy in the state. Ideally, council decisions would be consensus-based and informed by objective analysis. Three states at the top of the American Council for an Energy-Efficient Economy's *2013 State Energy Efficiency Scorecard* – Massachusetts (#1), Connecticut (#5), and Rhode Island (#6) – have efficiency stakeholder councils in place.

New Hampshire should explore revenue decoupling mechanisms that eliminate the utilities' financial incentive to promote electric and gas sales to make them stronger allies in promoting efficiency.

New Hampshire should adopt the most recent edition of the International Energy Conservation Code (IECC) for residential and commercial buildings. In addition, ENE recommends a legislative requirement to adopt each new IECC edition within one year of its publication. Updated on a three-year cycle, each new edition of the IECC builds upon the efficiency requirements of the prior version. The

2012 IECC is approximately 30% more efficient than the 2006 IECC edition. The 2015 IECC raises efficiency requirements by 45-50% over the 2006 IECC.[4]

Grid Modernization and Utility Rate Design

ENE recommends that New Hampshire adopt policies and incentives that reward utilities for taking a comprehensive and coordinated approach to improving the efficient use of the distribution grid and prioritizing high-value "non-wires alternatives" (NWAs) over traditional infrastructure upgrades. While the Draft Energy Strategy includes a recommendation to address utility incentives through rate redesign, ENE believes that policy makers should consider a more specific and comprehensive set of reforms to level the playing field for NWAs, through the following approach:

The state should require that state energy efficiency and demand-side policies are fully incorporated into long term system planning models and processes to right-size the distribution grid and reduce the risk of over-building. It should also mandate that utilities systematically identify customer-side resources that are cost-effective compared to traditional supply options.[5] Non-wires alternatives should be included in distribution system planning on an equal footing with supply options. Distribution system reliability needs should be identified and then solutions of all types should be solicited from the market.

Reforms should also ensure that customer and end-use data enable better assessments for the potential for NWAs to serve as distribution resources in general, and perhaps more important, in specific geographic areas. Guidance should be given to utilities to conduct a full accounting of the utility and societal costs and benefits of traditional and NWA resources, including environmental, health, and economic impacts. Consistent valuation of energy resources will help level the playing field and correct for systematic under-deployment of NWAs. Solutions should be compared on an equal, net present value basis and the lowest cost solution that is also consistent with New Hampshire's energy, environmental, and consumer goals should be chosen.

Regulators should direct utilities to incorporate a wide range of benefits and costs, to the extent allowable by law, including: electric delivery costs; generation supply costs; changes in fuel prices (including demand-reduction induced price effects); reliability benefits; savings from switching to electric end-uses for heating and transportation; and changes in greenhouse gas emissions. Policy makers or regulators should change utility incentives in order to make utilities partners in delivering a lower cost and more diversified energy system. It is critical to provide comparable financial treatment for NWAs, such as providing equal payments from properly structured markets for grid solutions. New Hampshire should take steps to re-focus utilities on delivering energy services rather than maximizing capital investments, including shifting some of the utility's financial opportunity from investments in equity to rewards for increasing the net benefits realized by consumers through the deployment of clean, cost-effective NWAs.[6]

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[4] U.S. Department of Energy, Energy Efficiency & Renewable Energy, Building Technologies Program. "Building Energy Codes – IECC 2012 and Beyond." http://apps1.eere.energy.gov/buildings/publications/pdfs/corporate/ns/webinar_residential_energycodes_20110222.pdf

[5] Rhode Island General Law § 39-1-27.7 requires standards and guidelines for "system reliability" that includes the "procurement of energy supply from diverse sources," including, but not limited to, renewable energy resources, distributed generation, including but not limited to, renewable resources and cost-effective combined heat and power systems, and demand response, designed to, among other things, provide local system reliability benefits through load control or using on-site generating capability. The "Standards for Least Cost Procurement and System Reliability Planning" are available from: http://www.ripuc.ri.gov/eventsactions/docket/4443-EERMC-LCPrevision_3-18-14.pdf

[6] This may take the form of a shared-savings mechanism with policies that encourage deployment of NWAs in high-cost areas. By concentrating NWAs in high-cost areas, cost savings can offset revenue losses and net savings are available to

Regarding rate redesign, utility regulators should address long-term rate design in a holistic manner, aligning incentives in a way that minimizes the costs of grid updates and avoids additional reliance on fixed customer charges. Before making determinations about advanced metering investments, utilities and regulators should undertake a full analysis of the extent of opportunities for justifying advanced metering infrastructure AMI investments. For consumers with AMI, time-varying rates should be the default for generation supply. This better aligns the price of both electricity consumption and distributed generation with the costs of power generation in the wholesale markets. Time-varying rates for distribution could be implemented on a mandatory basis as a broad proxy for the coincident peaks that drive distribution system infrastructure costs.

Current planning and incentive structures that assume that only a few customers will have distributed energy resources on-side should be over-turned and rates should be designed on the assumption that most customers will have distributed energy resources. Stand-by rates should be eliminated in the long run. In the medium-term, regulators should use administrative solutions to accurately price distributed generation. Concepts like the 'Value of Solar' tariff, being implemented in Austin and Minnesota, can accurately compensate distributed generation and eliminate cross-subsidies between customers. Fixed monthly customer charges work against clean energy goals, such as energy efficiency, distributed generation, and other clean energy technologies.

Renewable Power Generation

New Hampshire's Energy Strategy should reflect the important role of renewable energy in the state's energy vision. New Hampshire's existing Renewable Portfolio Standard (RPS) should be extended and expanded from current requirements in order to provide financial support for sustainable, low-carbon power sources that can help the state meet climate targets while promoting economic growth. In order to provide clarity to investors, RPS targets should be increased to at least 75% renewable energy by 2050, with potential revisions to 2025 and other interim targets to support the 2050 goal. New Hampshire's Alternative Compliance Payment (ACP) rates are among the lowest in New England and should be revised to better align with the ACP rates of other states in the region.

Streamlined solar permitting and interconnection should be a higher priority in the final Energy Strategy. Different tiers of permitting and interconnection requirements should be established based on system size and type in order minimize barriers and set clear expectations for solar developers. Streamlining these processes will make the New Hampshire solar market more attractive to solar installers and developers.

Finally, New Hampshire currently allows long-term contracting for renewables, but does not have a minimum requirement. The state should consider legislation requiring electric distribution companies to solicit long-term contracts for renewables to provide 3% of each utilities' total electricity sales. Adding a minimum requirement would encourage utility-scale solar and wind.

Fuel Choice

While Navigant has been receptive to comments on the changing potential of cold-climate air source heat pumps, we believe technology is advancing so rapidly that basing projections on historic shares will be inaccurate. Furthermore, multiple mini-splits, or new systems with multiple heads are coming online, so the assumption that customers need ductwork or can only put in one mini-split may be limiting the perceived potential.

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use in a targeted, shared-savings scheme to reward utilities for innovation and cost reductions and ensure that consumers benefit.

Transportation

As the Strategy notes, New Hampshire is the only state in New England that has not adopted the most recent California Low Emission Vehicle (CA-LEV) standards, and all but New Hampshire and Maine have also adopted the California Zero Emission Vehicle (ZEV) standard. Adopting CA LEV II and/or ZEV would be great steps toward bringing electric vehicles (EVs) to New Hampshire, and one that ENE fully supports, but the state should not rule out other incentive measures.

The Massachusetts Offers Rebates for Electric Vehicles program (MOR-EV) will include evaluations after six months, which can inform New Hampshire efforts. Other options such as time-varying rates also function as an incentive because EV owners can charge at home at low-cost hours.

The Strategy recommends the state "Install and support widespread EV charging infrastructure"; however, how this strategy would be implemented and who would be funding the installation is unclear. If state funds are going to be expended, ENE believes a better policy would be EV rebates. The state should implement policies to promote private investment in public charging infrastructure, while ensuring appropriate consumer protections. This would include: 1) clarifying that charging stations are exempt from utility regulations; 2) ensuring that charging stations aren't hit with unnecessary demand charges; 3) adopting NIST standards when finalized[7]; and 4) requiring public stations be truly open to the public, with access by credit card, and disclosure of station information to a public database.

While Amtrak expansion may not be realistic in the state, we believe a more specific focus on light rail as a mass transit option should be further explored.

We appreciate the opportunity to comment.

Respectfully submitted,

Ellen Hawes, Forest Policy Analyst

For Further Information:
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ENE

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ENE is a nonprofit organization that researches and advocates innovative policies that tackle our environmental challenges while promoting sustainable economic development. ENE is at the forefront of state and regional efforts to combat global warming with solutions that promote clean energy, clean air and healthy forests.

[7] U.S. National Work Group on Measuring Systems for Electric Vehicle Fueling and Submetering http://www.nist.gov/pml/wmd/usnwg-evfs.cfm

Liberty Utilities

Richard H. Leehr
President
Phone: 603-216-3521
E-Mail: richard.leehr @libertyutilities.com

July 25, 2014

Via First Class Mail

Meredith Hatfield
Office of Energy and Planning
Governor Hugh Gallen State Office Park
107 Pleasant Street
Concord, NH 03301

Dear Ms. Hatfield,

Liberty Utilities appreciates the opportunity to provide comments on the New Hampshire State Energy Strategy draft. Liberty Energy Utilities (New Hampshire) Corp. has two subsidiaries: Liberty Utilities (Granite State Electric) Corp. and Liberty Utilities (EnergyNorth) Corp. which serve 43,000 electric customers and 90,000 natural gas customers, respectively, in 53 communities across New Hampshire.

The draft strategy discussed many different energy options. A primary objective of the state energy policy should be to ensure there is a balance of energy choices available to consumers at reasonable prices. Energy costs and choices have direct impacts on the economic development of the state.

Liberty Utilities believes, in addition to promoting energy efficiency and renewable energy, the state's energy policy should provide access to and expansion of abundant, domestic natural gas and its CNG and LNG derivatives as part of a balanced energy portfolio for New Hampshire consumers. Natural gas is efficient, affordable and is a low-emissions resource. Lower energy costs are key components to fostering economic growth, job creation and overall benefits to businesses and homeowners alike. We appreciate the work of the New England Governors and applaud their commitment to cooperate with the effort to bring diversified energy sources such as natural gas into our region in order to help alleviate constraints and price volatility.

Liberty Utilities agrees with the objective discussed in the draft of promoting conversion to gas as a primary fuel source for customers who currently have nearby access to existing gas distribution mains. Such conversion will lower costs for all gas customers through greater utilization of fixed capacity. Liberty Utilities also agrees with securing low-cost financing options to help consumers cover the cost of new heating systems. As a result of the differential that exists between the cost of gas and the cost of oil, saturation rates along existing gas mains are high. Therefore, focus should include expanding gas availability to new extension customers as well. In the context of working with our regulators, Liberty Utilities continues to look at alternatives to help remove the barriers to expansion of our natural gas

distribution systems to meet high consumer demand. With respect to the strategy recommendation that targets be established for gas utilities to achieve higher utilization rates, Liberty Utilities favors an approach where utilities could be rewarded for increasing utilization. Liberty Utilities would oppose the establishment of targets if failure to achieve the target resulted in penalties to the utility.

Liberty Utilities looks forward to working with the Office of Energy and Planning and key stakeholders to create an energy policy that includes energy efficiency, renewables and natural gas which allows for consumer choice and enables the state to meet its renewable and greenhouse gas goals.

Sincerely,

Richard Leehr
President, Liberty Utilities

www.libertyutilities.com | F: 603-421-1769 | 15 Buttrick Road | Londonderry | New Hampshire | USA | 03053

The below letter was received from the following individuals:

- Molly Mizula
- Tammy Fareed
- Tanya Tenkarian
- Peter Bird
- Larry Learner
- Hannah Boyd

I am strongly opposed to the use of natural gas in New Hampshire's energy equation.

So-called Natural Gas is a finite resource. A five-year-old fracking well has produced half of the gas it will produce in its lifetime. When will solar, wind, hydro run out? As New Hampshire plans for future energy needs these issues need to be addressed. In 100 years where will our energy be coming from? New Hampshire needs to have built independent sustainable clean energy. An energy policy that relies on the increased use of a finite source such as LNG is counter productive and wasteful. Minnesota has addressed this issue by using solar energy to fuel a power plant. Prices in the Solar Energy market have dropped dramatically in the past two years and are now an economically viable option. New Hampshire needs to be solution and future focused about its current and long-term energy needs and LNG is not the answer. For the continued growth of our economy and for energy stability moving towards renewable energy such as wind, solar, geothermal, and biomass is a prudent efficient long-term public policy strategy.

Gas is not clean energy. While natural gas produces far less carbon when burned, the methane gas that is currently leaked in drilling, transmission and distribution is a far more powerful greenhouse gas and negates any gains over burning oil or coal. The destruction to property, conservation lands, and wilderness resources compounds the loss. It does not go without saying that hydrofracking itself is a highly destructive process.

I am very concerned about the dangers of making any long-term investments in natural gas infrastructure. Pipeline proposals, including the Kinder Morgan pipeline, create safety concerns in the communities they pass through, and create infrastructure that locks us into the use of fossil fuels for far longer than necessary.

Thank you,

The below letter was submitted to OEP by the following individuals:

- Fuat Ari
- Andrew Dey
- Andrew Hatch
- Barbara Deane-Gillet
- Gary Maynard
- Ian Raymond
- Josh Arnold
- Ruth-Ellen Post
- Randy Bryan
- Roger Saunders
- Nancy Nichols
- Nikki Sauber
- Marjorie Rogalski
- Cheryl Christner
- Joseph J Kowalik III

Director Meredith Hatfield
NH Office of Energy and Planning
Concord, NH 03301

Dear Director Hatfield and Members of the Energy Advisory Council:

I urge you to set a goal in the state energy strategy to reduce the export of our energy dollars from 66% (nearly $4 billion annually), to 50% by 2023, retaining over $1 billion of economic wealth each year in New Hampshire.[1] This goal can be reached by pursuing the following three strategies:

1. Significantly ramp up energy efficiency and conservation through system wide efficiency investments (customer-side and utility/supplier-side), to reduce overall energy use;
2. Replace imported fossil fuel use with locally produced renewable energy, with an emphasis on:
    a. distributed generation
    b. utility-scale generation
    c. thermal and electric fuel switching for heating, cooling, and transportation needs; and,
3. Unleash the private market to finance the infrastructure by minimizing policy risk, sending clear market signals, and better leveraging our minimal available public funds.

[1] Vermont Energy Investment Corporation et al. September 30, 2011. *Independent Study of Energy Policy Issues.*

Comments on the NH State Energy Strategy Draft of May 2014

First, I would like to thank the committee for allowing public input on this draft and the possibility of enactment of a comprehensive energy policy. I would also like to extend my thanks for allowing a public hearing to be held at Plymouth State University. I know that the requisite amount of hearings were already performed, so we appreciate the extra effort to make it to Plymouth.

I am writing these comments personally, but I come to the table with a little bit of knowledge. In 2004, along with Sandra Jones, I started the Plymouth Area Renewable Energy Initiative (PAREI) to help citizens in the Plymouth area plan and prepare for an uncertain energy future. Over the past 10 years our members have been looking for leadership. I think it is imperative that a plan be put in place so that our citizens can then assess their own situation and take appropriate action.

In the past decade the residents and businesses of the Plymouth New Hampshire region have installed over 300 solar systems. In addition to this, hundreds have performed deep energy retrofits to their buildings. The result is that close to $1 million dollars no longer leaves the Plymouth Area. Businesses are thriving, people have more money to spend and our energy future is more assured.

When these business and homeowners started to convert to a more efficient lifestyle there was little support and even less will in the state and local governments to do anything but business as usual. But these people took action anyway. Through the years there has been assistance and with the help of PAREI to watch the ebbs and flows of incentives and tax breaks the people of Plymouth have been able to take advantage of these opportunities.

After listening to our citizen's voice their opinion at the Plymouth informational meeting I am concerned that there are far to many conflicting voices to come up with a truly comprehensive energy plan. But ever the optimist, I would like to forward a few ideas (some already highlighted in the draft strategy) that might be able to get some traction.

Real Estate Value

I feel that without proper valuation of weatherization upgrades to a home or business it will be a very hard sell to consumers to weatherize even if a "green bank" provides low interest financing. As an example, if I am to put tens of thousands of dollars in energy upgrades to my house, not knowing if I am to stay in that house for many more years, I have to conclude that I might just be handing a new buyer all of the upgrade money.

If there were a mandatory HERS (or other type) rating required before the sale of a house the homeowner would know that their expensive efforts would be reimbursed in a sale. I would go a step further to say that there would be little need for incentive to weatherize. The norm would become: if you don't upgrade it would be likely that your home may not be sellable. People would weatherize, leading to more jobs in the weatherization field, to more training being needed and further supporting the community colleges of the state that provide that training.

Decoupling

I believe unless the utilities want to decouple they won't, but I think we should talk strongly about moving in that direction. If the utilities are in the business of making money on power there is little incentive for them to get on board with weatherization and personal renewable energy. If transmission was decoupled from power the utilities could charge a real and true cost of delivery and then would be

in the business of providing solutions to their customers energy needs. Again, I believe that the utilities have to WANT to do this for us to take the time to propose it.
Even Playing Field
If all power sources were rated on the same level and on the same terms renewable energy would very likely come out at least equal if not more favorable than their competitors. But we don't play on the same field.

We need to factor in many aspects that are currently being ignored if we want to have an equal playing field. Issues like health, environment, tax incentives, access to right of ways, preferred dealings with state government, access to lobby services and funds, not to mention nation wide issues like energy security and advantages achieved for the major energy players in military protection funded by us citizens. These all need to be added into the mix. We need to hold renewables to the same standards, but these standards need to be put on the table, analyzed, and measured.

Many of the incentives for the major utilities are hidden where incentives for renewables are in the open for all to see. This needs to change if there is going to truly be a comprehensive strategy.

Goals
We need to set goals and implement programs that move us to those goals. I felt the draft strategy was far to vague in the form of tangible strategies. Far to much of: "You could look at this, or look at that".

The goals need to be realistic, achievable and tangible. Talking about expanding natural gas to the rest of the state when the natural gas bubble could likely burst before the 10 years of this plan is up is very expensive folly.

On the other hand how much energy can renewals truly provide given a lack of desire to curb our states consumption?

We need to make sure that the goals are revenue neutral to the players and that revenues and profits are not part of the discussion. We need to stop hearing "that technology is too expensive" when the real statement should be "we can't make enough money by using that technology".

Incentives
I would like to thank the State for the incentives that have already been realized over the last decade. Those incentives have gone a long way to making NH more efficient and economically stable.

I know that the State works on very short budget cycles. But it is imperative that any future incentives be structured so they can be guaranteed well into the future. I believe that a .50 per watt incentive for solar PV over 20 years is better than a $3.00 per watt over 3 years. The ebb and flow of incentives is more harmful than the not having any incentive at all, in my opinion.

We need to earn this!
About this overall process of producing a compressive plan, we need to make sure we earn back the money and time that is being spent on this process. $200,000 was spent on the study (with a Massachusetts company) when other studies very similar to this existed and could have been brought into the light. Hundreds of meetings, thousands of miles driven, copies, staff time etc etc. The cost of this process is likely to exceed $1,000,000. And with the previous studies by GDS and others the cost

could be in the multiple millions. We need to earn this. If a comprehensive policy is not adopted and implemented, we have just thrown away millions of dollars. Not to mention wasted the time of countless people that could have been doing other very good projects to prepare of a very uncertain energy future.

To put this into prospective: A portion of the money that we will have wasted is equal to the savings the Plymouth Area achieves every year from solar and weatherization efforts. So we will have negated everything those good people did for at least one full year.

We need to earn this...

Go and do good work and let us know how we can help.

Thanks for listening,
Peter Adams, Campton, NH
July 24, 2014

Dear Director Hatfield and Members of the Energy Advisory Council:

I spent quite a bit of time in Concord this past year following the State Energy Strategy (Senate Bill 191). I do want to thank the Energy Advisory Council for the thought and effort displayed throughout the many, many sessions that led up to the release of the draft copy.

During one session, I remember a committee member stating "If you have kids or grandkids, it would seem to me you would want to put as many renewables as possible in the mix."

That is precisely my disappointment with this document as submitted by Navigant. It does not seem to be forward thinking in presenting renewable alternatives which would help New Hampshire satisfy our clean energy goals and keep our energy dollars in New Hampshire.

Although it isn't presented quite that way in this draft of the State Energy Strategy, it appears to me that, with the agreement signed at the New England Governors and Eastern Canadian Premiers conference at Bretton Wood, we are moving fast to switch to natural gas to fulfill a wide variety of our energy needs. By accepting natural gas as the de-facto choice for our future, this strategy overlooks a number of arguments against natural gas.

Is increasing our dependence on natural gas a wise move?
Consider that the goal of these pipelines is to get the gas to the world market where it can fetch a higher

price. Natural gas can be sold in Europe for two to three times the U.S. market price and in Asia for three to four times the U.S. price. Under North American Free Trade Agreement (NAFTA), exporting to Canada does not carry the restrictions that apply to export to non-free-trade countries. This would seem to be the reason for the rush to build pipelines to Canada -- to get the gas where it can more easily be sold abroad for more money. Gas is not likely to remain “cheap” under that scenario. We will be limiting our flexibility when gas prices could increase dramatically.

Natural gas is another finite resource.
I would ask how long our supply of natural gas is predicted (realistically) to last. Fifty years? So by adding the gas lines in New Hampshire and adjacent Massachusetts, we are building a hugely costly (financially and environmentally) infrastructure that only postpones transition away from fossil fuels.

My understanding is that productivity of a fracked well declines dramatically after a few years. So the natural gas available from existing wells will be in decline about the time these new pipelines are completed. Will we then be bound to continue the environmental devastation required to fulfill our commitment to natural gas?

What is the real cost of natural gas?
I recently attended the New England Council's Regional Energy Forum at Saint Anselm College. There was a lot of talk about money, but no mention of cost - specifically the cost to the people who are unfortunate enough to be living on the land over the natural gas deposits, the cost to people whose property is in the way of another pipeline, and the true cost to our environment. Just what are we willing to inflict on our neighbors to feed this desire?

Some have called their homeowners insurance company and been told that if a pipeline were to cross their property, their homeowner's insurance would be canceled. Most mortgage agreements require the home owner to carry homeowner's insurance.

Some have found that allowing an easement for a pipeline would violate a portion of their mortgage agreement. It would certainly be an adverse factor for anyone wishing to acquire a mortgage to purchase that property in the future.

Who will want to live in the vicinity of a compressor station - a building the size of a large horse barn with compressors that run 24 hours a day? These stations do vent gas periodically. The gas has not been purified - it still contains the toxic fracking chemicals. The gas in these lines has not had an odorant added, but they do have a documented history of leaking.

Let me expand on this. Are you aware what the extraction of this gas inflicts on land owners? Poisoned wells. Pets and livestock with their fur falling out. Animals sick and dying. People with headaches, nosebleeds, and neurological disorders. Cancers.

Those people are our neighbors too, in a larger sense. They're worried about their children's long-term health. But once fracking moves in, people can't easily sell their land. Who would buy a home without a source of water?

The industry seems determined to wring every last dollar they can out of their natural gas assets, welfare of the planet be damned. There are much better ways to spend the money it will take to expand an infrastructure which will only delay the inevitable transition to clean energy. And once it's built, the

argument becomes that we have so much invested in natural gas, we can't change now. That would make us even more dependent on a finite resource and put us in a very risky position with our environment.

Natural gas is a gangplank, not a bridge.
Professor Anthony Ingraffea, who was named one of Time Magazine's “People Who Mattered” for his 2011 scientific paper that warned of the risks of natural gas fracking and appears in Gasland 2 discussing his research, has penned a powerful op-ed in The New York Times speaking out against the danger posed by the ongoing natural gas boom. In the piece, Ingraffea criticizes President Obama's insistence that natural gas is a necessary bridge fuel to get us off of coal, instead calling it a "gangplank to more warming."

He continues "[T]he crux of the problem with natural gas is that it releases methane into the atmosphere, which behaves differently in the atmosphere than carbon dioxide, trapping more heat and therefore exacerbating the warming we must stop." You can read the full article at http://www.treehugger.com/fossil-fuels/ingraffea-natural-gas-gangplank-not-bridge-fuel.html

Why should electric customers pay for a line to export natural gas?
There's also the ethics of paying for this questionable infrastructure with a tariff on our already-too-high electric bills. Wasn't the requirement to have rate-payers pay for Seabrook a factor in New Hampshire's uncompetitive electricity rates? What incentive is there to guard against cost over-runs?
Strategy information not current.
Reference Section 4.4.1.1: The Natural Gas Northeast Expansion Project Pipeline has been superseded by the Northeast Energy Direct program, which incorporates added miles of pipeline and added capacity. Northeast Energy Direct is a large pipeline expansion project being proposed by Kinder Morgan Energy’s subsidiary, Tennessee Gas Pipeline Co. It includes the large new natural gas transmission line that, earlier, had been referred to as the Northeast Expansion, which would include new looping from a gas hub in Wright NY to Richmond, MA, then a new path from Richmond north and eastward to a hub in Dracut, MA. The larger project also includes new pipeline from TGP’s 300 line in Pennsylvania, up through Susquehanna Co. and into NY state to the hub in Wright, providing a direct path from the fracking fields of PA to the gas hub in eastern MA and the connecting Maritimes and Northeast pipeline in Maine. This section of the report should be updated.

Increasing our dependency on natural gas is an environmental setback.
Becoming so dependent on natural gas would ignore our need to reduce our use of fossil fuels. Natural gas is primarily methane, a greenhouse gas over 80 times more powerful than CO2 in the short term, over 20 times more in the long term. Studies show that, when the full impact (to include extraction and leakage) of methane on the environment is taken into account, fracked natural gas will work against New Hampshire's RGGI efforts.

There are alternatives.
Though New Hampshire has lagged a bit behind Maine and Massachusetts with offshore wind projects, New Hampshire House Bill 1312 to establish a committee to study offshore wind energy and the development of other ocean power technology did pass the House this year. Perhaps we should consider the results of that study before making any irrevocable decisions.

I believe there's great potential in the **New Hampshire Solar Garden** project (see www.nhsolar garden.com). That program could use some legislative help to become even more effective. **This project**

exhibits the type of creative thinking we need to incorporate in New Hampshire's energy vision.

In his 2014 State of the Union address, President Obama stated "...and when our children's children look us in the eye and ask if we did all we could to leave them in a safer, more stable world with new sources of energy, I want us to be able to say 'Yes, we did!'"

Please consider the many arguments for clean, renewable energy resources as opposed to more pipelines and greater dependence on fossil fuels.

Most sincerely,
Douglas Whitbeck, Mason, NH
July 25, 2014

Dear Ms Hatfield:

I've spent a lot of time pouring over regional energy policy, in an effort to learn both NH's decision-making context and the historical rationale for current policy positions. I am a Hollis resident, so the natural gas expansion that is rapidly overtaking the region has come into stark focus in the past 6 months for my neighbors and me. But beyond my interest as a resident in an affected community, I am an advocate for defining both a strategy and a goal - that helps us improve our state and region, over time.

The energy landscape in New England has shifted recently to incorporate a strong, new gas industry narrative that has us lining up for 'more', 'clean', 'cheap', 'natural' gas. This carefully crafted narrative works to convince policymakers and citizens alike, that increasing our region's dependence on this particular fossil fuel will be of some immediate benefit for peak energy demand and price volatility; but even the industry, does not claim that fossil fuel is sustainable - and yet, the plan is to accept a superficial premise and increase regional dependence - discouraging investment in other, cleaner technologies, by this choice.

The region seems to have evolved from considering NG as a bridging strategy, to betting the region's energy future on an elaborate NG infrastructure. So as disappointed as I am to see this petroleum industry narrative take root - my greater concern is that we are ignoring a far more compelling narrative, that of the International Panel on Climate Change 2014 Report.

The NH Energy Strategy Report pulls policy away from prior recommendations (Independent Study of Energy Policy Issues 9/30/2011) that praised our ability to keep natural gas dependence low. The currently proposed series of natural gas expansion projects seek a significant increase in the adoption of natural gas, creating a ubiquitous dependence that will help the petroleum industry in their quest to keep harvesting and burning fossil fuels 'for a long time to come'. So does NH acknowledge climate science and its impact on our environment beyond simply adding renewable sources to our portfolio?

The Energy Strategy Report clears the way for significant expansion of natural gas for everything from the conversion of residential homes and transportation sector vehicles to powering the electric grid. And yet, the only justification I can find is that gas is cheap and we may want to have more of it available, to address peak demand (again, to address cost). The 'cleaner fuel source' is also used in the reasoning, but this red herring only takes into account the cleaner burning properties and not the entire harvesting process - where the net climate effect may prove even dirtier than the fuels we seek to replace.

Algonquin Power & Utilities Company (parent to Liberty Utilities in Southern NH) states that their growth model is acquisitions, (Granite State Electric Company and EnergyNorth Natural Gas) expansion , (Kinder Morgan & Spectra Energy pipes) and price increases. We are marching to their drumbeat and undermining NH's long term sustainable energy goals - by limiting our citizens' fuel choices and expecting this unregulated industry to remain cheap and stable.

Natural gas is only outpacing energy sector competitors today, because it is externalizing its true costs as an unregulated energy source. Industry regulation stabilizes consumer pricing - and the oil and gas industries are currently operating outside Clean Air and Clean Water standards and without the impending add-on of a carbon tax. These costs, along with elaborate infrastructure spending, make natural gas a huge investment for the region, that will inflate consumer prices. So while we move to accommodate Kinder Morgan and Spectra Energy and Liberty Utilities in the near term, they are working on a plan to expand an infrastructure that will ensure their ability to reap higher prices, long after regulation catches up to the dirty practices of their fuel source.
Once the true environmental cost of natural gas extraction is levied, we will be longing for the days when Yankee helped power our electrical grid, with zero CO2 emissions. Letting this plant close, because it cannot compete against a subsidized gas boom, should be reconsidered as part of any strategic regional plan. There is no silver bullet in energy, unless it is our ability to continue to maintain a diverse portfolio - without significant reliance on any one source - especially if that source is fossil-fuel based.

The Vermont Yankee plant just had its license renewed by the NRC for 20 years. Yet, the benefits it brings to our economy, including over 600 excellent jobs and over 600 MWe of steady, reliable, clean power for our grid, is insufficient to invest in keeping it running? We do not even acknowledge Yankee's reliable service, and clean contribution to our energy portfolio or the fact that it provides capacity lacking in other clean energy sources. But the loss of Yankee is a big part of the reason we now see an opening for natural gas expansion. This loss of a clean power source is a critical omission in our sustainable landscape conversation and demands another look from our leadership.

Nuclear is expensive expressly because it is highly regulated and we are not giving it the attention it deserves. We are not pushing true innovation by demanding our government speed up red tape in getting new-nuclear online, with newer, safer designs (which exist). As long as we allow existing nuclear plants to languish in use and public opinion, our best chance at reducing impending climate impacts, will recede from view. (the IPCC report concluded that nuclear must be part of the solution if we are to avoid further climate disruption and yet the messaging we're responding to, parrots the fossil fuel industry and not our scientists).

NH and the region will be judged in the future by the choices we make today. There has got to be a way to clarify that the current plan for NG, will be limited to a bridging strategy. If we must use NG as a bridging strategy, then clearly spell out how that bridge will work, when it will end, and how we will

wean off of that dependence. Sponsoring bad corporate behavior (energy pollution, the taking of private and conservation lands, and increased carbon and methane emissions from pipes all over the country), at the expense of New England's natural resources feels like being caught on a runaway train. We only have a certain length of track to avoid disaster and we need for our leaders to take control of the break. Natural gas is not a panacea - it is a fossil fuel and as such, its role needs to be contained if we are truly pursuing a sustainable energy strategy.

Finally, the role nuclear power plays, and will play, in our energy portfolio needs to be defined and not ignored. The lack of any strategy relative to approximately 30% of the region's power points to consultants who were either instructed not to mention nuclear (he who shall not be named!), or a bias toward the wide-scale adoption of natural gas, despite its categorization as a dirty fuel source in our own NH statutes and ordinances. Either of these reasons, is unacceptable - because nuclear has an important role to play in helping us move off of fossil fuels. Perhaps we should begin educating people on its benefits, rather than caving in to those who bear an irrational fear of a clean energy source that has caused less deaths than wind power.

I am hoping that the final review of the draft report will be conducted with a eye toward ensuring that our 'strategy' includes honest discussion of how we intend to limit the role of natural gas and what mix of nuclear power will be invested in - to maintain a sustainable energy mix that supports our climate change imperative. Saying we cannot afford nuclear - while diverting to a new infrastructure plan, is short-sighted and disingenuous. We simply need the right strategy in order to make clean energy sources viable.

When I look at the Hollis landscape caught in the crosshairs of this gas boom, I can hardly believe that NH's leaders would permit private industry to carve up a bucolic community, so carefully designed to maintain NH's historic rural character, for the promise of cheap gas, that will not last. I hope you will consider using the NH Energy Strategy report to truly define a strategic vision that does not cave into the demands of the most powerful industry in history. Its a lot to ask, I know. But NH and New England are known for better-than-average decisions.

Best regards,
Kat McGhee
July 25, 2014

Comments on the New Hampshire State Energy Strategy
Aaron Brown
July 24, 2014

Thank you for this opportunity to comment on the Draft State Energy Strategy. The State of New Hampshire should be commended for looking at its future energy needs for electricity, heating, and transportation. These comments focus solely on the transportation sections of the report.

While the draft State Energy Strategy provides useful data on current transportation spending, fuel consumption, and projected changes, it fails to acknowledge the most significant problems facing a sustainable transportation future for the Granite State. Indeed, it seems the report's authors are practically unfamiliar with the State save for some statistics they found on the website of the Energy Information Agency.

The State's rural nature is alone not its greatest transportation challenge, as suggested on page 79. Rather, the three most significant challenges are: (1) a lack of state leadership to support transit, smart growth, efficient vehicles, and modernized infrastructure; (2) a lack of funding, due to an outdated tax structure and a Constitutional prohibition on the use of gas tax revenue for non-highway projects; and (3) a legislative prioritization of I-93's expansion over all other transportation infrastructure projects in the State.

Recommendations

(1) Eliminate the Constitutional prohibition on spending gas tax revenue on non-highway projects, tie the gas tax to an inflationary price index, and remove the 20-year/bond retirement limit on the recent gas tax increase.

Article 6-A of the New Hampshire State Constitution currently reads:

Use of Certain Revenues Restricted to Highways. All revenue in excess of the necessary cost of collection and administration accruing to the state from registration fees, operators' licenses, gasoline road tolls or any other special charges or taxes with respect to the operation of motor vehicles or the sale or consumption of motor vehicle fuels shall be appropriated and used exclusively for the construction, reconstruction and maintenance of public highways within this state, including the supervision of traffic thereon and payment of the interest and principal of obligations incurred for said purposes; and no part of such revenues shall, by transfer of funds or otherwise, be diverted to any other purpose whatsoever.

Passed in 1938, this Constitutional Amendment reflects the mindset of a bygone era and is the most significant hindrance New Hampshire faces in achieving a genuinely multi-modal transportation system. The amendment should be eliminated and replaced with a provision that dedicates a specific percentage of gas tax revenue to public transit, park-and-ride facilities, bicycle and pedestrian amenities, and electric vehicle infrastructure (e.g., charging stations).

The State recently passed a gas tax increase of $0.04/gallon (its first increase since 1991), but it is set to expire once the State has paid off the bonds for widening Interstate 93 or in twenty years, whichever happens first. The price of road maintenance and other transportation projects will not magically become cheaper once the Interstate project is complete. Concrete, other materials, and labor will all increase in cost over time. The State cannot continue to ignore this fact. Instead, it should tie the gas tax to an inflationary price index, such as the Consumer Price Index, to ensure that transportation revenues keep pace with costs.

(2) De-prioritize the widening of Interstate 93.

The State has legislatively prioritized widening a twenty-mile stretch of Interstate 93, from the Massachusetts state line to Manchester, over all other highway and bridge projects in the State. This decision has led to deferred maintenance of bridges and roads throughout the State, which in the long term will lead to significantly higher costs to keep basic infrastructure in working condition. Negative effects, however, are already occurring. The State closed thirteen bridges in 2012 due to structural concerns. 81% of State roads are considered in poor or fair condition.[1] The State will not achieve a sustainable transportation future – let alone preserve a system for single-occupant vehicles – unless it (1) finds an alternative method to pay for the interstate widening or (2) removes or temporarily suspends the prioritization of that project over all other highway maintenance and improvement needs.

Additionally, the State should re-examine several alternatives that were dismissed in the project's Environmental Impact Statement – namely increased bus and rail options for commuters travelling from southern New Hampshire to Massachusetts for work.

(3) Enable municipalities to collect parking levies to fund local transportation projects.

New Hampshire's municipalities are cash-strapped and have few legal mechanisms to pay for local transportation projects. The City of Lebanon, for example, has a 2014 paving budget of approximately $60,000 and over $1,000,000 in project needs. The reason for this gap in revenue is (1) over-reliance on property tax revenues for all municipal expenses and (2) lack of effective alternative funding strategies. Business Improvement Districts, for example, are prohibited from generating more than $20,000 in revenue per year.[2] Tax Increment Finance (TIF) districts, while useful for projects such as parking garages, are dependent on future development, user-generated revenue, or both. TIFs, therefore, are inappropriate for financing bike trails because one generally wants those resources to be free of charge and open to public.

The State should enable municipalities to collect parking levies on a *per space* basis and require that a minimum percentage be dedicated to improving public transit, bicycle, and pedestrian resources. Allowing municipalities to issue a levy on existing and future private parking would generate significant revenue and discourage the practice of building excess parking capacity.

(4) Re-establish State funds for public transit.

With the exception of a commuter bus service in southern New Hampshire (which the State funds only because the Conservation Law Foundation successfully challenged parts of its Interstate 93 Environmental Impact Statement), the State provides NO funding for public transportation.[3] This utter lack of support for public transit will make it impossible to achieve the State Energy Strategy's "Vision Element" on page 81: "Enhanced options for mass transit and supportive land use."

The Strategy suggests that this Vision Element could be achieved by "[working] with regional transit agencies and private partners to coordinate schedules and services using the General Transit Feed Specification." While better coordination is always welcome, and Google does make schedules easier to

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[1] Department of Transportation Commission Christopher Clement, "The Roads to New Hampshire's Future," Presentation to the Upper Valley Lake Sunapee Regional Planning Commission (January 2013).
[2] Upper Valley Transportation Management Association and Vermont Law School Land Use Clinic, "Managing Transportation Demand in the Route 120 Corridor: Policy, Finance, and Governance Options," prepared for the City of Lebanon, NH (December 2012). Available at http://www.vitalcommunities.org/uvtma/doc/FINAL%20Route%20120%20Corridor%20Study.pdf.
[3] The State does pass through Federal transit dollars, but it does not provide any match for those funds.

understand with its transit feed, coordination is not the biggest challenge facing public transit. A budget of $0.00 in state funds is.

(5) Establish a dedicated State program for park-and-ride lots.

While the State has done a fair job building park-and-ride lots along its interstates, the development of these resources has occurred in an unstrategic fashion. Looking to neighboring Vermont, New Hampshire should establish a dedicated State program for park-and-ride lots that annually makes funding available to municipalities to develop or expand commuter parking lots. Doing so will increase the number of carpoolers in the state and improve commuter transit services by providing an efficient way to board riders.

(6) Adopt California's Low Emission Vehicle Standard.

The Draft State Energy Strategy correctly identifies the need to adopt California's Low Emission Vehicle standard as a way of incentivizing automobile dealers to sell more efficient vehicles.

(7) Adopt complete streets legislation and establish a compliance fund to ensure all new and significantly renovated roadways accommodate all transportation modes.

The Draft State Energy Strategy also correctly identifies the need to "enhance support of municipal smart growth and transportation efforts" (p. 81), but it provides little guidance on how to achieve that. The State should adopt a complete streets law that requires all new and significantly renovated roadways to accommodate all transportation modes. Legislators would need look no further than neighboring Vermont for sample language for the law. However, learning from Vermont's experience with the law, New Hampshire should include a provision in its legislation that dedicates a certain portion of gas tax revenue to a complete streets compliance fund. This would ensure that projects will not violate the principles of complete streets due to lack of funding.

(8) Only support an expansion of natural gas fleets if a ban is placed on hydraulically fractured gas.

While natural gas does burn more cleanly than conventional gasoline and diesel, it does not necessarily reflect the wisest environmental choice for transportation fuel. If the State is going to support expanding natural gas fleets, it should ban the import of hydraulically fractured (or "fracked") gas.

Thank you again for this opportunity to comment on the New Hampshire State Energy Strategy. We hope that our recommendations will provide the Office of Energy and Planning, the Governor's Office, and the New Hampshire Legislature with ideas on ways to fund strategies for a more sustainable transportation future for the Granite State.

Sincerely,

Aaron Brown

I will restate what I said at the SB 191 public hearing in Plymouth on July 8. The Energy Strategy Draft which was presented is in contradiction to the NESCOE initiative which was recently revealed which stated they are seeking to build a natural gas pipeline and transmission lines for industrial hydro in New Hampshire. The draft emphasizes renewable energy while NESCOE is considering fast-tracking two forms of nonrenewable energy. Does this make any sense at all? The public has stated on many occasions that renewable energy is the highest priority for the country and for our state. Why then would NESCOE be considering natural gas and industrial hydro? This energy strategy is for the state of New Hampshire and should be implemented. There is no excuse or right for NESCOE to overrule NH's energy strategy. We demand real clean, green, renewable energy. And no backdoor, secret agreements with NESCOE that do not have the best interests of the NH citizens in mind.

-Peter and Pamela Martin
July 9, 2014

First, let me congratulate OEP Director Meredith Hatfield for the informative presentation and for the tactful and non---confrontational manner in which she fielded questions and comments from members of the audience.

As Chair of the Town of Hebron (pop. 605) Select Board, and as someone who has followed the energy situation from my years of working in the Electrical Engineering Department of Stone & Webster Engineering Corporation in the 1960s (anyone remember the November 9th, 1965 Northeast Blackout?), I have a strong interest in doing what I can, at both a personal level and a municipal level, to conserve energy, reduce carbon emissions, and use renewable forms of energy where economically viable.

Last year the Town of Hebron explored the possibility of installing a solar array on a hillside behind our Public Safety building. We worked with a solar power expert who advised that the location would be excellent. Because the solar array would generate more power than the Public Safety building would use, we explored Group Net Metering (GNM) that had been passed by the NH Legislature. I see that the NH PUC now has nine pages of "interim rules" on its web site:
http://www.puc.nh.gov/Sustainable%20Energy/Net%20Metering/Puc%20909%20interim%20rule%20adopted.pdf

My first suggestion and request is that the OEP recommend that the PUC encourage municipalities to use GNM and that they simplify and streamline the process to make this happen.

Because municipalities are not eligible for tax credits and incentives, the only way a small municipality could come up with the up---front purchase and installation costs of solar arrays, other than seeking a bond at Town Meeting (requires a 2/3 vote), is to find a private company who would get the tax credits and who would purchase and install the solar array.

My second suggestion and request is that OEP recommend that the Legislature and the PCU develop a program to encourage municipalities to deploy solar technologies through low---interest loans and/or subsidies.

Sincerely yours,
Eleanor Downey Lonske, Chair, Hebron Select Board
July 10, 2014

I am a member of the Fremont Energy Committee and would like to offer comments re: the [strategy].

Since the impetus of the proposed legislation is to reduce greenhouse gas emissions, it would be appropriate to increase the $fee per ton of CO2 and other pollutants. In my view, it would then be productive to substantially increase the amount of $ available, in the form of grants, to municipalities and other appropriate entities to take measures to improve energy efficiency and install alternative energy technology. This approach would enhance NH's GHG reduction efforts which have been unfortunately, behind our neighboring states , and below what is necessary to achieve national goals.

As you aware , the approach suggested above has been effective when applied using the RGGI program. The latest PUC estimate, which verifies previous studies done by UNH, indicates that for every $ awarded in grants, a projected savings of $4.95 is achieved.

Sincerely
Bob Larson
July 10, 2014

At this moment, I admit to NOT having read the lengthy Draft Energy Strategy document posted on the OEP Web site. I am instead passing on comments based primarily on the 'My Turn' opinion published by the Concord Monitor [on July 12, 2014].

Note my opinion that a 'dead end road' would the the optimum outcome for the Northern Pass Proposal, as it would be a discouraging factor (however slight) for further development of massive hydroelectric projects in northern Quebec. Burial of the power line is a second best alternative, particularly since the project is designed to enrich investors in major utility companies as they pass this power along to industries and consumers in Southern New England!

Instead, I favor two very different kinds of efforts:
A focus on domestic and industrial energy conservation similar to Efficiency

- Vermont
- A focus upon small and intermediate scale renewable power projects such as:
    - Solar panels and windmills that generate power and/or heat hot water that are mounted on roof tops and the like.
    - Larger solar panel farms and windmills located on landfills and similar unnatural sites that can't be used for other purposes.
    - Tiny power plants that utilize methane gas from dairy farm manure piles, landfills and the like.
    - Wind farms located on unimportant mountains such as Tenney Mountain in Groton and thus visable from Route 25 in West Plymouth and Rumney.

Kenyon Karl
July 12, 2014

I would like to thank the committee members for their hard work, and Meredith Hatfield for her helpful presentation in Plymouth.

I applaud the broad vision of the energy strategy, and the emphasis on energy conservation as well as renewable energy, which Ms. Hatfield highlighted in her talk. However, I feel that the emphasis is not as evident in a straight reading of the document, and I believe it is in the interests of NH's citizen's to make it very clear that the energy sources discussed in the report are by no means equal in their impact.

Specifically, I think it is essential to employ a simple rating system, or brief summary of positive versus adverse impacts, for each energy source. Relevant impacts would include environmental (in-state and out-of-state, since as we know from REGGI, NH is affected by our larger environment), carbon production, public health, economic (please include long-term), and social, along with sustainability/security considerations.

Such an analysis would make it immediately obvious that every dollar invested in conservation would have very different long-term and immediate results for our state compared, for instance, to dollars invested in a gas pipeline, and would allow the public, policymakers, and municipalities to have more informed conversations and decision processes.

Our state and our nation are facing critical decisions regarding energy choices. We cannot afford not to get it right. New Hampshire's Energy Strategy should provide a clear vision as well as specific guidance to help us achieve a sustainable future. By highlighting the relative impacts of each choice, the report could better guide us toward reliable energy sources that will enhance our quality of life, keep our energy dollars instate, and preserve our independence.

Jennifer Highland, Bridgewater, NH
July 14, 2014

MA candidate for Governor, Daniel Berwick's statement is the best, most succinct description of how NH's energy policy should be developed:

> "While we need a 'bridge' fuel in the short time until we can power our grid and mobile sources completely without fossil fuels, I am very concerned about the dangers of making any more long-term investments in natural gas infrastructure. Pipeline proposals, including the Kinder Morgan pipeline, create safety concerns in the communities they pass through, and threaten to create infrastructure that lock us into the use of fossil fuels for far longer than necessary. They also will likely invite fracked gas into the state (MA), which I oppose.
> "It is dangerous and misguided to support new pipelines unless we have fully exhausted every other option to supply reliable power. We should hit the pause button on new development...."

The Kinder Morgan project is a short sighted mistake for a myriad of reasons: among them, environmental devastation for communities being sacrificed to fracking and those receiving fracked gas through pipelines by building a costly, permanent infrastructure for a so called "bridge" fuel.

NH needs an energy policy that looks beyond further investment in fossil fuels. Please encourage our policy makers and Governor to take the time to craft smart policy. Legislate fixes for the aging, leaky

infrastructure we already have without committing to more of same. And pursue renewables; we'll get used to seeing towers and windmills!

Marilyn Learner, Hollis NH
July 14, 2014

Just taking a few minutes to provide input on the draft State Energy Strategy. My comments are simple, the solution may not be, but I hope my recommendations can be successfully addressed. For context, I attended the better part of two of the Navigant presentations, and have reviewed their slides and May 1, 2014 draft document, admittedly in a cursory fashion.

The Good

- The analysis is detailed and thorough, and lays the foundation for a comprehensive
- understanding of energy use in NH.
- Inclusion of the Transportation sector is important, and I am particularly interested in the
- presence and expansion of the "distributed energy" model and conservation, which I think
- are the most practical and beneficial approaches that can be rapidly implemented at the
- policy level.

The Not-So-Good

- The report is far too detail-oriented and technical for policy makers and citizens.
- The recommendations are not clear, and there is no cost-benefit summary that aids prioritization and implementation of next steps.

The Recommendations

- Create an Executive Summary that contains a cost / benefit matrix by sector (Transportation, Thermal, Electric) and prioritizes by cost, ease of implementation, economic benefit (ROI, keeping dollars in NH). Identify the Legislative / Policy / Departmental Agencies / Industry-Business-Consumer groups best able to take the lead role in next steps.
- Assign a timeframe that matches the policy life (10 years?), with most-likely 20, 30-year needs projections to keep our eyes on the horizon.
- Remove legislative and regulatory barriers to change (i.e, don't tax added value of residential / commercial conservation / generation improvements, continue net-metering)
- Fund a Green Bank through consolidations and annual savings from energy efficiency (recall this was est. to be $35M / yr.).
- Identifying the basic import (energy) / export (dollars) economics of NH energy is critical as a driving force to motivate policy makers and consumers to invest in change.
- To summarize, stimulating conservation, building insulation and efficiency, and on-site thermal and electric generating capacity will provide deep and long-lasting benefits in very short order that will allow more time to make the longer-term adjustments required to balance our economic environmental-energy goals and objectives.

Best regards,
Boyd Smith,
Director, Newfound Lake Region Association
July 18, 2014

It is encouraging to see that the Draft NH State Energy Strategy includes so many fine elements. The emphasis on energy efficiency and conservation is clearly called for, and I hope it leads to a much stronger effort to make progress on eliminating wasted energy across the board. The approach to renewable energy technologies supports much of what we have learned over the last few years; I am especially supportive of the expansion of all solar applications, more use of woody biomass for heat (and not for electricity), and avoiding large terrestrial wind energy installations in NH.

I am also compelled to note that there are some opportunities to make this a much stronger strategy.

- In order to clarify what we are for, sometimes it is appropriate to articulate what we are against. We have learned that there are many downsides to NH's deep reliance on fossil fuels. A section describing exactly what those are could drive home the need for everyone in the state to give alternatives a closer look. A good start would be to mention the cost of fossil fuels, and the fact that the money we spend on them leaves the state. The other major problem is that there are adverse environmental effects all along the supply chain, from extraction to refining to transportation to final combustion.
- The repeated mention of natural gas as a part of our energy future is irresponsible from an environmental perspective, and should be completely re-evaluated. The impacts of hydrofracking on air and water quality are unacceptable. Natural gas should not be looked at as a “bridge fuel”; it is just another fossil fuel that has no place in a viable energy future for New Hampshire.
- The notion of “low cost” must be kept in perspective. Since expense is a primary driver of peoples' consumption habits, it stands to reason that if energy is cheap, we'll be less likely to be concerned about efficiency and conservation. Also, the hidden costs of environmental degradation that do not appear on energy bills must be accounted for.
- The glaring omission in the Transportation Sector of the Draft is that there is no mention of reduced highway speeds as a way to cut down on fuel consumption and vehicle emissions. You have got to be kidding. Instead, the speed limit was just raised. Obviously, lowering highway speeds is very unpopular with much of the citizenry, but if there are opportunities for reduced energy consumption, they need to be quantified and included in the discussion.

If we are going to build an energy system that works for us over the long term, we will all need to make some changes. Having a statewide strategy that offers us clear goals will be a big help.

David Van Houten, Bethlehem, NH
July 18, 2014

I fully support the idea that New Hampshire must come up with a strategic plan to meet future energy needs, and I fully support working with our regional partners to pool our resources and leverage our larger influence as a region.

What we do next will affect at least a generation of New Hampshire and New England citizens, and we must see the larger picture. If we make the false choice between energy security and environmental protection, we are sacrificing the long term health, safety and way of life of New Hampshire for short term easy answers and profits.

We must take the bold step of not only supporting renewable energy, but of curbing the use of fossil fuels. We must create a regulatory climate that protects people from corporate profiteering at the expense of private property rights and the health and safety of our population and our environment. We must not allow fossil fuel and hydro energy interests to dictate our future.

As a resident of Brookline, NH, I now find myself joining with the residents of Brookline, Hollis, and 29 towns in Massachusetts to fight an unnecessary and dangerous gas pipeline that is being foisted on us under false assumptions that it will meet our energy needs. It is a textbook example of how New Hampshire's energy plan must change. The pipeline is for transmission of fracked natural gas. We have a moral obligation to meet our energy needs without resorting to methods that destroy other communities, whether in New Hampshire, New England, anywhere else in the United States or in Canada or around the world. The pipeline would increase our dependence on fossil fuels. Once in place, there would be a financial and regulatory resistance to increasing use of renewables. It aligns our energy policy with fossil fuels for decades to come. The pipeline is being financed in a scheme that allows a tariff on our electric rates, despite the huge profits that it will generate for the energy companies. Socializing risk while privatizing profit and other benefits must stop being our policy. The pipeline threatens private property rights and conservation land. We must use existing rights of way. We must not expand energy infrastructure at the cost of eminent domain used for private enterprise. The pipeline is larger than we need to meet peak demand, by a huge factor. It is not the job of our government to promote a project that is so obviously designed to meet a future plan for export. A project so clearly designed for export calls into question whether it will meet our peak needs when it is called upon to do so, and once we begin exporting this gas, any price advantage, any chance that the abundance of gas will contribute to price stabilization will disappear faster than we can write the checks.

First, we must end our dependence on fossil fuels. They are finite, they are becoming more expensive as they become more rare, and they are destructive to our environment and our health. The energy companies that push fossil fuel solutions to our future energy needs are interested in near-term profits, not long term solutions. Next we must not rely on giant hydro projects to meet our needs. The flooded land and damaged wildlife habitats, and the destructive transmission lines make this solution only slightly less disruptive and destructive than fossil fuel reliance.

We must become a leader in renewable energy. With conservation and a strong, unified effort towards renewable energy we can ensure that New Hampshire leads the nation in 21st century technology, rather than fall behind with 19th century pollution and environmental degradation.

I urge, in the strongest possible terms, Governor Hassan and our elected and appointed officials to not only avoid aligning our energy policy with the interests of the fossil fuel industry, I urge you to make New Hampshire a leader in the renewable energy future. If we must invest in infrastructure, as it is clear we do, then we must do so in a way that ensure a cleaner, healthier future for New Hampshire. With fossil fuels and giant hydro projects, we remain dependent on outside interests to meet our energy needs. With conservation and renewables, we increase our control over our energy supply, we begin to lessen our dependence on energy that destroys our environment, and we embrace a future where American technology and New Hampshire ingenuity drive our energy policy and our economy.

Sincerely,
Keith F Thompson, Brookline, NH
July 20, 2014

The draft needs a thorough discussion of metrics by which to gauge energy efficiency the range of uses.

Also, there should be a lot more emphasis on the use of City and town planning and zoning to reduce energy use, especially in transportation.

Charles dePuy, Enfield Energy Committee
July 21, 2014

To combat climate change and promote sustainability, an energy policy must take into account the true impact of natural gas. The draft policy, like many New England-based discussions of natural gas usage, fails to account for the enormous environmental damage caused by: 1) the extraction of the fuel by hydraulic fracturing, which involves the injection of numerous toxic chemicals into the earth, wastes huge quantities of fresh water, and apparently leads to seismic activity not previously experienced in the affected regions; 2) the leakage at every point in the process from the drilling site to the final destination of large quantities of methane, a far more potent greenhouse gas than carbon dioxide, into the atmosphere. Although methane burns with fewer harmful emissions than does coal or oil, the process of bringing it to market is no less damaging, and it should not be viewed as an acceptable long-term replacement for other fossil fuels.

Because of current market conditions, which do not reflect the true costs of gas, and the general tendency to overlook the negative impact on the environment, it is fashionable to view natural gas as a highly desirable “bridge fuel.” New Hampshire will certainly need to continue to rely on this fuel for some time, but state energy policy must be designed to move forcefully away from all fossil fuels. The current push to greatly expand the pipeline infrastructure, if unchecked, will effectively lock the region into over-dependency and overuse of this resource and will discourage efforts to improve efficiency and promote alternative forms of energy that are renewable and truly clean. It is essential that natural gas be properly evaluated as a major part of the problem we are trying to solve, rather than as the solution.

--Stephen Spaulding, Hollis, NH
July 21, 2014

I just skimmed the draft NH Energy Strategy document and would like to submit just a couple of general comments.

I was very surprised to see that NH ranks only in the 'middle' among the states for energy efficiency promotion. I would like to see NH invest more in energy efficiency measures for all sectors, but especially for residential. Energy efficiency benefits us by not using up resources, which to me has a high value in helping people and the planet far into the future.

I also value solar-type generation funding - PV and thermal - because this also has least impact environmental compared to wind and other renewables. I hope that long term benefits will win over short-sighted reluctance to fund energy efficiency.

Sincerely,
Deborah Munson, Chester, NH
July 22, 2014

I attended one of the meetings to hear about the state's energy strategy and appreciate your taking the time to get feedback from us and to put the work into energy planning for NH. We are at a critical junction in peak oil, climate change, and economic crises that requires us to think ahead more than a few years if we have a chance of reversing or stabilizing the situation at all.

I urge you to set goals to reduce the export of our energy dollars to less than 50% by 2023 keeping as much of our production and use as local as possible. We need to encourage and ramp up energy efficiency and conservation as the first step reducing overall use.

The second step is to help home and business owners to replace fossil fuels with renewable energy. Financing options and incentives are still needed to help the majority of people who would like to start replacing their fossil fuels.

Alternative fuels for vehicles should be encouraged -- perhaps incentives for electric charge stations and/or hydrogen fuel vehicles. Car-pooling programs and public transportation will also need support and help with infrastructure.

Thank you for your time,
Kim Quirk, Enfield, NH
July 22, 2014

I am opposed to the creation of new pipelines that transmit dirty fossil fuel energy. Long term solutions for energy should be developed in solar electric, solar thermal, wind, geothermal, biomass, landfill gas and in energy conservation strategies for residences and businesses. There exists ample successful developments for sustainable clean energy in New England that use renewable sources. Fracking is a horrid and destructive method for gas extraction that pollutes water and our continental crust. A pipeline transports it across the wild lands of shared watersheds bringing high emissions, leaks and accidents. Fossil fuel carbon emissions are not a sustainable in our atmosphere nor is the fuel source endless. It would be pure short sighted ignorance and greed that would allow the construction of another gas pipeline anywhere in New England. Regionalize and localize your energy production so as to be more self sufficient and cost effective with the least damage to our water, oxygen and soil. We have a bright future when the government is proactive and not reactive!

We can do this with renewable energy NH!

Sincerely,
Kari Bremer
dba Natural & Green Design ~ Sustainable Design Solutions since 1996
http://www.naturalgreendesign.com/ info@naturalgreendesign.com
Santa Fe, New Mexico, 87505 and Milford, New Hampshire, 03055
July 23, 2014

NH Energy Strategy 2015/25: Distributed power storage on a smart grid (reference 5.2.3.iii, in draft plan), utilizing upgrades in battery and renewable energy technologies.-.

With the increasing use of electric vehicles (EV) over the next decade, battery technology is and will continue to be advanced and refined. EVs today have batteries in them that have a 50+ kwh capacity (twice the daily demand of a typical residence). These batteries have a usable life of 25+ years, matching the life cycle of today's solar panels. Pairing these together will become a common configuration in the next decade. The NH Energy Strategy plan should should look to promote and to take advantage of this emerging technology pairing.

Utilities are looking at this trend and realizing that they too can share in this evolution, to lower their peak power loading requirements. With some innovative thinking and business model restructuring, on their part, Utility power production costs can be curtailed and consequently their profits increased. The Utilities could offer financial incentives to renewable energy generators with grid inter-connections who elect to deploy a local facility power storage or Battery Box (BB). This BB will charge from the renewable energy source during the off-peak times and discharge into the grid at the higher demand times (3pm-7pm). The financial incentive could take the form of a higher REC rebate then a non-BB REC recipient. The licensed electrician/solar installer will install the 2 cubic foot BB close to the residence/facility grid interconnect point. This will be done at the time of the renewable energy grid interconnect and REC meter installation, or as a retrofit to existing renewable energy sources.

In addition the utility will have the ability to store power from the grid into the BB directly, augmenting the power from the renewable energy source. This will allow the utility to retrieve the stored power when during times of peak demand. The in and out flow of power, will be managed and accounted in the Utility smart meter at the facility.

This BB could use the emerging configuration of Electric Vehicle (EV) batteries as the storage medium. This will allow a higher number of EV batteries to be manufactured, lowering the cost. Alternatively, recycled/refurbished EV batteries, could be used after their EV 'expiration of use' date has been met. As mention in the introduction, these batteries today have an average capacity of 50+ kwh. This is twice the daily capacity of a usual residence and would represent twice the daily production capacity of a typical 5 kw solar array. So multi-day distributed facility storage and utility power retrieval would be achievable. In a similar manner utility power users without a renewable energy source could see an adjustment in their rates if they would allow a BB to be installed in their residence/facility. The Utility could then make use of a larger pool of the distributed storage units in off-peak times and retrieval of power at times of peak demand.

During this next decade, 2015-2025, these battery technologies will see an order of magnitude increase in energy density. This will allow prices to drop an order of magnitude and the physical unit could be reduced in volume or upgraded in storage capacity in the original box. As this progression develops, the demand from users will escalate, producing lower manufacturing costs and retail pricing for this localized facility storage.

Coupling of these technology developments will allow for a smarter grid, with distributed localized storage that will result in a lower peak demand curve, this will allow for stabilization in utility generation and power pricing, all of which can be factored into this 2015/25 NH Energy Strategy plan.

William Dowey, BEC, July 22, 2014

I will limit my comments to one sector: Building Efficiencies.

"Residential and commercial buildings account for almost 39 percent of total U.S. energy consumption and 38 percent of U.S. carbon dioxide (CO2) emissions.1 [2] Nearly all of the greenhouse gas (GHG) emissions from the residential and commercial sectors can be attributed to energy use in buildings (see Climate TechBook: Residential and Commercial Sectors Overview [3])."
The goal to reduce our energy consumption within our buildings with achievable methods should be the approach for the State to pursue within this sector.

From section 5.1.3:
"....At a minimum, New Hampshire should strive to adopt the most recent code,....." . Codes are minimum standards (and the law of the land) there are other programs & standards that may get the State to the end result (goal) sooner than just relying on the current "standard" codes (minimum standards) to do so. I would suggest the consideration of other high performance building programs available to become the "code" or minimum standard for the State.

Building codes (energy codes) are a mandated minimum level of standards, the State of NH has adopted the 2009 building & energy codes (except Durham which is using the 2012 energy code). I would urge the State to adopt the most recent editions of the codes as soon as they are available. It is my understanding that every new code version is approximately 15% more efficient than the previous edition. Currently as I write this, the State is 30% behind in its' mandated building construction efficiencies by the delay of the adoption of the 2015 editions of codes.

But this code is only good for the newly built, additions or substantial renovations (with building permits) to homes and to those occupants, who will continue to pocket tens of thousands of dollars in lifetime savings from lower energy bills and live in better quality homes that are more comfortable, quieter, and enjoy a higher resale value.

The existing housing stock that may want to improve their building efficiencies needs a better "clearinghouse" mechanism for the consumer (homeowner) as to the efficiency & loan programs available. Is there any compliance/tracking method as to the number of existing houses getting efficiency upgrades? We know with new homes we can track building permits to get numbers etc...

I think the State should consider promoting a "house labeling" program as to the energy efficiency of homes. This would benefit the real estate professionals, home buyers, utilities etc. by giving a benchmark to houses similar to MPG is to vehicles.

Thank you for your consideration.

Bruce Buttrick, Goffstown, NH
July 23, 2014

I'm writing to you about New Hampshire's Energy Strategy. I've looked through the draft report and will try to keep this short and right to the point. What concerns me the most is that this report lacks concrete goals with respect to cutting CO2 emissions. It lists cheaper fuel costs and expanded stable grid energy, with both industrial and commercial access to LNG as drivers for a 'strategy'. For example, the graph on page 12 which shows expected CO2 emissions through the year 2032 is relatively flat. One of the key assumptions in the electric sector is there will be transmission expansion lines.

We must be extremely cautious about new (gas) expansion lines, as these typically come with long term contracts for the distribution company. This of course helps us out in the short term (with upcoming plant closings), but what about a long term goal of using clean renewable energy? New gas pipelines are counter-productive and will make us more dependent on fossil fuels.

Take for example, the Massachusetts Global Warming Solutions Act (2008), which "requires reductions from all sectors of the economy to reach a target of a 25% reduction of Greenhouse Gas (GHG) emissions by 2020 and an 80% reduction by 2050.". That's a solid goal.

New England is the global-leader of clean energy technologies. If we follow down the path of more reliance on fossil fuels, we won't be able to hold this position. Something has gone terribly wrong in the past few years as we've entered another oil and gas boom. Everyone wants to switch to natural gas because it's inexpensive and "clean". I'm afraid some of our leaders have become less focused on renewables because of this. Natural gas might "burn cleaner", but it is far from clean energy, especially when you take into account the process of extracting it (fracking).

Maybe NH can follow in the direction of Minnesota's footsteps and start ramping down on their carbon emissions this year? If you have a few extra minutes, I highly recommend taking a look at http://www.nytimes.com/2014/07/18/us/politics/without-much-straining-minnesota-reins-in-itsutilities-carbon-emissions.html?smid=fb-share&_r=1

Thank you very much for your time,
EJ Marmonti, Hollis, NH
July 23, 2014

While some gains have been made in NH the past few years pertaining to weatherization of our buildings and use of renewable energies – our progress has been under -proportionately small as compared to other States and significantly less than what we can feasibly accomplish. NH's economy, jobs, quality of life will all suffer if we do not plan more wisely, and strength education and funding for energy efficiency and alternative sources of energy.

Thank you,
Nancy J. Nichols,
NH Licensed Professional Engineer
Accredited Leader in Energy and Environmental Design
NH Licensed Home Inspector
July 24, 2014

Below is the Generic Letter that Southern NH Planning provided to send to you.

"I urge you to set a goal in the state energy strategy to reduce the export of our energy dollars from 66% (nearly $4 billion annually), to 50% by 2023, retaining over $1 billion of economic wealth each year in New Hampshire. This goal can be reached by pursuing the following three strategies:

1. Significantly ramp up energy efficiency and conservation through system wide efficiency investments (customer-side and utility/supplier-side), to reduce overall energy use;
2. Replace imported fossil fuel use with locally produced renewable energy, with an emphasis on:
    a. distributed generation
    b. utility-scale generation
    c. thermal and electric fuel switching for heating, cooling, and transportation needs;
3. Unleash the private market to finance the infrastructure by minimizing policy risk, sending clear market signals, and better leveraging our minimal available public funds."

I am not so naïve as to believe that this is possible in our state, the only way to achieve these goals would be to limit the ability of local communities to regulate the utilities/generators/transmission folks, and to significantly reduce the abilities of the environmental groups and agencies. This would be political suicide for any legislator, governor etc., a much better approach would be to reduce significantly the amount of energy required by every individual within our state.

In the past two years I have been constructing homes that use ½ the energy (all energy, electricity & fossil fuels) of typically built homes throughout New Hampshire. The cost increase to produce these homes is typically in the $2.00 per square foot range, so the cost is not prohibitive. The utilities have been doing a great job of educating builders on how to accomplish this, but without consumer awareness their efforts are falling far short of where we could be today. Without pressure from the consumer, builders are reluctant, very reluctant to build to these standards and 90% are not. This approach addresses new homes only, it is a huge undertaking to address existing homes with cost escalating as a homes age increases.

I would urge you to support programs to retrofit existing housing stock with energy saving updates, and to support the adoption of the 2015 energy code as part of the NH building code as soon as it is adopted. This 2015 energy code will force all builders within the state to construct homes that use 40-50% less energy than what the current code allows. (without the state having to spend a dime) The other part of this equation is the enforcement of these energy codes, or in most cases the failure of enforcement. There needs to be some effort on the states part to properly train the local building inspectors to ensure a level playing field.

If you have any questions regarding these issues I would welcome a discussion with you on them.

Thank you,
Bruce Fillmore, Weare, NH
July 21, 2014

My only comment is that [the strategy] seems to have insufficient goals for solar power and I would like to see that part increased significantly.

My electric rates here in Hollis are increasing from 8 cents to 12 cents/kwh in the next couple of months!
I have been looking into solar PV panels for my roof and given the increase, I am quite certain I will install a system.

The State of NH needs to promote the use of solar here in NH and provide incentives to increase the use of this available, pollutant free, import free and now cost effective source of energy.

Personally my main concern with the increase use of rooftop PV panels and battery powered cars will be the stability of the electric grid! The experts at Navigant and at the state and PSNH need to plan now to avoid this potential instability.

Thanks for your time,
Eric Ryherd, Hollis NH
July 24, 2014

Important considerations for an effective energy strategy:

1) Work to ensure state energy independence in the sectors where we already have it (such as electricity) and work toward achieving it in other sectors (such as heating and transportation).
2) Promote a stable environment for investment in renewables by providing consistent incentives every year.
3) Consider higher incentives for equipment (such as PV modules, inverters, etc) manufactured within the state.

E. H. Roy
July 24, 2014

I have read most of the draft energy strategy and am impressed by the wealth of important information it contains. My main comments are:
1. Given how important this information is, it is a pity the report is so difficult to decipher. Legislators in particular have little time to read long documents. I urge that you make major efforts to improve the readability of the report. Please make this a report that legislators and ordinary citizens can pick up and understand.
2. I was very distressed to see that increasing reliance on fracked fossil fuels was accepted uncritically. These fuels are not acceptable and we should be moving away from and not towards them. I understand that your work was not to judge fuel sources, by the damage caused by fracking cannot be ignored.
Thank you for your work on this important report.
Judy Elliott, Canterbury, NH, July 24, 2014

Please consider that there is no greater threat to more citizens and many species than climate change resulting from our dependence on fossil fuels. Not only is it essential that this plan drive significant reductions in fossil fuel burning but it should address the need for revenues to pay for the rising costs of weather related disasters. Each year more NH communities are faced with cruel climate change roulette as increasingly violent storms wipe out infrastructure, homes and businesses. One of the shortcomings of the current price structure is that the "true" cost of coal and oil is underwritten by taxpayers who are saddled with such hidden costs as the health effects of pollution and the increasing storm damages. If oil sold at its genuine cost to society, motorists would be inclined to switch to more energy-efficient transportation. A carbon fee would discourage coal-fired electricity, help offset some of the local costs and promote alternatives such as wind and solar power.

As a retired energy auditor and solar contractor I can assure you that there are significant opportunities to save billions of BTU's in our buildings and to generate many gigawatts of clean renewable energy locally which will provide local jobs and reduce our dependence on imported (to our state) fossil fuels.

I urge you to set a goal in the state energy strategy to reduce the export of our energy dollars from 66% (nearly $4 billion annually), to 50% by 2023, retaining over $1 billion of economic wealth each year in New Hampshire. This goal can be reached by pursuing the following strategies:

- Significantly accelerate energy efficiency and conservation through system wide efficiency investments (customer-side and utility/supplier-side), to reduce overall energy use;
- Consider carbon fees starting with the dirtiest fossil fuel coal and phase in the fees for all fossil fuels within 10 years;
- Replace imported fossil fuel use with locally produced renewable energy, with an emphasis on:
    - distributed generation, micro grids for improved resilience
    - utility-scale generation
    - thermal and electric fuel switching for heating, cooling, and transportation needs; and,
- Unleash the private market to finance the infrastructure by minimizing policy risk, sending clear market signals, and better leveraging our minimal available public funds.

Thank you,
John Kondos, Spofford, NH
July 23, 2014

As the Chairwoman of the Temple Energy Committee, I represent the will of our citizens, as directed by their vote at our 2007 Town Meeting, requesting that Temple work to reduce greenhouse gas emissions on the local and national level and support the increased use of renewable energy sources.

Therefore, in behalf of our citizens, I must strongly urge you to focus our state's energy strategy around rapidly and significantly increasing energy efficiency programs and energy conservation throughout the state, and replacing imported fossil fuel use with our own locally produced renewable energy sources.

Thank you,
Bev Edwards, Temple, NH
July 24, 2014

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1. **P. 2** – SB191's Advisory Council "to assist OEP in the development of a state energy strategy":
   - The competitive process that results in hiring Navigant Consulting may unhelpfully tie a future decision-making process to Navigant Consulting when another consultant may be more productive. What if, for instance, the task at hand would better be served by Rocky Mountain Institute's advice, because RMI combines energy planning with environmental concerns as two equal concerns? Or another consultant might be preferred.
   - When I looked online at Navigant Consulting's staff, I could find no expert environmentalist. Even a corporation like Shell Oil hires environmentalists.
   - Navigant's "Governance, Risk and Compliance" staff may cover answering to EPA requirements, but not really be environmental in expertise and concerns.
   - No consultancy contract should extend past this draft use. Each future need for consultancy help should search according to the need.
2. **P. 3** - "NH is not an energy island and some issues are out of the state's control." Leads into a <u>default</u> position - "...actions the state can take":
   - Actions as listed are okay, but should not be limited to these. When legislation to our east (VT) (NY) and / or our west (ME) is more favorable to environmental needs, we should by policy study it and anticipate enacting complementary legislation. VT and NY and ME all deal with similar energy v. environment problems as NH does. We should be ready to present a unified front with our neighbors where the environment is concerned. Energy will always have its big-money powers and voices; the environment needs special notice because it will be local, unmoneyed advocates speaking for the environment, easily ignored or dismissed by those catering to big-money powers / energy industry. Governors especially need to know that environment can't be traded off for jobs or cronyism's comforts.
3. **P. 4** - "Demand is steady" - this is an industry that should be helped to celebrate decreased demand. Should be incentivized to welcome decreased demand. P. 7 – Navigant's analysis includes "increasing fuel choice for all areas of the state."
   - I'm concerned that Navigant will view and promote Hydro-Quebec water power as simply another fuel choice. Navigant will not factor in the cost to the Canadian environment of this artificial power source and will necessitate its power lines north to south through NH, not factoring in that cost to the environment. "...Protecting natural, historic, and aesthetic resources and encouraging local and renewable energy resources" is <u>half</u> the charge given by SB191.
4. **P. 11** - "Fuel Choice Context" and "Fuel Choice Strategies" - "new fuel choices" would logically include Quebec-Hydro water power, yet that is destructive as a source, with methane release to the atmosphere due to flooded forests. It requires destructive transmission construction. Is this a loop-hole-y language <u>place in the DRAFT</u> that intentionally or not lets in non-environmentally positive (so are environmentally negative) power sources?
5. P. 13 "Other Things to Consider" - "Navigant and public commenters provided additional ideas to consider" followed by examples. So some discussion happened in the past and here we have a sampling of what was discussed, is one way to read this. What if Navigant, also hired to consult with New York State, provided (or provides in the future) an idea to close down Indian Point nuclear plant and replace its energy in the grid with Hydro-Quebec? Of course "other things to consider" is good critical thinking to include, but let it not mask that Navigant is already anticipating patching together a "good deal" that is good for their credential and good for NY State, but not good for NH – because of the impact of power lines on our tourism industry. Navigant should not have a permanent place in our State Energy Strategy.

Lynn R. Chong, Sanbornton 7/24/2014

If you had 30 seconds to summarize the thrust of the NH State Energy Strategy, what would you say? If you had to persuade a key member of the legislature about the importance of this plan to the state's economic future on an elevator ride from the 1st to the 3rd floor of the Legislative Office Building, could you do it?

The DRAFT state energy strategy prepared by Navigant under your direction is a comprehensive and highly technical assessment of NH's current energy usage, and its future potential. What the DRAFT lacks is a single, compelling, overarching goal that can succinctly capture the essence of the plan, and against which we can easily measure our 10-year progress.

I am not the first to suggest that **this goal should be a metric related to retention of energy expenditures in the state**. As the NH Clean Tech Council and others commenting on this draft plan have shown, a realistic and achievable set of actions can lead to the retention of $1 billion in annual energy expenditures over the 10-year horizon of the plan, thus reducing the outflow of citizen and business wealth from 66% of total annual energy expenditures to 50% by 2025.

This goal lends itself to a clear set of actions framed around 1) the reduction in overall energy use (efficiency and conservation) and 2) the generation of the electric, thermal and transportation energy we use from sources we control and do not have to import (renewables and fuel switching). This should be the primary focus of the plan. All tangible public benefits of a progressive energy strategy – job creation, resurgent and sustainable development, greenhouse gas emission reductions, environmental benefits, and mostly importantly economic self-determination – will flow directly from this goal. It can be easily measured, tracked and reported.

This is simple, and compelling! Use less energy, and of the energy we use – produce as much as possible here at home. What policy maker or opinion leader could be opposed to this, and to the private/public sector initiative such a strategy would unleash if we truly committed ourselves to it?
As the council and consulting team complete their work in the next two months, I hope you will seriously consider framing the plan around this simple and elegant goal. The resulting plan will be easier for NH citizens to understand, more compelling for people to support, and as a result, more likely to be accomplished.

Sincerely,
Charles R. Niebling, Boscawen
July 24, 2014

I urge the committee to include solar and wind renewable energy as a major component of the state policy. As you know, the state of Wisconsin recently chose to purchase a 100 MW Photovoltaic system in a competitive bid situation over three bidders specifying natural gas power plants. The age of affordable renewable energy is here, now. Why send our money out of state for fuel we can get - FREE - here, in NH.

KEEP OUR ENERGY DOLLARS AT HOME!

Bob Irving, president
RH Irving Homebuiders
Affordable Net Zero Homes

Thank you for taking input from the citizens of this state.

"Natural Gas" is a finite resource. A five-year-old fracking well has produced half of the gas it will produce in its lifetime. When will solar, wind, hydro run out? As New Hampshire plans for future energy needs these issues need to be addressed. In 100 years where will our energy be coming from? New Hampshire needs to have built independent sustainable clean energy. An energy policy that relies on the increased use of a finite source such as LNG is counter productive and wasteful. Minnesota has addressed this issue by using solar energy to fuel a power plant. Prices in the Solar Energy market have dropped dramatically in the past two years and are now an economically viable option. New Hampshire needs to be solution and future focused about its current and long-term energy needs and LNG is not the answer. For the continued growth of our economy and for energy stability moving towards renewable energy such as wind, solar, geothermal, and biomass is a prudent efficient long-term public policy strategy.

> **Gas is not clean energy.** While natural gas produces far less carbon when burned, the methane gas that is currently leaked in drilling, transmission and distribution is a far more powerful greenhouse gas and negates any gains over burning oil or coal.

While we need a 'bridge' fuel in the SHORT time until we can power our grid and mobile sources completely without fossil fuels, I am very concerned about the dangers of making any more long-term investments in natural gas infrastructure. Pipeline proposals, including the Kinder Morgan pipeline, create safety concerns in the communities they pass through, and threaten to create infrastructure that lock us into the use of fossil fuels for far longer than necessary.

Thank you for taking into consideration my thoughts.
Molly Mizula, Hollis, NH
July 25, 2014

This is to report that I wish the transportation section contained information relative to transportation issues other the highways in addition to that on highways. Rail is becoming increasingly important to New Hampshire, as are other means of public transportation.

Sincerely yours,
Robert Z Norman, Lebanon, NH
July 25, 2014

I am commenting on your energy report, specifically the assumptions you make about transportation. I am president of the NH Railroad Revitalization Association, (NHRRA). Founded in 1992 NHRRA is a transportation advocacy organization whose mission is the upgrade of the rail system in NH to facilitate the restoration passenger rail service and enhanced freight rail service as part of balance transportation system.

I currently serve on the executive committee and board of Southern NH Regional Planning Commission. Previously I served on the executive committee and board of Rockingham Planning Commission. I also served as Chairman for two years.

In several sections you use the term public transit options. How do you define public transit options? You use the phrase in relationship to transporting individuals to tourist destinations. What are the transportation modes that service tourist destinations in NH? Is there a transit option that provides a reliable level of service that could be used by tourist? Currently there is no rail service from Boston or Canada our major trading partner, to any tourist destination in NH. The Downeaster serves Exeter, Dover and Durham none of which are tourist destinations.

There are now direct flights from Boston to Beijing, Tokyo, Dubai, Turkey, Europe and England. Flights will be added to Hong Kong and Shanghai. All of these countries have spent billions on public transportation. It is highly unlikely that when visitors from these countries reach Boston they will rent a car and come to NH? Will they instead take a train to Hyannis or a ferry to Provincetown?

In your section on mass transit you suggest that an obstacle to implementation of mass transit is that NH is a rural state and there are no concentrated centers of demand. The combined populations provided by Google of Concord, Manchester and Nashua is over 239,000 people. All of these cities are on the same rail line and is the subject of the NH Capitol Corridor Rail study. If we are such a rural state why will we invest about 800 million dollars in widening Rt 93? The Downeaster rail service is carrying over 560,000 people.

The reality is that southern NH south of Concord is suburban Boston. The construction of Rt 93 in the early 1960's solidified that position. We have the same symbiotic relationship with Boston that cities like Stamford, CT, White Plains, NY and Jersey City have to NYC. Boston and NYC provides the jobs. NH and suburban NYC provide the workers. However what has happened in NYC is that due to the accessibility of rail there is a reverse commute which has turned Stamford, White Plains and Jersey City into economic powerhouses. This can be done in NH also. It will also allow NH to tap into the Boston worker pool. There is also a rail study in progress that is exploring extending rail service from Haverhill to Plaistow.

Another perspective that needs to be addressed is how we used our rail-banked rail corridors. These are abandoned corridors purchased by the state for future rail use. For example the I 93 transit study conducted by NH and MA, in which my rail group was a stakeholder, evaluated transit options to compliment the widening of Rt 93. One of those options is restoration of rail service on the old Manchester and Lawrence rail corridor. Millions are now being invested in converting it to a rail trail. Is this the best use of this corridor? These corridors need to be evaluated for their use for freight rail.

NH currently has no direct rail connection with Canada. You referenced the Pioneer Valley initiative. The Knowledge Corridor as it is known will benefit four states and if treaty negotiations with Canada are successful will restore service to Montreal. There needs to be comments made about developing a funding source to implement energy saving public rail options.

Thank you for reading my comments.

Peter J. Griffin.
July 25, 2014

It is so late in the afternoon, that I only had time for a quick skim of the transportation sector. Nevertheless, I am amazed to discover that the analysis of that sector is limited to the highway sector, with zero recognition of any other mode of transportation. Admittedly, that is an almost reasonable description of New Hampshire's current transportation system as it is almost totally reliant upon its highways. Should however the NH Rail Transit Authority achieve its goal, the State will have commuter rail service on its NH Capitol Corridor to Nashua, probably Manchester, and possibly Concord. In addition, Amtrak is in its 13th year of providing intercity rail service to three NH stations Exeter, Durham, and Dover, while NH DOT is involved in an effort to extend commuter rail service on that same corridor to Plaistow.

Clearly, the existing Amtrak service and the proposed commuter rail services envision diesel-electric powered trains similar to what both Amtrak and MBTA currently operate out of Boston's North Station. However, I note that the plans for the new MBTA service to New Bedford and Fall River will be electrically operated. And should the North-South Rail Link ever be built between North and South Stations, it too will necessarily be electrically operated. By extension, should the Federal funding for such ever become available, it is my expectation that the construction of the North-South Rail Link will provide ample motivation to extend the electrification into the various North Station Commuter lines. In turn, planning for the electrification of the Boston-Lowell line will in turn lead to extension of that electrification to the NH Capitol Corridor.

Note that the forgoing is clearly conjecture on my part. But that conjecture is based in large part upon the electrification of commuter rail services between 1900 and the 1930's in New York, Chicago, and Philadelphia, all of which are still operating today. But equally important is the vast network of light electric railways that once existed across the country, for which the only available evidence is contained in a handful of railway museums such as the Seashore Trolley Museum in Kennebunkport, ME

Kenyon Karl, July 25, 2014

I truly appreciate the amount of work that you, your staff, and Navigant Consulting have put into this document. There are two additions I would like to see.

The first is I would like to see the state encourage the federal government to invest more in basic research for sustainable energy sources. It is basic research that is going to provide the technological advances that make these energy sources cost effective. We need those advances to be non-proprietary, and available industry-wide, which is best achieved through public funding of research.

The second is I would like to see a consumer education component. I think UNH Cooperative Extension does a good job of dispensing knowledge about topics of interest to consumers, and the state should consider using them as the primary vehicle for disseminating the information consumers need to make wise decisions about their energy consumption. This is particularly important since the information about programs is fragmented. I think they could integrate that information in a way that helped consumers to find the options that make sense for their particular situation, and I think they have the network that could get that information into the hands of consumers.

Regards,
Christina Hamilton, Brookline, NH
July 25, 2014

In my May 1, 2014 comments I proposed that various sources of energy be ranked using a list of attributes such as safety, reliability, intermittency, cost, fuel use, emissions, etc. At the end I included the following:
Intermittent sources of power can improve their ranking with:
Associated energy storage 'partner' for 'balancing', reliability, dispatchability
Associated energy source 'partner' for 'balancing', reliability, dispatchability
The intermittent energy source and 'partner' are then ranked as a pair for above valuations
This combining of intermittent sources with a 'partner' should probably have included a brief explanation:

For example, taken by itself, an intermittent and therefore unreliable and non-dispatchable source of power like wind should result in a very low ranking when compared with most other sources of power. When wind power is added to the electrical grid, it usually replaces a more reliable, dispatchable source of power, usually fossil fueled, with the intent of using less fossil fuel and generating lower emissions.

But some reliable, dispatchable power source must always be available as 'backup' to quickly replace wind power when the wind drops at least some of the time daily to produce no power at all, especially in the summer when power demands are highest. Cycling these 'backup' conventional power sources to operate in cooperation with wind power reduces their efficiency, causing them to use more fossil fuel and increase their emissions more than if they were allowed to run more evenly, as they did before the intermittent wind power was introduced.

So intermittent, unreliable sources of power like wind have been encouraged and promoted for the clean power they generate, rather than more accurately evaluated for the combination of their clean power and the necessary back up power plants running less efficiently. It was the intent of my May 1 proposal to improve their ranking by combining the two, as necessary for reliable operation on the electrical grid, so the now-reliable pair are compared more fairly with other reliable energy sources.

Alternatively, and preferably, if some cost-effective energy storage devices were available, and paired with intermittent energy sources like wind, that pairing could also be compared more fairly with other reliable sources of power for the electrical grid.

I hope this longer explanation helps the reader understand the concepts intended in my May 1 comments for SB-191.

Thank you,

Joe Wilkas, Bridgewater, NH
July 25, 2014

Energy planning for New Hampshire should have a vision of energy sources of the future. Current renewable resources like solar, wind and hydro should be considered for our future path. Investments in the development of these technologies and newer ones would support New Hampshire's energy needs well beyond the lifetime of depleting fossil fuels.

The natural gas industry proposes a future of new pipeline projects. They ignore that the gas in the pipelines is not sustainable for the future. New pipelines destroy scenic New Hampshire as easement swaths are cleared of everything but grasses. They put our precious natural water supply at risk during construction and later in operation as they leak. They put our residents at risk from contaminated water and explosions. Claims of "clean burning" gas puts our children at risk by ignoring that methane gas is released during the drilling, transportation and distribution of natural gas causing far more greenhouse gas than burning either oil or coal.

The New England concerns of natural gas "shortages" are based on a few high demand hours during a few weeks of the coldest months of the year. The remainder of the hours in the day and the remaining days of the year our pipeline capacity is more than adequate. This means our gas "shortages" could be solved with planning and storage of fuel during less than high demand periods.

Large projects such as the proposed Kinder Morgan/Tennessee Gas Pipeline Northeast Direct Energy project would trample the hard earned and preserved properties of smaller communities. Residents and local governments are sold on a New England need for 600 million cubic feet/day. The pipeline as proposed would transport 4 times that amount of 2.2 billion cubic feet/day so that this pipeline could be used for export to Canada and beyond.

Natural gas is an important "bridge" fuel but future investment in new pipeline infrastructure would be a mistake. The temporary nature of a "bridge" fuel means funds committed to this effort would be better spent on research and renewable sources.

Investment in energy efficiency and conservation is also key to New Hampshire's energy future. Continuation of these types of programs already in place would reduce our energy demand.

New Hampshire should also continue investment in more local power sources. Large centralized sources require transportation of the energy and therefore require destructive easements through our scenic landscape. Local power sources like solar and wind could connect to the grid allowing energy flow on existing power lines without sacrificing more of our forests, residential properties and conservation lands to utility easements.

Please focus future energy plans on renewable energy sources that will be available in the future. Please avoid projects which would increase the infrastructure and dependency on limited fossil fuels. Please consider local power alternatives so that our treasured New Hampshire landscape can be preserved and enjoyed for many more generations.

Thank you,

Robert Chesebrough, Hollis
July 25, 2014

This is a very good plan, based on my involvement with energy issues and state energy plans.

1. The purpose of the plan is to MINIMIZE impacts on the environment. It may be useful to state that there are no energy strategies that have NO impact. In the heated public discussion, advocates against some sources act as though they expect and can demand perfection – NO impacts from sources they oppose, and that there are none from those they favor. This is most often seen in the nuclear (must be perfect) vs. alternatives (no impacts mentioned).
    - A growing population and economy make it impossible for things to stay the way they are. (Northern Pass opposition).
    - It is reasonable to ask everyone and every area to answer the question, "What is your fair share" of the negative impacts that are inevitable when projects benefit a larger public –county, state, region, nation, world. It is reasonable for localities to ask "What compensation will take place
2. The electric generation forecast is flat. It should be noted that there may be "game changers" in both supply and demand. Figure 4-8 is in units of capacity. It should be in units of energy per year, which is capacity multiplied by hours per year the capacity can deliver. Solar and wind generation cannot deliver 90% of the year. Game changers may be: further decreased cost of solar electric power coupled with the invention/development of an economical storage technology; electric vehicles using the new economic storage; modular nuclear reactors (Seabrook station was built with transmission capacity for two plants): etc.
3. Figure 3-2 shows "efficiency" as a very important contributor. Knowing the average age of housing underscores the large opportunity for savings in heating, operating and cooling. Slowing progress is lack of Building Code requirements. Energy Efficiency professionals have found that improvement will only come slowly until housing unit efficiency is required, and measured during and after construction. This is available now. Home builders will complain that this will raise the price of houses, and they are correct when only first cost is considered. When lifetime costs, including first cost, heating, cooling, repair and maintenance are included, and calculated with reasonable projections of future fuel costs, the energy efficient house is economically justified. Commercial firms now offer energy efficiency guarantee contracts. However, homeowners are left holding the bag.

Speaking as a homeowner that needs to make major efficiency improvements, I'm stuck with having to do my own research and there is no one to guarantee results. I would be happy to spend a lot on efficiency improvements, if I could find someone to guarantee the results long term. The discussion on page 44 says that there is now only 1/3 of the investment needed to achieve 2025 goals. This may be a large part of the reason.

Howard Shaffer PE, Enfield, NH
July 25, 2014

Dear Ms. Hatfield,
Thank you for the opportunity to comment on the draft State Energy Strategy. I was able to participate in several of the Advisory Council meetings in Concord and the public meeting in Nashua as an interested community planner. I am impressed with the comprehensive approach and inclusive nature of the proceedings.

SB 191 presents an opportunity to clarify the purpose of a State Energy Strategy and define a forward looking policy for energy security and development. Therefore I would like to emphasize at the outset, that this strategy must define specific goals and metrics. NH has taken a pragmatic approach over the years in ensuring energy security and diversity, promoting economic development and environmental protections, piecing together the framework for this project. Furthermore, the NH legislature, and importantly, government administrators have incrementally adopted policies and legislation to move the state toward a reduced carbon footprint and energy security. However, the absence of a comprehensive, enforceable energy policy has left gaps and inconsistencies in statutes and administrative rules, and resulted in a policy vacuum. My concern is the absence of a reference in this Strategy to the policy goal of greenhouse gas reductions of RSA 362-F (renewable portfolio standards) and RSA 125-O (regional greenhouse gas initiative), particularly as the funding for the development of this plan derived from these programs.

The Public Utilities Commission and the Office of Energy and Planning confirm a pro-active approach to plan for grid security, storage and energy diversity. In a recent State Energy Council Meeting, discussion revolved around the importance of distributed generation and implementing new technologies for net metering to provide an open feedback loop to utilities to manage demand, mitigate intermittency issues and minimizing line losses. What was particularly striking at this meeting, comprised of agency personnel, a bipartisan representation of the House and Senate, and industry and utility interests, was the apparent consensus that the energy strategy should be based on market incentives and metrics be performance based. Innovation and new technologies will derive from industry and energy entrepreneurs creating dynamic efficiencies in production and distribution.

Enacting a State Energy Strategy that sets forth a clear policy direction, sets enforceable performance standards, and is inclusive of the myriad energy statutes, will ensure a more coherent approach to GHG reductions and secure NH's energy future. Also important is streamlining the regulatory process, updating the RPS to address regional REC and ACP pricing, and formalizing energy efficiency and alternative energy programs. Funding for EESE should be protected through the proceeds from the RGGI and ACP. I believe many of your commenters have provided specific recommendations elaborating on the above thoughts.

NH has a history of small but important steps beginning in the 1990's that laid the foundation for energy planning and climate change preparedness, placing NH ahead of many other states, and the nation. I hope we can build on those successes with this Strategy to keep NH on this positive trajectory for energy independence and economic resiliency.

Best regards,
Jo Anne Carr
Director of Planning and Economic Development, Town of Jaffrey
July 25, 2014

Thank you for the opportunity to provide public input into the SB191 process.

As you are likely already aware, Gordon van Welie, CEO of ISO-NE, very recently stated:
"It's going to be very tricky for NE over the next 3-4 years."
Mr. van Welie is referring to our regional capacity of 33,000 MW which, as you know, proved to be inadequate this past winter as auctions came up short and power had to be "imported" from a New York nuclear plant.
As you formulate your recommendations for a much needed updated and forward looking statewide comprehensive energy plan, you obviously have to be cognizant of the six state IS0-NE footprint our NE region governors met to discuss two weeks ago.

Did you see Bloomberg News today? http://www.bloomberg.com/news/2014-07-24/german-utilities-bail-out-electric-grid-at-wind-s-mercy.html Germany is the world's "leader" in industrial scale wind. It's a disaster as emissions there continue to rise. They cite "falling prices" but that reflects subsidies and the fact that Germany is still among the most costly markets in Europe for consumers and businesses, roughly 2-3X the US.
In New England, industrial scale wind produces power almost always when the grid least needs it. A grid that is already constrained does not need low or no capacity generation sources that almost never correlate with load. Local solar is a far better more sustainable, more economically attractive option, than industrial scale wind.

How about Australia, which has apparently recently figured out their bet on industrial wind is a failed one. They have 3000MW of installed wind capacity. A recent high load day saw a 4% capacity average and a 2 hour stretch with zero MW generated across all of their wind "farms."

The point here is that NE cannot rely, any more than these "wind leaders" now realize they can, on an anemic power source that has claimed to deliver benefits it evidently never has. There are a lot of generation combinations that don't involve industrial or "community scale" wind that are economically and environmentally far superior to those generation scenarios that do involve wind.

Any "modeling" of future NE generation combinations should make the real world experiences of other countries, as well as our friends in grid challenged California, a priority set of inputs for the model.

The fact that our grid is already maxed out as it were is not going to be solved by low capacity, non-dispatchable, low correlation to demand, intermittent and unpredictable generation sources. We can cut carbon effectively and efficiently through smart local renewable generation efforts, conservation and energy efficiency.

Continuing to follow failed policies around the world and here in the states is something I hope/trust SB191 will not do.

Thank you again for the chance to participate.

Sincerely,
Larry Goodman, Hebron, NH
July 25, 2014

I think the draft Energy Strategy provides a nice summary of past and future status quo projections of energy use, and lays out some options for moving forward. However, I find it is lacking in providing a bold, or even clear vision of what we want to achieve over the next 10 years. I adamantly believe that without a clear goal and a firm commitment to a course of action, little will be achieved.

Global conventional energy supplies are dwindling and both the cost and environmental impact of energy will continue to trend upward because most of the conventional sources that remain are either:

- difficult to get to(Arctic, North Sea, Gulf of Mexico, etc) resulting in increased costs and chance of spills(i.e. Deep Water Horizon),
- in areas hostile to the US and/or volatile(middle east, Russia, etc) making them unreliable, or
- of poor quality resulting in increased negative environmental impact(coal, tar sands, etc).

To prevent significant, and potentially catastrophic economic and environmental impact on NH residents and businesses we need to substantially reduce our dependence on conventional energy sources through increased efficiency, conservation and use of clean/renewable energy sources such as solar, wind, biomass/biofuel, and tidal power sources.
I urge you to set a specific goal in the state energy strategy to reduce the export of our energy dollars from 66% (nearly $4 billion annually)[1], to 50% by 2023, retaining over $1 billion of economic wealth each year in New Hampshire. This goal can be reached by pursuing the following three strategies:

1. Significantly ramp up energy efficiency and conservation through system wide efficiency investments (customer-side and utility/supplier-side), to reduce overall energy use. In addition to the measures outlined in the draft Energy Strategy, this should include improving the coordination and other programming of traffic signals(such as switching to flashing red/yellow overnight), which would not only yield significant fuel savings but also have many additional benefits[2] such as:
   - Increasing the traffic handling capacity of roads.
   - Reducing collisions, both vehicular and pedestrian.
   - Encourages travel within the speed limit to meet green lights.
   - Reducing unnecessary stopping and starting of traffic - this in turn reduces fuel consumption, air pollution, noise and vehicle wear and tear.
   - Improve journey time.
   - Reducing driver frustration and 'road rage'
2. Replace imported fossil fuel use with locally produced renewable energy, with an emphasis on:
   a. distributed generation
   b. utility-scale generation
   c. thermal and electric fuel switching for heating, cooling, and transportation needs; and,
3. Unleash the private market to finance the infrastructure by minimizing policy risk, sending clear market signals, and better leveraging our minimal available public funds(for example, stop raiding funds intended to reduce dependence on fossile fuels, such as RGGI, to balance the budget in other areas).

Thank you,
Thomas L. Werst, Merrimack, NH
July 25, 2014

[1] Vermont Energy Investment Corporation et al. September 30, 2011. *Independent Study of Energy Policy Issues.*
[2] Wikipedia March 2009 *Traffic light control and coordination*

For some time I've wondered at the number of small hydro dams being destroyed for no good reason. The present push to shove a large gas pipeline into N.H. strikes me as more than a coincidence. We have PSNH trying to avoid having to do business with small, independent power producers, and, a large pipeline company working to drive a pipe to the east coast for export of gas and condensates.

PSNH wants it's economies of scale. That is a given. It is using a period of time when America has a lot of available energy to try to shut down what it regards as nuisances. N.H. required PSNH to do business with these small sources to build resilience and independence into the system. While that is good for N.H., PSNH only cares about what is good for PSNH. That makes them want fewer suppliers and a simpler business model. As there is less pressure on the Legislature at this time to secure our energy independence, PSNH regards the time as ripe.

We are told that we must have more electrical generating capacity. We are told that there were shortfalls. Yet we, as a state, are a net exporter of electrical energy. We should consider the reasons for those shortfalls.

At the time when "there was a shortage of gas" and generators were having to buy off the spot market, the incoming pipeline was running at only 75% of capacity. This points to poor planning by the generators and poor management of the existing pipeline. It also point to poor storage. Liberty gas has published a document that shows that of the new capacity it intends to get from the southern N.H. spur, 50% will go to replace gas lost to storage leaks in Nashua, and, 37% will go to replace gas lost to leaks in Manchester. To allow these people more gas to dump into the atmosphere as an alternative to repairing their leaks is unthinkable. For them it's cheaper to buy than repair. Their leaks are adding more greenhouse gas than any coal plant. Thus, their proposal for a new spur to replenish what they waste is just like a drunk who wishes to lie under the spigot and drink what he wishes from a stream that is mostly wasted. Liberty should be prohibited from any new sources of gas until they repair their existing leaks.

Due to the use of an air conditioner, my electrical use doubled this billing cycle. My cost did not. The net effect is that the more one uses, the less, proportionately, one pays. There was a time when this sales model sort of made sense. Today, it no longer does. Rather than maintain the current practice of charging a baseline fee for the customer being connected to the grid, we should roll that fee into the price per KWH. Further, the practice of discounting electricity by volume used should be reversed for residential customers. Consider it a form of rationing by cost level. After consuming a reasonable number of KWHs per month, further consumption by a customer should be at progressively higher rates. Most customers are cost conscious. Those who make responsible use will pay less per KWH by staying within the base rate. Those who waste the most will pay the most. Industrial / commercial users could be kept on the old model or a modification of the new one. Rule making could provide protection / discounts to medical patients. The wastrels / conspicuous consumers would justifiably pay for their excess consumption. Such pricing structure should produce significant reductions in waste. Naturally, reducing waste should eliminate the need for rapid construction of new generating capacity. It would also lower the demand for new gas.

Additionally, slowing the rush to new construction would allow the state time to construct rules to favor small producers of hydro power and other distributed generation capacity. Tax credits could be provided to those who build small hydro dams or flow diverters to power smaller generators.

John Stark, July 25, 2014