The University of Vermont

# The Vermont Legislative Research Service

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## Federal and Vermont State Subsidies for Renewable Energy

Subsidies for renewable energy take many different forms at the federal and state levels. While some subsidies provide simple per kilowatt-hour incentives, others, such as tax credits, research and development grants, and loans and loan guarantees, are much more complicated. Given that a single subsidy program could either influence many types of renewable energies or focus on a specific sector (small businesses, rural areas, etc.), this report includes subsidies for renewable energies only, but does not attempt to quantify net subsidies for each renewable energy type. Data were gathered through online research of state and federal databases and reports, and the group frequently called contacts found within reports to clarify if Vermont was a final destination for the subsidy in question. Many subsidy programs that were researched, particularly those at the federal level, delivered no funding for renewable energy to Vermont, even if they delivered funding for renewable energy to other states.

## National Energy-Specific Subsidies for Fiscal Year 2013

### Definitions of Different Subsidy Programs[1]

*Direct expenditures to producers or consumers*

These programs provide direct cash outlays which provide a financial benefit to producers or consumers of energy.

*Tax expenditures*

At the federal level, these are largely provisions found in the Internal Revenue Code that reduce the tax liability of firms or individuals who take specified actions that affect energy production, distribution, transmission, consumption, or conservation. At the state level, the Vermont Department of Taxes manages various tax credits and exemptions.

[1] United States Energy Information Administration, "Direct Federal Financial Interventions and Subsidies in Energy Year in Fiscal Year 2013," *United States Department of Energy*, last modified March 23, 2015, https://www.eia.gov/analysis/requests/subsidy/.

*Research and Development*

The federal government has an extensive program of funding energy research and development (R&D) activities aimed at a variety of goals, such as increasing U.S. energy supplies or improving the efficiency of various energy consumption, production, transformation, and end-use technologies. R&D programs generally do not directly affect current energy consumption, production, and prices, but if successful, they could affect future consumption, production, and prices. Research is a distant source of subsidy, leading to difficulty in ensuring this report included all money subsidizing Vermont renewables. Therefore, federal research grants were excluded as subsidies in this report.

*Loans and loan guarantees*

The federal government provides financial support for certain energy technologies either by guaranteeing the repayment of loans obtained in the private debt market or by lending money directly to energy market participants. The Department of Energy (DOE) is authorized to provide financial support for innovative clean energy technologies that are typically unable to obtain conventional private financing due to their high technology risks. In addition, eligible technologies must avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases. The authority to enter into loan guarantees under the Energy Policy Act of 2005 expired on September 30, 2011. The federal government also supports portions of the electricity industry through loans and loan guarantees made by the U.S. Department of Agriculture's Rural Utilities Service (RUS) at interest rates generally below those available to investor-owned utilities (IOUs).

Table 1 shows the nation-wide quantified energy-specific subsidies and support by type from the 2013 Fiscal Year. The energy subsidies include: Direct Expenditures to producers or consumers, Tax Expenditures, Research and Development funding, and Federal Electricity Programs supporting federal and rural utilities. The energy types receiving subsidies include coal, refined coal, natural gas and petroleum liquids, nuclear and then six different types of renewable energy sources (biomass, geothermal, hydropower, solar, wind and other).

**Table 1: Quantified energy-specific subsidies and support by type, FY 2013 in million 2013 dollars**

| Beneficiary | Direct Expenditures | Tax Expenditures | Research and Development | Federal and RUS Electricity | Total | ARRA Related |
|---|---|---|---|---|---|---|
| **2013** | | | | | | |
| Coal | 74 | 769 | 202 | 30 | 1,075 | 129 |
| Refined Coal | - | 10 | - | - | 10 | - |
| Natural Gas and Petroleum Liquids | 62 | 2,250 | 34 | - | 2,346 | 4 |
| Nuclear | 37 | 1,109 | 406 | 109 | 1,660 | 29 |
| **Renewables** | **8,363** | **5,453** | **1,051** | **176** | **15,043** | **8,603** |
| Biomass | 332 | 46 | 251 | - | 629 | 369 |
| Geothermal | 312 | 31 | 2 | - | 345 | 312 |
| Hydropower | 197 | 17 | 10 | 171 | 395 | 216 |
| Solar | 2,969 | 2,076 | 284 | - | 5,328 | 3,137 |
| Wind | 4,274 | 1,614 | 49 | - | 5,936 | 4,334 |
| Other | 209 | - | 380 | 5 | | 229 |

Source: United States Energy Information Administration, *Direct Federal Financial Interventions and Subsidies in Energy in Fiscal Year 2013* (United States Department of Energy, 2015), xv, https://www.eia.gov/analysis/requests/subsidy/pdf/subsidy.pdf.

## Federal Subsidies Impacting Vermont Renewable Energy[2]

*Solar Energy Technologies Office of the Department of Energy (SETO of DOE)*

Vermont has received federal aid through the SunShot initiative for solar energy funding. Vermont has won a competitive grant of $150,000 for rooftop Solar PV, which has been managed by the Clean Energy Development Fund (CEDF).[3] The DOE offers many competitive grants; however, this is the only grant received by Vermont identified in this report.

*Energy Efficiency and Conservation Loan Program (EECLP)*

Offered by the Rural Utilities Service (RUS) through the US Department of Agriculture (USDA), EECLP funds can be used for both renewable energy and energy efficiency projects. Efficiency

[2] *Guide to Federal Financing for Energy Efficiency and Clean Energy Deployment*, (United States Department of Energy, 2014), http://www.energy.gov/sites/prod/files/2014/10/f18/Federal%20Financing%20Guide%2009%2026%2014.pdf.
[3] Andrew Perchlik (Director of Clean Energy Development Fund, Vermont Public Service Board), phone interview with Evan Leonard, April, 2016.

Vermont has applied for RUS funding and in January 2016 received $46 million in federal loan funds for rooftop solar installations and energy efficiency projects.[4]

*Qualified Energy Conservation Bonds through Department of the Treasury*

Vermont has $6.45 million in funding available through this program to be appropriated towards a variety of uses including renewable energy. As of November 29th 2013, none of that funding was known to be issued. [5]

**Recently ended sources of federal subsidy**

*American Recovery and Reinvestment Act (ARRA)*

Between 2009 and 2013, ARRA provided $13.87 million in funding for 1,199 renewable energy awards and incentives, alongside $2.65 million for combination efficiency, renewable and planning projects.[6] These funds were appropriated through the Energy Efficiency and Conservation Block Grant program and the State Energy Program of the DOE.

*Renewable Energy Production Tax Credit*

The Renewable Energy Production Tax Credit offered a 2.3 cent per kilowatt hour (kWh) credit on wind, closed-loop biomass and geothermal projects, along with a 1.2 cent per kWh credit on open-loop biomass, small irrigation power, municipal solid waste, qualified hydropower, and marine and hydrokinetic power. This program ended January 1, 2015.[7]

[4] Vermont Energy Investment Corporation, "VEIC Welcomes USDA Sec. Vilsack for Clean Energy Financing Announcement," news release, January 8, 2016, http://eanvt.org/wp-content/uploads/2013/04/VEIC-news-release-RUS-annoucement-FINAL-.pdf.
[5] *Qualified Energy Conservation Bonds*, (Energy Programs Consortium, 2013), 26, http://energy.gov/sites/prod/files/2014/06/f16/QECB_memo_12-13-13.pdf.
[6] *American Recovery and Reinvestment Act Funds Spur Clean Energy Projects in Vermont: A Final Report to the Vermont Public*, (Vermont Public Service Department, 2013), 14, http://publicservice.vermont.gov/sites/dps/files/documents/Renewable_Energy/CEDF/Reports/ARRA%20Public%20Report%20FINAL.pdf.
[7] Molly F. Sherlock, *The Renewable Electricity Production Tax Credit: In Brief*, Congressional Research Service, R43453, 2015, http://nationalaglawcenter.org/wp-content/uploads/assets/crs/R43453.pdf.

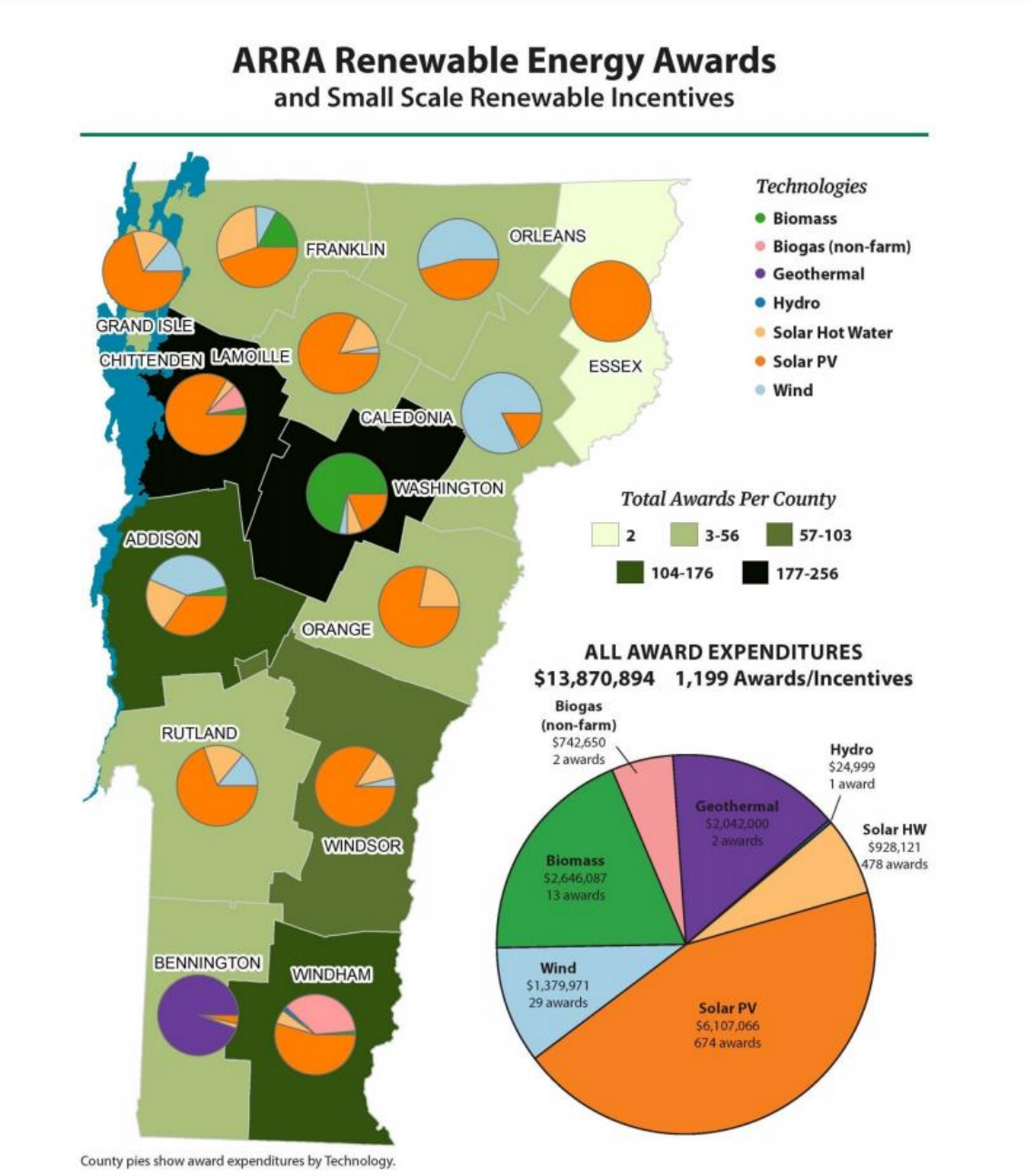


**Figure 1: ARRA Renewable Energy Projects in Vermont**

Source: Molly F. Sherlock, *The Renewable Electricity Production Tax Credit: In Brief*, Congressional Research Service, R43453, 2015, http://nationalaglawcenter.org/wp-content/uploads/assets/crs/R43453.pdf.

**Vermont Government Energy Subsidies and Programs**

*Green Mountain Power Solar Power Program*

Green Mountain Power Solar Power program is a performance-based incentive program that offers credit to customers with net-metered photovoltaic (PV) systems. In addition to the value from net metering, customers with a PV system less than 15 kilowatts receive a credit of $0.053 per kilowatt-hour, while those with a PV system of more than 15 kilowatts receive a credit of $0.043 per kilowatt-hour. The incentive does not have a specified duration or expiration date and it available to all Green Mountain Power Customers.[8]

*Clean Energy Development Fund (CEDF)*

CEDF is a public benefits fund which was established in 2005 to promote the development and deployment of cost-effective and environmentally sustainable electric power and thermal resources, primarily renewable energy and combined heat and power (CHP) technologies. The CEDF is also authorized to support emerging energy-efficient technologies, natural gas vehicles and/or fueling infrastructure, and electric vehicles and associated charging stations. For the 2015 fiscal year, CEDF had a budget of $5,882,076.[9]

*Vermont Sustainable Energy Loan Fund*

The Vermont Sustainable Energy Loan Fund is comprised of four loan programs, three of which subsidize renewable energy.

> The Agricultural Energy Loan Program provides loans to agriculture or forest product-based companies for renewable energy and energy efficiency projects. The maximum total amount of loans that can be outstanding to a borrower at any time is $1,355,000. Loans are provided at variable rates, although fixed rates may be available in some circumstances. Loan terms are determined on a case-by-case basis, but the maximum loan term is 20 years.[10]
>
> The Commercial Energy Loan Program provides loans to businesses for larger renewable energy and energy efficiency projects, with the maximum loan amount being $2,000,000. Loans are provided at variable rates, which are adjusted on a quarterly basis. Loan terms are determined on a case-by-case basis, but the maximum loan term is 20 years.[11]

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[8] "Solar FAQ," *Green Mountain Power*, last modified 2016, http://www.greenmountainpower.com/innovative/solar/faqs/.
[9] Autumn Proudlove, "Clean Energy Development Fund," *DSIRE*, last modified August 4, 2015, http://programs.dsireusa.org/system/program/detail/1870.
[10] Autumn Proudlove, "Agricultural Energy Loan Program," *DSIRE*, last modified October 7, 2015, http://programs.dsireusa.org/system/program/detail/5513.
[11] Autumn Proudlove, "Commercial Energy Loan Program," *DSIRE*, last modified October 7, 2015, http://programs.dsireusa.org/system/program/detail/5512.

The Small Business Energy Loan Program provides loans to businesses for smaller renewable energy and energy efficiency projects, with the maximum loan amount being $350,000. Loans are provided at fixed rates and loan terms are determined on a case-by-case basis, but the maximum loan term is 10 years with a maximum 15-year amortization.[12]

*Standard Offer Program*

The Standard Offer Program is a feed-in tariff program which offers long-term contracts with fixed standard offer rates to promote the rapid deployment of renewable generation facilities which have a capacity of 2.2MW or less and were commissioned on or after September 30, 2009. The Standard Offer Program built off of and replaced the original Sustainably Priced Energy Enterprise Development (SPEED) Program in 2009, which encouraged the development of renewable energy resources in Vermont as well as the purchase of renewable power by the state's electric distribution utilities (name changed in June 2015).[13]

*Investment Tax Credit*

The Vermont Department of Taxes offers a personal tax credit program for installations of renewable energy equipment on business properties. The credit amounts are:

- 7.2% for solar, fuel cells and small wind placed in service on or before 12/31/2016
- 2.4% for solar (except hybrid solar lighting) placed in service on or after 12/31/2016
- 2.4% for microturbines and combined heat and power technologies placed in service on or before 12/31/2016
- 2.4% for geothermal indefinitely

Any unused credit may be carried forward for five years.[14]

*Property Assessed Clean Energy (PACE)*

PACE is a locally-based Vermont program, meaning that local governments establish PACE Districts to provide property owners with financing to pay for energy improvements. Over 30 municipalities in Vermont have implemented PACE programs. The amount borrowed is typically repaid via a special assessment on the property over a period of up to 20 years. Financing cannot exceed $30,000 or 15% of assessed property value (whichever is less), and the combined amount of the property assessment and outstanding mortgages may not exceed 90% of the property value.[15]

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[12] Autumn Proudlove, "Small Business Energy Loan Program." *DSIRE*, last modified October 7, 2015, http://programs.dsireusa.org/system/program/detail/5511.
[13] Brian Lips, "Standard Offer Program," *DSIRE*, last modified February 17, 2015, http://programs.dsireusa.org/system/program/detail/5680.
[14] Autumn Proudlove, "Investment Tax Credit," *DSIRE*, last modified June 1, 2015, http://programs.dsireusa.org/system/program/detail/3428.
[15] Autumn Proudlove, "Local Option – Property Assessed Clean Energy," *DSIRE*, last modified August 18, 2015, http://programs.dsireusa.org/system/program/detail/3536.

*Renewable Energy Systems Sales Tax Exemption*

Vermont has a sales tax exemption for renewable energy systems. Specifically, the exemption applies to systems up to 500 kilowatts that generate electricity using renewable energy resources, combined heat and power systems up to 20 kilowatts, and to solar water-heating systems. The exemption is for 100% of the sales tax upon purchase. It applies to both on- and off-grid systems.[16]

*Uniform Capacity Tax and Exemption for Solar*

The Uniform Capacity Tax and Exemption for Solar provides a 100% property tax exemption for solar PV systems less than or equal to 50 kilowatts. For solar PV systems that are greater than 50 kilowatts, the state provides a uniform $4.00 per kilowatt property tax payment. These payments apply to the equipment on the land, not the land itself.[17]

*Vermont Small Scale Renewable Energy Incentive Program*

Vermont Small Scale Renewable Energy Incentive Program has provided funding to Vermonters for solar photovoltaic, solar hot water, micro-hydro, and modern wood pellet heating energy system installations since 2003. A system must be installed by a pre-approved installer to be eligible for the funding. Applicants have six months to complete solar projects and up to one year to compete micro-hydro projects. The incentive amount depends on the technology and the sector (Residential, Commercial, or Special Category, which includes low-income housing, non-profits, municipalities, and public schools).

Solar Photovoltaic

- Special Category: $1.00 per watt of direct current (DC) up to 10 kilowatts or $10,000
- As of January 2015, incentives for residential solar PV are no longer offered under this program.

Solar Hot Water

- Residential: $0.40 per kilowatt hour per year, up to $3,000
- Commercial: $0.40 per kilowatt hour per year, up to $16,500
- Special Category: $0.80 per kilowatt hour per year, up to $45,000

Micro-hydro

- Residential and Commercial: $1.75/3 feet per gallon per minute, up to $8,750
- Special Category: $3.00/3 feet per gallon per minute, up to $17,500

[16] Autumn Proudlove, "Renewable Energy Systems Sales Tax Exemption," *DSIRE*, last modified October 14, 2015, http://programs.dsireusa.org/system/program/detail/44.
[17] "Uniform Capacity Tax and Exemption for Solar," *DSIRE*, last modified December 1, 2015, http://programs.dsireusa.org/system/program/detail/5209.

Modern Wood Pellet Heating

- Residential: $2,000 per unit, up to $4,000 or 50% of the installed cost
  - Thermal efficiency adder: $350
  - High performance adder: $500 per unit, up to $1,000
- Non-residential: $2,000 per unit, up to $4,000 or 50% of the installed cost
  - Thermal efficiency adder: $500
  - High performance adder: $500 per unit, up to $1,000[18]

*Net Metering*

Vermont provides net metering subsidies for its electric customers after the customer has obtained a Certificate of Public Good from the Vermont Public Service Board. The system capacity limit is 2.2 megawatts for renewable energy facilities on military property, 20 kilowatts for micro-CHP systems that use non-renewable fuel, and up to 500 kilowatts for all other systems that generate electricity using renewable energy sources. It is available on a first-come, first-serve basis until the cumulative capacity equals 15% of utility's 1996 peak demand or peak demand during the most recent calendar year, whichever is greater. In accordance with legislation passed in 2014, a revised net metering program will be established by January 1, 2017.[19]

## Conclusion

At the federal level, much of the funding for renewable energy has ceased as ARRA has ended. This will be a significant blow to overall renewable energy subsidies in the state. However, at the federal level, Vermont can take advantage of the Qualified Energy Conservation Bonds program, which has millions in unutilized funding. The $46 million in RUS funding awarded to Efficiency Vermont is an enormous sum, but much of the money will be used for efficiency projects. It is unclear how much of this funding will be appropriated for renewable energy projects, but this is the largest influx of funding for the state presented in this paper.

At the state level, the Investment Tax Credit for solar, fuel cells, and small scale wind will drop from 7.2% at the end of 2016, replaced with a 2.4% credit for solar built in 2017 and after. Other programs appear to be remaining stable for the foreseeable future. Depending on the allocation of RUS funds by Efficiency Vermont, the net change in renewable energy subsides available in the state could either be positive or negative. This information will be available when Efficiency Vermont has completely filed loan forms with RUS and the Public Service Board has approved the program. This is anticipated to occur in the second quarter of 2016.

[18] Autumn Proudlove, "Small-Scale Renewable Energy Incentive Program," *DSIRE*, last modified May 28, 2015, http://programs.dsireusa.org/system/program/detail/1239.
[19] Autumn Proudlove, "Net Metering." *DSIRE*, last modified August 4, 2015, http://programs.dsireusa.org/system/program/detail/41.

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