

NET ZERO ENERGY

BURLINGTON VERMONT



About Burlington Electric Department (BED)

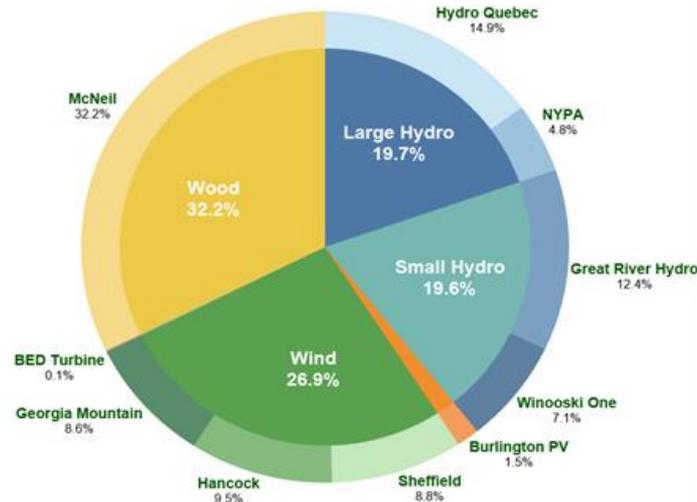
- Burlington's municipal electric utility
 - Public power since 1905
 - 118 employees, including the McNeil Generating Station
 - Third-largest electric utility in Vermont
- 21,000+ customers
 - 17,282 residential, 3,983 commercial and industrial
 - 5,500-6,000 residential accounts turn over each year
- Electricity facts:
 - Summer peak: ~65 MW; annual energy use: ~330,000 MWH
 - McNeil is the largest energy producer in Vermont with Vermont Yankee retirement
 - 100% of power from renewable generation as of 2014
 - No rate increase from 2009-2021; first rate change in FY22 due to pandemic - 7.5%; FY23 rate change - 3.95%





2022 BED ENERGY SUPPLY

Prior to REC Sales & Purchases

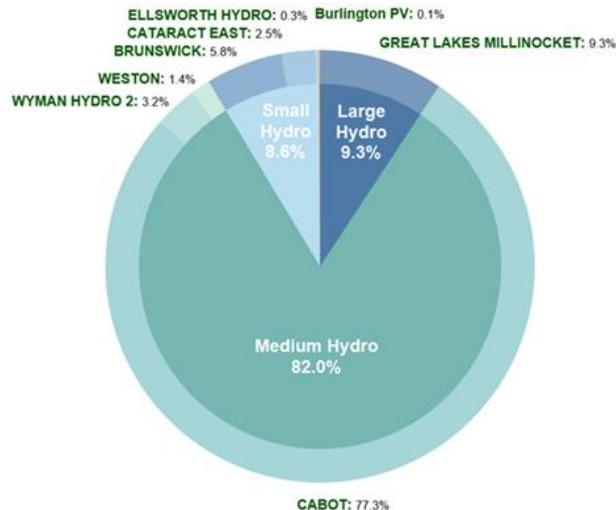


BED's 2022 energy supply by source - The above chart represents energy purchased by BED prior to REC purchases and sales and amounts to 349,402 MWh of electricity. The chart does not represent an ability to claim those fuel types for renewability purposes – for more detailed information, see BED's website. BED has no contracts for resources fueled by natural gas, nuclear or coal. 0.1 percent of generated energy comes from oil used at the BED Gas Turbine (in excess of BED's energy needs). The sourced energy from renewables exceeded sales by 10 percent. Hydro is divided into large (≥ 100 MW), medium (≥ 30 MW and < 100 MW), and small (< 30 MW).



2021 BED RENEWABILITY

After REC Transactions

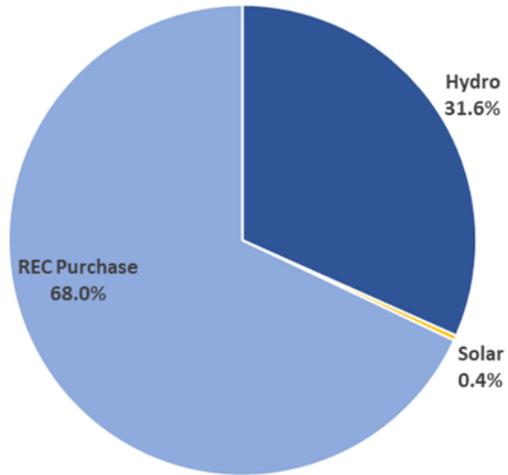


BED's renewability profile for calendar year 2021. Compliance for Vermont's Renewable Energy Standard is determined on an eight (8) month lag relative to the calendar year due in part to the REC trading period for New England that trades on a six (6) month lag. Due to this, Renewability for 2022 will not be finalized until the REC trading period closes in June and the Renewable Portfolio Standard Compliance Filing is submitted in August. BED expects its renewability profile to resemble what has been reported for Calendar Year 2021. BED retired renewable energy certificates (RECs) in excess of its sales by 2.6% during this period, which accounts for line losses on the distribution and transmission systems along with company use. The number of RECs retired amounts to 326,677 MWh. Hydro is broken out into Large (≥ 100 MW), Medium (≥ 30 MW and < 100 MW), and Small (< 30 MW).



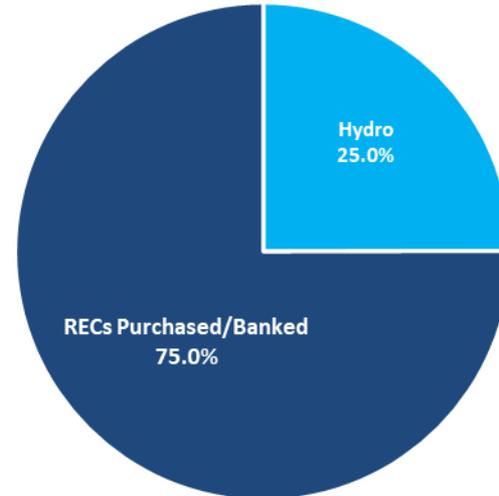
CY 2019 BED Renewability

Including REC Sales & Purchases



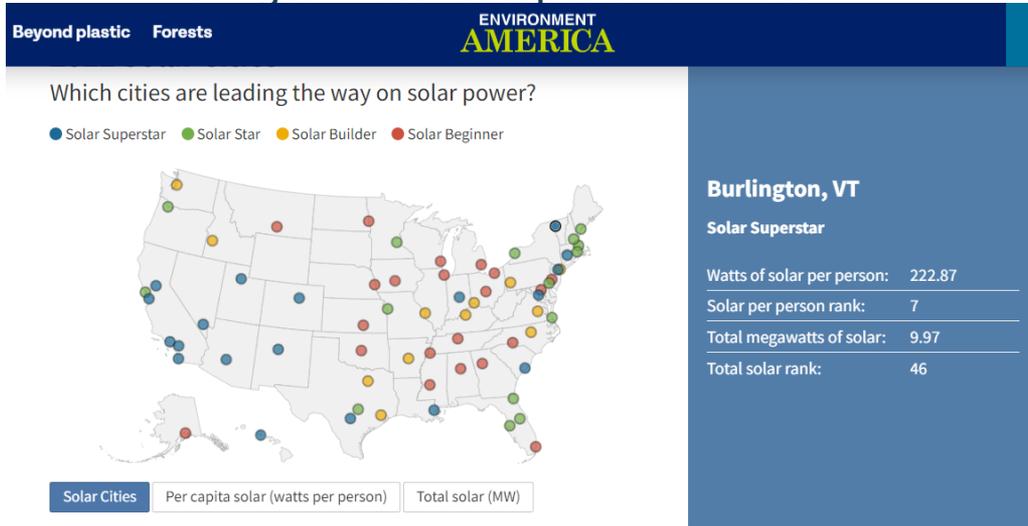
2020 BED Renewability

Including REC Sales & Purchases





Burlington Most Per Capita Solar in East



Top cities for solar per capita

- [1. Honolulu, HI](#)
- [2. Las Vegas, NV](#)
- [3. San Diego, CA](#)
- [4. Albuquerque, NM](#)
- [5. San Jose, CA](#)
- [6. San Antonio, TX](#)
- [7. Burlington, VT](#)
- [8. New Orleans, LA](#)
- [9. Phoenix, AZ](#)
- [10. Washington, DC](#)

Top cities for total solar

- [1. Los Angeles, CA](#)
- [2. San Diego, CA](#)
- [3. Las Vegas, NV](#)
- [4. Honolulu, HI](#)
- [5. San Antonio, TX](#)
- [6. New York, NY](#)
- [7. Phoenix, AZ](#)
- [8. San Jose, CA](#)
- [9. Albuquerque, NM](#)
- [10. Washington, DC](#)

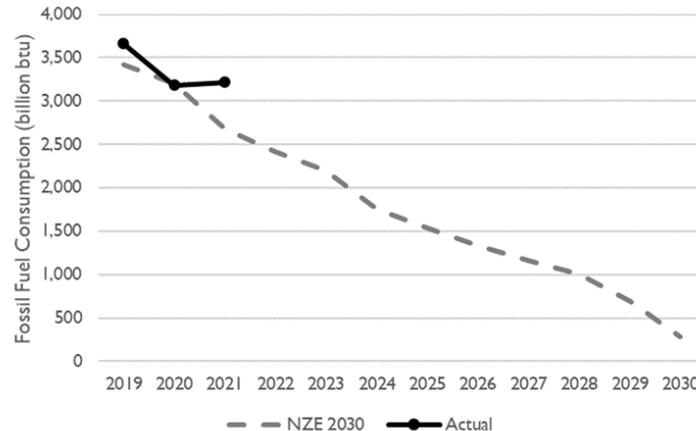


2030 Vision: Make Burlington a Net Zero Energy city by eliminating fossil fuel usage across electric, thermal, and ground transportation sectors. www.burlingtonelectric.com/nze. The Net Zero Energy Roadmap was adopted by the City Council in September 2019. Burlington's Net Zero Energy Roadmap is the most ambitious local climate change plan in the nation that BED is aware of, *recognized by the Smart Electric Power Alliance as the "first US Net-Zero 2030 plan."*

Synapse Energy Economics Net Zero Energy Roadmap Update for 2022 – Commissioned by BED

Fossil Fuel Energy Consumption:

Thermal and Ground Transportation 2019-2021

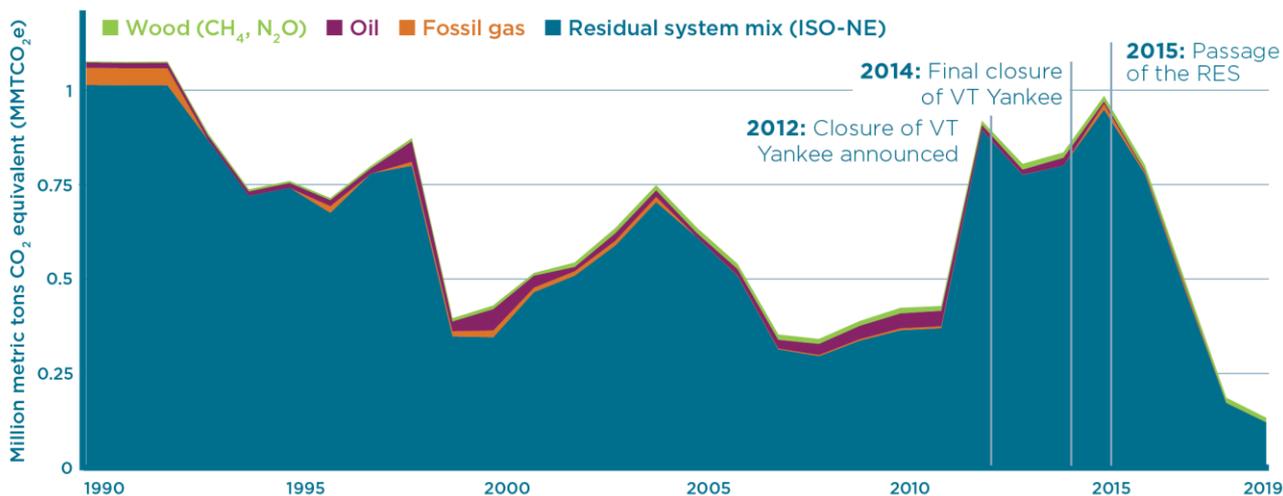




Context Vermont RES

- Vermont's 2015 RES reduced Vermont's Greenhouse Gas Emissions –

Historical VT electricity GHG emissions by source

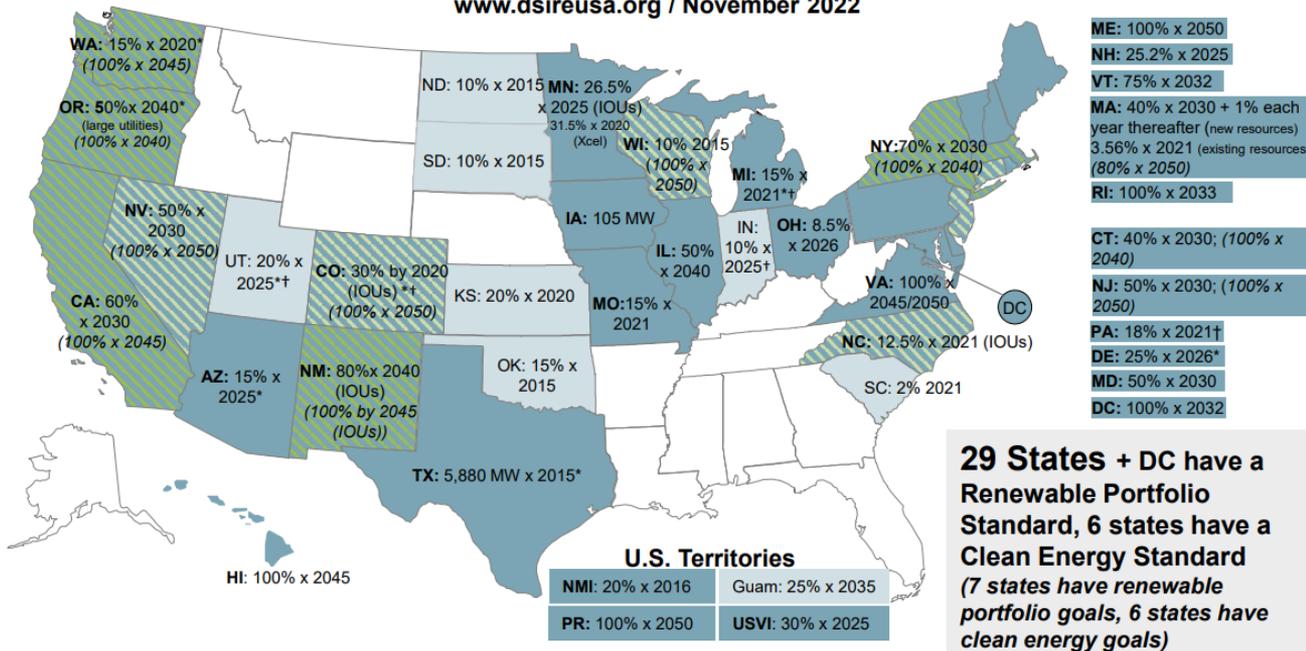


Source: Vermont Agency of Natural Resources, Vermont Greenhouse Gas Inventory: 1990 - 2017, 2021. Note: Since hydroelectricity does not produce GHG emissions at the point of generation, it has historically been counted as 0 emitting by VT Agency of Natural Resources. However, a supplemental lifecycle emissions inventory for all of Vermont's energy use is underway.



Renewable & Clean Energy Standards

www.dsireusa.org / November 2022



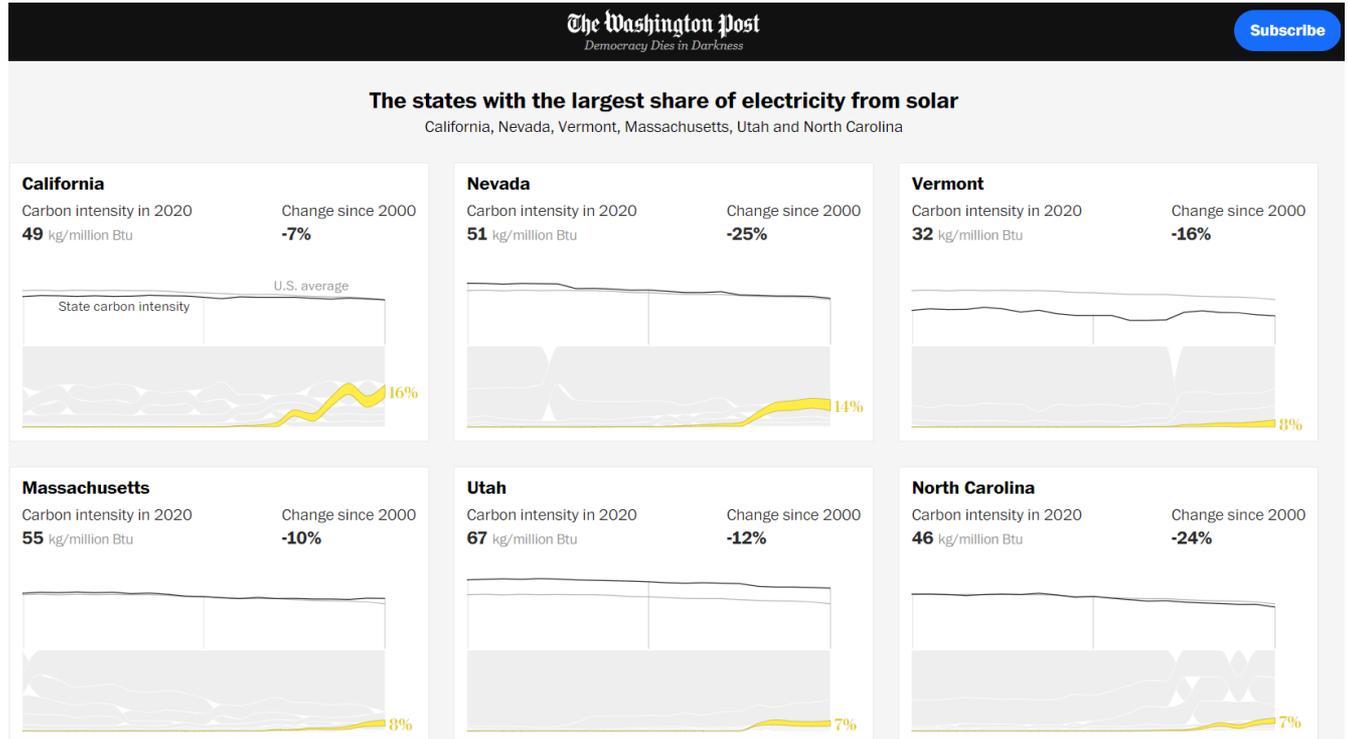
29 States + DC have a Renewable Portfolio Standard, 6 states have a Clean Energy Standard (7 states have renewable portfolio goals, 6 states have clean energy goals)

Renewable portfolio standard
 Clean energy standard
 Renewable portfolio goal
 Clean energy goal
 * Extra credit for solar or customer-sited renewables
 † Includes non-renewable alternative resources



Context Vermont RES

- Vermont's is Leading –





Context Vermont RES

- Vermont's is Leading -

The Washington Post
Democracy Dies in Darkness

Subscribe

The states that make the cleanest power

Vermont, Washington, Oregon, New Hampshire, South Dakota and South Carolina

Vermont

Carbon intensity in 2020
32 kg/million Btu

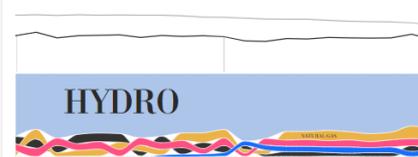
Change since 2000
-16%



Washington

Carbon intensity in 2020
34 kg/million Btu

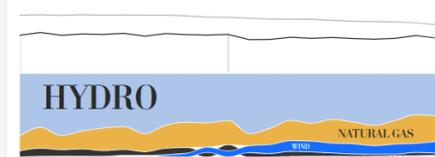
Change since 2000
-11%



Oregon

Carbon intensity in 2020
35 kg/million Btu

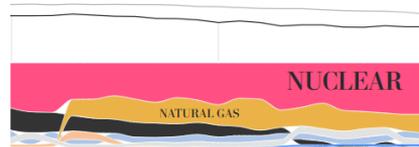
Change since 2000
-8%



New Hampshire

Carbon intensity in 2020
36 kg/million Btu

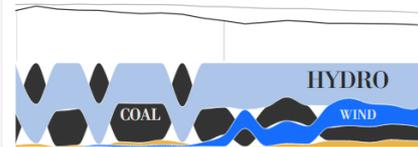
Change since 2000
-25%



South Dakota

Carbon intensity in 2020
37 kg/million Btu

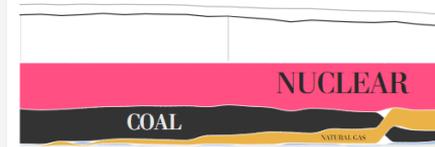
Change since 2000
-30%



South Carolina

Carbon intensity in 2020
37 kg/million Btu

Change since 2000
-23%





Context Vermont RES

- **Vermont's 2015 RES is projected to continue to reduce Vermont's Greenhouse Gas Emissions –**
- "Overall, across all energy using sectors, the Department estimates that by 2031, on an annual basis, Vermont will consume around 16% less fossil-based energy than it does today in the baseline load forecast scenario, or approximately 20% less in the high forecast scenario, as a direct result of RES, with an additional 1.9% reduction resulting from the increased share of nuclear. Similarly, annual carbon dioxide emissions could be reduced by nearly 1,003,000 tons (baseline load forecast) or 1,224,000 tons (high load forecast scenario) in 2031 as a direct result of RES, a reduction on the order of 12% and 14%, respectively, relative to recent levels across all sectors (estimated to be around 8,600,000 tons)"
- Public Service Department 2023 RES report
- https://publicservice.vermont.gov/sites/dps/files/documents/2023%20Vermont%20Annual%20Energy%20Report_0.pdf



Context Vermont RES

- Vermont's 2015 RES is projected to continue to reduce Vermont's Greenhouse Gas Emissions –

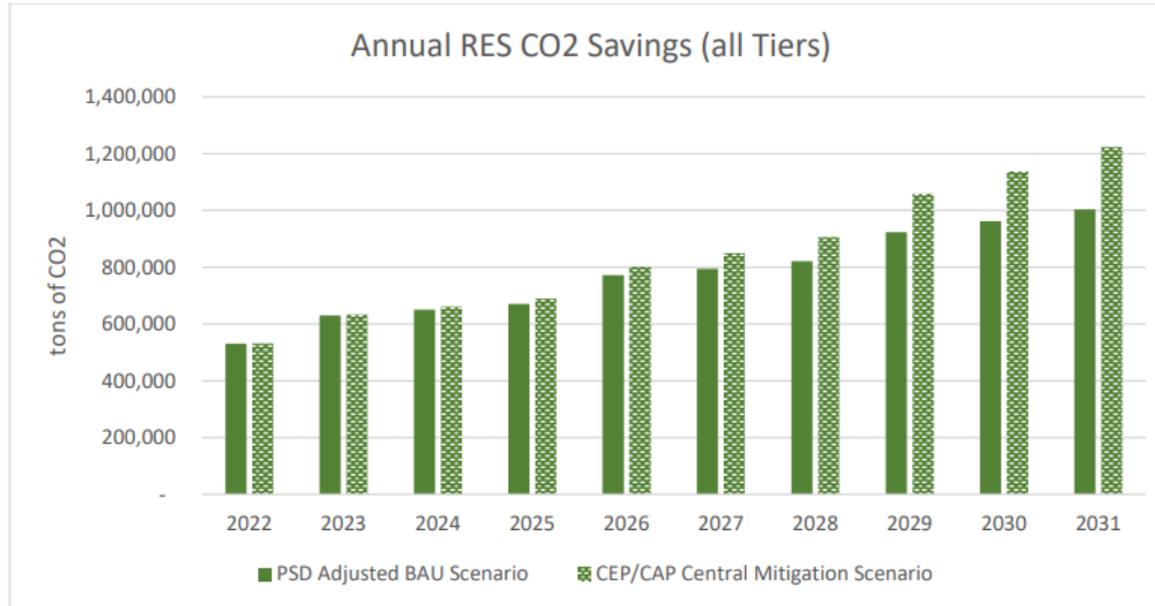


Figure 9. Annual CO2 savings due to the RES from all Tiers, 2022-2031.



Context Vermont RES

- Vermont's 2015 RES is projected to continue to reduce Vermont's Greenhouse Gas Emissions, estimated less than 1% of state emissions in 2022 according to ANR's most recent GHG emissions inventory -

Table 11: Five- and Ten-Year GHG emissions projections.

Inventory Sector	(MMTCO ₂ e) 2022	(MMTCO ₂ e) 2027
Transportation/Mobile	3.25	3.36
Residential/Commercial/Industrial (RCI) Fuel Use	2.62	2.51
Agriculture	1.30	1.30
Industrial Processes	0.61	0.64
Electricity	0.08	0.07
Waste	0.13	0.13
Fossil Fuel Industry	0.03	0.04
Total	8.02	8.04

[https://dec.vermont.gov/sites/dec/files/aqc/climate-change/documents/Vermont Greenhouse Gas Emissions Inventory Update 1990-2017 Final.pdf](https://dec.vermont.gov/sites/dec/files/aqc/climate-change/documents/Vermont%20Greenhouse%20Gas%20Emissions%20Inventory%20Update%201990-2017%20Final.pdf)



Context Vermont RES

- **Tier 3 was most important component of bill and remains a leading policy in the United States supporting electrification work** – First of its kind strategic electrification policy, since adopted in other states like Washington. Strong and adaptable regulatory foundation.
- **Relative percentages for Tiers was result of careful modeling and evaluation to balance costs and benefits** – During consideration of the RES legislation, DPS produced initial rate impact estimates for each of the three Tiers, and a sensitivity cost analysis at the request of legislators.

<https://legislature.vermont.gov/Documents/2016/WorkGroups/House%20Natural%20Resources/Bills/H.40/Witness%20Testimony/H.40~Darren%20Springer~Energy%20Innovation%20Program~1-23-2015.pdf> and
<https://legislature.vermont.gov/Documents/2016/WorkGroups/House%20Natural%20Resources/Bills/H.40/Witness%20Testimony/H.40~Darren%20Springer~SPEED%20Program-H.40%20briefing%20paper~2-10-2015.pdf> and
<https://legislature.vermont.gov/Documents/2016/WorkGroups/Senate%20Natural%20Resources/Bills/H.40/Testimony/H.40~Department%20of%20Public%20Service~Memo%20Updating%20the%20PSD's%20model%20of%20H.40%20to%20incorporate%20the%202015%20Annual%20Energy%20Outlook%20forecast%20of%20oil%20prices~4-22-2015.pdf>



Key Policy Considerations

- **Electric rates matter for the climate** – Despite some progress on strategic electrification, BED is not seeing load growth relative to pre-COVID levels.
 - In 05-08 timeframe BED sales to customers were ~360,000 megawatt hours.
 - 2016-2018 timeframe BED sales to customers were ~ 340,000 megawatt hours.
 - 2019-2022 timeframe BED sales to customers ~314,000- 320,00 megawatt hours.

BED has seen upward rate pressure coming out of pandemic (7.5% in FY22, 3.95% in FY23, projected 5.5% in FY24). Critical for policy not to add more rate pressure if we want to keep electrification measures (heat pumps, EVs) economically competitive for customers.
- **Vermont is unique in having multiple 100% renewable electric utilities** – Most states do not have 1, much less 3, utilities that are already 100% renewable. There is no precedent for requiring utilities already at 100% to make costly changes to their portfolios.
- **REV's proposal would penalize utilities for early action** – REV proposal would add potentially tens of millions in power supply costs to BED over life of proposal, penalize early adopter utilities by not accommodating existing portfolios.



Suggestions for Language in Committee Bill

- **Analysis is necessary prior to making RES changes** – REV is proposing dramatic changes to state policy, rigorous analysis is needed to understand full cost/benefits of various approaches from a rate, cost, and carbon standpoint
- **Study should be conducted/managed by PUC or DPS** – The study contemplated in the bill should be managed by the PUC or DPS given their deep expertise in utility rates, energy markets, and utility regulation.
- **Study should include following** –
 - - consideration of ratepayer impacts of various approaches;
 - - consideration on *net* job creation and *net* revenue impacts of various approaches;
 - - consideration of impacts on strategic electrification programs of various approaches;
 - - consideration of GHG emissions reduction benefits and costs of various approaches;
- **Storage bill edits** – Utilities submitted storage bill proposed changes, to extent S. 140 is wrapped into the Committee's RES bill. Hoping all DUs can participate in any study, and that mandate-related language can be modified.