Helping New Hampshire Achieve Its 25 x 25 Goal

Renewable Energy Incentives, Energy Metering, and Energy Conservation Incentives

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Prepared by:

Alexandra E. Mahler-Haug
Elizabeth B. Mitchell

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Contact:
Nelson A. Rockefeller Center, 6082 Rockefeller Hall, Dartmouth College, Hanover, NH 03755
http://rockefeller.dartmouth.edu/shop/ • Email: Ronald.G.Shaiko@Dartmouth.edu

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EXECUTIVE SUMMARY

New Hampshire's "Renewable Portfolio Standards" legislation sets the goal that by 2025 a quarter of the energy used in the state will be generated from renewable resources.[1] Currently, approximately nine percent of the energy consumed in the state is produced by renewable sources. Even though this compares favorably to the national average of seven percent,[2] New Hampshire is still far from its goal of 25 percent by 2025.

This report outlines three methods New Hampshire could use to achieve its goal and increase its production and use of renewable energy. First, it describes financial incentive programs that could be used to encourage consumers to install renewable energy devices as a mechanism for increasing New Hampshire's production of renewable energy. Second, it explains options for reimbursing residents and businesses that own renewable energy devices and supply their surplus energy back to the grid. Third, it describes programs that could be used to encourage consumers to invest in energy conservation or weatherization projects as a mechanism for decreasing New Hampshire's total energy consumptions. This report also examines underused incentives already present in New Hampshire to see how their appeal could be broadened and brought into the general public's consciousness. Each of these sections suggest different policies that New Hampshire could adopt to make better use of its natural resources and to increase its use of renewable energy, while decreasing its overall energy consumption.

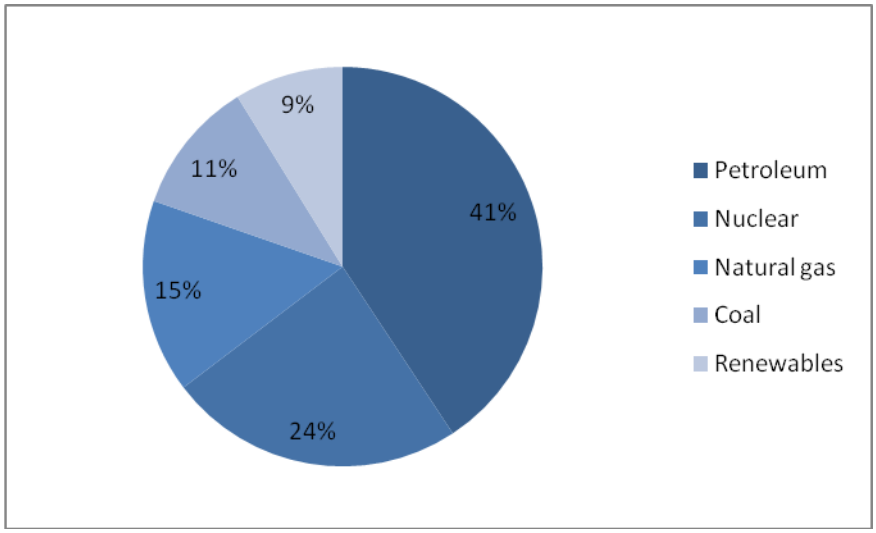
1. ENERGY IN NEW HAMPSHIRE

New Hampshire's per capita energy consumption is among the lowest in the U.S.[3]However, the state's energy expenditures were 8.9 percent of GDP in 2006 and net energy consumption has grown over 168 percent since 1970.This trend looks poised to continue, despite higher energy costs and greater awareness of increased environmental costs of current levels of consumption.[4]

Despite its relatively low energy consumption profile, New Hampshire overwhelmingly relies on fossil fuel sources for its energy provision. Figure 1 graphically shows this reliance: in 2006, 67 percent of New Hampshire's energy came from petroleum, natural gas, or coal. This energy is expensive; only five states pay more than New Hampshire for each unit of energy.[5]New Hampshire has no in-state sources of fossil fuels. Most of the state's energy is imported (90 percent in 2006), making New Hampshire's energy strategy vulnerable to disruptions due to weather, price volatility, commodities markets dynamics, political unrest, and other factors beyond the state's—or the nation's—control[6]

The transportation and residential sectors are New Hampshire's largest consumers of energy; this report will primarily focus on the residential sector and examine strategies that may help change the sector's current energy consumption profile.

Figure 1. New Hampshire Energy Consumption, by Source (2006)



Source: New Hampshire Office of Energy and Planning[7]

1.1 Renewable Energy in New Hampshire

In May 2007, New Hampshire adopted a "Renewable Portfolio Standard" that requires 25 percent of the State's electricity to be generated from renewable sources by 2025, creating the "25 x 25" initiative.[8]In addition to the environmental benefits, renewable energy could decrease energy costs and price volatility by decreasing reliance on external energy sources. In short, New Hampshire's 25 x 25 initiative will help the state decrease its reliance on external energy sources and could decrease energy costs for all consumers in the long run.

To help achieve this goal, New Hampshire could offer residential or small business consumers various incentives to invest in renewable energy projects or to decrease total energy consumption. Currently, New Hampshire offers property tax incentives, rebates, and loans to residents who invest in renewable energy devices or energy efficient technology, as well as a low-income energy efficiency assistance program. Also available to New Hampshire consumers are private programs that work with businesses and residents to increase renewable energy consumption or to decrease energy consumption. Current available programs (public and private) in New Hampshire include:

- *Local property tax incentives*: Towns and cities are permitted to offer local property tax incentives to residents with renewable energy devices. Currently, 84 municipalities offer some sort of property tax incentive for renewable energy devices.[9]
- *Photovoltaic and wind turbine rebates*: New Hampshire's Public Utilities Commission (PUC) is required to offer a three dollar per watt of capacity rebate for residential photovoltaic or wind turbine devices, up to a maximum of $6,000.

Rebates will only be awarded to the extent that funding is available.[10] Due to the fact that this policy[11] was enacted on July 14, 2009,[12] there is little data available on its success.

- *Public Service of New Hampshire (PSNH) SmartSTART*: Offers loans to consumers to install energy saving devices. Loans are repaid at a rate proportional with the reduction in monthly energy bills.
- *New Hampshire Weatherization Assistance Program*: Working with the U.S. Department of Energy and the U.S. Department of Health and Human Services, this project is focused on increasing energy efficiency and reducing the financial burden of home heating for low-income families.

The New Hampshire Electric Co-Operative offers a SmartSTART program similar to the PSNH initiative. The Co-Op also offers an Energy Assistance Program for low-income families. This program reimburses families for energy saving products and provides services, such as energy audits.[13]

1.1.1 Prospects for renewable energy in New Hampshire

In the recent 2010 State of the State Poll, conducted by the Rockefeller Center at Dartmouth College, respondents were asked what might sufficiently incentivize them to increase their home energy efficiency, such as undertaking a weatherization project. The incentive options given were a state grant program, a state loan program, a property tax deduction, or community investment funds. Even though the state or certain municipalities already offer some of these options, they may be currently for other renewable energy purposes (besides weatherization) or not well known. Respondents could choose more than one option. Table 1 shows the results to this question.

Table 1. Results from 2010 Rockefeller Center State of the State Poll (N = 406)

	Would Incentivize	**Would Not Incentivize**	**Number of Respondents**
State grant program	53.08%	46.92%	373
State loan program	17.51	82.49	377
Property tax deductions	81.12	18.88	377
Community investment funds	27.89	72.11	355

Source: Rockefeller Center at Dartmouth College, 2010 State of the State poll

About 8 percent of respondents would take advantage of any of the four incentive programs. About19 percent would take advantage of three of the programs, 30 percent would take advantage of two, 30 percent would take advantage of only one, and 13 percent would take advantage of none of the incentive programs.[14]

Property tax deductions are by far the most popular option: 81 percent of respondents reported that property tax deductions would incentivize them to invest in a weatherization project. Of the respondents who would undertake a weatherization project by using only one incentive program, 84 percent would do so by using a property tax deduction. This demonstrates the potential a property tax deduction policy might have on residents' weatherization and increased energy efficiency habits. Property tax deductions are discussed in Section 2.3.

1.2 Viability of Renewable Energy in New Hampshire

Not all types of renewable energy make sense for every state. Viability of renewable energy sources depends on factors such as geographical location, average wind speed, and solar distribution. Table 2 provides average national efficiencies for hydroelectric, biomass, wind, and solar resources.

Table 2. Typical Net Efficiencies of Some Power Sources

	Yield (Percent)
Hydroelectric (best case)	90
Biomass	75 (est.)
Wind	35 – 60
Photovoltaic solar	15

Source: Cunningham and Cunningham, pp. 451–468

The yields for renewable resources in New Hampshire would most likely differ from the averages given in Table 1due to the state's geographic location and climate. For example, New Hampshire has notable potential for wind resources, especially along ridgelines and in the northern parts of the state, an area that is rated "superb" by the National Renewable Energy Laboratory, as shown on the map in Appendix II.[15]In comparison, New Hampshire has weak solar potential, especially during the winter months.[16] Finally, although the state has great potential in hydroelectric energy, this market is saturated with many existing hydroelectric plants. The market for micro-hydro power, however, is less saturated; New Hampshire has many millponds with unrealized micro-hydro potential.[17]

When considering how best to reach the 25 x 25 goals, it is important for New Hampshire to consider the viability of different renewable energy sources. The viability of renewable energy sources affects the payoff period for renewable energy projects, which could influence investment decisions. For example, given the weak solar radiation in New Hampshire and the difficulties in placing personal wind turbines in productive locations, the payoff period for these types of renewable energy projects could be 20 to 40 years.[18] Comparatively, improving the efficiency of buildings through improved insulation, double-paned windows, and energy-efficient utilities has a potential payoff period of only five to seven years.[19]It is evident that certain strategies to increase renewable energy consumption, as well as to reduce overall energy consumption, are more preferable than others.

1.2.1 Lempster Wind Project

The Lempster Wind Project is New Hampshire's first commercial-scale wind farm, and can serve as an example of the viability of wind power in New Hampshire. This 24 megawatt wind farm came online in November 2008 and is located on privately-owned land near the Town of Lempster, located in the southwest of the state. The farm features 12 wind turbines along a ridgeline. It was developed by Iberdola Renewables, which also currently has additional wind projects in development in New Hampshire, Vermont, and Massachusetts.20

The wind farm was projected to have the capacity to make enough electricity each year to power approximately 10,000 New Hampshire homes. According Paul Copleman of Iberdola Renewables, production has met expectations one year after the facility went online, although he declined to provide the project's exact production figures.[21]PSNH purchases the entire electricity output of the project, and works with the New Hampshire Electric Cooperative as the local Lempster service provider. The wind farm supports the local economy through payments to the Town of Lempster and to private landowners. According to Iberdola, the contractors and crews for the project came from New Hampshire and New England. Additionally, many supplies and services were purchased from New Hampshire firms, including concrete, electrical cable, fuel, sand, food, and lodging. In all, the project created 120 construction jobs and three or four permanent maintenance jobs.[22]According to Copleman, the number of jobs that have been created by the project is in line with projections.[23]

While wind turbines do have a long pay-back period for investors (typically 30 to 40 years), they can still represent a way for landowners with preferably situated property to realize some extra income.[24] Property owners who lease their land to wind projects earn a national average of $6,500 to $7,500 per year, per windmill.[25]

2. RENEWABLE ENERGY: FINANCING INCENTIVES

One way New Hampshire could increase its usage of renewable energy is to offer financial incentives to consumers to invest in renewable energy devices. Financial incentives used in other states include: personal tax incentives, corporate tax incentives, sales-tax exemptions, property-tax exemptions, buy-downs, grants, loans, and production incentives. New Hampshire lags behind other states in terms of the financial incentives it offers to residents. Appendix I provides a U.S. Department of Energy (DOE) table illustrating the various financial incentives offered in each state. This chart shows that New Hampshire offers only property tax incentives, rebates, and loans. Comparatively, Vermont and Rhode Island each offer these three as well as personal tax incentives, corporate tax incentives, sales tax incentives, grants, and production incentives. Although two of these options are unsuitable for New Hampshire, the state could expand its renewable energy incentive programs to include grants and production incentives in order to achieve its 25 x 25 goal.

In addition to helping residents and businesses afford renewable energy devices, financial incentives help build a market for renewable energy by increasing demand for the products. Increased demand could encourage competition and energy innovation, building a robust renewable energy market even after particular incentive program end.

This section will review various types of financial incentives, examining options that have the potential to help foster renewable energy production and consumption in New Hampshire: loans, grants, and production incentives.

2.1 Loans

A loan program provides the buyer with capital, making the initial high cost of renewable energy devices more affordable. Although there are multiple types of renewable energy loan programs, these loans typically have low interest rates, long amortization periods, and lenient qualifying standards. The qualifying standards can be more lenient because the device can be used as collateral and because the buyer's monthly utilities bill is likely to decrease, reducing overall financial obligations to the buyer. A loan program can be beneficial for a state because it does not result in a net fiscal loss.[26]

There are various ways that states can contribute to a renewable energy loan program. First, the state can act as the underwriter by directly loaning to a resident and thus assuming the full financial risk of default. Secondly, the state can match a loan given by a private bank. This structure reduces risk as well as the state's financial burden and administrative costs (as banks will conduct the comprehensive risk analysis). Thirdly, states can buy down commercial interest rates by subsidizing private bank loans. This effectively lowers the interest rates banks charge customers investing in renewable energy. Finally, the state can initiate a Pay as You Save (PAYS) program, which offers renewable energy installation at no upfront cost to the buyer. The buyer pays for the device through a monthly installment plan with payments that are below the magnitude of the customer's monthly energy savings. Under this program, the debt obligation remains with the device, so the next owner of the house will continue to pay off the debt.[27] Vermont has a private and a public example of a direct loan program.

2.1.1 Vermont: New Generation Energy

Similar to New Hampshire, Vermont has a Renewable Portfolio goal of producing 25 percent of the energy consumed in the state from renewable sources.[28] Vermont has many programs aiming to build its renewable energy capacity. Amongst them is a partnership with New Generation Energy (New Generation), a Boston-based non-profit.

New Generation runs a Community Solar Lending Program. The program offers loans with the criteria given in Table 2 on the basis that the recipients use the loan to install a photovoltaic system. To fund this program, New Generation issues Renewable Energy Investment Notes (REINs). REINs allow for socially conscious investors to support the program by investing $1,000 to $1,000,000 in New Generation, with returns up to 2.5

percent annually over a seven-year period.[29] Although REINs are not FDIC insured, they do give investors an opportunity to promote renewable energy advancement.[30]

Currently, all REIN revenue is pooled together to cover all of New Generation's funded projects. It would be possible, however, for New Generation to create regional or statewide notes, so that all revenue from New Hampshire investors was reserved for renewable energy projects in New Hampshire.[31]

Table 3. New Generation Energy Loan Information

	Criteria
Loan Amount	$5,000-$100,000
Term	Typically 1-5 years
Loan Rate	Up to 5.0%
Payments	Monthly amortization repayment No Penalty for early payment
Collateral	The equipment funded plus a personal guarantee

Source: Community Lending Program

New Generation limits its loan recipients to commercial, industrial, educational, and agricultural businesses, in addition to multi-family and low-income residences.[32] New Generation's director, Chuck Lewin, says that they focus on these sectors rather than households because businesses and non-profits must make decisions based on the bottom-line. Households do not have outside stakeholders; they have the option to make decisions based on preferences rather than profit. According to Lewin, many households that would invest in renewable energy initiatives have already done so, or would do so without financial incentives.[33] Nonprofits and small businesses, on the other hand, must justify their investment decisions, so financial incentives could be crucial in motivating them to decide to invest in renewable energy.

2.2 Grants

Grants provide buyers with a lump-sum payment to help cover the initial cost of a renewable energy device. According to the Clean Energy States Alliance, the best practice for grant programs is a five-to-ten year funding commitment. "This is critical to allow local markets to develop and stabilize, without boom and bust cycles of funding."[34] Additionally, states must set eligibility criteria and rebate levels. Eligibility criteria can be based on system types and performance, customer type, or installer. The third criterion is especially important as it can lead to a public-private partnership between the state and a renewable energy device company.

2.2.1 Vermont: Clean Energy Development Fund

Vermont runs a Clean Energy Development Fund (CEDF) loan and grant program. The criteria for this program are presented in Table 4. Table 3 lists the current incentive levels for various types of renewable energy devices. These low interest-rate loans or grants are

available to all qualifying Vermont residents and businesses wishing to invest in a renewable energy device or an energy efficiency project. The CEDF is funded through the Vermont Department of Public Service and Entergy Nuclear Operations, Inc. According to the 2010 fiscal year budget, the CEDF expects to receive approximately $21 million from federal programs, including funds from the American Recovery and Reinvestment Act, and approximately $7 million from state funds. The state funds include funds from Entergy, a nuclear energy company owned by General Electric, which will continue making payments to the fund through 2012.[35]

Table 4. Vermont CEDF Loan Information

	Criteria
Loan Amount	$50,000-$500,000
Term	3-10 years depending on the use of the loan (working capital, machinery, or real estate)
Loan Rate	Fixed at 2.0%

Source: CEDF Loan Brochure 7-15-09

Table 5. Vermont CEDF Incentive Levels

	Individuals and Businesses	**Multi-Family and Low-Income**
Solar Electric	$1.75/Watt	$3.50/Watt
Solar Hot Water	$1.75/100Btu/day	$3.50/100Btu/day
Wind	$2.50/Watt	$4.50/Watt
Hydroelectric	$1.75 per 3ft-gal/min	$3.50 per 3ft-gal/min

Source: Annual Plan FY 2010, 2009

According to the Vermont Department of Public Service, "the goal of the Fund is to increase the development and deployment of cost-effective and environmentally sustainable electric power resources—primarily with respect to renewable energy resources, and the use of combined heat and power technologies—in Vermont."[36] The CEDF has been successful in reaching its goal: 84 new renewable energy systems were installed and another 168 were approved for future installation during 2008. Of the 84 completed projects, five were wind systems, 69 were photovoltaic systems, and ten were solar hot water systems.[37]

Recipients of CEDF grants are diverse. One project funded by the CEDF was $50,000 for a solar photovoltaic project proposed by a farmer, Edgar May. The total project cost was $454,710. May estimated that the payback for the renewable energy project would be 48.6 years without the grant, and 42.9 years with the grant. As a comparison, payback for other approved projects was as low as 4.5 years for a $1.8 million Biomass Combined Heat and Power Partnership by the Brattleboro Hospital. The CEDF agreed to grant $500,000 towards covering the costs of this project.[38]

2.3 Property Tax Incentives

New Hampshire RSA 72:61-72 allows local governments to offer exemptions from local property taxes for the installation of certain renewable energy devices.[39] According to the New Hampshire Office of Energy and Planning, 84 towns and municipalities offer some sort of property tax incentive for residents to install renewable energy devices and systems. These incentives range from offering exemptions, deductions, to a combination of both. Incentives are offered for solar, wind, wood heating, or a combination of those three.[40]

2.3.1 Local Property Tax Incentives around New Hampshire

Available property tax incentives in municipalities differ not only in terms of the eligible systems, but also in the specifications of the deductions or exemptions. The towns offering property tax incentives that were interviewed for this report fell into one of three general categories.

First, some towns offer incentives by discounting the increased property value that results from installing a renewable energy system. This discount is applied after the property has been re-assessed with the renewable energy system. In this case, the net property value usually increases, but not as much as it would without the incentive. Second, some towns simply do not include the added value of an installed renewable energy system in property assessments. Third, some towns do not include the added value derived from an installed renewable energy system when assessing the property, while also offering a deduction from the original property tax. This provides additional incentive for residents to invest in renewable energy systems.

Table 6 provides an overview of some towns in New Hampshire and the property tax incentive programs that they offer, demonstrating that programs and their success vary widely by town.

Table 6. New Hampshire Property Tax Incentives

Town	Eligible systems	Deduction amount	Other specifications	Number of systems
Columbia[41]	Solar, wind	Based on cost of system	Deduction after property value re-assessed	• 2 solar • 1 wind Adopted in 1980s
Keene[42]	Solar	• Based on cost of system, up to $10,000	• Deduction after property value re-assessed • Competitive application process (includes inspection)	• 2 in 2009 • 3 applications for 2010
Pelham[43]	Solar, wood heating	• Based on cost of system • Up to $10,000 for solar • Up to $3,000 for wood heating	• Deduction after property value re-assessed • Does not have to be connected to grid	• 14 solar • 42 wood heating • Adopted in 1982
Wolfeboro[44]	Solar	• Based on cost of system (range from $3,00 to $30,000)	• Deduction after property value re-assessed	• 6 (2 are net-metered) •
Conway[45]	Solar, wind, wood heating (not weatherization)	• None	• Does not add to property values • No application	• Does not keep track • Program started in early 1980s
Colebrook[46] **and Winchester**[47]	Solar, wind, wood heating	• None	• Does not add to property values	• Does not keep track
Enfield[48]	Solar, wind, wood heating	• None	• Does not add to property values	• 1 solar (existed before incentive program) • 1 wind-mill

				• 2 new solar
Newmarket[49]	Solar, wind, wood heating	• $6,000 - $10,000 for solar • $4,100 - $6,000 for other systems	• Does not add to property values • New system must be main source of energy	• 4 total

Another difference between the programs is the environment under which they were started. About half of the programs in the above list are antiquated and began in the 1980s. Most others were the results of individuals' initiatives. Politically and environmentally conscious individuals that are aware of RSA 72:61-72 have moved for their municipalities to adopt property tax exemptions. None of the listed towns adopted property tax exemptions as a result of the local government's initiative.

While the relative success of various property tax incentives in encouraging residential investment in renewable energy devices around the state is difficult to determine, it is evident that there is a certain amount of demand for such incentives. However, property tax deductions do not decrease the up-front costs of renewable energy production and consumption, and thus may not overcome prohibitive financing challenges. However, given the striking results from the 2010 Rockefeller Center State of the State Poll (Section 1.1.1), smaller scale projects (such as weatherization projects) may be more readily undertaken with the incentive of a property tax deduction.

3. RENEWABLE ENERGY: PRODUCTION INCENTIVES

Net metering is a production incentive that measures the amount of energy exported back into the grid by customers who use renewable energy devices. Customers receive credit for any net energy they provide back to the system. Net metering utilizes meters that are capable of recording energy production and consumption. It provides incentives to homeowners and businesses with renewable energy facilities by crediting customers for net excess electricity generated each billing period. Net metering is a simple mechanism that promotes the use of small-scale renewable energy systems.

Net metering has many attributes that make it an attractive option for increasing renewable energy production and consumption. One of the predominant characteristics is that net metering can address many challenges often associated with renewable energy sources. For example, many renewable energy sources such as wind and solar, are intermittent and often unpredictable resources, making it more likely that production and consumption occur at different rates necessitating sufficient energy storage capacity. It is traditionally expensive (and often environmentally hazardous) to store energy, as batteries are most commonly used, with limited effectiveness.[50]

However, net metering addresses the difficulties in aligning renewable energy production with consumption by overcoming these storage problems often associated with renewable energy sources. Net metering enables customers to receive credit for excess energy contributed back to the grid during the times that production exceeds consumption. Without net metering policies, customers would receive no compensation for their excess production. Net metering, therefore, incentivizes residents to both invest in renewable energy devices and to connect these devices to the grid.

Secondly, utility companies benefit from net metering because it reduces stress on energy grids. External power lines are not needed because energy is produced at the same source where it is consumed, reducing traffic along the lines. Additionally, solar energy consumption is typically correlated with production; the most energy is consumed on hot, summer days, which is also when the most solar energy is produced. It is these peak days that usually cause the most stress to energy grids, sometimes leading to blackouts. Overall, net metering enables utilities to manage their peak load more efficiently.[51]

There are also several costs that should be considered when implementing a net metering system. First, there are upfront costs, including the safety equipment to protect grid components and individual energy devices in the event of an electrical surge.[52] Additionally, a two-way meter must be installed to allow for both consumption and production measurement.[53] It is also significant to note that net metering could decrease revenue for utilities whose consumers' energy production offsets their consumption.

3.1 Net Metering Policy

Under the federal Energy Policy Act of 2005, all public electric utilities are required to make net metering available to the customers they serve.[54] However, net metering policies are allowed to vary by states and localities. Components of net metering policy that can vary from state to state include:

- *Subscriber Limit:* A limit on the allowance of net-meter energy that the utility company can intake from customers who contribute energy to the grid. This is given as a percentage of the utility's annual peak load, and ranges from a low of 0.1 percent to a high of no limit.[55]
- *Power Limit:* A limit on the power capacity of each subscriber's device. Appendix III details the range of capacity limits by the states that have adopted a net metering policy. These capacities range from ten kilowatts in Indiana to unlimited capacity in Arizona, Colorado, and Ohio.[56]
- *Rollover:* A policy that states the maturity of energy credits accumulated by customers. This policy is necessary because renewable energy typically varies by season. A rollover option accounts for seasonal variations in energy reimbursement.

- *Compensation:* A policy that stipulates type and value (retail versus wholesale cost) of energy credit reimbursements for customers.

According to the Database of State Incentives for Renewables and Efficiency, "42 states and the District of Columbia [had] adopted a net metering policy" by November 2009. The map in Appendix III shows that New Hampshire has a lower capacity limit than most New England states but is fairly average when compared the nation as a whole.[57]

New Hampshire requires that all utilities in the state provide net metering to its customers. Utilities cannot provide net metering for more than one percent of its annual peak load (subscriber limit). Additionally, the capacity of each renewable energy device is limited to 100 kilowatts. Net energy generation from a billing period is credited to the customer over subsequent periods. There is monthly rollover of energy credits, with an annual reimbursement at retail price if needed. Eligible renewable sources include "photovoltaics, landfill gas, wind, biomass, hydroelectric, geothermal electric, small hydroelectric, tidal energy, wave energy, and biodiesel."[58]

3.2 Virtual Net Metering

Virtual net metering allows customers to receive net metering credits for a renewable energy device that is not located on their property. Consumers benefit from the same accounting structure as net metering, receiving credit for net energy provided to the power grid. This is less advantageous to utilities because it does not decrease stress on the grid, for the energy (while renewable) must still be transported from production site to consumption site.

Often, virtual net metering will deliver electric power to a group of customers through a shared power grid and infrastructure. This aggregated metering is often referred to as "community net metering" or "neighborhood net metering." There are different ways to structure aggregated metering systems. Generally, each customer owns or leases a fraction of the system, which includes shared electric distribution cables, remote monitoring instruments, and reporting instruments. Customers still pay individual bills based on their net electricity usage.[59]

The primary advantage of virtual net metering is that consumers may participate in net metering programs regardless of their geographic location. Further, it allows renewable energy sources to be placed in areas with greater potential to produce renewable energy.[60] For example, virtual net metering could enable New Hampshire residents and municipalities to benefit from remote but ideal locations for wind energy production, such as the mountain ridges shown in Appendix II. New Hampshire legislation does not currently address virtual net metering or net metering aggregation.[61]

3.1.1 Virtual Net Metering in Other States

According to the Interstate Renewable Energy Council (IREC), only seven states had adopted "meter aggregation" policies as of October 2009. These seven states (followed by policy) are: California (Multifamily Affordable Solar Housing Program), Massachusetts (neighboring net metering), Oregon (meter aggregation allowed on contiguous property), Pennsylvania (virtual meter aggregation allowed), Rhode Island (meter aggregation allowed for certain customer classes), Vermont ("Group Net Metering" allowed), and Washington (meter aggregation allowed).[62]

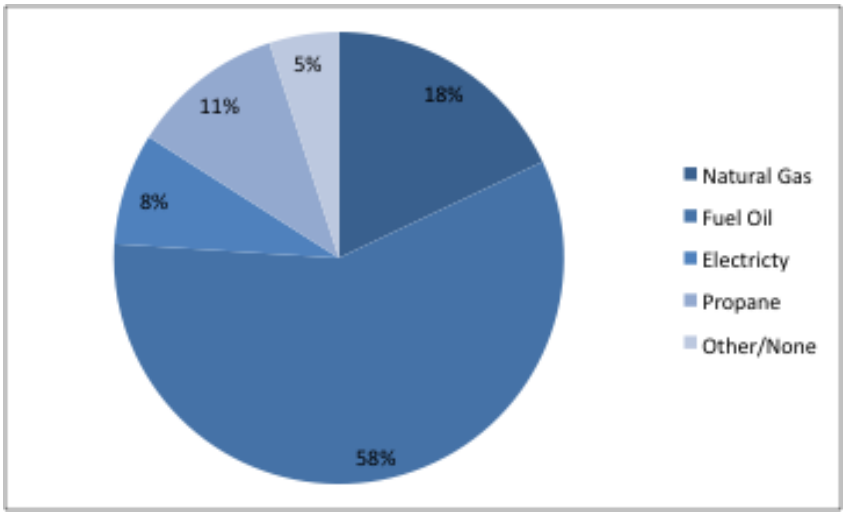
Vermont's net metering legislation allows for "Group Net Metering." Under this provision, a group of customers can collectively invest in one renewable energy system from which they can all benefit. The capacity of the group's system may exceed 250 kilowatts (Vermont's net metering limit) as long as the group appeals to the Public Service Board. The utility issues a "single aggregate monthly bill" to the group to allocate net credits amongst its members.[63] There is one example of group net metering being successfully implemented in Vermont, even though the legislation allowing for it was passed over five years ago. This project was implemented by David Blittersdorf of All Earth Renewables.

4. ENERGY CONSERVATION: WEATHERIZATION

An additional mechanism that New Hampshire could use to achieve its 25 x 25 goal is a program to decrease total energy consumption through increased energy conservation and efficiency. This would increase the proportion of renewable energy without increasing the total amount of energy provided by renewable sources. This section will focus on how to achieve residential energy consumption reductions through improved efficiency and weatherization.

Winters in New Hampshire are long and cold. This has severe implications for energy consumption. Approximately half of the energy used by New Hampshire homes is for heating and most of which is sourced from fossil fuels, as shown by Figure 2.[64] In recent years, it has become more expensive to heat homes; according to the Energy Information Administration, the average price for heating oil increased 9.5 percent from 2006 to 2007, and 23.5 percent from 2007 to 2008.[65] The typical New Hampshire household spent around $3,000 on heating last winter.[66] Residential heating demand in New Hampshire represents a large expense and a significant opportunity for savings.

Figure 2. Heating for New Hampshire Residences, by Source (2000)



Source: U.S. Department of Energy, Energy Efficiency and Renewable Energy[67]

4.1 Benefits of Weatherization

One way to reduce energy expenditures on heating while maintaining climatic comfort is through residential weatherization. Weatherization projects include minor air-sealing, window wrapping, closing sections of houses, and moving furniture away from air ducts, radiators, and baseboards. Residential weatherization projects can help mitigate the effects of the state's climate for residents while reducing the financial burden of home heating. Ultimately, these projects could also help reduce overall state energy consumption.

Even in a well-insulated home, up to 30 percent of heat energy is lost through small cracks around doors, windows, thresholds, and frames,[68] and few New Hampshire homes were built with energy efficiency as a priority. Basic weatherization can have a large impact on energy expenditures on heating. For example, by simply plugging air leaks with caulking or sealing, a family can save 10 to 20 percent on their heating bills, and sealing ductwork alone can result in an average annual savings in heating bills of 17 percent.[69] According to the Department of Energy, residents who have thoroughly weatherized their homes can see their annual energy bills reduced by an average of about $350, depending on fuel prices.[70] Additionally, because the energy improvements that make up increased weatherization are long lasting, the savings keep adding up over time, to substantial benefit of homeowners.[71]

4.2 Residential Weatherization

The first step in undertaking a weatherization project is assessing how much energy a home consumes and to evaluate what measures can be taken to make a home more

energy-efficient. This can be accomplished through a home energy audit, which will highlight problems that may (when corrected) save a homeowner significant amounts of money through reduced consumption of energy. Audits also determine the efficiency of a home's heating and cooling systems.

A simple energy audit can be self-performed by a homeowner, but it is best to have a professional energy auditor carry out a more thorough audit. A professional auditor uses a variety of techniques and equipment to determine the energy efficiency of a structure. Thorough energy audits often use equipment such as blower doors, which measure the extent of leaks in the building envelope, and infrared cameras, which reveal areas of air infiltration and missing insulation. Though fees may vary, an energy audit typically costs around $500.[72]

4.3 Weatherization in New Hampshire

There are many options available to homeowners wishing to weatherize their residences and decrease their energy consumption. In New Hampshire, these options are limited, as the available weatherization assistance programs are either narrowly focused on aiding low-income families or are private programs that are focused on customers of particular utility companies.

4.3.1 New Hampshire Weatherization Assistance Program

New Hampshire's Office of Energy and Planning (OEP) operates a Weatherization Program with funding from the DOE and the U.S. Department of Health and Human Services, and in partnership with Community Action Agencies around the state. New Hampshire's Weatherization Assistance Program is focused on reducing the financial burden of home heating for low-income households through increased weatherization. In addition to reducing energy costs, increased weatherization can have the benefit of decreasing reliance on state aid and energy assistance through reduced overall energy consumption for low-income families.[73]

New Hampshire's Weatherization Assistance Program is not available to the general population, as eligibility is based upon household income and must not exceed 200 percent more than the federal poverty guidelines for a given number of residents in a household.[74] This criteria means that only 17 percent of New Hampshire's population would be eligible for such a program.[75] The Weatherization Assistance Program is also constrained by other factors, such as funding. Even within the population eligible for state weatherization assistance, there is a higher need than can be met. In 2004, there were 7,633 applicants for the Weatherization Program, but only 787 could be serviced.[76] In 2009, the OEP applied for funds through the American Recovery and Reinvestment Act (ARRA) Weatherization Assistance Program, and received enough funds to weatherize approximately 3,500 more homes, while also increasing the average investment per dwelling, from $2,500 to $6,500.[77] However, these expanded services are only available for low-income households.

There are other options for residents who would like to undertake a weatherization project, such as programs provided by utilities. However, there is no comprehensive weatherization program available to the general population of New Hampshire. There are several examples of other weatherization programs—made possible primarily through funding from ARRA—which could help inform New Hampshire as it looks to achieve a more sustainable and secure energy future.

4.4 Weatherization in Maine

As the first state to implement an energy efficiency program and the first state to pass legislation addressing global warming, Maine is a leader in the development of innovative energy policies. In January 2009, the Governor's Office of Energy Independence and Security (OEIS) presented the state's first comprehensive energy plan, which cited the necessity of building public-private partnerships that can "transform an energy inefficient and consumption-driven culture into a more efficient and sustainable energy culture."[78] The OEIS Comprehensive Energy Plan called on Maine to establish policies and implement programs that will help the state evolve from a fossil fuel-dominated culture to a sustainable energy culture, stressing the need to increase overall energy efficiency through reduced consumption, conservation, and weatherization.[79]

To work toward achieving the goal of reduced energy consumption, increased conservation, and increased weatherization, Maine administers Efficiency Maine. This statewide energy program focuses on reducing overall electricity costs and usage through increased efficiency. Efficiency Maine works towards these goals by helping residences, businesses, and schools reduce electricity energy costs through energy audits, incentives, and loans; providing weatherization assistance through the Maine Home Energy Savings Program; and administering a renewable energy program that includes solar and wind power rebates.[80]

4.4.1 Maine Home Energy Savings Program

The Home Energy Savings Program offers incentives up to $3,000 to homeowners at all income levels to weatherize their homes and reduce their energy expenditures on heating. This is accomplished through reimbursements to residents for pre-approved energy-efficiency upgrades and increased weatherization performed by participating contractors. This program is funded through a State Energy Program Formula Grant in the State Energy Program (SEP) section of the ARRA, which is administered by the DOE.[81] The Home Energy Savings Program is broadly available to residents in Maine. Homeowners of any income level are eligible to apply for Maine's program, but low-income households are encouraged to apply for special weatherization services through Community Action Agencies.[82]

The Home Energy Savings Program works to provide residents with resources to reduce their energy consumption, while offering training for contractors and professionals to increase their knowledge of weatherization techniques. Residents' weatherization projects are eligible for reimbursements through the Home Energy Savings Program if

the projects are significant, amounting to household savings of at least 25 percent on heating and hot water expenditures.[83] This is determined by a home energy audit, performed by a pre-approved professional. After the energy audit is complete, eligible home improvements through the program include:

- Insulation and air sealing
- High efficiency heating systems
- High efficiency water heaters
- Solar heating systems
- Programmable thermostats
- ENERGY STAR™ windows
- Other home upgrades, such as new heating systems

If the weatherization measures save 25 percent of energy expenditures, residents are reimbursed for 30 percent of the completed project cost, up to a maximum amount of $1,500, but if 50 percent or greater savings are achieved through the recommended weatherization measures, residents are reimbursed for 50 percent of the completed project cost, up to a maximum of $3,000.[84] According to Andrew Meyer, the Program Director, as of April 2010, Maine's Home Energy Savings Program has 50 participating contractors, 135 home energy audits completed, and 12 completed weatherization retrofits, which is on track with the Program's forecasts and short-term goals.[85]

4.5 Weatherization in Minnesota

While Minnesota's Weatherization Assistance Program is not available to the general population (it focuses on aiding low income families), it provides an example of a recently expanded weatherization assistance program that, through increased funding and scale of operations, can better meet demand.

4.5.1 Minnesota Weatherization Assistance Program

The Minnesota Office of Energy Security receives annual funding from the DOE to support the state's Weatherization Assistance Program, which has existed since 1976. The program's funding was greatly expanded through funds from ARRA, when Minnesota received $132 million through the DOE's Weatherization Assistance Program.86

Nearly 60 percent of Minnesota's residential energy use goes to home heating.[87]Through Minnesota's Weatherization Assistance Program, qualifying homeowners can receive up to $6,500 for home weatherization improvements. Qualifying homeowners must earn less than 200 percent of the poverty level, or must earn less than 50 percent of the state's medium income.[88] Households where one or more members have received Temporary Assistance for Needy Families or Supplemental Security Income within the last twelve

months also qualify. Priority is given to households with at least one elderly or disabled member and to households with the highest heating costs.[89]

Similar to New Hampshire, one of the central goals of this particular initiative is to decrease the reliance on state aid and energy assistance. For example, it is estimated the weatherization improvements, such as installing new doors and windows, will cut energy bills for Minnesota residents by as much as 30 percent, which has the potential to help low-income households reduce their reliance on state energy assistance in the long-term.[90]

As of January 2010, almost 1,400 homes have been weatherized in Minnesota since it received the ARRA funding, with another 2,300 homes in progress.[91] Additionally, the expanded Weatherization Assistance Program created 341 full-time equivalent jobs in Minnesota for the period between October 1, 2009 and December 31, 2009.[92] It is also estimated that 52 direct jobs and 23 indirect jobs are created for every $1 million invested in weatherization efforts.[93] Minnesota provides an example upon which to successfully model the expansion of an existing weatherization assistance program for low-income residents while also bolstering the economy through the creation of jobs.

5. ENERGY CONSERVATION: SMART METERING

Smart metering allows utilities to conduct real-time monitoring of their customers' energy consumption. This technology enables differential pricing, a practice that charges customers different prices based on the time of day or season of their energy consumption. Differential pricing can reduce peaks in energy demand by charging higher prices for energy consumed during peak times, and lower prices for energy consumed during non-peak times. These different rates incentivize consumers to alter their consumption behavior. Differential pricing additionally increases the efficiency of power plants by making use of the energy produced during non-peak hours; because it can take days for a power plant to reduce production rates, the plant must always be producing enough energy to provide for the peak load. This causes most of the energy produced during non-peak hours to be lost because it is expensive and environmentally hazardous to store electrical energy.[94] Smart metering has the potential to increase grid efficiency and decrease total energy production.

Additionally, smart metering can incentivize individuals to decrease energy consumption by providing real-time feedback about energy usage. Dartmouth College professor Lorie Loeb has designed a Green Lite monitor, which uses smart meter technology to display real time energy use for a building, using analytical and emotional means. The display compares present energy use to average energy use and to past energy use. Loeb reports that the simple installation of Green Lite monitors in Dartmouth residence halls has resulted in a 10 percent decrease in energy consumption. This decrease in energy consumption jumps to 30 percent during competition periods when students are hyper-aware of the monitors.[95] The success of these monitors shows that promotion of smart meters in New Hampshire could create measurable decreases in energy consumption.

6. FUNDING OPPORTUNITIES: ARRA

The American Recovery and Reinvestment Act of 2009 (ARRA) offers unprecedented opportunities for state and local governments to reduce energy, reduce greenhouse gas emissions, and create jobs through the implementation of clean energy (which is defined as energy efficiency, renewable energy, and combined heat and power) programs. While New Hampshire has recently enacted a revolving loan program to help business owners and non-profit organizations in the state make energy improvements on their buildings, funded through the State Energy Program of the ARRA, there are many other opportunities that states and local governments can take advantage of in order to ensure a better, more sustainable energy future. See Appendix V for more information about specific funding opportunities.

7. CONCLUSIONS AND RECCOMENDATIONS

This paper reviewed three methods New Hampshire could use to achieve its 25 x 25 initiative, drawing upon examples from states, private entities, and other organizations to generate ideas and lessons learned. Focusing on the residential sector, this report discussed ways that New Hampshire could increase its production of renewable energy, and strategies to decrease its overall fossil fuel energy consumption (which could increase the proportion of energy used from renewable sources).

First, financing incentives such as loans and grants would effectively decrease the price of renewable energy devices, making them more affordable to consumers. This could increase demand for the devices and help build a renewable energy device market, while also increasing the amount of renewable energy produced in New Hampshire. Financing incentives could also be used to decrease total energy consumption by encouraging consumers to invest in energy efficient appliances and other measures, such as weatherization projects. These incentives include tax deductions, rebates, and more.

Another way to encourage energy conservation is through production incentives, such as net metering and smart metering. Smart metering involves a differential pricing system that is aimed at reducing peaks in energy demand, while net metering can incentivize investment in renewable energy devices because it guarantees compensation when excess energy is produced, allowing it to be provided back to the grid. Virtual net metering and community net metering could be especially effective in New Hampshire because it allows for consumers to be credited for off-site renewable energy devices, which can then be strategically placed in more efficient areas. Thirdly, creating more opportunities for residents to increase their home energy efficiency through weatherization is a way for New Hampshire to decrease overall energy consumption in the state, and thus should be considered as a complimentary strategy to financing and production incentives.

An additional strategy that New Hampshire could pursue in order to increase interest in renewable energy production and consumption is to raise awareness of local property tax deductions and exemptions for the installation of renewable energy systems. Currently, New Hampshire allows towns and municipalities to offer property tax exemptions for

residents who install a wind, solar, or wood heating systems. While 84 towns and municipalities offer certain property tax deductions and exemptions, these measures vary around New Hampshire, by eligible systems and by deduction or exemption method.

Based on interviews with nine New Hampshire towns, it seems that many local property tax exemptions arose at the behest of an individual, with few others taking advantage of the resulting deductions or exemptions. New Hampshire should undertake a campaign to raise awareness of property tax incentives in order to motivate citizens to either take advantage of existing measures or urge their towns and municipalities to pass property tax measures for renewable energy systems. However, given the number of people who said that they would be incentivized to undertake a weatherization project by a property tax deduction in the 2010 Rockefeller Center State of the State Poll, it seems that this incentive has great potential. Because of the many benefits associated with increased weatherization and enhanced energy efficiency, New Hampshire should consider adding a measure to NH RSA 72 to include weatherization projects to be eligible for property tax deductions along with wind, solar, and wood heating systems.

In conclusion, financing incentives, production incentives such as energy metering programs, and financial incentives for increased weatherization could help New Hampshire decrease its total energy consumption and increase its renewable energy consumption, all in working to achieve its goals of 25 percent of renewable energy by 2025.

APPENDIX I. FINANCIAL INCENTIVES FOR RENEWABLE ENERGY, BY STATE

State	Personal Tax	Corp Tax	Sales Tax	Prop Tax	Rebates	Grants	Loans	Industry Support	Production Incentives
Federal	3-F	4-F				3-F	5-F	1-F	1-F
Alabama	1-S				2-U	1-S	1-S 1-U		1-U
Alaska						1-S	2-S		1-U
Arizona	3-S	1-S	1-S	2-S	6-U		1-U	1-S	
Arkansas					1-U		1-U		
California				1-S	7-S 38-U 3-L	1-S	2-S 1-U 3-L		1-S 1-U
Colorado			2-S 1-L	2-S	9-U 1-L	1-S 1-L 2-P	1-S 4-U 2-L		
Connecticut			2-S	1-S	2-S 2-U	3-S	2-S 1-P	2-S	
Delaware					1-S	2-S			
Florida		2-S	2-S	1-S	1-S 10-U 1-L	1-S	5-U	1-L	2-U
Georgia	1-S	1-S	1-S		1-S 8-U		1-U		2-U
Hawaii	1-S	1-S		1-L	2-U		1-S 2-U 1-L	1-S	1-S
Idaho	1-S		1-S	1-S		1-P	1-S		1-P
Illinois			1-S	2-S	1-S 1-U	2-S 1-L 1-P	1-S		1-P
Indiana				1-S	4-U	1-S	1-U		
Iowa	1-S	1-S	1-S	3-S	11-U	1-S	2-S 1-U		
Kansas				1-S	2-U			1-S	
Kentucky	1-S	2-S	1-S		7-U		1-U 1-L 1-P		1-U
Louisiana	1-S	1-S		1-S			2-S		
Maine			1-S		1-S	1-S	1-S 1-P		1-S
Maryland	3-S	3-S	2-S	4-S 7-L	3-S 1-L		3-S		
Massachusetts	2-S	3-S	1-S	1-S	2-S 6-U	4-S	1-S 1-U 1-P	1-S	1-P
Michigan				2-S	3-U	2-S		3-S	1-U
Minnesota			2-S	1-S	2-S 23-U	2-S 2-U	5-S 3-U		1-S 1-U
Mississippi					4-U		1-S 2-U		1-U
Missouri		1-S			7-U		1-S 1-U		
Montana	3-S	1-S		3-S	4-U	1-U	1-S	2-S	1-P
Nebraska			1-S		2-U		1-S		
Nevada			1-S	3-S	1-S		1-S		
New Hampshire				1-S	1-S 4-U		1-S 1-P		
New Jersey			1-S	1-S	5-S	1-S	2-S 1-U	1-S	2-S
New Mexico	4-S	3-S	2-S				1-S	1-S	3-U
New York	3-S	1-S	1-S	2-S 1-L	5-S 4-U 1-L	2-S	3-S 1-L	2-S	
North Carolina	1-S	1-S	1-S	2-S	6-U	1-S	3-S 1-U		3-U 1-P

North Dakota	1-S	1-S		2-S			2-U		
Ohio		1-S	1-S	1-S 1-L	5-U 1-P	6-S	2-S 1-U 1-L	1-S	
Oklahoma		1-S			3-U		4-S 2-U	1-S	
Oregon	1-S	1-S		1-S	8-S 21-U	1-S 1-P	3-S 11-U	1-S	1-S 1-U 1-P
Pennsylvania	1-S	1-S		1-S	1-S 1-L	8-S 1-U 2-L	6-S 1-U 5-L	3-S	
Rhode Island	1-S	1-S	1-S	2-S	1-U	1-S	1-S 1-P		1-P
South Carolina	1-S	2-S	1-S		4-U		1-S 4-U		1-S 1-U 1-P
South Dakota				3-S	4-U		2-U		
Tennessee				1-S		2-S	1-S	1-S	1-U
Texas		1-S		1-S	19-U 2-L	2-S	2-S	1-S	1-U
Utah	1-S	1-S	1-S		6-U			1-S	
Vermont	1-S	1-S	1-S	1-S	1-S	1-S 1-U	2-S 1-P		1-S 2-U
Virginia				1-S	3-S		1-S	1-S	1-U
Washington			1-S		16-U	1-L 1-P	13-U	1-S	1-S 3-U 1-P
West Virginia	1-S	1-S		1-S					
Wisconsin			1-S	1-S	3-S 4-U	1-S 1-U	2-S	3-S	5-U
Wyoming			1-S		1-S 3-U		2-U		
DC					1-S				
Totals	39	39	36	63	315	70	157	32	52

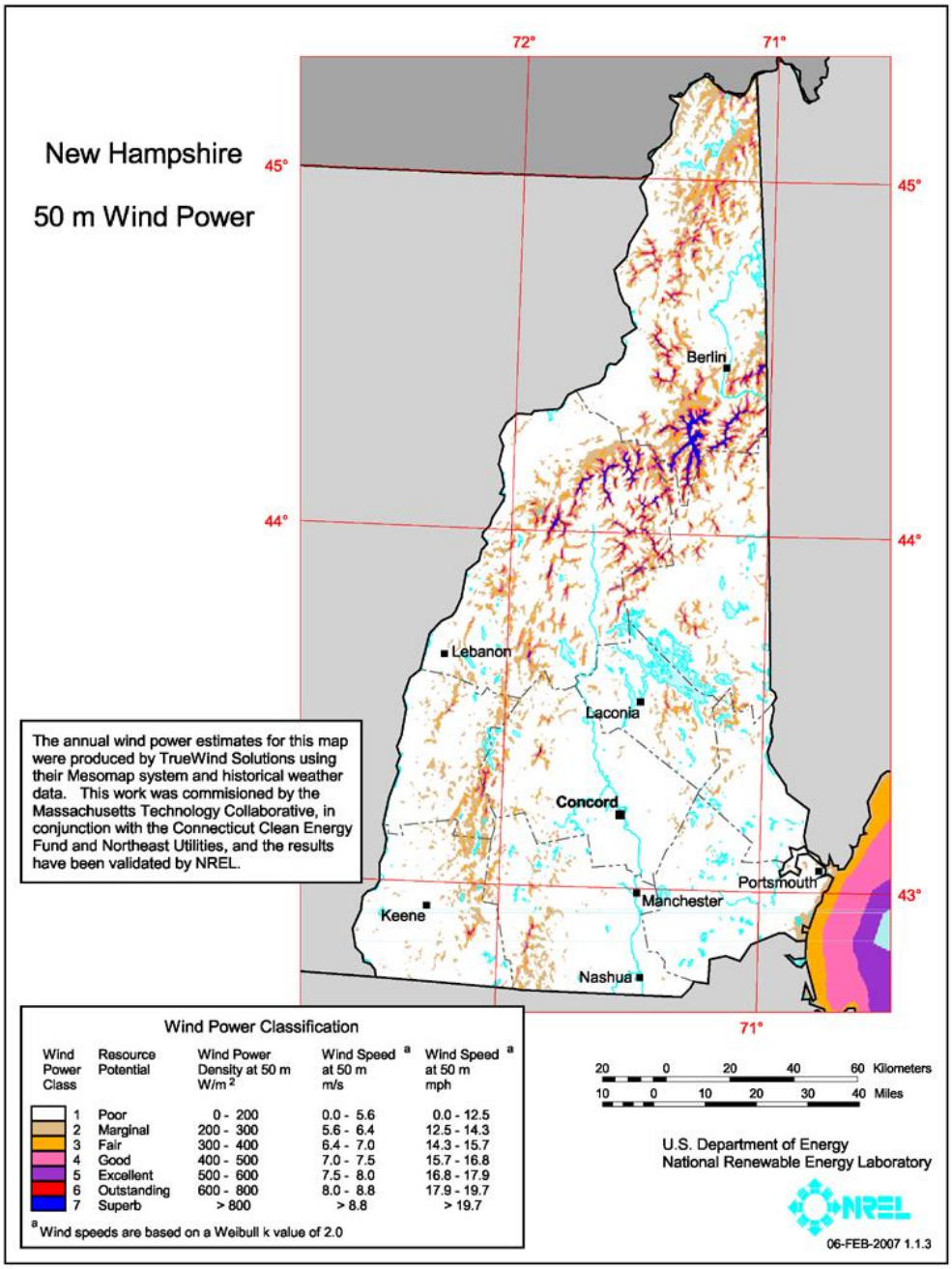
Source: DSIRE: Summary Tables – Financial Incentives

APPENDIX II. IOWA: ALTERNATIVE ENERGY REVOLVING LOAN PROGRAM

Iowa leads the nation in production of renewable wind energy.[96] In addition to its advantageous geographic characteristics, its successes also stem from two measures taken by the state legislature. In 1983, the Alternative Energy Production law "required the state's investor-owned utilities to purchase 105 megawatts (averaged) of electricity from renewable energy projects."[97] (As a comparison, the wind farm in Lempster, NH has a capacity of 24 megawatts).[98]

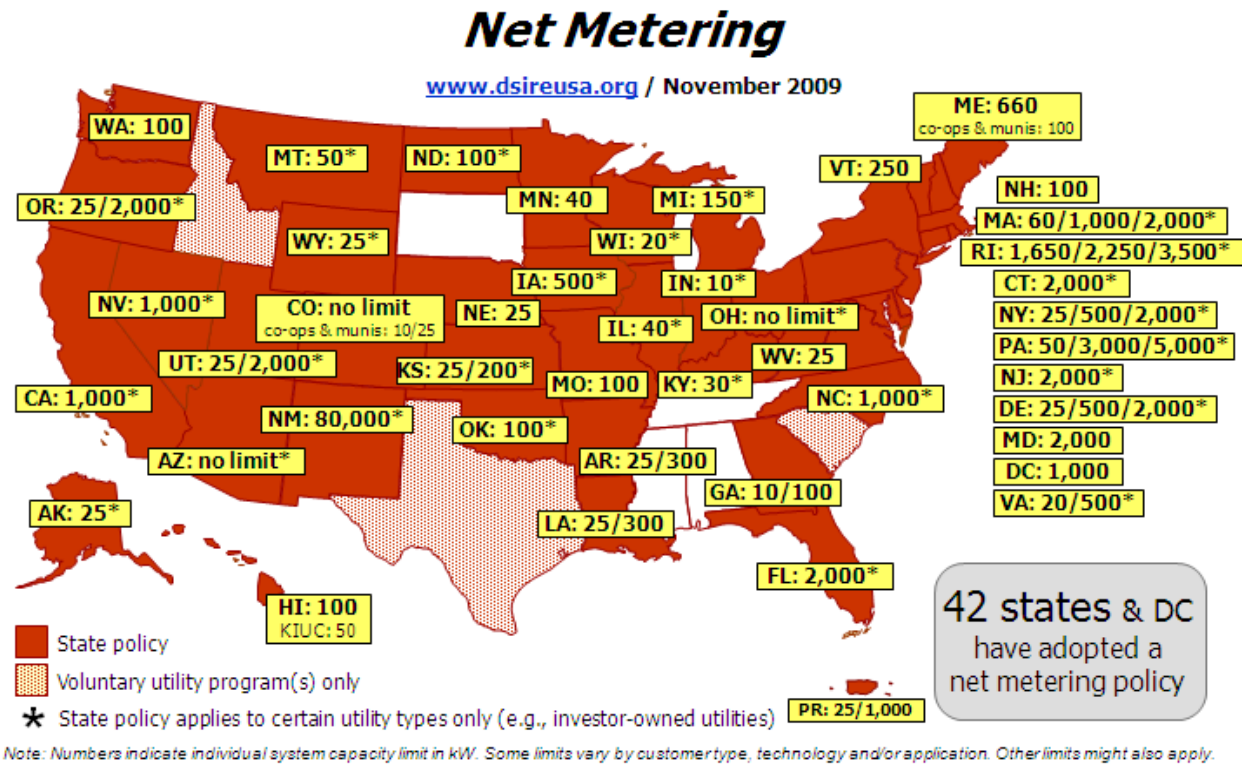
Secondly, Iowa passed the Alternative Energy Revolving Loan Program (AERLP) in 1996. This program uses state funds to provide zero-interest loans to help fund residential and commercial renewable energy projects. The loans cover up to half of each project's cost, with a cap of $1 million. Approximately $6 million were initially allocated by the state to fund the program.[99] Additional revenue for the program comes from a tax on statewide investor-owned utility businesses.[100] The state limits its risk by making the loans competitive and by funding no more than half of each project's projected costs. This structure shifts the risk analysis to the private banks that provide the rest of the funding. Further, AERLP requires that loan recipients submit annual reports after installation, providing the state with a vast database of cost-benefit comparisons to refer to for future projects.[101] As of March 1, 2009, the AERLP had funded 88 renewable energy projects, producing almost two million megawatt-hours of energy per year.[102]

APPENDIX III. NEW HAMPSHIRE WIND ENERGY POTENTIAL



Source: Wind Powering America: New Hampshire Wind Resource Map

APPENDIX IV. UNITED STATES NET METERING POTENTIAL



Source: DSIRE: Summary Maps – Net Metering

APPENDIX V. PROGRAMS AND FUNDING OPPORTUNITIES FOR LOCAL AND STATE GOVERNMENTS

The ARRA includes a large number of funding opportunities and tax incentives to support investment in clean energy at the local level, strengthen the economy and promote clean and renewable energy. ARRA will directly foster improved energy efficiency and increased production and use of renewable energy sources through grants and loans for specific projects and indirectly through tax incentives. In general, direct funding opportunities include grants for weatherization and energy improvements for affordable housing projects; schools; local government operations; water quality protection programs; and research and job training to prepare workers for careers in renewable energy and energy efficiency industries. Tax incentives in ARRA that are relevant to state and local governments include expansions of pre-existing tax credits for installation of renewable energy generation and related utility installation; an entirely new tax credit for facilities that invest in, rather than produce, renewable energy sources; and expansion of a credit for installing alternative fuel pumps. Some of the programs are new, while others are existing programs receiving increased funding under ARRA, such as the Weatherization Assistance Program. In general, the funds allocated under ARRA are designated as emergency funds that are to be spent as soon as feasible. In keeping with this goal, all funds under ARRA are made available until September 30, 2010.

Sources of ARRA funding which may be of interest to New Hampshire include Energy Efficiency and Conservation Block Grants, the State Energy Program, the Weatherization Assistance Program, and other tax incentives.

Energy Efficiency and Conservation Block Grants
EECBG funds can be used for energy efficiency and conservation programs, community-wide projects, and renewable energy installations in or on government buildings. Activities eligible for use of funds include development of an energy efficiency and conservation strategy; building energy audits and retrofits, including weatherization; financial incentive programs for energy efficiency such as energy savings performance contracting, on-bill financing, and revolving loan funds; transportation programs to conserve energy; and any other appropriate activity that meets the purposes of the program and is approved by DOE.

The State Energy Program
Under the terms of the ARRA, the DOE provides grants to the States and Territories governors through the State Energy Program (SEP). The funds, distributed to the states by formula allocation, will be used for state-wide energy programs such as building retrofits, programs that incent efficiency for utilities, adoption and enforcement of energy efficient building codes, and transportation measures. The states will prioritize the programs carried out with these funds toward increased energy efficiency and renewable energy applications. SEP includes funds for programs, projects and measures that are designed to save energy, create or retain jobs, increase energy generation from renewable resources, reduce greenhouse gas emissions.

According to the DOE, states should plan for and maximize efforts toward achieving the specific goal of reducing per capita energy consumption by at least 25 percent of the state's 1990 per capita energy use by 2012. This is a minimum goal, and the DOE strongly encourages higher goals. This criteria may prove to be a difficult obstacle for New Hampshire, as its 25 x 25 goal uses a baseline from 2004. However, the DOE has preference for proposals designed to permanently transform energy markets. According to the SEP guidelines, states are uniquely positioned to incite innovative solutions that have broad and lasting impacts across a variety of institutions, resulting in measurable and meaningful changes in how energy decisions are made at a fundamental level. Accordingly, strategies such as revolving loans, on-bill financing strategies, and performance contracting are encouraged.

Revolving Loans

Within SEP, one of the program areas that the ARRA legislation encourages is the creation of long term funding mechanisms such as Revolving Loan Funds (RLF), in order to extend the impact of the ARRA funds. By creating a revolving loan fund, states are not subject to expiration of the funds after the current three year ARRA timeframe. The only restriction is that the entire amount allocated to the loan program must be loaned in the initial three-year time period, but repayment can be stretched over additional years.[103] Many states have applied for ARRA funding in order to set up a RLF for energy efficiency or renewable energy. According to the DOE, RLFs are an excellent way to provide access to capital to borrowers who might not have other resources, reduce borrowing costs, and create jobs.[104]

Weatherization Assistance Program

The Weatherization Assistance Program (WAP) is run through the DOE and works to help low-income families to reduce their energy expenditures by making their homes more energy efficient and more resilient. Funding for WAP has been dramatically expanded through ARRA, giving states increased opportunities to bolster their existing weatherization assistance programs. Through WAP, the DOE provides funding and technical guidance to the states, who run their own programs, set rules for eligibility and review applicants, select service providers (such as Community Action Agencies and trained contractors), and review the provision of weatherization services.

Tax Incentives and Bond Programs

Along with the funding opportunities provided to local governments are many tax incentives that encourage innovative approaches to energy efficiency. Local governments may be able to take advantage of these provisions directly or share information with their communities to encourage use. Some of the credits modify eligibility requirements in existing law to expand eligible recipients for tax benefits, while other credits are entirely new. In one example of a modification to an existing law, the existing $2,000 cap on the 30 percent tax credit for the installation of solar- and geothermal-powered utilities has been lifted, as has the previous small-scale wind power cap. One of the new tax credits is the Advanced Energy Investment Credit, which establishes a 30 percent tax credit for those who invest in “advanced energy property.”

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[14] Anecdotally, some of the respondents who said they would not take advantage of any of the programs said so because they felt their house was already energy efficient. Other respondents skipped this question because they feel their home is already energy efficient (explaining the discrepancy between the number of respondents to the survey and the number of respondents to the question). Finally, some respondents did not answer the question if they did not understand the program, such as community investment funds.
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[18] Even though wind could be an ideal renewable energy source in New Hampshire, many residences are not optimally located on mountain ridges. Additionally, residential wind turbine blades spin much faster than commercial ones, creating a greater hazard, especially for birds. (Friedland, 2009)
[19] These numbers are debatable depending on the source. They are taken from Andrew Friedland, the chair of the Environmental Studies Department at Dartmouth College, who is believed to be an un-biased, non-partisan, and well-informed source. (Friedland, 2009)
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[43] Interview with Susan, Town of Pelham Assessing Department, Pelham, NH (May 18, 2010).
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