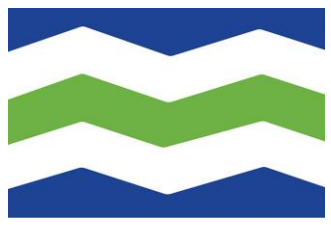


Electrify Everything!

How City Government Can Lead the Way

Mayor Miro Weinberger | Burlington, Vermont
Mayor's Innovation Project 2024 Winter Meeting



Burlington's Municipal Climate Leadership: A 35-year Journey in Three Chapters

- 1. 1989 – Today: Energy Efficiency**
- 2. 2004 – 2014: Renewable Generation**
- 3. 2016 – Today: Electrification**



About the Burlington Electric Department

Burlington's municipal electric utility

- Department of the City of Burlington
- 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

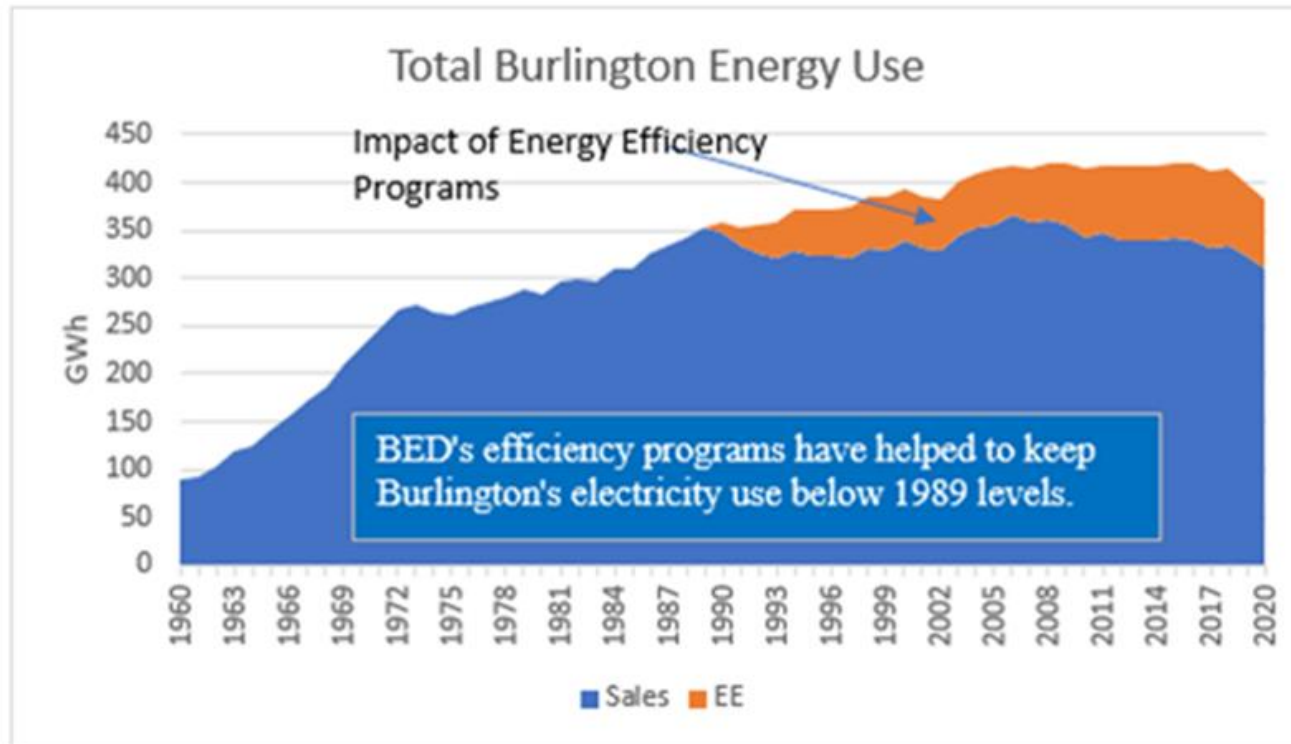
Electricity facts:

- 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





Chapter 1: Energy Efficiency



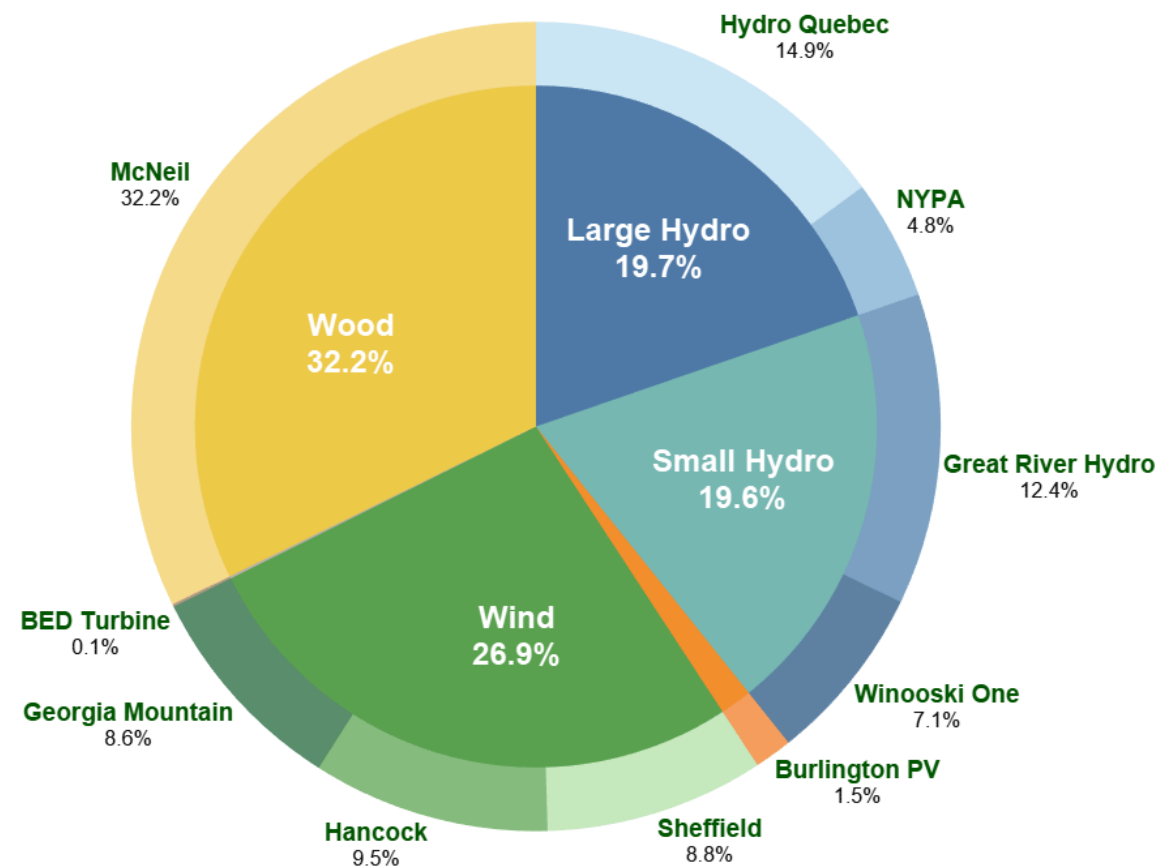
Burlington's first pillar is energy efficiency, which was kick started by a revenue bond of \$11.3 million issued in 1990, and supplemented since by tens of millions of investment by BED and its customers.

Burlington today uses less electricity than we did in 1989. If the rest of the country had followed same trajectory some 200 plus coal plants worth of energy would be avoided.



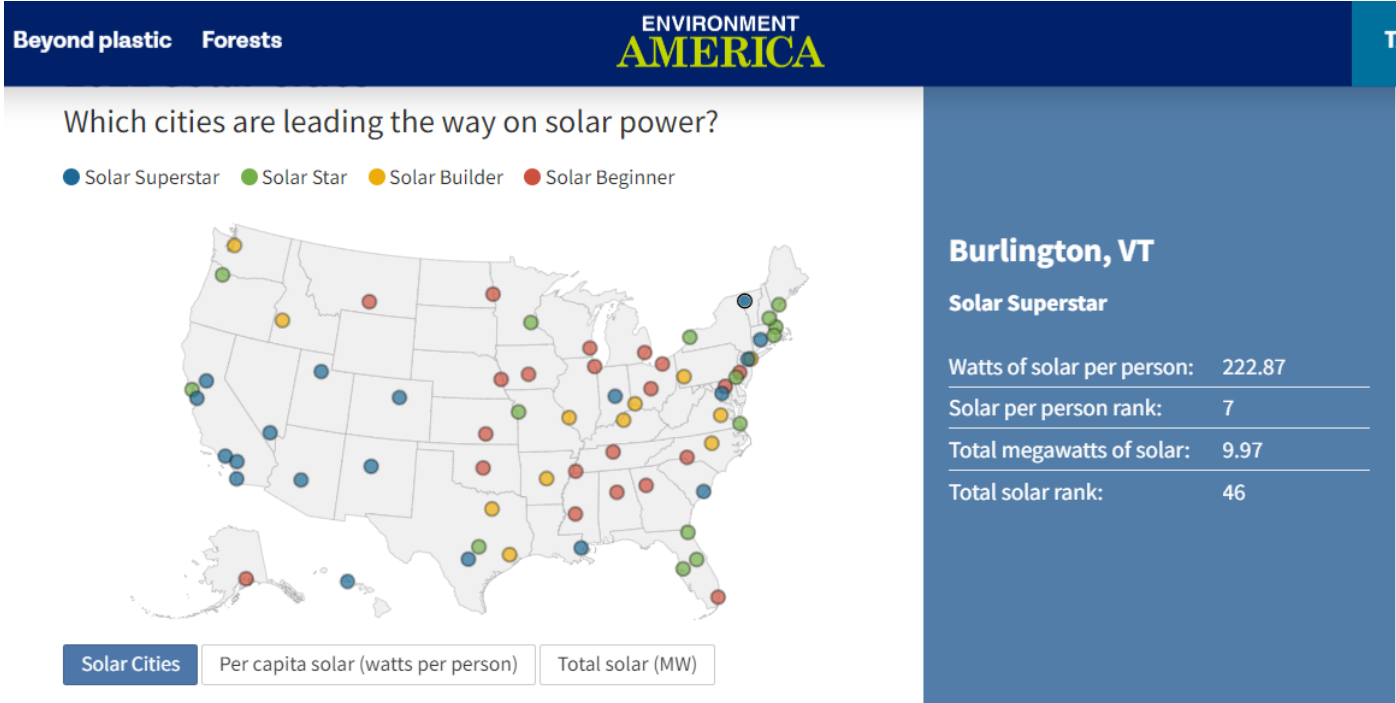
Chapter 2: Burlington Becomes First City in US to Achieve 100% Renewable Generation in 2014

- Burlington became first city in nation to source 100% of its power from renewable generation in 2014.
- To the right is BED's 2022 energy generation supply, prior to renewable energy credit (REC) transactions. BED has resources covering more than 100% of its sales, accounting for transmission line losses.
- BED is 100% renewable both prior to REC sales, and post-REC sales and purchases.





Burlington is a Top City for Solar Installations Per Capita

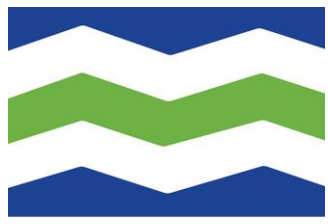


Top cities for solar per capita

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

Top cities for total solar

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



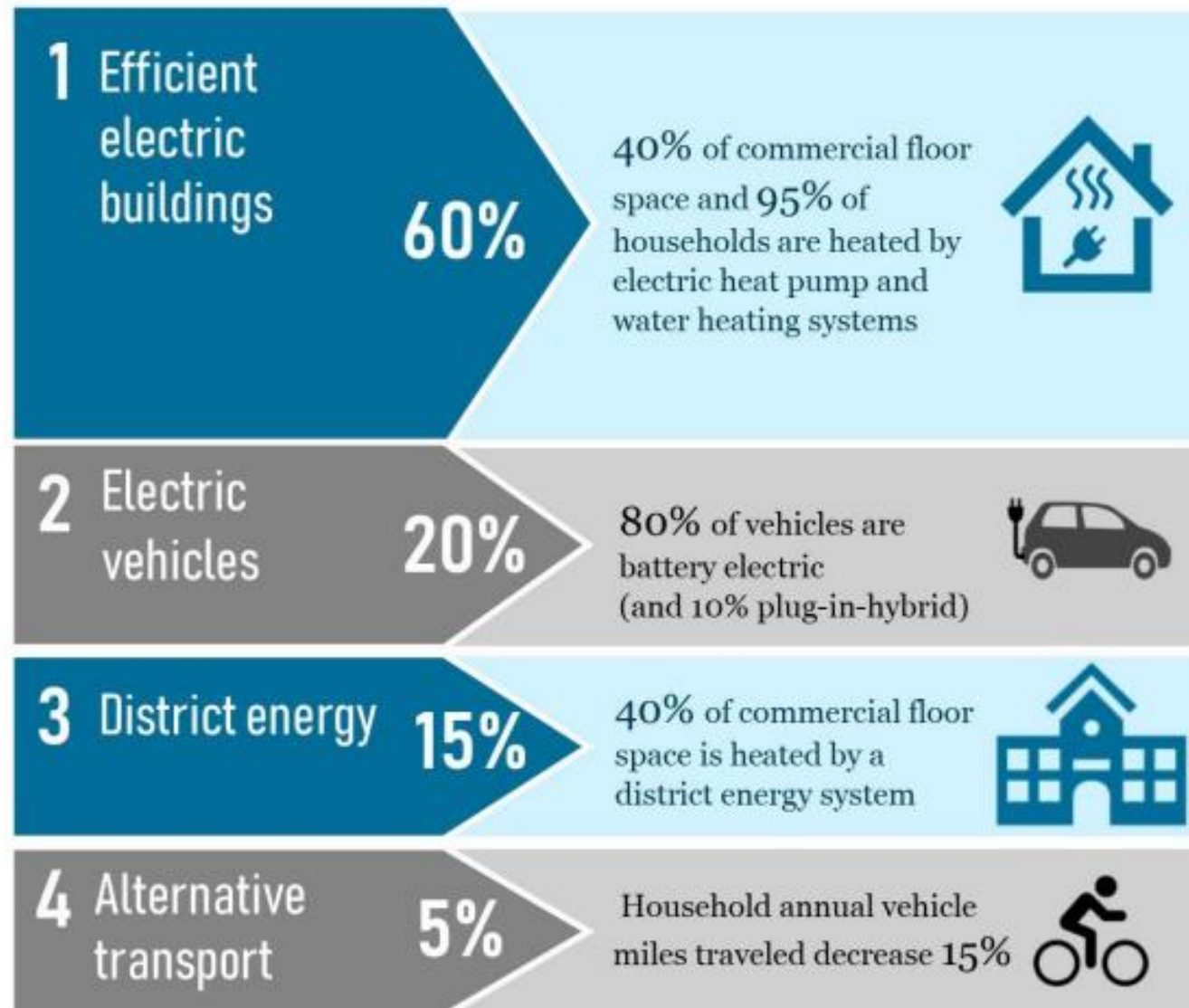
Chapter 3: 2030 Vision – Make Burlington a Net Zero Energy City

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. Plan was recognized by the Smart Electric Power Alliance as the “first US Net-Zero 2030 plan.”**
- **All Departments of the City play a role in supporting implementation.**

4 Fossil Fuel Energy Reduction Pathways



Environmental, Economic, and Social Benefits

- Safer and more comfortable living spaces
- Improved air quality
- Healthier residents due to improved air quality and more active modes of transport
- Increased property values
- Reduced congestion
- Economic Development
- Support for local jobs
- A more resilient city
- A better planet for future generations



Main Strategies for Pursing Road Map

- **City Procurement**
- **Incentives to Electrify Everything**
- **Infrastructure Investment**
- **City Policy and Regulatory Authority**
- **Innovation**



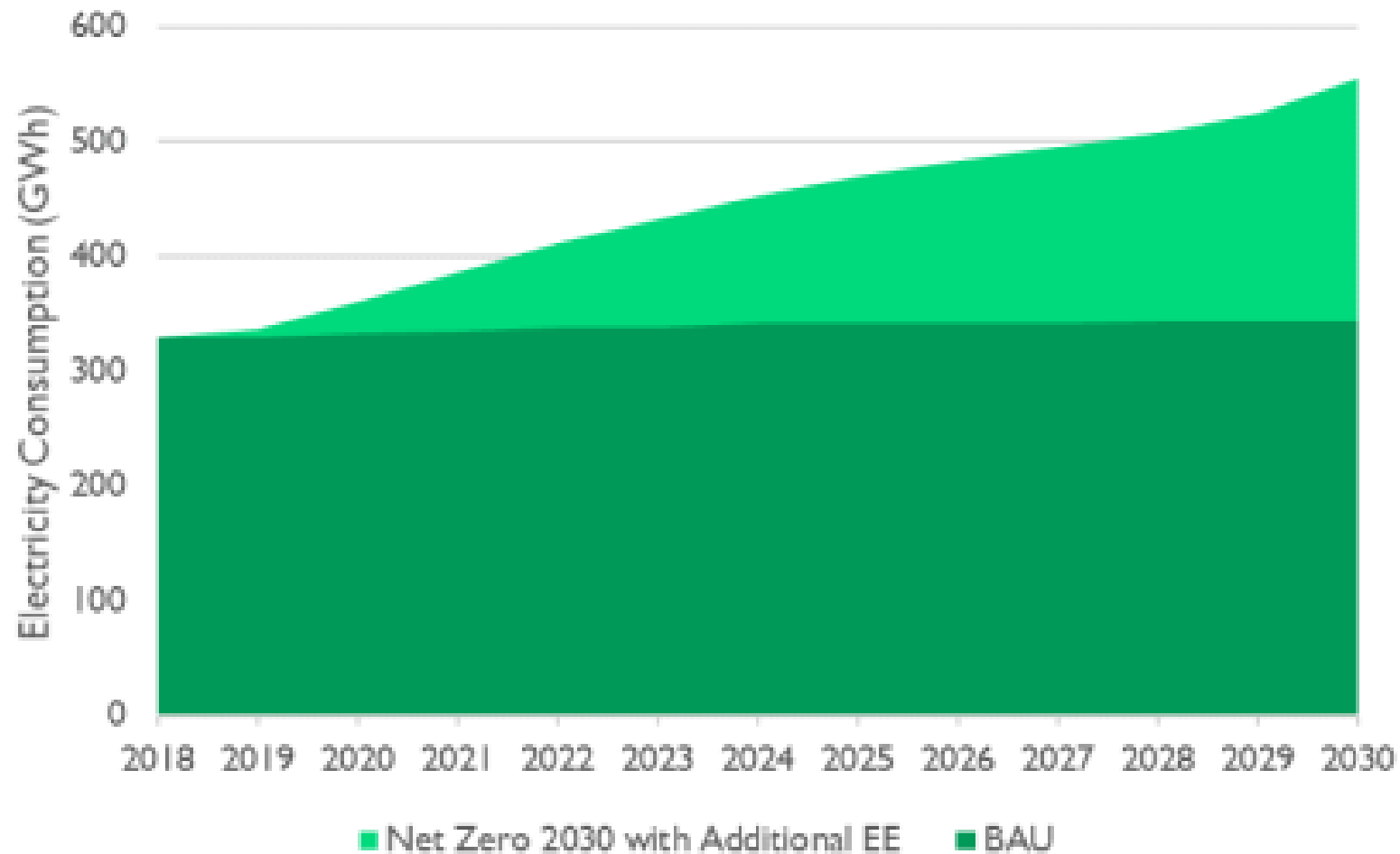
Procurement





Electrification

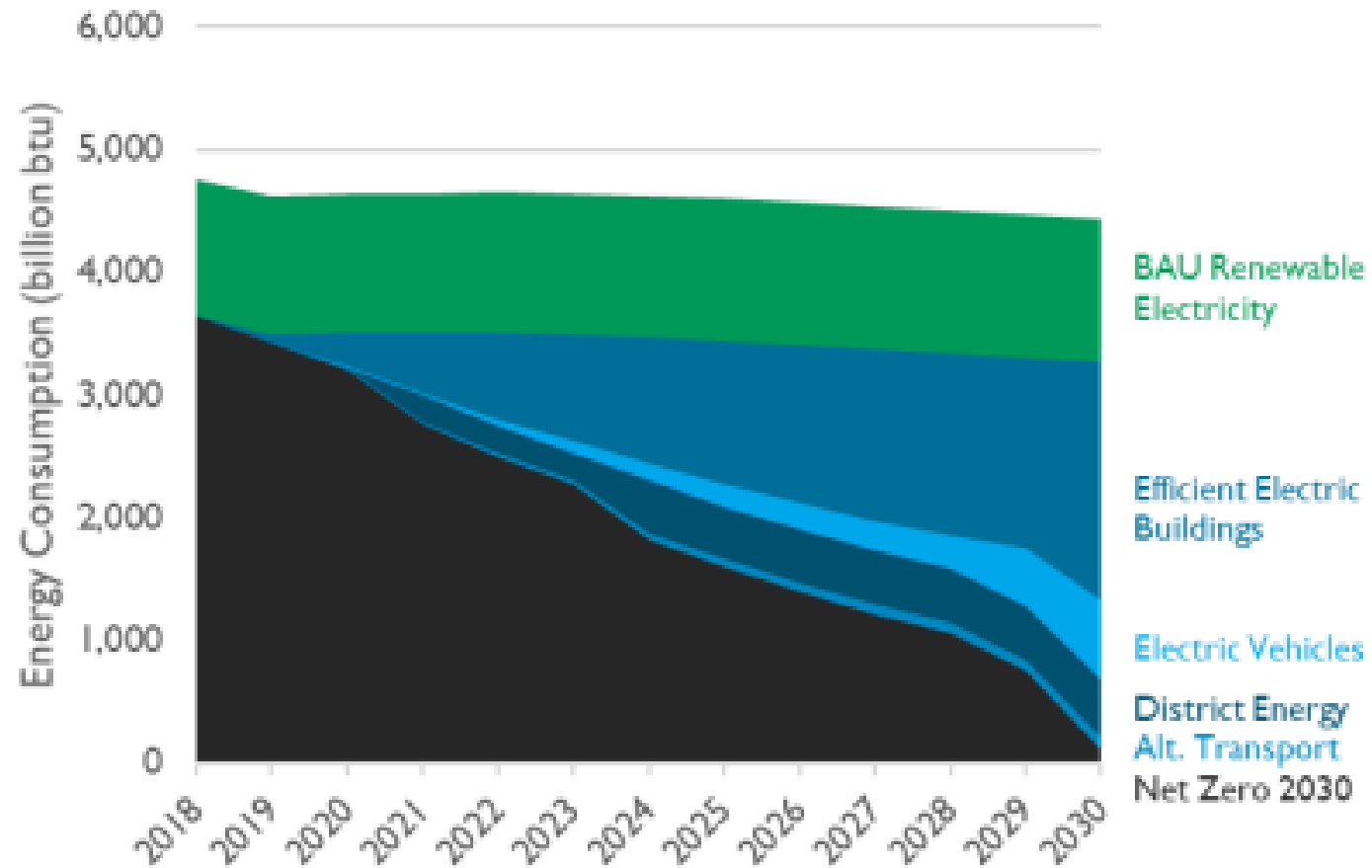
Figure 8: Increase in electricity consumption





Electrification

Figure 11: Fossil fuel reductions by pathway





Electrification Incentives

Tier 3 Budget for FY23 = \$2.1 million

EEU and Act 151 Budget for FY23 = \$1.55 million

EV rebate of \$2,300, or \$3,000 for low/moderate income (LMI) customers up to 80% area median income

PHEV rebate of \$2,000, or \$2,300 for LMI customers

Pre-Owned EV/PHEV rebate - \$1,300, plus \$200 for LMI customers

Incentive for residential charger up to \$900

EV finance partnership with three credit unions

EV Workplace Charging Station Incentive of up to \$10,000

EV Public Chargers – 16 stations and 29 ports

E-Motorcycle - \$500 rebate

E-Bus incentive – two buses delivered in 2020

Electric Induction Cooking – up to \$200 rebate

E-Bike rebate of \$200, 0% loans for low-income customers

E-Mower rebate of \$100-\$300 residential and \$3,500 commercial

Custom Programs –VRF, geothermal, etc.

Cold-Climate Heat Pump rebate – up to \$3,350 including \$400 LMI rebate

Central-Ducted Heat Pump rebate/discount – up to \$6,250, plus \$400 per condenser for LMI customers

Air-to-Water Heat Pump rebate – up to \$12,400, including \$400 for LMI customers

Heat Pump Water Heater rebate – up to \$1,000, plus \$200 additional for LMI customers

Electric Forklift rebate – up to \$6,500

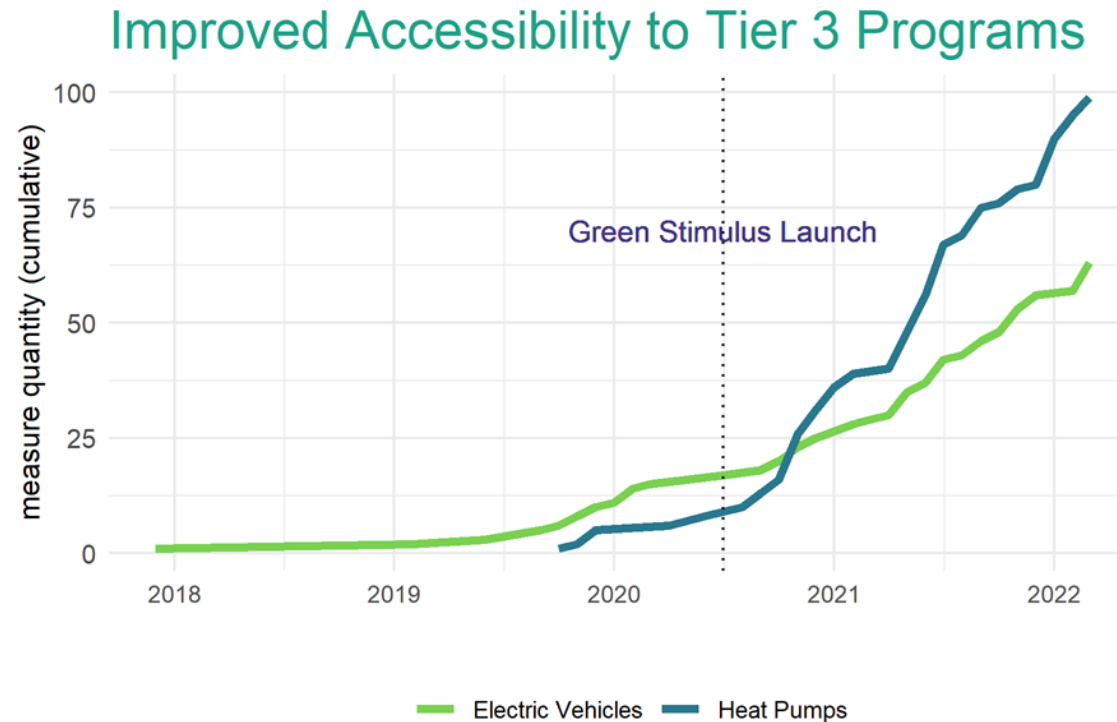
Electric Leaf Blower rebates - \$50 residential, \$150 commercial

Residential Loan Program– as low as 0% for income-qualified customers for heat pumps, water heaters, Energy Star appliances

0% Commercial Loan Program– on-bill finance for efficiency, heating and cooling, ventilation



Electrification Incentives

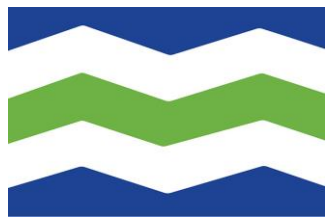


As of early 2023 - 18.2% of EV/PHEV rebates and 15.5% of heat pump rebates have been enhanced rebates available to income-qualified customers



2020 \$20 Million Net Zero Energy Revenue Bond

- **Builds on Prior Energy Efficiency Bond** – BED’s \$11.3 million revenue bond for energy efficiency in 1990 jumpstarted our energy efficiency investments. 2022 Net Zero Energy Revenue Bond continues that foundational investment strategy.
- **Supports Investment in BED Infrastructure** – The 2022 Revenue Bond is funding upgrades, maintenance, and continued reliability of BED distribution system and grid, technology systems, and renewable energy plants in a manner that is fiscally responsible for ratepayers. Some of the infrastructure support is needed for upgrades to serve increasing loads from electrification. Has supported new fast chargers, new BED electric trucks (including first-in-state bucket truck).
- **Permits Additional Progress Toward Net Zero Energy Goal** – The 2022 NZE Revenue Bond also frees up BED’s GO Bonds to permit increased investment in customer incentives to accelerate progress toward Burlington 2030 Net Zero Energy goal.



City Policy & Regulatory Authority

- **Rental Weatherization Standards Implementation** – Multi-year implementation requiring rental properties above certain energy use threshold to weatherize buildings.
- **Primary Renewable Heating Ordinance Implementation** – Requires as of 2021 all new construction to have primary renewable heating system capable of serving at least 85% of building load.
- **Carbon Fee Ordinance** – **Approved by City Council Nov. 2023**, first-of-its-kind in Vermont, places \$150 per ton carbon fee on any new construction fossil fuel thermal systems, and on heating/water heating replacement systems for large existing buildings 50,000 sq. ft. or larger. Fee rises annually with rate of inflation. Fee will support fund for low-income residents to access clean heating technologies.



Burlington Electric Department and City Energy Innovation Projects Underway

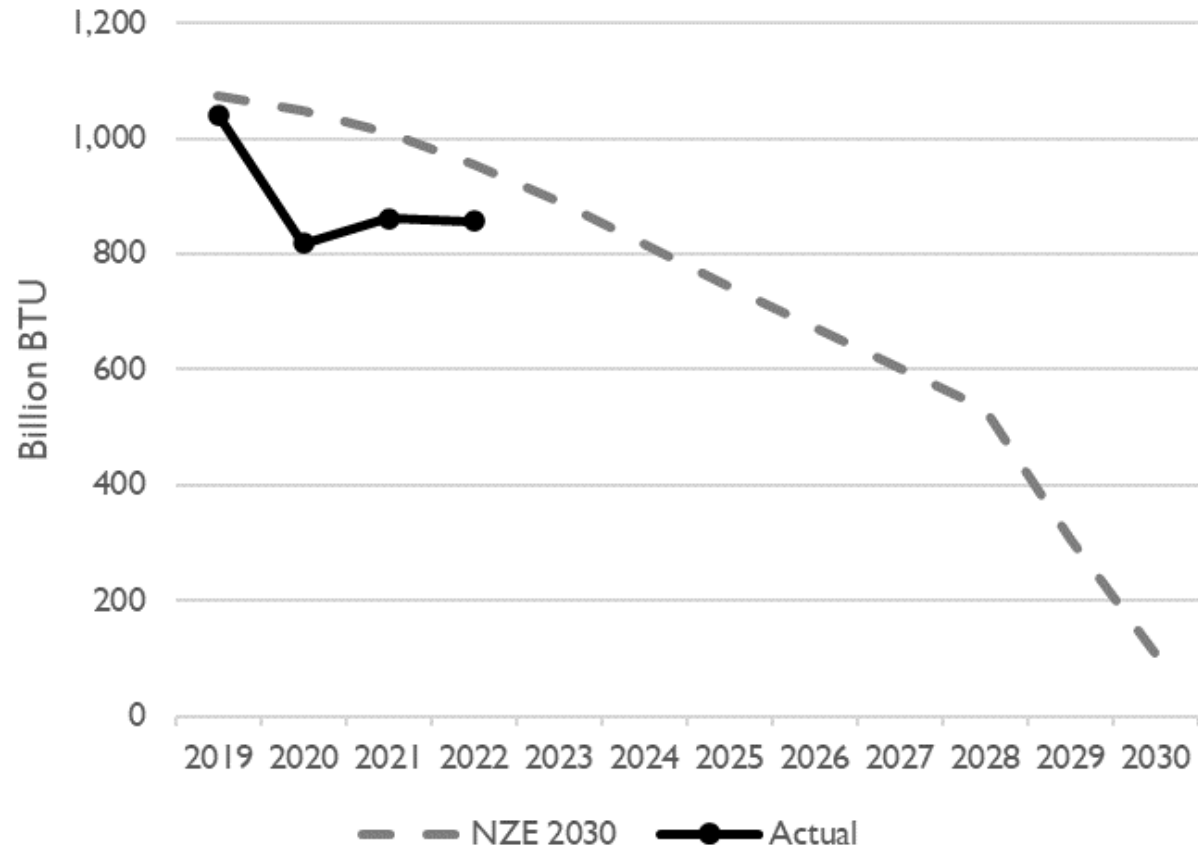
- Solar Research Center with University of Vermont
- Continued participation in DeltaClime clean energy business accelerator
- NZE Revenue Bond funded capital projects, such as first modern Level 3 fast chargers
- Geothermal well testing funding available for first time
- Electric bucket truck for BED! More EVs and E-Mowers and E-Zamboni for City!
- Working with CarShare Vermont to expand access to Evs
- 14 EVMatch chargers at rental/multi-family buildings, expanding with 50-60 more
- District Energy at McNeil Plant – Improve Efficiency and reduce commercial sector natural gas use by 16%
- BED Low-income pilot rate in FY23





Results

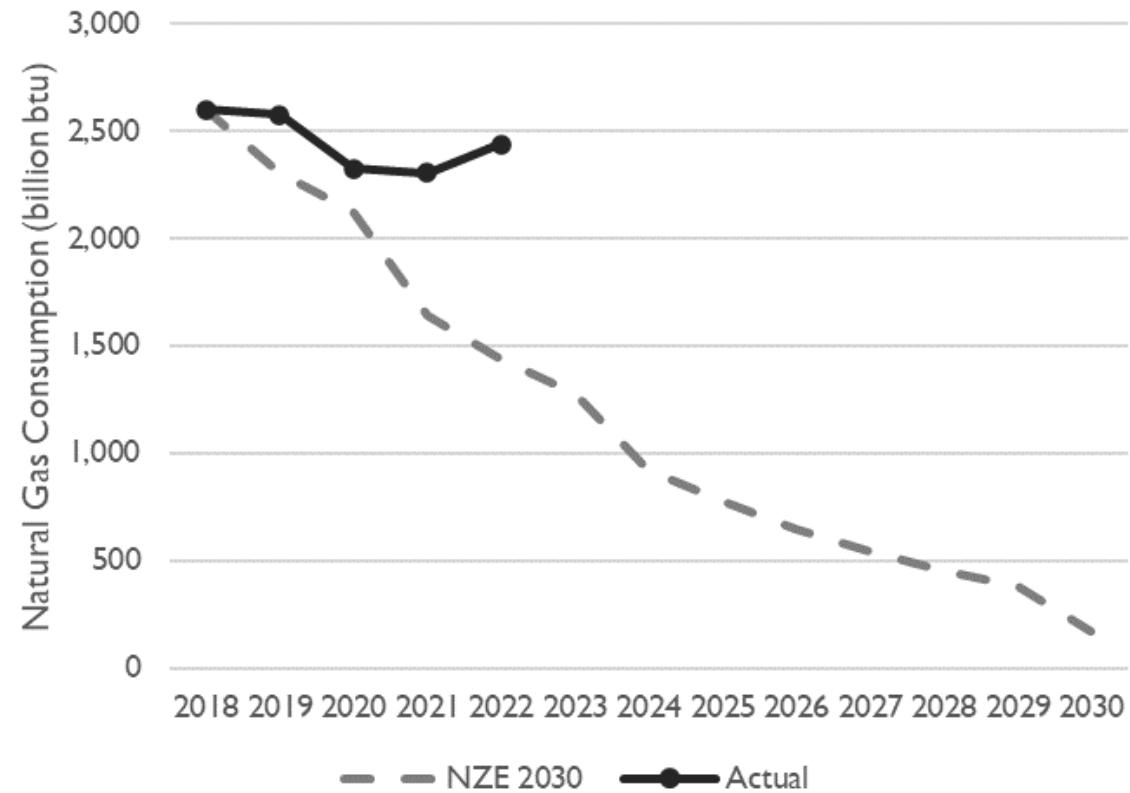
Gasoline and Diesel Consumption – Ahead of Ambitious Roadmap Pace





Results

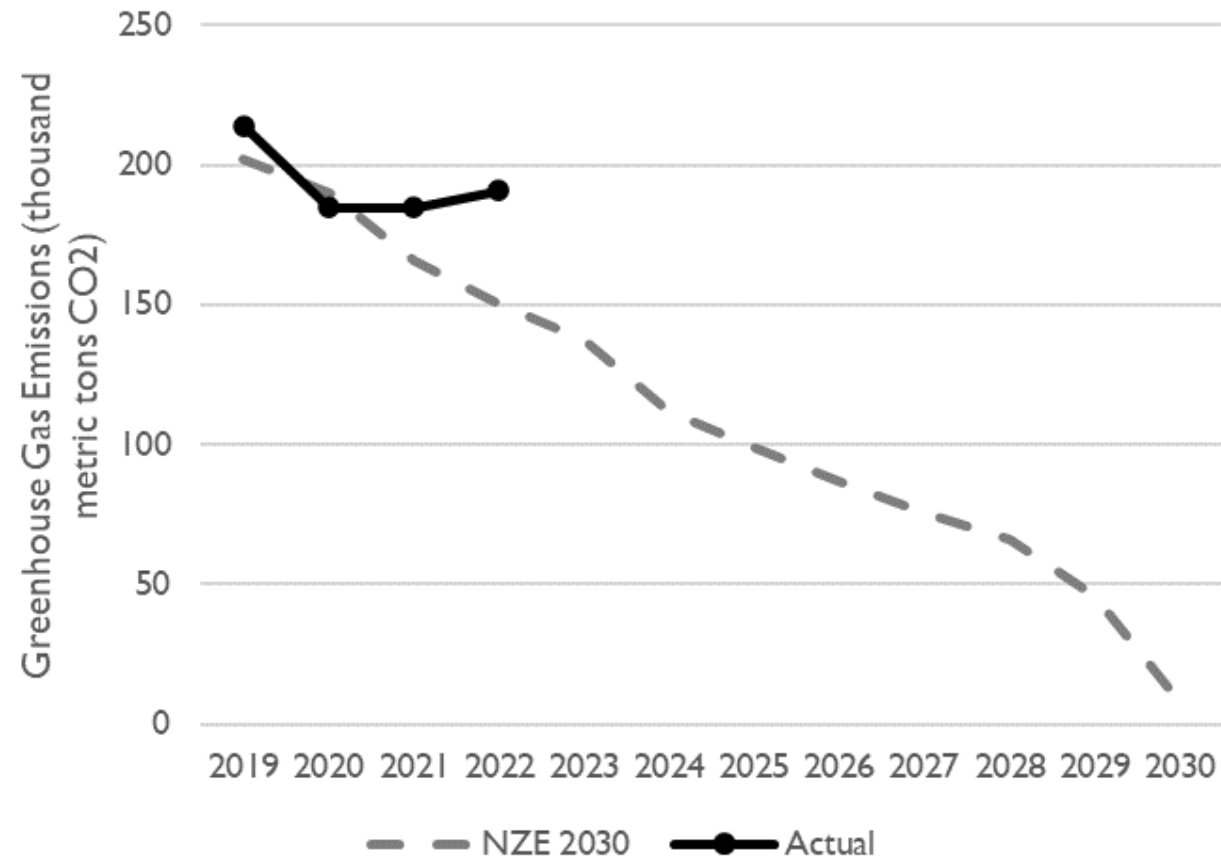
**Total natural gas consumption all sectors
(not weather normalized)**

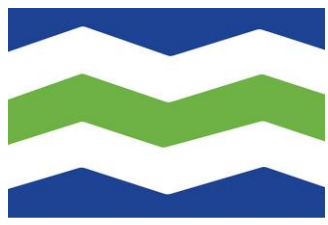




Results

**GHG emissions:
Thermal and Ground Transportation 2019-2022
Down 11.2% since 2018,
mild rebound post-pandemic compared to national trends**





Lessons from the Burlington Experience

- Setting an ambitious goal, issuing a roadmap, and garnering support for it has been a great north star and driver for action for us.
- Having a municipal electric utility is a significant benefit for Burlington in these efforts, but there is a strong business/sales growth case for all electric utilities to invest in electrification. Particularly with Inflation Reduction Act incentives helping too.
- State policy and regulation matters too. VT has strong efficiency policies, strong renewable energy policies, and with our renewable energy standard Tier 3 a broad innovation platform for electric utilities to design and implement incentive programs for customers without needing years of process and approvals. On other hand, VT has fallen behind on developing wind, for example, which is a headwind to efforts for the state to be 100% renewable.
- Cities can lead by example in visible ways, particularly electrifying our fleets (buses, lawn mowers, trucks, cars, Zambonis!), and building charging infrastructure to serve those vehicles and public charging infrastructure at City buildings/parks/locations.

In short, mayors can
save the world!