8. Energy

This Energy Plan outlines a path to a secure, stable, resilient supply of energy to sustain the development and quality of life that our citizens envision for Irasburg's future, in accord with the fundamental Irasburg planning principles of respect for the environment, sound economics and regard for community values. It aligns with the Regional Energy Plan of the Northeastern Vermont Development Association and the goals of the 2016 Vermont Comprehensive Energy Plan.

Irasburg's Energy Plan endeavors to incorporate all of the available and emerging tools to meet municipal, regional and state energy goals: conservation, efficiency, advances in energy technology, fuel switching and the development of appropriate community- and residential-scale renewable energy generation. The Plan considers a robust community where citizens work together to achieve common goals and benefits to be a key component of a workable energy plan.

Irasburg's Energy Plan has been developed with the aim of seeking "substantial deference" in the Section 248 process. This is not an academic exercise for Irasburg. With a developer's 2015 announcement of the proposed construction of utility-scale wind turbines on the town's dominant ridgeline, Irasburg has been forced to consider the potential effects of such development on our community. In response, Irasburg citizens have expressed deep concerns regarding the siting of large-scale renewable-energy facilities.

In October 2015, Irasburg citizens voted 274-9 not to allow the development of utility-scale wind projects on the town's ridgelines. At the same time, the citizens presented to the Selectboard a petition, signed by 421 of Irasburg's voters, asking the Selectboard to oppose the proposed ridgeline wind turbine project "by all means possible" and "To develop a town plan that protects all of Irasburg's ridgelines from industrial wind development." In a very real sense, the initial impetus for this Town Plan, Irasburg's first, comes directly from our citizens. This Plan expresses Irasburg's intent to seek a stronger voice in determining energy policy for our town.

Irasburg's Energy Plan also responds to citizens' values expressed in a March 2016 community survey[1]: preserving Irasburg's rural setting and historic character; supporting agriculture and forestry; and protecting wildlife habitat, water

In this Chapter:

1 Appendix B, Community Survey

Wood fired stove

resources, ridgelines and steep slopes; and enabling a future of strengthened economic opportunity within a context that preserves the qualities they most value in the town they have chosen to make their home.

Energy generation and transmission systems that connect to the electrical grid are exempted from local land use regulation by 24 V.S.A. §4413(b). They are instead regulated by the Vermont Public Utility Commission under 30 V.S.A §248. These systems include net-metered distributed energy installations, as well as more utility-scale generation, transmission and distribution facilities. The town of Irasburg encourages the PUC to consider project conformance with regional and municipal plans before issuing a Certificate of Public Good for any proposed energy project whether located within Irasburg, or neighboring towns pursuant to Act 174.

The Town enjoys statutory party status in §248 proceedings, pursuant to 30 V.S.A. §248(a)(4)(F) and receives notice of applications before the PUC. The Town may participate informally by providing comments on a proposed project or may request more formal status as an intervener with rights to participate and appeal. Should the Town choose to intervene, it recognizes that it still must submit comments within the established timeframe in the application provided through the PUC's website. Town participation in the state's review process, based on the General Energy Siting Standards on pages 73-75 and including Visual Impact Analysis outlined on pages 18-19, is one way to ensure that local conservation and development objectives are given consideration and weight by the PUC.

Until recently, the PUC has been obligated only to give "due consideration" to the recommendations of the municipal plan when determining if a proposed project will not "unduly interfere" with the orderly development of the region. Vermont statute does not define "due consideration," nor does it indicate who shall determine what constitutes "due consideration."

Act 174 of 2016 established a new set of energy-planning standards. If they meet these standards, regional and municipal plans may carry greater weight—"substantial deference"—in the §248 process. Unlike "due consideration," "substantial deference is codified to mean:"

"…that a land conservation measure or specific policy shall be applied in accordance with its terms unless there is a clear and convincing demonstration that other factors affecting the general good of the State outweigh the application of the measure or policy."

The Town of Irasburg has developed this Energy Plan to receive substantial deference under Act 174 in order to have a greater say in the siting of renewable energy projects in our community.

Energy Use

NVDA estimates that transportation accounts for the largest share of energy use in Irasburg, closely followed by thermal energy for heating space and hot water..

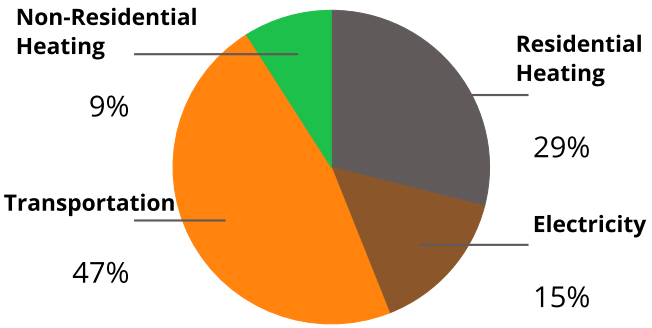

Figure 8.1 Irasburg's Current Energy Use
Source: Irasburg Energy Profile from NVDA

Fuel Type: Space Heating	House-holds	Total avg. use (Annual)		% use: (All HHs)	% Use: Owner	% Use: Renter	% Cost (All HHS)
Tank/LP/etc. Gas	6	21,599	gallons	.9%	3.9%	22.1%	11.9%
Electricity	7	188,068	kWh	1.3%	1.6%	0.0%	4.1%
Fuel Oil	276	175,666	gallons	53.0%	51.5%	60.5%	56.2%
Wood	189	854	cords	36.3%	40.0%	17.4%	27.8%
Coal/Coke	N/A	0	tons	0.0%	0.0%	0.0%	0.0%
Other	13	0		2.5%	3.0%	0	0

Table 8.01 Residential Heating by Fuel Source *Source: Irasburg Energy Profile from NVDA*

Thermal

NVDA developed its residential thermal estimates using American Community Survey 5-Year Estimates for primary heating sources. Average household square footages were developed from ACS estimates as well as American Housing Survey estimates. Although this calculation uses best available data, it clearly has some limitations. Like most Northeast Kingdom residents, Irasburg residents are likely to use multiple heating sources. The NVDA estimate accounted for the age of housing stock, since pre-1940 housing structures are likely to be poorly insulated and leaky. In Irasburg, 20 percent of owner-occupied housing and 15 percent of renter-occupied housing dates from before 1940. The NVDA estimate assumed 80,000 BTUs per square foot for pre-1940 housing stock, 45,000 BTUs for housing built later than 1940. Total thermal usage for occupied housing is estimated at 46,299 MMBTUs at a total cost of $696,499[2].

No information is available on heating sources for non-occupied seasonal housing units, but Department of Public Service guidelines suggest that it is reasonable to assume that they account for about five percent of the average owner-occupied unit. Using this assumption, Irasburg's 71 seasonal housing units account for another 325 MMBTUs annually.

Non-residential thermal estimates were developed using data from the Department of Public Service and the Vermont Department of Labor's Economic and Labor Market Information. The Census does not have estimates of non-residential heating sources, but the DPS is able to estimate average heating loads on types of business. (Note: this method does not work for industrial uses, which are highly specific to the type of operation. However, Irasburg does not have any heavy industrial uses.)

Est. # of Commercial Buildings	6
Avg Annual Heating Load per Building	897 MMBTUs
Est. Total Heat Energy Consumption	14,352 MMBTUs

Table 8.02 Non-Residential Heating Uses
Source: Irasburg Energy Profile from NVDA

2 Refer to the NVDA Regional Plan for methodology used to determine these figures.

		November 2011			November 2016				
Types of Energy	BTU/Unit	Adj. Effic.	$/unit	$/ MMB-TU	Typ-ical Effic.	$/Unit	$/ MMB-TU	High Effic.*	High Effic. $/ MMBTU
Fuel Oil, gallon	138,200	80%	4.08	$36.89	80%	$2.23	$20.14	95%	$16.96
Kerosene, gallon	136,600	80%	$4.08	$36.89	80%	$2.80	$25.65.		
Propane, gallon	91,600	80%	$4.45	$40.71	80%	$2.54	$34.64	95%	$29.17
Electricity, kWh (resistive)	3,412	100%	$0.16	$46.37	100%	$0.15	$43.46		
Electricity, kWh (heat pump)**	N/A	100%	$0.16	$46.37	100%	$0.15	$43.46		
Wood (cord-green)	22,000,000	60%	$192.03	$14.55	60%	$227.00	$17.21		
Pellets (ton)	16,400,000	80%	$263.51	20.09	80%	$275.00	$20.96		

Table 8.03 Costs of Fuel 2011-2016
Source: Dept of Public Service, Vermont Fuel Price Report (2011 adjusted for inflation)

Irasburg residents have begun a shift toward more efficient heating systems over the past five years. They include wood and wood pellets as well as heat pumps, particularly for heating water. Many residents have a secondary, back-up heating source, for example wood heat backed up by oil.

Table 8.03 shows the various costs of heating sources available to Irasburg residents. When oil prices were high, many NEK residents turned to alternative fuels, especially wood pellets, which are cleaner burning and more efficient than cord wood and are relatively easy to use, since, unlike traditional wood stoves, pellet stoves and furnaces can be thermostatically controlled. Wood pellet prices have remained relatively stable in recent years, although some heating seasons have seen shortages in supply. Wood pellet stoves and furnaces may be a significant investment for most homeowners, so they have continued to use pellets even after the price of heating oil dropped. In 2018, Vermont Electric Co-op began offering an on-bill credit of $150 for wood pellet stoves. To qualify they must be installed in a building using an existing fossil fuel-fired heating system, and have <2g/hr of PM^2.

In 2015, the Vermont Fuel Price Report was amended to account for "high efficiency" ratings of furnaces that are manufactured to meet higher efficiency standards and can result in savings on energy for customers.

Heat Pump Technologies The Vermont Fuel Price Report has also begun including information on electric-powered heat pump technologies, which deliver more heat than can be derived from traditional resistance heating. This high return rate, called a coefficient of performance, or COP, allows approximately 2.5-3.5 times more BTUs to be "moved" than the amount that could be achieved through resistance heating.

Geothermal, or "ground source heat pumps," extract low-temperature thermal energy from

the ground during colder months for heating and transfer thermal energy from the building to the ground in warm months for cooling. This technology operates much like a refrigerator, using a heat pump, heat exchanger and refrigerant. While geothermal systems do require electricity to operate the pumps, the systems generally deliver three to five times more heat than the electrical energy they consume, depending on the type of system.

In recent years, manufacturers have developed air-source heat pumps that operate more consistently over Vermont's vast temperature ranges, thanks to new refrigerants and more advanced air compressors. Also called "cold-climate heat pumps" or "mini-splits," these units also have a high COP allowing users to significantly reduce traditional, primarily fossil-fuel, sources. Unlike geothermal units, they do not require excavation or duct work and are therefore less expensive to install. Typically, a multi-zone setup is required, which may pose a challenge for large older homes with multiple wings or ells. Small homes with open floor plans are good fits, utilizing one or two heat pump units. Despite recent improvements in effectiveness, sub-zero temperatures require a back-up heating source. Despite these considerations, cold climate heat pumps may be particularly useful in Irasburg as an effective supplemental heat source. In addition, heat pumps can be paired with net-metering systems to further offset energy costs, and reduce carbon-sourced power.

For many Irasburg households (average income $48,393), cost is a barrier to transformation to heat-pump technology. However, market acceptance of cold-climate heat pumps appears to have reduced their costs since inception of the technology. Through the Cold-Climate Heat Pump Incentives of the Vermont Electric Co-op, Irasburg's major electric utility, VEC members can work through Efficiency Vermont's program to receive a $600-800 discount on the initial purchase of a qualifying cold-climate heat pump. Once the cold-climate heat pump is installed, VEC members can receive an additional $150 VEC bill credit for each heat pump installed. In 2018 the same Tier III program, which is tied to the state energy goals was expanded to include heat pump water heaters.

Total Vehicles	989
Avg. Annual Vehicle miles traveled (VMTs) per vehicle	14,000
Total Annual VMTs	**13,846,000**
Fossil Fuel Use	572,721 gallons 69,448 MMBTUs
Ethanol Use	56,643 gallons 4,798 MMBTUs
Total	74,246 MMBTUs $1,416,068

Table 8.04 Transportation Energy Use in Irasburg
Source: Irasburg Energy Profile from NVDA

Transportation

The development pattern of the Northeast Kingdom strongly influences energy use in transportation. Long commutes and incidental trips for the necessities of daily life require NEK residents to drive an average of 14,000 miles per year. Collectively, Irasburg residents drive almost 14 million miles annually, at a cost of over $1.4 million. As Table 8.04 indicates, nearly all of this energy is non-renewable. Ethanol currently accounts for nearly all renewable transportation energy use—about 6.5 percent—while electricity accounts for a minuscule .02 percent. As of January 2017, Irasburg has a grand total of two registered electric vehicles. Still, the selection and availability of EVs and plug-in hybrids is continually evolving and market acceptance statewide is growing. (According to Drive Electric VT, per capita Vermont is 6th in the nation for EVs.)

Approximately 15 trash-filled tractor-trailer trucks per day make two round trips through Irasburg on their way to and from Vermont's only landfill, in neighboring Coventry, for a total of more than 58,000 annual VMTs within Irasburg's boundaries. Since these large trucks consume significantly more fuel and produce more emissions than smaller personal vehicles, the effect on energy consumption and carbon emissions within Irasburg—and of course throughout Vermont—is considerable. New England Waste Services of Vermont has recently applied for an expansion permit to add capacity to the landfill. If approved, the landfill will last an additional 22 years at the present rate of waste deposit. Irasburg's citizens appear to have few options for reducing this significant use of energy within the town's borders. Opening more landfills in other locations and switching to rail transportation of garbage to reduce VMTs for garbage hauling are options that state and regional officials should investigate.

Town	Location
Barton	Barton Village Offices
Danville	Marty's First Stop
Derby Line	Derby Line Unitarian Universalist Church
Hardwick	Lamoille Valley ford
St. Johnsbury	Twin State Ford
St. Johnsbury	Pearl Street Parking Lot
St. Johnsbury	Northeastern Vermont Regional Hospital

Table 8.05 Public Charging Stations for Electric Vehicles in the Northeast Kingdom
Source: US Department of Energy's Alternative Fuel Locator

Plug-in electric vehicles have the greatest potential to reduce Vermont's statewide greenhouse gas emissions. Refueling by plugging into an electric outlet costs the equivalent of about $1.00 per gallon of fossil fuel.

Currently, there are two types of EVs:
All-Electric Vehicles: An AEV can range as far as 80 miles on a single charge, but on very cold days this range can be cut in half. In the NEK climate, AEVs are therefore best used as a second car.
Plug-in Hybrid Evs: A PHEV generally does not range as far as an AEV, but they can switch over to gasoline when the battery charge runs low, making this a more practical option for those with longer drives and greater distance from public charging stations. About 75 percent of EVs registered in Vermont are PHEVs.

Chittenden County has the highest concentration of EVs on the road—about one-third of all EVs in the state. Nevertheless, Northeast Kingdom drivers are beginning to use them as well. In January 2017, there were two EVs registered in Irasburg and 134 in the entire Northeast Kingdom. The highest use occurs in St. Johnsbury, Lyndon, Hardwick, Derby and Newport. The nearest dealership is Lamoille Valley Ford in Hardwick. A number of public charging stations have been established around the NEK. Barton's is the nearest to Irasburg. More charging stations may be needed to support expanded EV use; the confluence of heavily used state and local highways in Irasburg's village center suggests its potential as a site for an EV charging station. To date, however, EV/PHEV users garner most of their "fill-ups" at home charge stations.

For many Irasburg residents, cost is a barrier to the transformation to EVs. Through Vermont Electric Co-op's Electric Vehicle and Plug-In Hybrid Electric Vehicle Bill Credit, VEC members who purchase or lease a plug-in hybrid electric vehicle, can receive a bill credit of $250 for the purchase of a new or used PHEV, and $50 for each year of a vehicle lease (up to $250). Customers of VEC who purchase full electric vehicles (EVs) will receive $500,

or $100/year for leased EVs. State and federal tax credits, as well as manufacturers' rebates, have the potential to increase the use of electric vehicles in rural areas with economic challenges.

Price volatility of gasoline in the first half of the past decade helped to spur an interest in the development of alternative fuels. Biodiesel is commonly made from soybeans, rapeseed (canola) and sunflowers, which can all be grown in Vermont. Biodiesel can be blended with diesel up to five percent for on-road vehicle use. Higher blends, up to pure biodiesel, can be used in off-road equipment and farm vehicles.

460 housing units in Irasburg and an estimated 16 commercial buildings. Thanks to efficiency and conservation measures, Irasburg residents have reduced their average electricity use in recent years.

Irasburg's residents have begun the process of improving energy efficiency; there remains considerable potential for improvement. During the drafting of this plan, the Planning Commission organized a workshop led by Efficiency Vermont and participated in the 2017 "Button-Up Vermont" initiative. These efforts provided information on the impact of local energy-saving efforts and led several citizens to make efficiency-related improvements.

	2014	2015	2016	Total
Commercial & Industrial	3,200,790	3,344,811	3,469,569	10,015,170
Residential	3,507,445	3,491,795	3,498,840	10,498,080
Total	**6,710,249**	**6,838,621**	**6,970,425**	**20,513,250**

Table 8.06 Annual Electricity Use in Irasburg, in kWh *Source: Irasburg Energy Profile from NVDA*

Research has shown that oilseed crops, when grown in rotation with other crops, can help to support sustainable, diversified and profitable agricultural enterprises. The Vermont Bioenergy Initiative, a program of the Vermont Sustainable Jobs Fund, provides early-stage grant funding, technical assistance and loans to producers. Although the recent drop in fuel prices has somewhat reduced the incentive for farmers to enter biofuel production, NVDA encourages further innovation and research into this area as a long-range economic opportunity.

Electricity

Use Irasburg's electric utility data is collected by Vermont Energy Investment Corporation. Customers are primarily residential; there are about

Generation and Distribution

Irasburg is served by three electric utilities: Vermont Electric Co-op, Barton Electric and Orleans Electric. By far the dominant provider is VEC, which obtains 95 percent of its power supply from renewable sources. VEC is a member-owned electric distribution facility.

Barton Electric and Orleans Electric are represented by the Vermont Public Power Supply Authority, which has broad authority to buy and sell wholesale power on behalf of all the municipalities. All the utilities obtain hydropower from various sources including Hydro Quebec and New York Power Authority. Biomass production includes the McNeil plant in Burlington and Ryegate Power Station, which distributes power through Vermont's Standard Offer Program.

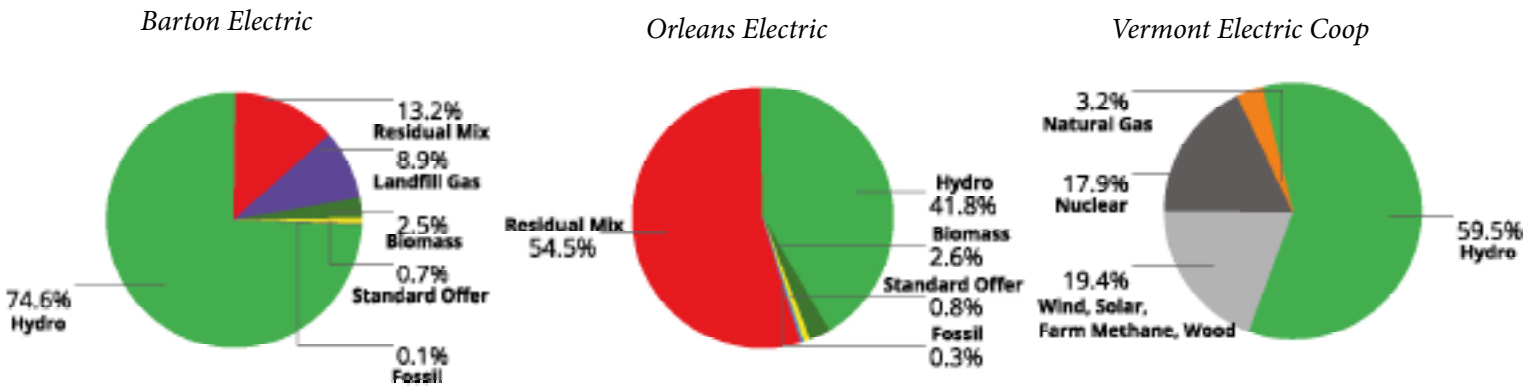

Figure 8.2 Power supply for Barton Electric, Orleans Electric & Vermont Electric Coop
Source: Irasburg Energy Profile from NVDA

All three utilities are expanding solar capacity. In late 2016, VEC opened a "community solar project" in Alburgh, which allows VEC customers to sponsor solar panels in exchange for a credit on their monthly utility bills. Two more VEC community solar projects were constructed in Grand Isle and Hinesburg in 2017. In 2015, VPPSA was awarded two standard offer contracts for solar projects in Lyndon, sized at 475 kW and 500 kW.

Two major legislative initiatives, Act 56 and Act 99, will drive the development and use of renewable energy in the coming years.

Act 56 This initiative establishes a Renewable Energy Standard for the portfolios of Vermont's electric utilities:

Tier I: Starting in 2017, existing total renewable energy will rise four percent every three years to reach 75 percent in 2032. A utility can meet this requirement by owning renewable energy or renewable energy credits from any plant as long as the plant's energy can be delivered in New England.

Tier II: Utilities now have a distributed generator requirement connected to Vermont's electric grid. Starting in 2017, one percent of the utility's portfolio must be distributed renewable generation, rising six-tenths percent each year to reach 10 percent in 2032. Utilities can reach this requirement by renewable energy or RECs that have come into service after June 30, 2015, are 5 MW or less, and are directly connected to Vermont's grid (in-state generation).

Tier III: This is an energy transformation requirement that starts from two percent in 2017 and rises to 12 percent in 2032. Utilities meet this requirement either through additional distributed renewable generation or "transformation projects" that replace or reduce fossil fuel consumption. Such projects include home weatherization, installation of heat pumps, the use of biofuels, the retirement of propane or diesel generators, or incentives to purchase EVs. As smaller utilities, Orleans Electric and Barton Electric were exempt from this requirement until 2019, but VPPSA's program will likely include weatherization and heat pumps, biofuels, energy and storage and EVs and charging infrastructure.

Act 99 Net-metering—an arrangement whereby utility customers receive a credit for energy they generate that exceeds what they use—has been very popular in Vermont. Net-metering systems are capped at 500 kW. Act 99, which became effective in 2017, removed the cap on Vermont's utilities. Under early versions of the rule, PSB Rule 5.100, a utility program cap had been raised from four percent to 15 percent, meaning that the utilities have to take on net-metered systems on a first-come, first-served basis to all its customers until the cumulative generating capacity of all net-metered systems equals 15 percent of the utility's peak demand. Previously, solar generators received a "solar adder" for net metering.

Act 99 eliminated the solar adder and replaced it with a REC adder, or penalty, and series of adjustments for siting solar on defined preferred

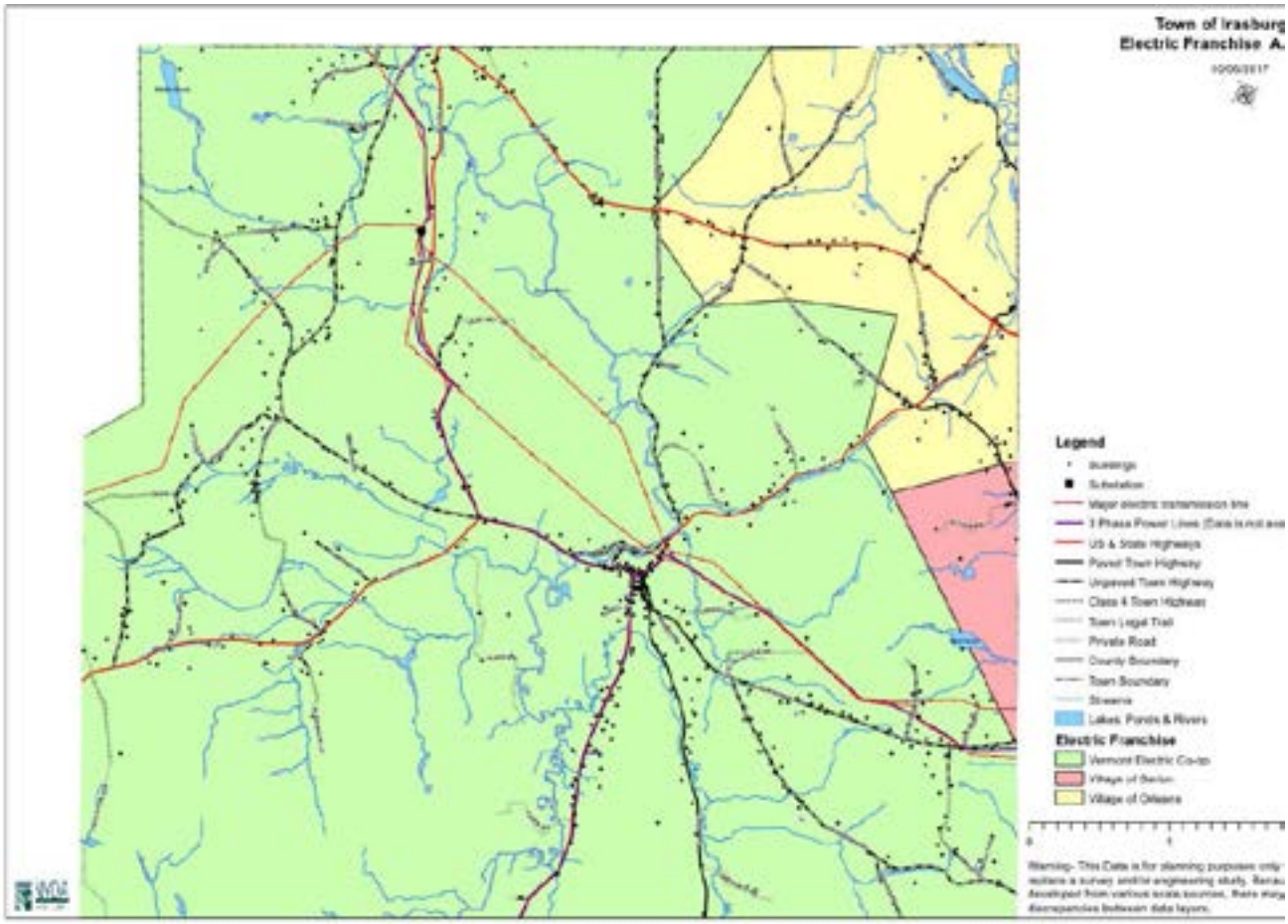

Figure 8.3 Town of Irasburg Electric Franchise Map *Source: NVDA*

sites that have already been disturbed: rooftops, parking lot canopies, brownfields and gravel pits. There is no site adjustment for installations of 150 kW or more, so the new net-metering rule tends to incentivize small developments away from open fields and other undeveloped areas. Notwithstanding the influences of the siting adjusters, net metering projects of up to 500 kW require attention to a series of siting concerns including set-backs, screening, storm water run-off and interconnection, and conformance with the overarching objectives of the Town and Regional Plans. Irasburg supports the preferred location of solar projects on sites identified in Act 99.

Irasburg currently has four net metering projects totaling 38 kW and an off-grid installation of 3 kW PV & 2.5kW wind.

There is currently one community-scale solar project under consideration in Irasburg. An installation in an expanding gravel pit, proposed by Boardwalk LLC Irasburg Northeast Sand and Gravel would occupy two to three acres and contain 500 kW of solar modules. For many reasons, renewable-energy generation has been slow to develop in Irasburg, but shows potential for carefully considered growth to ensure that respect for the environment, sound economics and regard for community values are maintained while encouraging appropriate renewable energy generation. Rooftop solar installations and the use of barren lands for solar generation offer potential for energy generation.

Program Name
Business Investment Tax Credit
Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Solar Thermal Process Heat, Photovoltaics, Wind, Biomass, Geothermal Electric, Fuel Cells, Geothermal Heat Pumps, CHP/Cogeneration, Solar Hybrid Lighting, Fuel Cells using Renewable Fuels, Microturbines, Geothermal Direct-Use. This credit has been amended several times, most notably in 2015 in the Consolidated Appropriations Act, when the expiration date for these technologies was extended with a gradual step-down of the credits between 2019 and 2022. An investment tax credit is also available to homeowners (such as for solar installations) through 2021.
Modified Accelerated Cost Recovery System
Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Solar Thermal Process Heat, Photovoltaics, Landfill Gas, Wind, Biomass, Geothermal Electric, Fuel Cells, Geothermal Heat Pumps, Municipal Solid Waste, CHP/Cogeneration, Solar Hybrid Lighting, Anaerobic Digestion, Fuel Cells using Renewable Fuels, Microturbines, Geothermal Direct-Use. Also amended in the Consolidated Appropriations Act, the "placed in service" deadline for bonus depreciation was extended to January 2018.
Renewable Energy Production Tax Credit
Landfill Gas, Wind, Biomass, Hydroelectric, Geothermal Electric, Municipal Solid Waste, Hydrokinetic Power (i.e., Flowing Water), Anaerobic Digestion, Small Hydroelectric, Tidal Energy, Wave Energy, Ocean Thermal. This credit phases down for wind commencing construction after December 2016 and expires for other technologies.

Table 8.07 Federal Subsidies for Renewable Energy Development
Source: NVDA Regional Plan

Getting to 2050: Irasburg's Plan for Meeting Statewide Energy Goals

Irasburg's energy plan supports Vermont's 2016 Comprehensive Energy Plan, which contains the following goals:

- Reduce the total energy consumption per capita by 15 percent by 2025 and by more than one-third by 2050.
- Meet 25 percent of the remaining energy need from renewable sources by 2025, 40 percent by 2035, and 90 percent by 2050.
- Achieve three renewable end-use sector goals for 2025: 10 percent transportation, 30 percent buildings and 67 percent electric power.

The chart on page 67 shows what the region's total end use of ALL fuels might look like if the region met the "90 by 50" CEP goals. This scenario is based on Long-Range Energy Alternatives Planning, an integrated modeling that can estimate and track consumption across all sectors based on a set of assumptions, such as population growth. This LEAP scenario reduces demand enough to make 90 percent renewable energy possible. This scenario makes use of wood energy, but there is more growth in electric heating and transportation to lower total energy demand. Where the graphs show "Avoidance vs. Reference," that is the portion of energy that is no longer needed because of the efficiency improvements through weatherization, equipment upgrades and fuel switching. Despite a modest growth rate of population and economy, energy use declines because of efficiency and electrification. Electrification of heating and transportation has a large effect on the total demand, because the electric end uses are three to four times more efficient than the combustion versions they replace. This explains why even though wood heating (including cord wood) continues to play an important part in the area's energy use, growth in electric heating reduces overall energy use.

Energy efficiency is, generally, the most cost-effective method of saving energy and

reducing the town's carbon footprint. Therefore, pursuing energy-efficiency solutions such as home energy audits and energy efficiency retrofits should generally take first priority before the investment in the installation of renewable energy systems. The 2016 CEP states that efficiency will help to ensure an affordable and stable cost of doing business in the state, improve labor market conditions, drive production and drive improvement in demand-side thermal and electric efficiency and conservation. Vermont towns all have a role in helping their citizens achieve energy efficiencies and promoting emerging technologies that prove cost-effective.

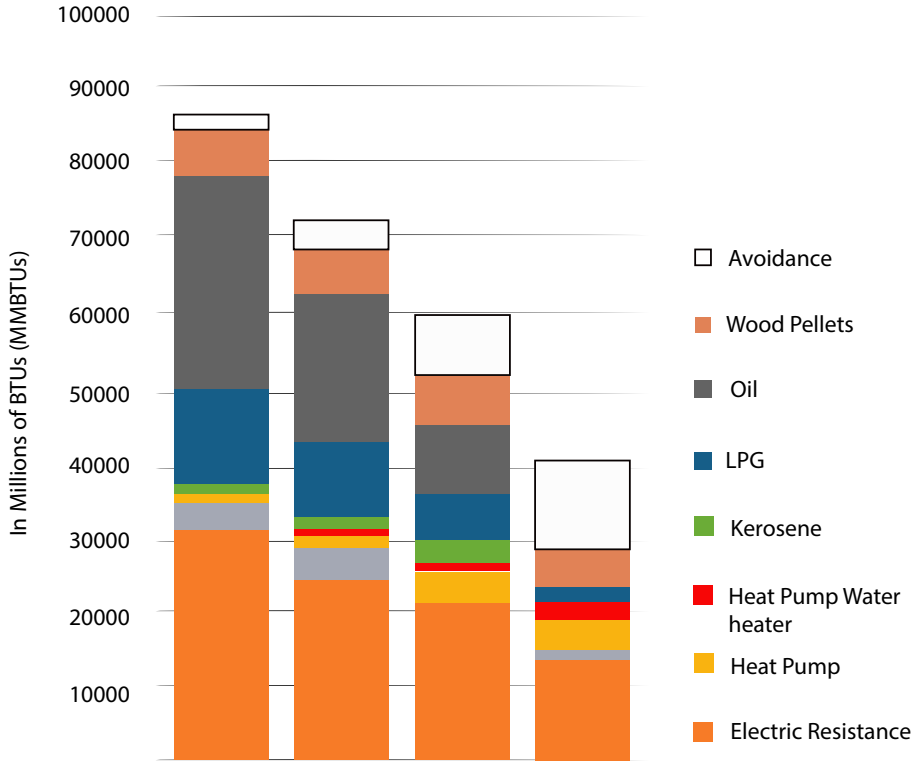

Figure 8.4 Irasburg Residential Energy Consumption by Fuel
Source: Long-Range Energy Alternatives Planning model from Vermont Energy Investment Corporation (VEIC)

Thermal Efficiency Improvements
Regional thermal efficiency and weatherization efforts are spearheaded through two organizations: Efficiency Vermont and Northeast Employment and Training Organization. In the past decade, NETO has provided weatherization services to 39 homes in the town of Irasburg.; Efficiency Vermont has undertaken two such projects. In 2010, NVDA carried out an energy audit of all of Irasburg's municipal buildings. Year by year, as funds allow, the town has carried out the recommended improvements, including window replacement, improved insulation and switching to LED lighting. The Town Clerk's Office is next on the list. The Irasburg Village School carried out an energy audit, with student participation, in November 2017. Students will also take part in carrying out the resulting efficiency improvements recommended by the energy audit. The IVS has applied for a weatherization grant from Vermont Electric Co-op.

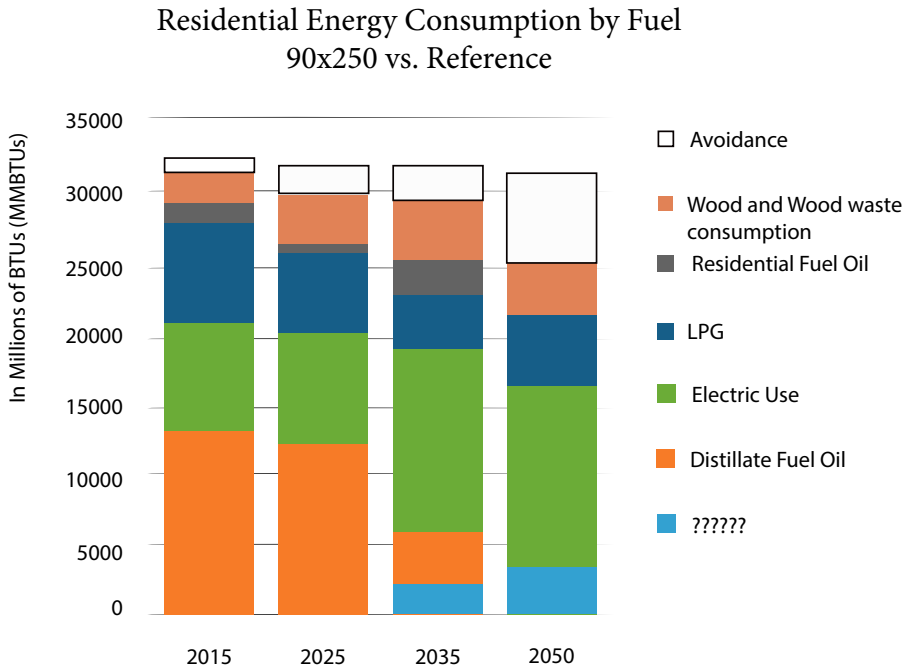

Figure 8.5 Irasburg Commercial Energy Consumption by Fuel
Source: Long-Range Energy Alternatives Planning model from VEIC

	2025	2035	2050
Estimated # of Households	552	585	621
% of households to be weatherized	28%	46%	47%
# of households to be weatherized	156	271	290
Estimated number of commercial establishments	17	18	19
% of commercial establishments to be weatherized	5%	8%	14%
# of commercial establishments to be weatherized	1	1	3

Table 8.08 Residential and Commercial Thermal Efficiency Targets
Source: Irasburg Energy Profile from NVDA

At left are targets for reducing heat energy demand, an essential component of meeting 90x50 goals. Increased fuel switching from non-renewables to renewables will not compensate for lower weatherization targets. Conversely, more aggressive weatherization strategies will lower fuel-switching targets.

These projections estimate a six percent increase in number of housing units/commercial establishments over each period. Weatherization projects are assumed to achieve an average of 25 percent reductions in MMBTUs for residential units and 20 percent for commercial establishments over each period, although some weatherization projects can achieve greater savings. Increasing the average savings will decrease the number of weatherization targets.

	2025	2035	2050
Estimated number of Residential Customers	828	878	931
% of Residential Customers to upgrade Electrical Equipment	24%	36%	49%
# of Residential Customers to Upgrade Electrical Equipment	200	314	460

Table 8.09 Electricity Efficiency Improvements
Souce: Irasburg Energy Profile from NVDA

Electricity Efficiency Improvements
A small number of Irasburg residents have already made efficiency improvements by taking such measures as installing LED lighting and more efficient appliances. Below are targets for further reducing electrical energy demand. These targets are based on the projected number of households through 2050 multiplied by 1.5 (generally there are more utility customers than households). They assume an average savings of 400 kWh.

Fuel Switching Irasburg can achieve further reductions in energy use by fuel switching during the coming decades, for example by the installation of efficient wood heat systems and heat pumps as alternatives to fossil-fuel technology and by the increased use of plug-in electric vehicles. As in all other areas, the cost of fuel switching will be an important factor in achieving these efficiencies. State- and utility-sponsored incentives, as well as technological advances, that help to lower costs will help to make these targets achievable.

	2025	2035	2050
New Efficient Wood Heat Systems in Residences	408	340	247
% of households with Wood Heat Systems	74%	58%	40%
New Efficient Wood Heat Systems in Commercial Establishments	2	3	4
% commercial establishments with wood heat systems	22%	44%	53%
New Heat Pumps in Residential Units	121	260	329
% of households with Heat Pumps	15%	31%	37%
Estimated commercial establishments with Heat Pumps	1	2	2
% of commercial establishments with Heat Pumps	5%	9%	13%

Table 8.10 Thermal Fuel Switching Targets for Residential and Commercial Buildings
Source: Irasburg Energy Profile from NVDA

The tables on this page show Irasburg's targets for thermal and transportation fuel switching.
The projected number of vehicles in the area is estimated to be roughly commensurate with projections of population and households. Estimates assume a gradual increase in EV fuel economy from 3 miles per kWh to 4 miles per kWh by 2050. The switch to EVs in Irasburg will be challenging, requiring performance improvements on steep and often wintry terrain and improved battery storage for long distances between charging stations. Currently, the paucity of plug-in charging stations in the Northeast Kingdom is one deterrent to the spread of EVs. The confluence of heavily traveled state and local routes in Irasburg's village center makes it a promising potential location for a charging station.

	2025	2035	2050
Projected # of light-duty vehicles in the area, by year	1,115	1,254	1,411
# of vehicles powered by electricity	117	372	801
% of vehicles powered by electricity	10%	30%	57%
# of vehicles using bio-fuel blends	793	545	95
% of vehicles using bio-fuel blends	71%	43%	7%

Table 8.11 Fuel switching targets for transportation *Source: Irasburg Energy Profile from NVDA*

Irasburg's Energy Portfolio

The table below shows estimates of energy generation from existing renewable energy generation in Irasburg.

Irasburg's new net generation target in support of 2050 goals is 328 MWh. This target is based on Irasburg's share of the regional population. Existing generation in Irasburg does not count toward the target, but the region already has a low net generation target because of the utility-scale wind production in Sheffield and Lowell. The region's net generation target for new solar ranges from 246 MW to 377 MW. There is no regional net generation target for wind.

Renewable Type	Capacity in MegaWatts (MW)	Capacity in MegaWatt Hours (MWh)
Solar	.017	20.8
Wind	0.02	54.9
Hydro	0.0	0.0
Biomass	0.0	0.0
Other	0.0	0.0
Total Generation	**0.037**	**75.7**

Table 8.12 Existing Energy Generation
Source: Irasburg Energy Profile from NVDA

There are three area farm methane digesters in Coventry, Newport Center, and Berkshire, and three in-state hydro producers in Troy and North Troy, and West Charleston generating power through the Standard Offer program (aka SPEED). While not located in Irasburg, they are part of a shared generation asset and the local economy.

Irasburg has sufficient land for the orderly development of solar and residential and commercial-scale wind generation, according to NVDA's mapping analysis. The maps shown in Appendix A, **which are to be used to gauge overall siting potential rather than as a definitive siting tool,** identify known constraints as well as possible constraints:

- Known constraints are areas not likely to be developed for renewable energy because they contain one or more of the following: vernal pools; river corridors; FEMA floodways; significant natural communities; rare, threatened and endangered species; national wildlife areas; wetlands (Class 1 and Class 2); and elevations above 1200'.
- Possible constraints are areas that would likely require mitigation because they contain one or more of the following: agricultural soils; special flood hazard areas (outside of the floodway); protected and conserved lands; deer wintering areas; Act 250 mitigated agricultural soils; hydric soils and high-priority forest blocks.
- Areas not identified on the maps are not suitable for solar or residential and commercial-scale wind generation.

These maps are for planning purposes only. They show potential areas where state and town constraints would not prohibit development of certain energy facilities. In the absence of state and town constraints, individual landowners, of course, may or may not choose to pursue such development.

Scale of Renewable Energy Facilities

This plan adopts the definitions of residential, commercial, net-metered and utility scale energy development shown at right.

Solar Using conservative estimates of prime solar acreage alone (i.e. no constraints) Irasburg has 1,277 acres with potential for solar development. About ten acres are required to produce 1 MW of solar power, according to VEC's subject experts. Obviously, not every prime acre in Irasburg is actually available for solar development.

Property owners may not wish to lease their land; interconnection costs may be too high; the electric grid may lack capacity; and certain sites may be unsuitable due to setback requirements, neighbor concerns or other factors. The plan therefore assumes a more conservative estimate of 1 MW for every 60 acres.

Energy Scale Definitions	
Wind	
Residential	**≤10kW**
Commercial	**≤100kW**
Utility	**≥1MW**
Solar	
Net Metered Residential ≤15 kW	
Net Metered Small Commercial ≤50kW	
Net Metered Medium Commercial or Small Residential Group ≤150 kW	
Net Metered Large Commercial or Large Residential Group ≤500W	
Utility-Scale >500kW	

Figure 8.5 Energy-scale definitions
Source: Vermont Department of Public Service).

Rooftop solar—now a preferred site under Act 99—also offers development potential. While not every rooftop is a viable site, encouraging the maximum number of residential rooftop solar installations could produce considerable output by 2050. Rooftop commercial, which might include barns and other outdoor structures, also offers some limited potential for solar development, but can be at odds with larger, more cost-effective renewable projects.

For residential rooftop solar, NVDA had calculated about 10% of all residential structures (60), with an average capacity of 4KW, and a total MWh capacity of 296. NVDA estimated nearly 40 kWh in solar from two small commercial structures.

Wind It is the position of the NVDA that no further development of utility-scale wind turbines should take place in the Northeast Kingdom. It is the position of the citizens of Irasburg, expressed by vote and by petition, that no development of utility-scale wind take place on the town's ridgelines. Any future new wind generation will be residential- and commercial-scaled with a maximum height of 150 feet and a maximum capacity of 100 kW with a setback of 10 times the height of the facility from full-time or part-time residences. Our analysis assumes about 9.5 kW (typical of a small-scale turbine) for every 25 acres of Irasburg's 838 acres of prime wind areas. This conservative scenario yields an estimate of nearly 14 MW in potential output, with a total output of 17,128 MWh.

Hydro Irasburg has no areas identified as suitable for hydro generation. It is highly unlikely that the town could establish a hydro facility of any scale. Nevertheless, hydro should be considered an important part of Irasburg's energy portfolio, because of hydro's important contribution to the energy portfolios of the utilities that serve the town. While it is true that hydro power facilities can alter the ecosystem of a waterway, causing stress to fish populations and riparian-habitat wildlife, the existing FERC relicensing requirements may reduce or even eliminate some of the in-state hydro facilities that currently serve our region and utilities.

Biomass and Methane Irasburg has a high proportion of forested and agricultural land. Our own extensive woody biomass holds significant potential to reduce the town's consumption of fossil fuel. Wood chips and wood pellets offer the greatest opportunity for transition to these fuels, while giving much-needed support to Irasburg's traditional forest economy and stabilizing fuel costs. Particularly if fossil fuel prices climb, the ease of handling, local availability, low emissions and general low costs of wood resources will promote an opportunity to expand this resource.

Methane, a common gas found in the environment, can be burned to produce electricity. Large amounts of methane are produced through the anaerobic digestion of manure, agricultural wastes, and other organic wastes. Large farms, of which Irasburg has two, have the potential to use this resource. However, on-site systems are costly. If state and federal grants, tax credits and incentives were sufficient to bring the costs within reach, manure-methane generation could have a place in Irasburg's energy-generation mix.

Depending on fuel costs and other market forces, the agricultural production of oilseed crops for biodiesel could also offer potential for Irasburg.

Combined, Irasburg has an estimated generation potential of 40 MW and 210,240 MWh from biomass and methane.

Opportunities and Challenges

Land Use and Development

Compact, mixed-use development can reduce residents' reliance on the automobile, vehicle miles traveled, and inherent system energy costs, including costs associated with maintaining roads and infrastructure. Targeting economic and residential growth within areas intended for more concentrated development allows people to walk to their destinations and makes public transit services between growth centers more economically feasible. At the site level, a south-facing building orientation and landscaping can effectively reduce energy demand. Energy-efficient development patterns should be encouraged.

While smart-growth principles are worthy goals for Irasburg, they remain in many ways aspirational, with a number of land-use, economic and socio-political constraints. Irasburg's existing village center provides few opportunities for development. With little undeveloped real estate, the area lacks access to a waste water system and its dense clay soils are ill suited for septic systems. Adding a wastewater treatment plant would be cost-prohibitive for Irasburg. The village water system has limited additional capacity. An analysis of long-term development trends in Irasburg shows that market demands favor scattered and dispersed development; and, as always, cost is a factor. While Irasburg is wary of land-use regulations to drive development, some planned measures could provide incentives for village-center reinvestment. Irasburg intends to seek Village Center Designation, and existing residences and commercial establishments have the potential to increase population density in the village center.

Transmission Constraints and Electricity Demand

Irasburg is served by severely constrained Northeast Kingdom transmission lines, which already carry the significant outputs from Kingdom Community Wind and Sheffield Wind projects. The NEK already generates far more power than it consumes. As a result, renewable projects sometimes have to be shut down because there isn't enough room on the grid for the energy being generated, according to a draft June report from the Vermont Electric Power Company (VELCO), which manages Vermont's electric grid. Both NEK wind generation sites have faced transmission challenges and shutdowns, leading to financial losses to the developers and utilities.

A 46 kilovolt (KV) line runs from Alburgh east to Sheffield. On that line are both the Sheffield and Kingdom Community wind projects. The line is referred to as the Sheffield-Highgate Export Interface (SHEI).

According to Vermont Electric Co-op, with all of the generators on the line running at capacity, there would be 350MW of electricity moving across the line, but the line only holds 250MW. All the power for Vermont from Hydro-Quebec also flows across that SHEI interface. In northern Vermont, nearly all of the energy already on the grid is renewable. Thus, adding more renewables to a full grid means shutting other renewable sources down. Upgrading the transmission grid to accommodate more power

would be extremely expensive, a cost that would be borne by ratepayers. In addition, efficiency measures have further driven down local demand for electricity. As a result, both VEC and Green Mountain Power oppose a number of recently proposed renewable projects in the area, including the recently withdrawn proposal for the Kidder Hill utility-scale wind project in Irasburg.

Energy storage would allow energy to be stored and used when, and where, needed. As battery technologies advance and costs come down, energy storage will offer another option.

The long-range solution to transmission constraints is beneficial electrification, the replacement of traditional fossil-fuel sources with electricity. Fuel switching, as in the installation of heat pumps and increased use of EVs, will reduce greenhouse gases and, ultimately, reduce costs to users.

The utility companies' Tier II credits required under the new Renewable Energy Standard will be helpful. As noted earlier, Vermont Electric Co-op already offers financial incentives to VEC members who purchase EVs. Additionally, VEC's Clean Air Program offers customized service to under-served and off-grid customers, such as maple syrup producers, who require three-phase power to switch from fuel-burning operations. The VPPSA, which represents Barton Electric and Orleans Electric, is weighing a variety of options to meet the Tier III requirement. These programs offer a significant opportunity for Irasburg residents.

Irasburg's municipal energy policies encourage a secure, stable, resilient supply of energy to sustain the development and quality of life that our citizens envision for Irasburg's future.

Siting Policy

The purpose of Irasburg's municipal energy policies is to encourage a secure, stable, resilient supply of energy to sustain the development and quality of life that our citizens envision for Irasburg's future, in accord with the fundamental Irasburg planning principles of respect for the environment, sound economics and regard for community values.

Irasburg's energy policies support the development of renewable energy resources and facilities in Irasburg, while limiting the adverse impacts of such development on public health, safety and welfare; on Irasburg's historic and planned pattern of development; on environmentally sensitive areas; and on our most highly valued natural, historic and scenic resources. These policies are consistent with related development, resource protection, and land conservation policies set forth elsewhere in this plan. These policies are to be considered in undertaking municipal energy projects and programs and in the review of new or upgraded energy facilities by the Town and by the PUC under 30 V.S.A. §248.

General Standards

1. In-place upgrades of existing facilities, including existing transmission lines, distribution lines and substations as needed to serve the town and the region: To the extent physically and functionally feasible, existing utility systems, including transmission lines, distribution lines and substations, should be upgraded or expanded on site or within existing utility corridors before new facilities or corridors are considered. This Plan does not support infrastructure upgrades for the sole purpose of exporting energy from new renewable energy facilities out of the Northeast Kingdom.

2. Irasburg supports appropriately sized and sited renewable energy development where the energy is largely consumed on site, or on contiguous property such as a large farm, school or business, to offset usage; and discourages large utility-scale installations where the developer seeks to sell power or generate credits for unrelated entities, at the cost, to Irasburg, of disruptive and disproportionate development.

3. The location of individual and net-metered renewable energy projects, community-based projects and other small-scale distributed-energy systems serving individual users should be carefully evaluated according to the criteria of respect for the environment, sound economics and regard for community values. Residential-scale wind generation facilities should have a maximum capacity of 10 kW and a setback of 10 times the height of the facility from full-time or part-time residences. Farm and commercial-scale wind generation facilities should have a maximum capacity of 100 kW, a maximum height of 150 feet, and a setback of 10 times the height of the facility from full-time or part-time residences. Solar energy installations, including solar trackers and roof mounts, should be sited so as to not to detract from the historic aesthetic of Irasburg's central village square.

4. The Northeast Kingdom has experienced a sharp increase in the number of applications for renewable energy installations, which will worsen already congested transmission, especially at the Sheffield Highgate Export Interface where existing generation is frequently curtailed. While Irasburg supports appropriately scaled and sited renewable energy development, the town has a commitment to ensure that such development is sustainable and feasible. Irasburg supports energy development that is consistent with land use and conservation measures contained in this plan, with long-range transmission plans and integrated resource plans in order to ensure grid stability and to minimize expense to ratepayers. To this end, Irasburg will collaborate with other municipalities, utilities, NVDA, and local and state officials to achieve energy development that is mutually beneficial to utilities and customers.

5. The location height, setbacks and access of renewable energy projects must not impair the pristine, iconic nature of the viewshed. They must minimize the visual and sound impacts to neighboring landowners; as well as the impact on wildlife crossings and habitat; erosion; and the conservation of natural and historic resources. Siting must avoid hazard areas such

Any project that requires a Section 248 proceeding must include an independent Visual Impact Analysis carried out according best professional practice as described on pages 18 and 19.

as floodplains and steep slopes, conservation areas where there will be adverse impacts on surface waters, primary agricultural land as mapped by the USDA Natural Resource Conservation Service for the state, and significant wildlife habitat. Impacts to forestland should be minimized by using existing roads and locating along existing forest boundaries to avoid forest fragmentation. Any project that requires a Section 248 process must include an independent Visual Impact Analysis carried out according to best professional practice.

6. Because of Irasburg's central position in the Black River Basin, with a multitude of brooks and streams flowing into the Black River and thence into the international waters of Lake Memphremagog, the siting of energy facilities must give particular emphasis to flood prevention and the preservation of water quality. To prevent sediment from washing down the hillsides in extreme weather events, causing flooding and diminished water quality, energy siting must conserve and protect upland headwaters.

7. From the outset, siting decisions should involve all stakeholders to the greatest extent possible. Among the stakeholders represented should be property owners and residents of adjacent properties; developers; seasonal residents; business owners; state and municipal officials; interested citizens; and the Agencies of Natural Resources and Agriculture, Farms, and Markets.

From the outset, siting decisions should involve all stakeholders to the greatest extent possible.

8. As new technologies emerge to generate, transmit and store energy, Irasburg will apply the same siting criteria—based on respect for the environment, sound economics and regard for community values—that the town currently applies to existing technologies.

9. Siting for utility-scale wind projects merits particular consideration in Irasburg, because of the utility-scale wind project proposed for the town's dominant ridgeline. Irasburg's citizens have had ample first-hand opportunity to observe the effects of such projects in neighboring NEK communities; and the citizens of Irasburg have voted overwhelmingly against the development of utility-scale wind projects on the town's ridgelines. Irasburg has paid close attention to the divisiveness that has accompanied such projects and the damage that they visit upon communities. Because of the importance of this issue for our town, Irasburg's Energy Plan reiterates here the position of the NVDA on utility-scale wind energy:

The NVDA sees one clear benefit to industrial wind energy, one clear problem, and a host of troubling questions. The clear benefit is the tax relief that industrial-scale wind turbines bring to their host towns. The clear problem is the bitter divisions that wind brings to our communities. The troubling questions involve the unreliability of wind energy, the amount of energy produced versus the social and environmental disruption, the costliness of the electricity, and the dubiousness of the claims of environmental benefit. We are even more troubled by the potential impacts on human health, essential wildlife habitat, water quality, aesthetics, property values, and our tourism industry. We are also troubled by the state's energy policies, the state's permitting process, and the ease with which the public good as expressed in our municipal and regional plans can be overridden by people who may never have even visited our region.

It is the position of the NVDA that no further development of industrial-scale wind turbines should take place in the Northeast Kingdom.

For all of these reasons, and because of the 274-9 vote of the citizens of Irasburg to oppose the development of utility-scale wind, this plan takes the position that no development of utility-scale wind should take place in the town of Irasburg or within a distance of 10 times the height of a facility from Irasburg's borders, as specified in 30 V.S.A. §248, subsection 4(H), which reads:
H) The legislative body and the planning commission for the municipality in which a facility is located shall have the right to appear as a party in any proceedings held under this subsection. The legislative body and planning commission of an adjacent municipality shall have the same right if the distance of the facility's nearest component to the boundary of that adjacent municipality is within 500 feet or 10 times the height of the facility's tallest component, whichever is greater.

Energy Planning

The preparation and adoption of this plan represents the beginning of formal energy planning in the town of Irasburg. When the task of completing the Town Plan is accomplished, this plan recommends the formation of an Irasburg Energy Committee, taking advantage of the offers of support and guidance from Energy Committees from neighboring communities and from other organizations. The Energy Committee would strengthen Irasburg's efforts to increase efficiency in energy use and to increase the proportion of existing needs met by renewable energy while improving the general quality of life in terms of cost, comfort and convenience.

Goals

To achieve a secure, stable, resilient supply of energy to sustain the development and quality of life that our citizens envision for Irasburg's future, through a combination of efficiency, conservation and generation, in accord with Irasburg's principles of respect for the environment, sound economics and regard for community values.

To support Vermont's Comprehensive Energy Plan by meeting or exceeding the standards and targets set forth in this plan for energy use, efficiency, conservation and generation.

Actions

- Upon Town Plan completion, form an Irasburg Energy Committee to strengthen Irasburg's efforts to increase efficiency in energy use and to increase the proportion of existing needs met by renewable energy. Work with existing Energy Committees in neighboring towns to learn from their experience in developing best practices.
- Encourage weatherization of existing commercial and residential structures and energy-efficient construction practices for new construction. Participate in Efficiency Vermont's Button-Up Vermont initiative.
- Encourage energy efficiency in sugaring operations, making use of dedicated programs offered by Efficiency Vermont and electric utilities.
- In partnership with the Selectboard, develop an Energy Communication Plan (with goals, key messages, target audiences, strategy and tactics) to build robust community awareness of available resources, opportunities and ongoing activities in energy efficiency, conservation and generation.
- Continue to work in close collaboration and consultation with NVDA, the regional planning

commission, to ensure that regional energy policy addresses Irasburg's needs and concerns and to influence energy-related policy at the state level.

- In partnership with the Selectboard, develop improved Park & Ride facilities in close proximity to the Village Center to encourage car-pooling and reduce single-occupancy vehicle trips.
- Pursue Village Center Designation to encourage development and redevelopment in the historic Village Center; to access grant funding and training opportunities; to encourage improved pedestrian and bicycle access within the Village Center; to develop a dedicated Park & Ride facility; and to investigate the feasibility of installing an EV charging station.
- Increase presence of rooftop solar on residential structures in keeping with the General Standards outlined elsewhere in this chapter. Ensure that all firefighters have current training for roof-mounted solar installations and wind installations.
- Work with electric utilities to identify and publicize opportunities to encourage fuel switching, including the potential location of a plug-in charging station for EV's in Irasburg's village center.
- Irasburg supports state and federal "swap out" programs to update older models of outdoor wood boilers as well as incentives that encourage home and commercial owners of older wood boilers to upgrade to newer, more efficient models.
- Complete actions recommended by 2010 energy audits of town buildings, as budgets permit, and publicize resulting energy savings, to serve as a model for cost-effective energy efficiency.
- In collaboration with the Selectboard, consider developing an Irasburg website to support community awareness and engagement on energy-related issues and opportunities (among other purposes); and to develop more complete baseline data on energy usage.
- Work with Leach Library after-school enrichment program to introduce energy- and environmentally-related program offerings for Irasburg elementary-school students. Strengthen energy-related educational opportunities for adults through "Button-Up Vermont" and other Efficiency Vermont Programs and the potential University of Irasburg.
- Encourage the further development of a weekly farmers' market on the Irasburg Common to promote local food consumption and to conserve fuel that would be otherwise used to transport food from long distances.
- Support the NEK Food Cycle Coalition and NVDA in efforts to implement Vermont's Universal Recycling Law, Act 148, to reduce truck traffic driving to the Coventry Landfill.
- Complete and gain approval for Irasburg's first Town Plan!
- Build a robust sense of community among Irasburg's citizens, recognizing that a culture of trust and mutual support is key to the preservation and enhancement of the quality of life that Irasburg citizens value.