

# **FACT SHEET**

# Financing Clean Energy: A Powerful Tool for Driving Investment in New Hampshire's Economy

By encouraging private-sector investment in renewable energy and energy efficiency, strategies to finance clean energy are playing an important role in transforming clean energy markets in the United States and other countries. Institutions that run clean energy financing programs can provide underwriting support, facilitate conversations with key stakeholders, and educate the public and lenders on technological options.

Based on the experiences of existing clean energy financing initiatives, the Union of Concerned Scientists (UCS) has analyzed the potential impact of creating such an enterprise in New Hampshire. According to this analysis, the state could leverage an initial capitalization of \$14 million into a \$300 million investment in renewable energy and energy efficiency projects over the next 15 years.

By 2031, this clean energy investment could:

- Support the deployment of 70 megawatts (MW) of new solar- and wind-power capacity and generate or save the equivalent of 3.2 percent of New Hampshire's 2015 electricity sales;
- Save homes and businesses \$40.3 million on their annual electricity bills by investing in efficiency; and
- Reduce carbon dioxide emissions by nearly 222,900 tons, equivalent to taking 42,600 cars off the road.

A comprehensive strategy for financing clean energy would be a cost-effective tool that drives investment and creates new clean energy jobs in communities across New Hampshire. At the same time, it would help New Hampshire achieve state targets for energy efficiency, renewable energy, and reducing global warming emissions.

# A Promising Pathway for Clean Energy Finance

The basic approach of clean energy financing programs is to leverage a pool of public-sector funds to garner a larger pool of private-sector investments in renewable energy and energy efficiency. They do this by bringing together a suite of financial products that support the development of clean energy projects. Just as important, these programs raise awareness of

clean energy technologies and their benefits. Already, New York's and Connecticut's green banks, and Rhode Island's Infrastructure Bank are aiding the transition from government incentives for clean energy to financial products funded primarily with private-sector capital. And many more states, including New Hampshire, have developed related loan programs for efficiency and renewable energy.<sup>1</sup>

Typically, the performance of a clean energy financing initiative is measured as a leverage ratio of private-sector to public-sector funds invested. For example, Connecticut and New York have achieved an average leverage ratio across their programs of more than \$5 of private funds to every \$1 of public funds over recent years (Shrago and Healey 2016; NY Green Bank 2016; Connecticut Green Bank 2016).

By increasing the leverage ratios, policy makers aim to reduce the need for government incentives and make clean energy markets more sustainable. This makes clean energy financing programs a viable strategy for helping states foster economic growth and competitiveness while reducing emissions and meeting goals for renewable energy and efficiency.

A clean energy financing initiative in New Hampshire could build on the economic accomplishments of the state and help it achieve its climate goals. For example, between 2012 and 2014, New Hampshire spent \$41.6 million from revenue generated by the Regional Greenhouse Gas Initiative, primarily on energy efficiency and direct bill assistance that will result in nearly \$62 million in economic activity and 580 job-years of employment between 2012 and 2025 (Hibbard et al. 2015). And this is just a start, as New Hampshire lags behind its neighbors and the rest of the country on energy efficiency. In 2015, the

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American Council for an Energy Efficient Economy ranked New Hampshire 30<sup>th</sup> for achieving a modest 0.59 percent reduction in electricity use from energy efficiency investments. However, the state recently adopted targets of about 1 percent per year through 2020; these rank New Hampshire 16<sup>th</sup> nationally (ACEEE 2016).

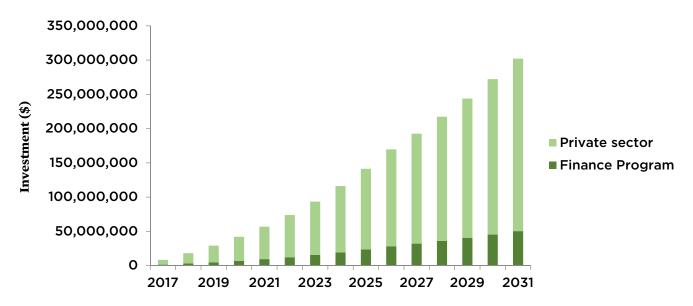
New Hampshire also lags in deploying solar and wind power. With only 14 MW of installed solar capacity through October 2015, New Hampshire ranked 36<sup>th</sup> with 731 solar jobs at 73 companies and 17<sup>th</sup> in solar jobs per capita (Solar Foundation 2016). In 2015, the state ranked 31<sup>st</sup> with 185 MW of installed wind power capacity, representing a \$380 million capital investment and avoiding an estimated 200,000 tons of carbon dioxide (CO<sub>2</sub>) (American Wind Energy Association n.d.). The wind industry employs between 100 and 500 people in New Hampshire in construction, operation and maintenance, and manufacturing, according to the American Wind Energy Association.

# Building on Existing Clean Energy Programs in New Hampshire

New Hampshire already offers a number of financing programs and incentives to invest in energy efficiency and renewable energy. A more comprehensive approach to financing clean energy could expand, enhance, and supplement these and future programs. Current programs and policies are administered by numerous state entities and utilities, including the following:

- The New Hampshire Community Development
  Finance Authority (CDFA) administers several
  financing programs as part of its \$9 million Clean
  Energy Fund, a revolving loan fund that provides
  financing to municipalities, nonprofits, and businesses
  in New Hampshire to better control their long-term
  energy costs by improving the energy efficiency of
  their buildings and adding renewable energy
  technologies when economically appropriate.<sup>2</sup>
- CDFA-administered programs include the **Enterprise Energy Fund** and the **Better Buildings Program**, both of which provide low-interest loans to businesses and nonprofits and the latter includes a loan-loss reserve fund (DSIRE 2016a).<sup>3</sup> The **Municipal Energy Reduction Fund** provides loans of \$5,000–\$400,000, with interest rates of 2.5–4 percent for energy efficiency improvements and alternative energy sources in municipal buildings (DSIRE 2016b). Funding for these programs has come primarily from the American Recovery and Reinvestment Act of 2009 and the Regional Greenhouse Gas Initiative.

FIGURE 1. Cumulative Investment Leveraged by the Clean Energy Finance Authority



Within 15 years, a New Hampshire clean energy financing program could leverage more than \$250 million of private capital to finance renewable energy and energy efficiency projects in homes and businesses.



In 2015 the Laconia Housing Authority gave their 100 year old Strafford House facility a deep energy retrofit with the help of funding from the Community Development Financing Authority. The project included comprehensive air sealing and insulation, triple pane windows, LED lighting with smart controls, low-flush toilets and a 35kW rooftop solar array. (NHCDFA)

- Property-Assessed Clean Energy (PACE) enabling legislation, enacted in 2010, authorized New Hampshire towns, cities, and villages to establish PACE financing districts. In 2015, a second act authorized third-party organizations to administer PACE loans and removed caps on loan funding. The Jordan Institute, a nonprofit based in Concord, administers the state's commercial-sector C-PACE program (DSIRE 2015). PACE financing has been significantly underutilized in New Hampshire because the enabling legislation does not allow such loans to precede mortgages or other loans; this is in contrast to successful programs in Connecticut and other states (Connecticut Green Bank 2016).
- New Hampshire is one of nine Northeast and Mid-Atlantic states that participate in the **Regional Greenhouse Gas Initiative (RGGI)**, a mandatory, market-based program established in 2009 to reduce power-sector CO<sub>2</sub> emissions. Between 2012 and 2014, New Hampshire received \$41.6 million from the sale of CO<sub>2</sub> emissions credits, with 98 percent of these funds supporting energy efficiency programs and providing direct assistance to consumers for their utility bills (Hibbard et al. 2015). Ten percent of RGGI funds are set aside to help low-income residential customers reduce their energy use (PUC n.d.a).
- All utilities in New Hampshire must offer net
  metering for customer-owned solar and other
  distributed generation systems up to one MW in size.
  There is an overall statewide cap of 100 MW, with 40
  MW reserved for systems under 100 kilowatts (kW).
  Any excess generation from these systems in a month
  is credited to the customer's next monthly bill at the
  retail rate and is carried forward indefinitely.

- Customers can choose to receive payment for any excess generation at the end of an annual billing period at the utilities avoided-cost rate. New Hampshire also has "virtual" net metering, which allows multiple customers to be credited to a single facility of up to one MW (NESEMC 2016). But it does not allow bill credit sharing, and all payments for net exports are made to the group host once per billing cycle. New Hampshire is undergoing a 10-month Public Utilities Commission proceeding to determine a future net metering program, with a final order due in March 2017.
- New Hampshire's Renewable Portfolio Standard (RPS) requires investor-owned utilities to acquire renewable energy credits equivalent to 24.8 percent of retail electricity sold to end-use costumers by 2025. In 2012, New Hampshire extended the RPS to include thermal technologies (e.g., hydrogen from biomass or landfill gas, ocean thermal, geothermal, solar thermal, and biomass energy systems) that begin producing energy after January 2013 (DSIRE 2016c).
- New Hampshire's **Renewable Energy Fund**, administered by the PUC and funded with Alternative Compliance Payments under the RPS, is a dedicated fund for renewable energy. It is used for rebate, incentive, and grant programs for residential, commercial, and industrial customers (PUC n.d.b). Since 2008, funding levels have ranged from \$1.3 million to \$19.1 million per year; the fund received \$4.2 million in 2016 (PUC 2016a). The fund has a leverage ratio of \$4 to \$5 in private-sector funds for every \$1 of public funds.
- In 2016, the New Hampshire Public Utilities
  Commission (PUC) established an Energy Efficiency
  Resource Standard (EERS) that requires the state's
  four major investor-owned utilities to meet cumulative
  energy savings targets of 3.1 percent of 2014 electricity
  sales and 2.25 percent of 2014 natural gas sales by
  2020. The PUC also increased the state's System
  Benefits Charge to help fund the higher targets and
  increased funding for low-income programs (PUC
  2016b). Under the NHSaves Program, utilities offer a

A clean energy financing program leverages a pool of public-sector funds to garner a larger pool of privatesector investments in renewable energy and energy efficiency.

- variety of residential, low-income, commercial, and industrial efficiency and renewable energy loan and rebate programs. Combining these funds with RGGI proceeds, the program budget has been about \$25 million every year (EERE 2015).
- In May 2016, Governor Maggie Hassan issued an Executive Order that set **new energy efficiency and renewable energy goals** for state-owned facilities, including a 30 percent reduction in energy use by 2020, increasing to 40 percent by 2025 and 50 percent by 2030. New Hampshire's **2009 Climate Action Plan** also set a long-term target of reducing the state's global warming emissions 80 percent below 1990 levels by 2050 across its economy (EERE n.d.).

A comprehensive financing initiative could help New Hampshire meet the state's targets for clean energy and emission reduction. Potential hosts for such an initiative include the New Hampshire Community Development Finance Authority (CDFA) and the New Hampshire Business Finance Authority (BFA). The CDFA is the state's largest provider of capital for financing energy efficiency and renewable energy loans; the BFA operates a revolving loan program for energy generation and efficiency for the agricultural and industrial sectors. In any scenario, new clean energy financing programs would need to be coordinated with these state institutions to make use of their staff knowledge and expertise. Given the great variety of resources New Hampshire already provides to stimulate clean energy investments, centralizing them under a single "clean energy finance authority" might greatly increase efficiency and public awareness of these funds.

# The Leverage Potential of a New Hampshire Clean Energy Finance Authority

A comprehensive financing initiative in New Hampshire could supply a range of financial products that would help transform or advance clean energy markets (Rhodes, Bloustein, and Pitkin 2013):

financing programs could offer to occupy a first-loss position or create a loan-loss reserve fund in the case of default. Both of these actions can lower a lender's perceived risks, allow loans to be issued to a wider variety of credit ratings, or assist with funding new or emerging technologies. States previously provided enhanced credit for efficiency using American Recovery and Reinvestment Act funds, but legislative changes could prevent this type of public-private finance strategy in the future.

A comprehensive strategy for financing clean energy could help NH jump start the state's solar and efficiency industries while achieving both economic development and climate goals.

- Warehousing and securitization services aggregate loans and sell the collections as securities. The institution can then use the proceeds to further its programs. Several states have used the warehousing model (NASEO n.d.): Connecticut (through its C-PACE program), Pennsylvania and New York (through the Warehousing for Energy Efficiency Loans—WHEEL—program), and Oregon (through the Clean Energy Works program) (Beldon, Clemmer, and Wright 2015).<sup>5</sup>
- Direct lending involves traditional consumer or business loans for renewable energy or energy efficiency projects. The Community Development Finance Authority through its Clean Energy Fund and the New Hampshire Business Finance Authority already provide these services. A New Hampshire clean energy finance authority could make use of this expertise and further leverage these efforts.
- Structured products and other financing tools include PACE financing, state-backed leasing programs for renewables, and performance-based incentives, grants, and other support mechanisms.
- Technical expertise on such topics as underwriting support can help traditional lenders improve their knowledge of new technology investments and lower the risks.

Each of these products and services carries its own risks and benefits, of course, and an effective financing strategy may support different clean-energy market segments through different means of financing.

Driving Investments and Emissions Reductions under a New Hampshire Clean Energy Finance Authority

For our analysis of the impact of creating a clean energy finance authority in New Hampshire, UCS developed an illustrative example of what a program focused on saving or generating electricity could accomplish by investing in energy efficiency and renewable energy. It shows significant economic and emission reduction benefits.

We did not analyze additional technologies and sectors that could be good candidates for clean energy loan programs, such as biomass heating, energy storage, transportation, combined heat and power, and financial products for low-income and minority communities. Also, more analysis and input from stakeholders are needed to identify preferences and priorities among the possible technologies, sectors, and communities. Nevertheless, given the great variety of financing and rebates already provided to stimulate clean energy investments, improved coordination of these funds could leverage further private and even institutional investments.

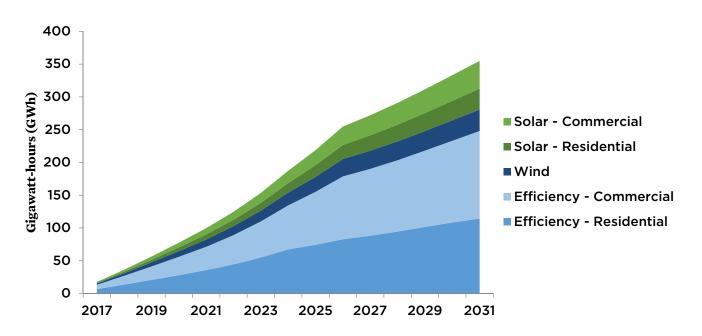
We based the analysis on several assumptions about inputs, all of which reflect the experience of existing clean-energy lending programs in Connecticut, New York, Rhode Island, and elsewhere:<sup>6</sup>

- The initial capitalization for the hypothetical New Hampshire clean energy finance authority would be \$14 million, a figure derived by applying a per-capita investment ratio similar to that of New York's comprehensive green bank.
- The authority would provide direct-lending products for solar, wind, and energy efficiency programs.
   Because markets and financing for utility-scale wind

- and solar projects are relatively mature, we allocated 40 percent of the fund to residential and commercial solar projects, 10 percent to community wind projects, and the remaining 50 percent to efficiency investments in homes and business.
- The loan term would be seven years for energy efficiency and 10 years for renewable energy; the interest rate would be 5 percent.
- Each \$1 of public funding would leverage \$5 of privatesector funding for energy efficiency and renewable energy projects.

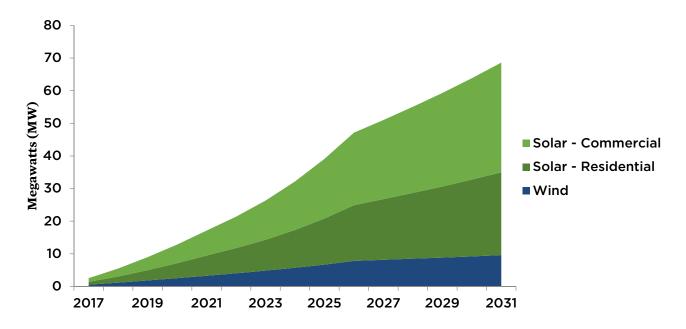
By structuring the program as a revolving loan fund, with loan repayments regularly returned to the program to fund additional projects, we estimate that the annual impact would increase each year. Over 15 years, a clean energy finance authority in New Hampshire with an initial \$14 million in public funds could lend more than \$50 million to projects, while leveraging more than \$250 million in private sector funding, for a total investment of more than \$300 million (Figure 1). In other words, homes and businesses would cover almost all of the upfront investment costs by repaying loans to financial institutions that are involved with the program.

FIGURE 2. Cumulative Energy Efficiency Savings and Renewable Generation Added under the New Hampshire Clean Energy Finance Authority



Over 15 years, investments from a clean energy financing authority would generate or save 355 GWh of electricity through renewable energy and energy efficiency projects. This is equivalent to 3.2 percent of New Hampshire's 2015 electricity sales.

FIGURE 3. Cumulative Wind and Solar Capacity under the New Hampshire Clean Energy Finance Authority



By deploying a suite of financial products, a New Hampshire clean energy finance authority could support 70 MW of wind and solar power by 2031.

The resources built with the support of clean energy financing would be substantial. After 15 years of operation, investments would rise to the point where new energy efficiency and renewable energy resources would generate or save 355 Gigawatt hours (GWh) each year, equivalent to 3.2 percent of New Hampshire's 2015 electricity sales (Figure 2). The investments would lead to 248 GWh of efficiency savings, lowering consumer electricity bills an estimated \$40.3 million annually by 2031, based on 2015 average retail electricity prices (US EIA 2016).

Through these energy efficiency and renewable energy resources, New Hampshire would avoid about 222,900 tons of carbon dioxide emissions by 2031. This would be equivalent to taking roughly 42,600 cars off the road, making an important contribution to New Hampshire's carbon reduction goals.

The authority could also support the development of 70 MW of new solar and wind capacity over the next 15 years (Figure 3).

#### Conclusion

A comprehensive clean energy financing strategy in New Hampshire could be an effective tool for expanding and enhancing existing programs and policies, while leveraging additional private-sector investment, increasing the sustainability of clean energy markets, and improving access to clean energy in low-income and minority communities. Potential institutions that could be expanded to host or coordinate a clean energy financing initiative include the New Hampshire Community Development Finance Authority and the New Hampshire Business Finance Authority.

If New Hampshire decides to pursue a comprehensive approach to finance clean energy, key stakeholders such as existing program managers, utilities, lenders, and communities across the state should engage in a dialogue to set its goals and priorities. Adding a greater focus on financing to New Hampshire's clean energy programs could be an effective strategy for helping the state reach its long-term goals for clean energy, carbon reduction, and economic development.

An expanded clean energy financing initiative in New Hampshire could save homes and businesses \$33 million on their annual electricity bills by investing in energy efficiency.

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#### **ENDNOTES**

- For further details, see: Financing Clean Energy: Cost-effective Tools for State Compliance with the Clean Power Plan (Belden, Clemmer, and Wright 2015).
- 2 For more information on the Clean Energy Fund, see: www.nhcdfa.org/energy.
- 3 For more information on the Enterprise Energy Fund, see: www.nhcdfa.org/energy/eef. For more information on the Better Buildings Program, see: www.nhcdfa.org/energy/better\_buildings.
- 4 For more information on the RGGI, see: www.rggi.org/rggi?
- 5 For more information on Clean Energy Works, see: http://energy.gov/eere/better-buildings-neighborhoodprogram/portland-shows-how-clean-energy-works.
- 6 For a more detailed discussion of methodology, please see the companion document Quantitative Methodology Description: www.ucsusa.org/greenbanksmethodology

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