

VERMONT ELECTRICITY PRESENT AND FUTURE

ISO-NE Consumer Liaison Group

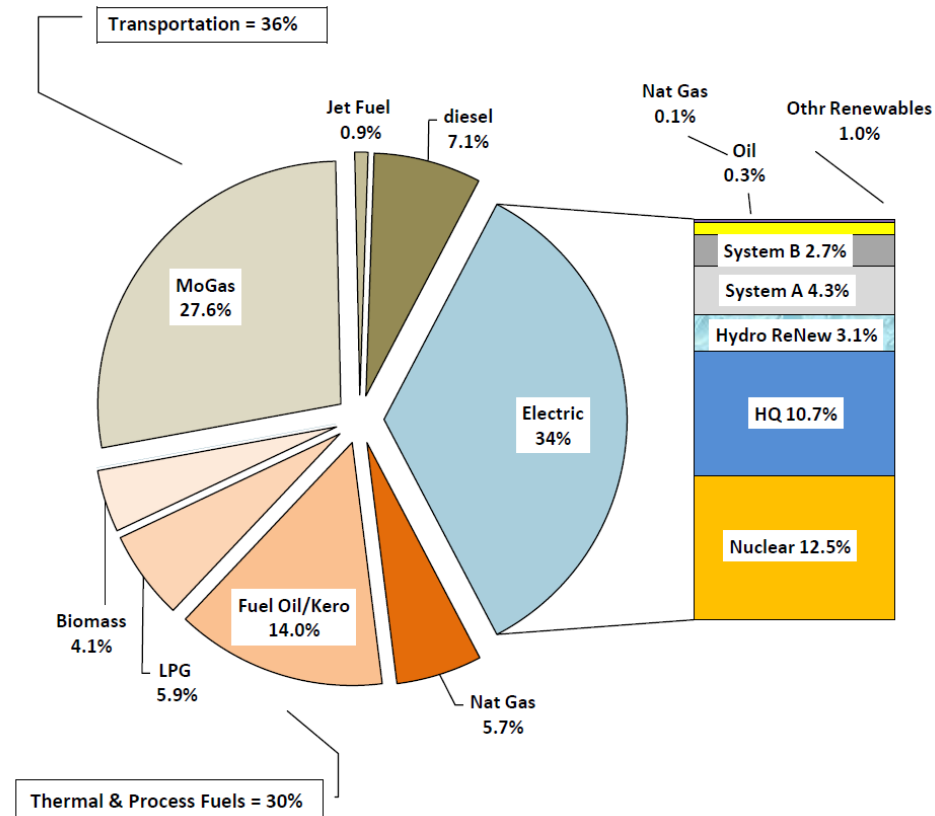
TJ Poor

Vermont Public Service Department

March 13, 2015

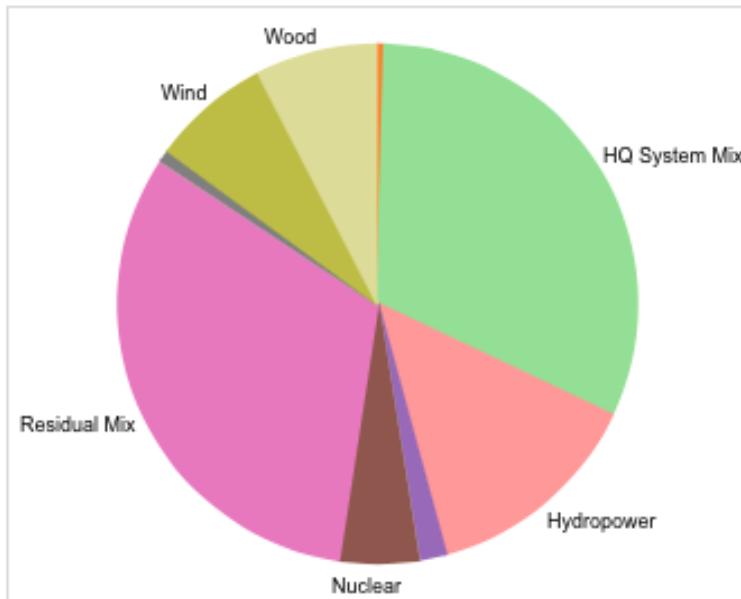
Vermont energy in brief

- 129 Trillion BTU of primary energy per year – over half of which is petroleum products
- Electricity ~45% renewable (mostly hydro)
- Thermal:
 - Limited natural gas access
 - High use of fuel oil and propane
- Transportation
 - Rural state – lots of driving

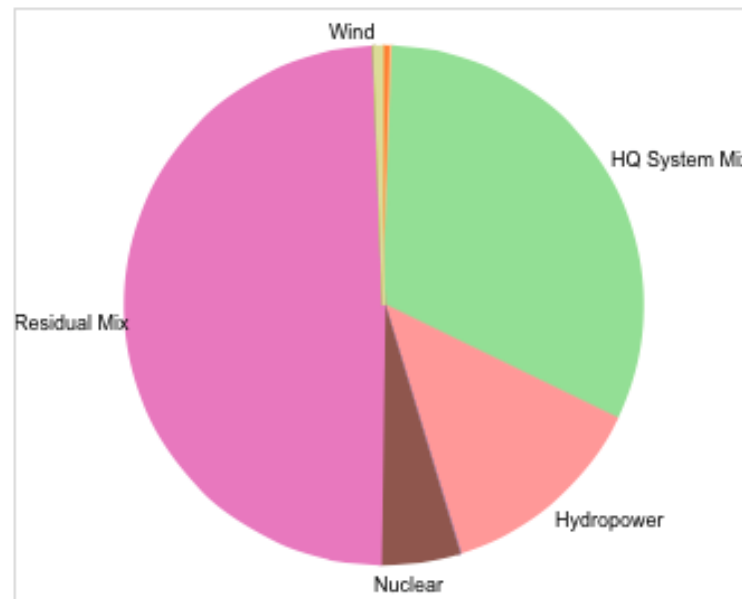


Electricity portfolio

2013 Power Supply, Ignoring RECs



2013 Power Supply, Accounting for RECs



Source



<https://public.tableausoftware.com/profile/jrw8457#!/vizhome/2013PowerSupplyBeforeAfterRECs/Dashboard1>

State energy policy 30 V.S.A. §202a

It is the general policy of the state of Vermont:

- (1) To assure, to the greatest extent practicable, that Vermont can meet its energy service needs in a manner that is **adequate, reliable, secure and sustainable**; that assures **affordability** and encourages the state's **economic vitality**, the **efficient use** of energy resources and **cost effective** demand side management; and that is **environmentally sound**.
- (2) To identify and evaluate on an ongoing basis, resources that will meet Vermont's energy service needs in accordance with the principles of **least cost integrated planning**; including **efficiency, conservation and load management** alternatives, wise use of **renewable resources** and **environmentally sound** energy supply.

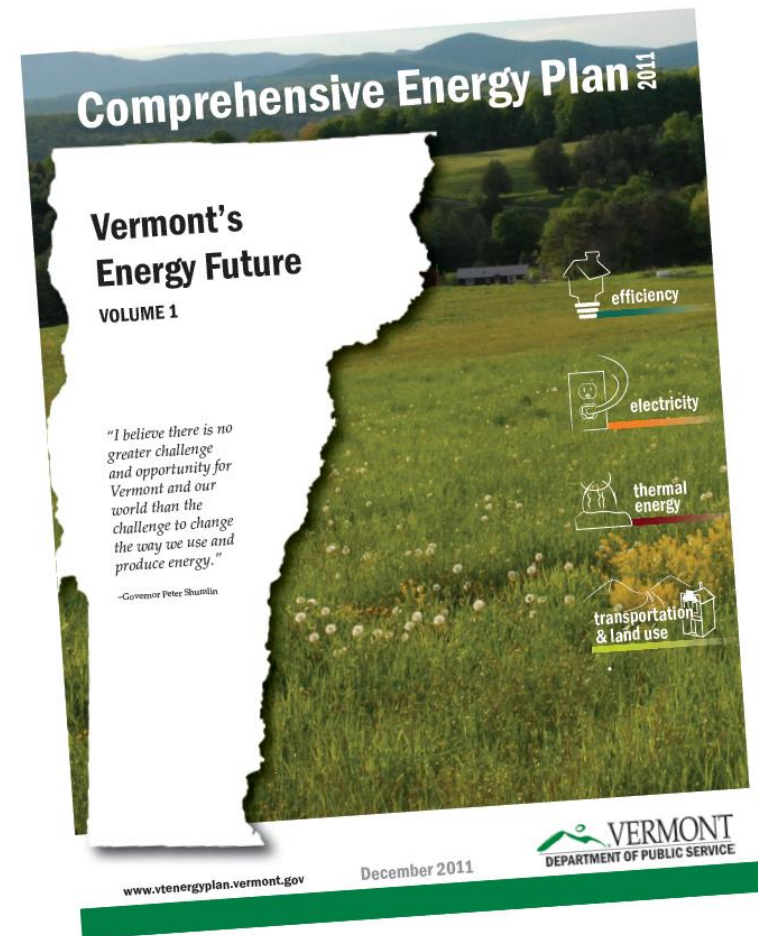
Renewable energy and climate goals

Vermont's Legislature has adopted climate change mitigation goals

- 50% reduction in GHG emissions from 1990 levels by 2028
- 75% reduction by 2050 “if practicable using reasonable efforts”

Our 2011 Comprehensive Energy Plan sets a goal of 90% renewable energy across **all sectors** by 2050

- We are currently at about 20% renewable



Distributed Energy: Grid Operations Progress

- Nearly statewide AMI deployment, statewide fiber-optic visibility into substations, and VELCO has a Deep Thunder/weather analytics partnership with IBM.
- The PSD and GMP have received a grant from the US DOE to improve the interconnection process in VT, including examination of load flows on each of GMP's circuits.
- Green Mountain Power
 - testing “eHomes” with data being collected on performance of appliances, PV, CCHPs, thermal energy storage, etc.
 - Partnering with Dynapower, a world class power electronics firm in S. Burlington, building an islandable solar microgrid w/ storage at Stafford Hill in Rutland.

A Distributed Energy Future: H.40's role

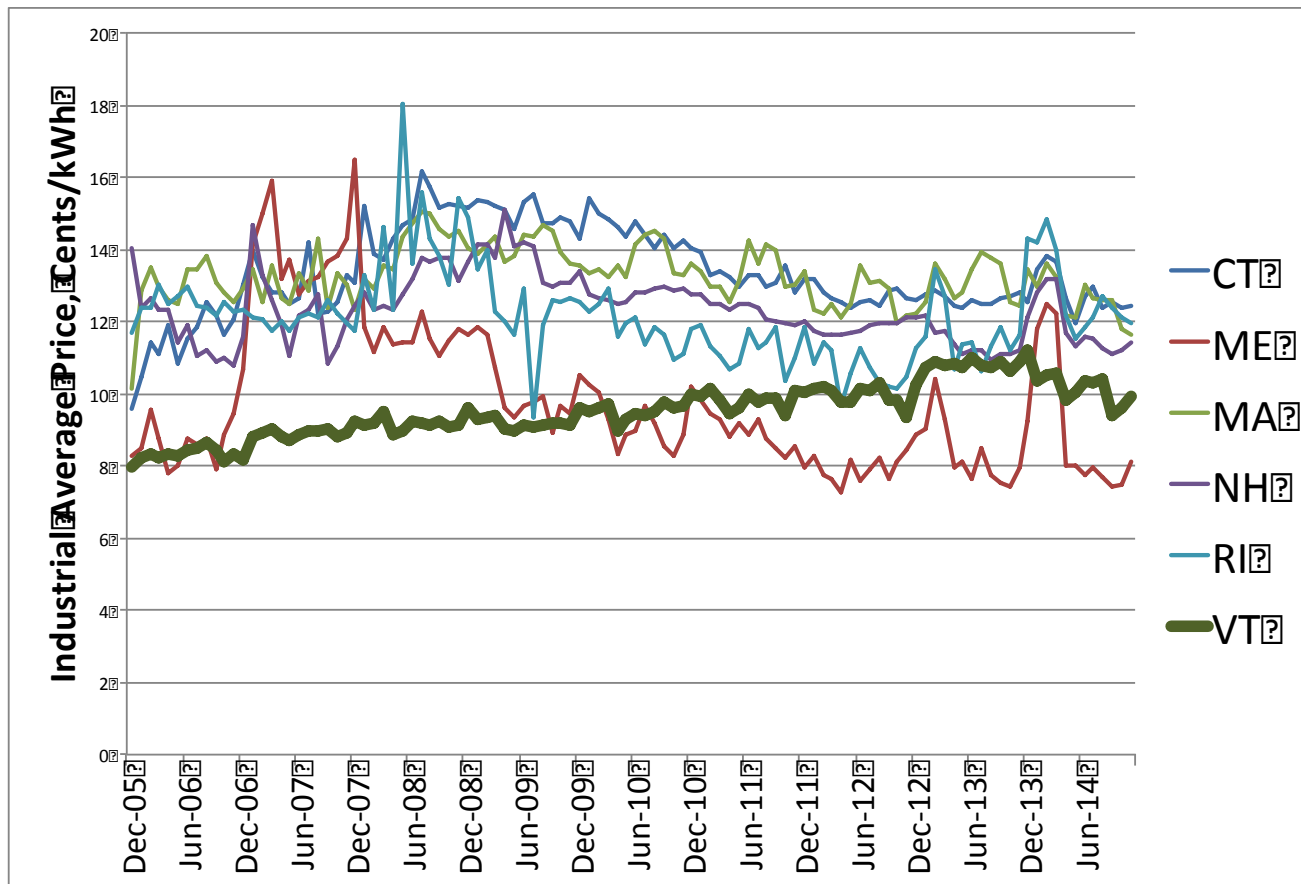
- Current SPEED program is voluntary goal for renewable energy in 2017 that allows utilities to sell RECs to mitigate rates
 - Risk that those RECs would no longer be accepted in regional markets
- H.40 would require new DG on our grid to provide 10% of retail electric sales by 2032. That corresponds to 400+ MW of DG (VT's peak load is ~1 GW).
 - This is on top of 150+ MW of other DG installed prior to the 2017 start of the RPS.
 - By 2032, therefore, we expect DG capacity to approach or exceed 50% of the state's peak load.
- H.40 would also accelerate strategic electrification of both heating (via cold-climate heat pumps) and transportation (via EVs). This has spurred conversations about active load control to avoid peak-driven costs.

DG and Rates

- VT has a history of success with using electric energy efficiency and DG to avoid or defer distribution and transmission infrastructure upgrades.
- Market-based process for awarding Standard Offer contracts has brought prices down 60%.
- DG can also help reduce our share of the costs from the multi-\$billion transmission build-out of the last few years, and cushion us from the coming capacity price increases in 2017 and beyond.

Why not restructured?

I wasn't here at the time. However,
Rate stability:



Why not restructured?

I wasn't here at the time. However,

Integrated thinking:

- Least-cost integrated planning (and action!) is possible because the same entities that own and run the grid are also empowered to make power supply choices to address those needs and costs
- Allows Vermont to rely on traditional planning tools and processes (e.g. IRP) to determine least cost resources, while harnessing the market to deliver those resources at least cost.
- Distributed energy future will require more, not less, integration of historically separate aspects of utility operation

Concluding Thoughts

- It is possible for State policy goals, often thought to be competing, to instead be in harmony with one another.
 - Addressing our challenges and reaching our goals requires balancing regulation with market forces
- Vermont's current regulatory and policy structure allows for creative, long-term, integrated planning for the future while harnessing the power of the market to facilitate stable prices

Thank you

Public Service Department webpage:

<http://publicservice.vermont.gov>

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