

Vermont’s Electricity Outlook: Today through 2016

By Guy Page

INTRODUCTION

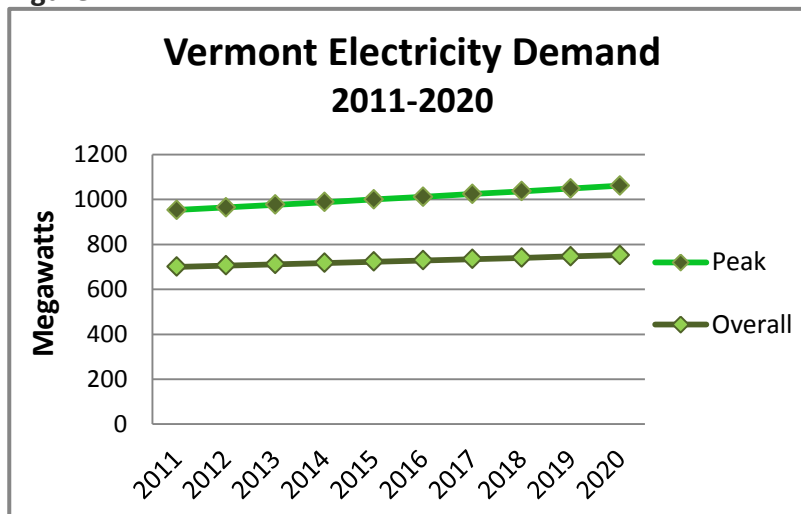
Vermonters care deeply about the how their electricity is generated. Cost and safety issues and the environmental pros and cons of Vermont’s power supply routinely make front-page news and provide fodder for debate on opinion pages.

The mix of fuel sources that make up Vermont’s energy profile has changed dramatically in the last several months. New standards to increase the state’s power supply with renewable and low-carbon resources have placed the burden on utilities to meet demand with fewer supply options. Vermont’s utilities currently only have enough committed power to meet demand through the end of the year. Starting in 2013 and moving forward, there will be an increasing gap between committed power and potential demand. In order to fill that gap, Vermont’s utilities will have to turn to power purchased directly from the Independent System Operator (ISO) New England energy market, leading to potential electricity price increases, less investment in in-state renewable generation, and higher carbon emissions.

The Vermont Energy Partnership, in its continuing efforts to educate the public on energy issues, has compiled this overview of Vermont’s present-day and near-term electricity portfolio, focusing on the year 2016 as our reference point. Virtually all of the portfolio statistics are derived from the Vermont Department of Public Service (DPS) and Vermont’s electric utilities, thus creating the most accurate picture of the state’s energy future.

VERMONT’S ELECTRICITY DEMAND: 2011-2020

Figure 1



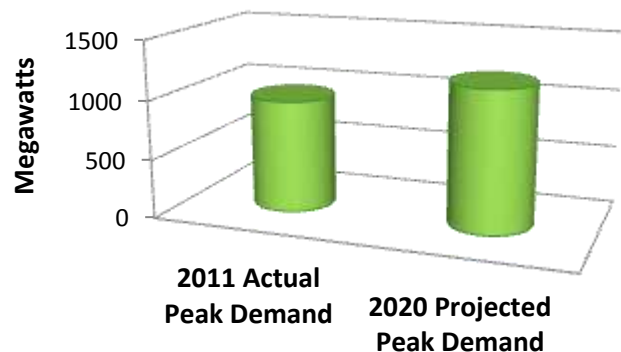
Source: ISO New England

In the 2011 Regional System Plan, the Independent System Operator (ISO) New England forecasted that Vermont’s overall electricity demand would grow at a rate of less than one percent annually over the next decade (Figure 1). ISO forecasted the state’s peak (summer) demand to grow 1.2 percent annually over the next decade (Figure 2).

Figure 2

Vermont’s daily average demand is about 700 megawatts of electricity, although this figure varies by season. ISO-New England determined Vermont’s peak demand for 2011 was 953 megawatts. Based on its formula for peak-demand growth, ISO-New England estimated electricity demand would rise to about 1190 megawatts by 2020.

Vermont Peak Electricity Demand



Source: ISO New England

WHAT FUELS VERMONT?

Vermont’s utilities have commitments from electricity suppliers to meet 60 percent of the state’s projected need in 2016. Electricity sourced from wind, nuclear, hydro, and natural gas power — mostly imported from neighboring states and Canada — will provide the lion’s share of Vermont’s electricity. The following overview of each power source is based on Vermont DPS power-portfolio projections, further explained in Figure 3.

Nuclear Power

Nuclear power will still be a significant part of the state’s energy mix, comprising a little more than 12 percent of the total power used in 2016. That power is committed through Green Mountain Power’s (GMP) contract with the Seabrook plant in New Hampshire and from Connecticut’s Millstone 3 reactor, which is partially owned by Central Vermont Public Service (now merged with GMP). Prior to 2012, Vermont filled approximately 30 percent of its overall electricity demand with nuclear power generated by Vermont Yankee.

Natural Gas and Oil

Together, oil and natural gas commitments are expected to comprise less than one percent of Vermont’s total power in 2016. Vermont does not generate natural gas in the state: it was the first state in the U.S. to ban hydraulic fracturing (fracking). Additionally, there are only a handful of small, oil-burning facilities in Vermont, which generate very little electricity. Most committed oil and natural gas power will come from market power contracts with out-of-state producers.

Market Power

This category represents power generated by out-of-state producers and then bundled into a package by power brokers like Morgan Stanley. This power is predicted to make up about 5.5 percent of Vermont’s fuel mix in 2016. The contracts, which deliver specific amounts of power mostly generated from natural gas in southern New England, are set to phase out by the middle of the decade but new contracts to replace these are likely.

Imported Hydro

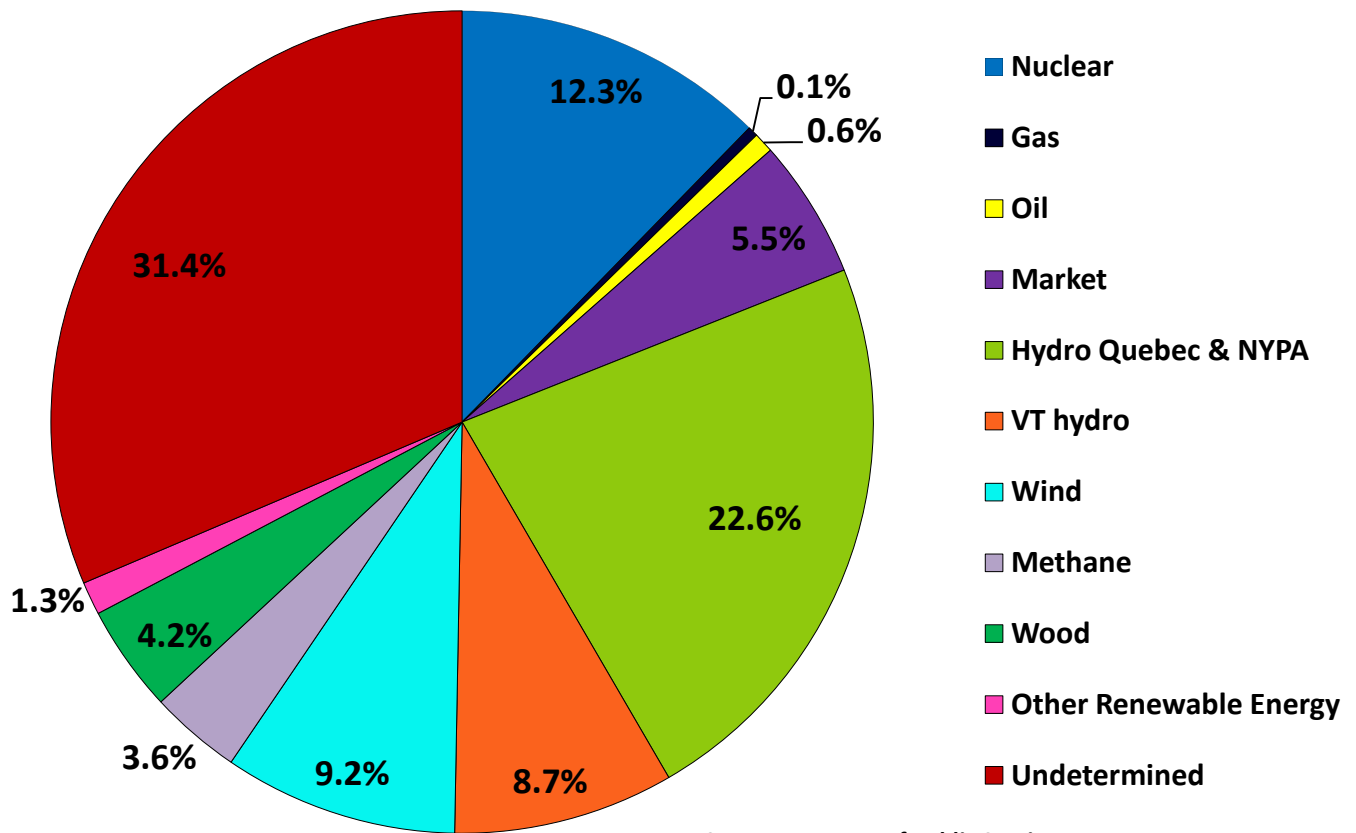
Hydro electricity is now the largest power generation source by category, providing about 23 percent of Vermont’s electricity. For the next 20-plus years, Hydro-Quebec will deliver about 220 megawatts directly to Vermont. New York Power Authority’s massive dams will also deliver a small percentage of the state’s power.

Vermont Hydro

No significant generation growth is expected from Vermont’s 84 dams, which will make up nine percent of the state’s total power supply by 2016. This power source is considered almost fully developed in the state. Environmental concerns are one of the main constraints on expanding in-state hydropower.

Figure 3

**2016 Vermont Electricity Portfolio
(Estimated)**



Source: VT Dept. of Public Service

Wind

Three medium-to-large wind farms — Lowell, Milton, and Deerfield — are slated to become operational in the near future, and one, Sheffield, recently went online. Green Mountain Power’s smaller Searsburg I wind farm continues to operate. About nine percent of the total demand for electricity in the state in 2016 will be derived from these new wind farms, existing wind generators, and Vermont’s 50 MW share of the Granite Reliable wind farm in Coos County, New Hampshire.

Methane

No large-scale generation growth is expected from methane burned at several Vermont farms and landfills. The two most productive sites are the Coventry and Moretown landfills. In 2016, these operations will produce four percent of Vermont’s electricity

Wood Biomass

Vermont currently gets about 70 megawatts of electricity from burning woodchips at plants in Burlington and Ryegate. Two proposed plants, one in Springfield and the other in Fair Haven, face uncertain futures. One obstacle is a consistently lukewarm response from the State of Vermont on the role of wood biomass as a large-scale producer of electricity. At this time, wood biomass is predicted to comprise just over four percent of Vermont’s fuel mix in 2016.

Solar and Other Renewables

This category comprises less than one percent of Vermont’s current electricity mix. To offset this low level, the state has embarked on a program for renewable power called the Standard Offer, which can best be described as an “if you build it, they must buy it” policy. This program requires Vermont utilities to purchase power from new, in-state wind and solar projects. For example, if a developer builds an approved solar panel project that will generate 2.2 of fewer megawatts, Vermont’s utilities must buy the electricity for a set price of 24 to 27 cents per kilowatt-hour (or approximately eight times the prevailing market price for natural gas power). It is estimated that event with the Standard Offer program, solar and other renewables will produce about one percent of the state’s total demand in 2016.

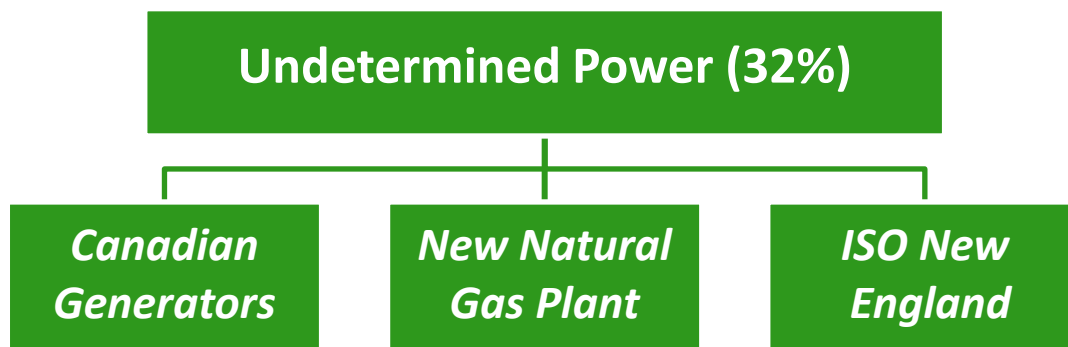
Undetermined Power

The source of nearly 32 percent of Vermont’s electric power in 2016 is yet to be determined. At this time, Vermont’s utilities do not have commitments to meet this portion of the state’s projected demand. This percentage is approximately the same amount of power that Vermont Yankee supplied directly to Vermont utilities through March of 2012. Looking at the contributions to our electric power portfolio, it is clear that apart from a dramatic, unexpected change in the amount of power anticipated from wind or biomass, very little new electric power will be generated within Vermont’s borders.

FILLING THE VOID

Where will the “undetermined” 32 percent of electric power come from by 2016? There are three possible sources: the first two sources have uncertain outcomes and are several years away from reaching their potential, while the third energy source is in place and operating right now.

Figure 4



New power from the Eastern Canadian provinces

Energy is certain to be the focus of this year's Northeast Governors and Premiers Conference, scheduled to take place July 29-30 in Burlington, Vermont.

It is broadly understood that while Canada produces the plentiful power that New England demand requires, a transmission bottleneck exists between seller and purchaser. There is limited capacity on existing high-power transmission lines, the interstate highways of electric transportation.

At a working session at the Vermont Statehouse in May, Governor Peter Shumlin called for a new transmission line to be built from the Canadian border through Maine to service New England. A similar proposed Canada to New England transmission line, the Northern Pass of New Hampshire, faces serious and growing grassroots and state government opposition. Considering the controversy in New Hampshire over this proposal, the development of a new high-power transmission line corridor through Vermont is equally unlikely. It is unclear whether a similar power corridor in Maine will face similar opposition.

A new natural-gas power plant in Rutland County

Governor Shumlin and other state leaders support the extension of the Vermont Gas pipeline to the Rutland area. In recent years, construction of a gas pipeline from the Marcellus shale of western New York to southwestern Vermont has been discussed as well. Natural gas delivered through a pipeline can be used to generate electricity via a large-scale, base load power plant – a common sight throughout the rest of New England but non-existent in Vermont.

Of course, both of the options listed above are highly speculative due to political, financial, and permitting challenges.

ISO New England

Vermont meets its current “undetermined” power needs through the purchase of electricity from natural gas, nuclear, and hydro plants in the southern New England regional power market.

This market is run by the regional independent system operator called ISO New England. For Vermont utilities, purchasing power from the open regional market is practical, reliable, and (due to current low prices) cost-effective. However, prices fluctuate daily. Additionally, Vermont receives none of the economic benefits and exerts none of the regulatory control that comes with in-state power production.

VERMONT'S ENERGY FUTURE

While Vermonters debate and discuss the pros and cons of various forms of in-state power production, the actual trend seems to be slow-to-no growth. Fossil-fuel-generated power, which adds more carbon to the atmosphere, is being rushed in by Canada and other U.S. states to fill that 32 percent gap.

There is a clear disconnect between the expectations of Vermonters and what is actually being done to shape our state's energy portfolio.

There are those who want a renewable-energy renaissance in Vermont, where future demand is met by a combination of solar and wind power and efficiency measures. Yet, the reality is that there has been very limited growth of in-state generated renewable energy to date.

Since Vermont's utilities stopped purchasing power directly from Vermont Yankee in March, the utilities' purchases of natural gas and other fuel sources from the regional power market have risen significantly. This suggests that Vermont's utilities essentially replaced the power they were getting from Vermont Yankee with regional power.

It is possible that a technological breakthrough in the generation and storage and/or transmission of renewable power in the next 20 years will affect the sea change long hoped for by its advocates. However, it is unlikely that change will occur anytime soon.

This analysis has intentionally avoided the subject of cost. This is due to the fact that power generators regard such information as proprietary; for example, Vermonters still do not know how much they are paying for Hydro-Quebec power.

In the absence of firm data about the cost of power, Vermonters have no way of knowing why their electricity rates continue to stay the same, despite the fact that rates have been falling elsewhere in the region.

The only energy price that is clearly known is that for Standard Offer power, which is written in state law (priced at 24-27 cents per kilowatt-hour) but, as noted above, this source contributes less than one percent to the state's electricity portfolio. Ratepayers would benefit from more information on the fiscal, economic, and environmental impact of an increased reliance on foreign energy. This is especially true of the business sector which is in need of greater certainty in this difficult economic recovery.

(Guy Page, of Cambridge, is the communications director of the Vermont Energy Partnership.)

SOURCES

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Vermont Department of Public Service, "Vermont Electricity Portfolio 2011 – 2031," May 2012.

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