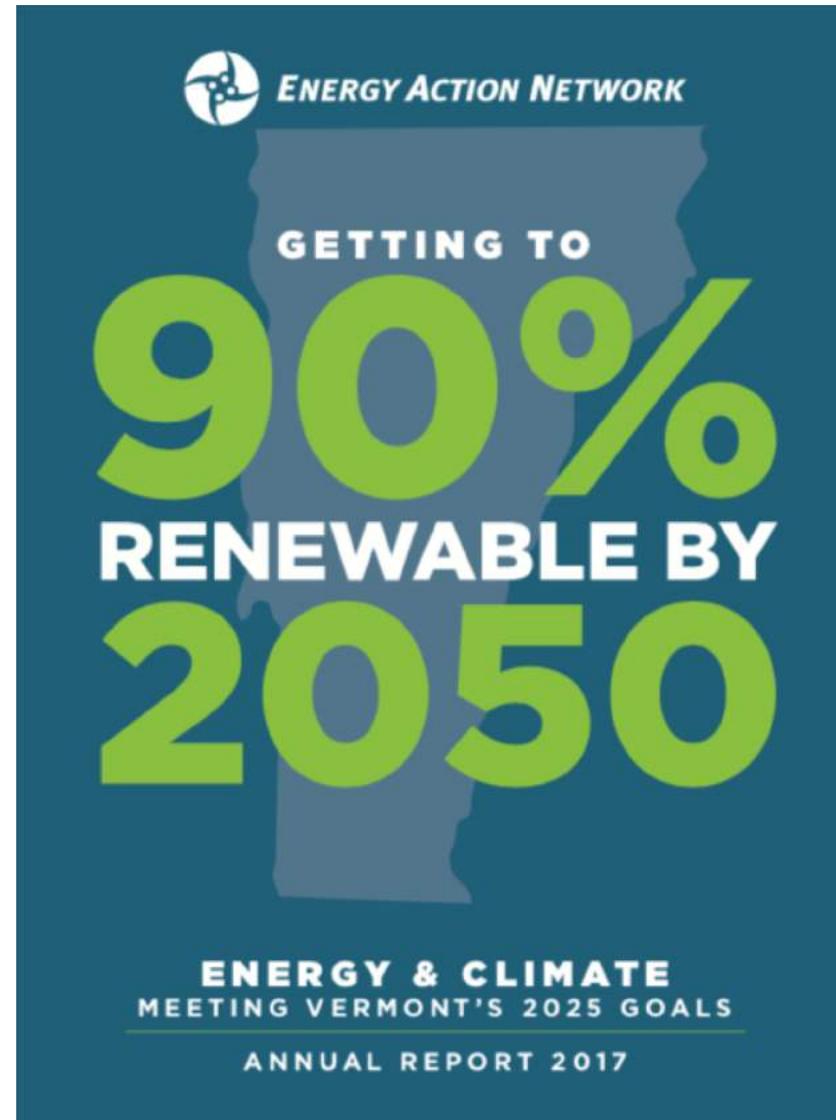


Getting Serious About VT's Renewable Energy & Climate Commitments

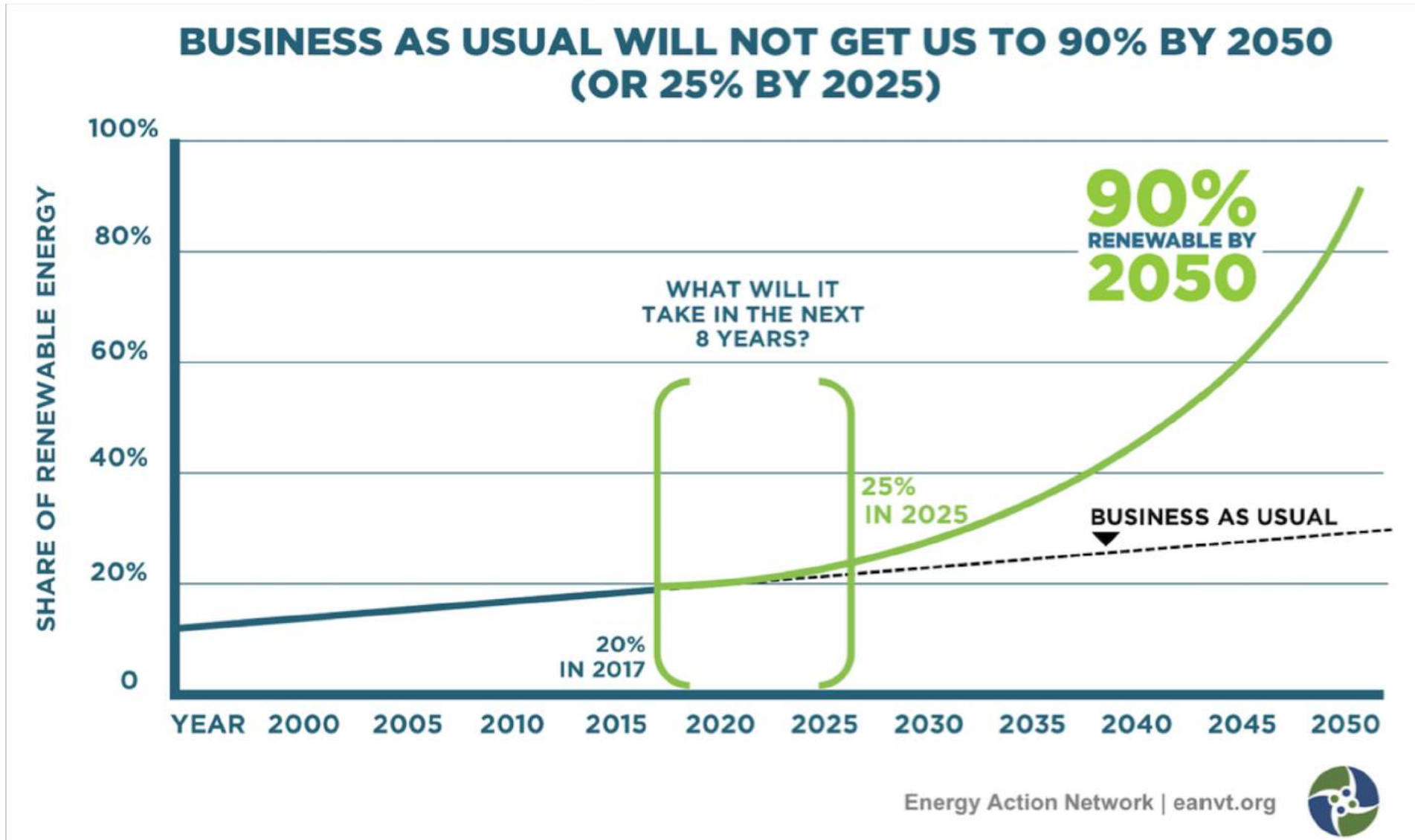
Vermont Energy & Climate Action Network
December 1, 2018



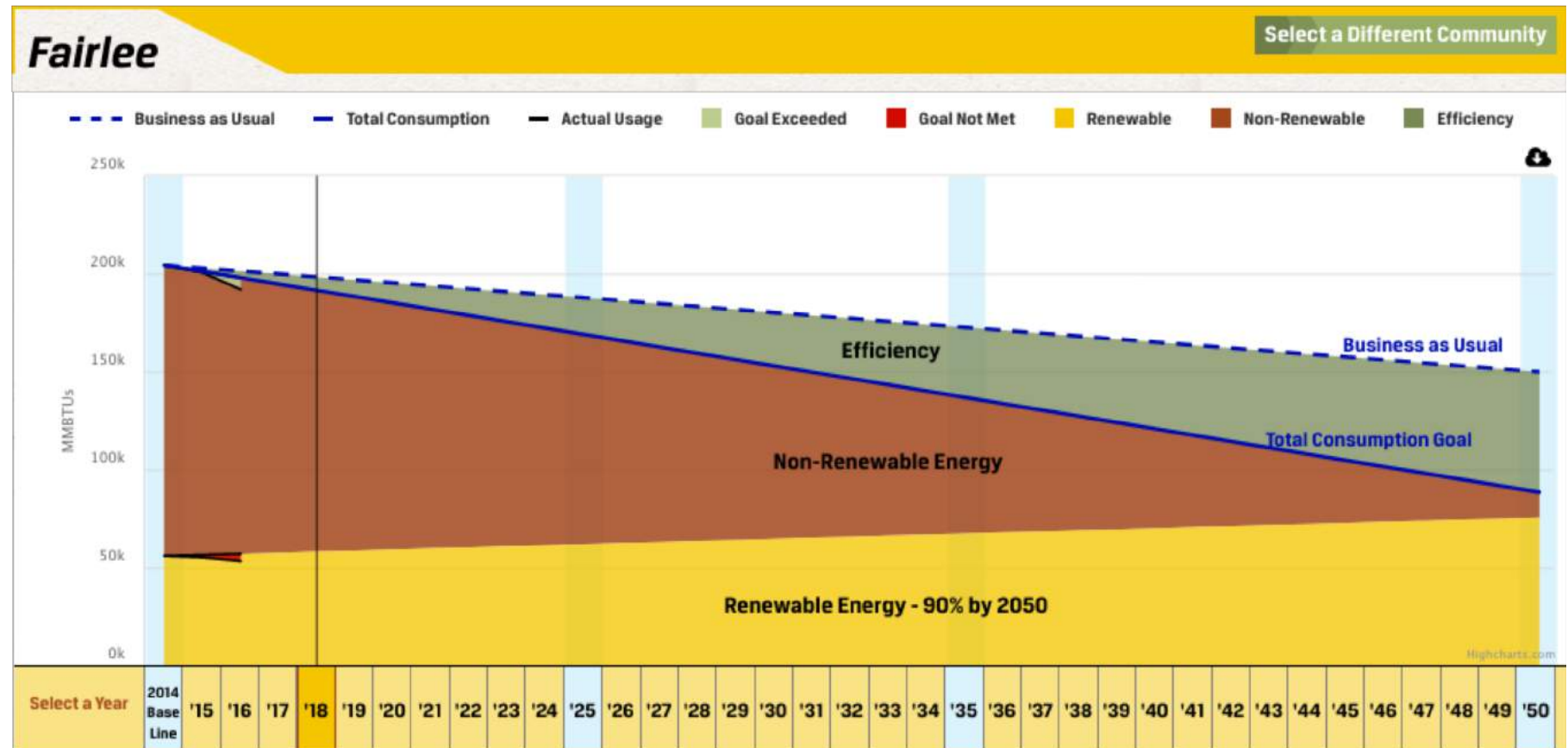
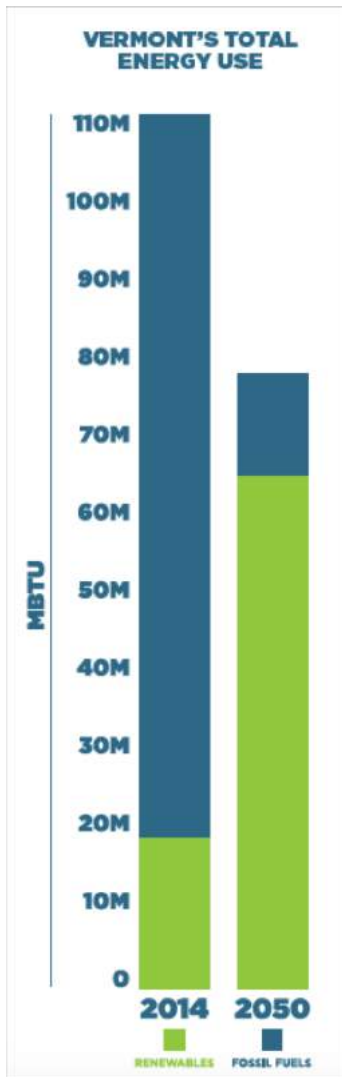
EAN: The Collective Impact Network Model



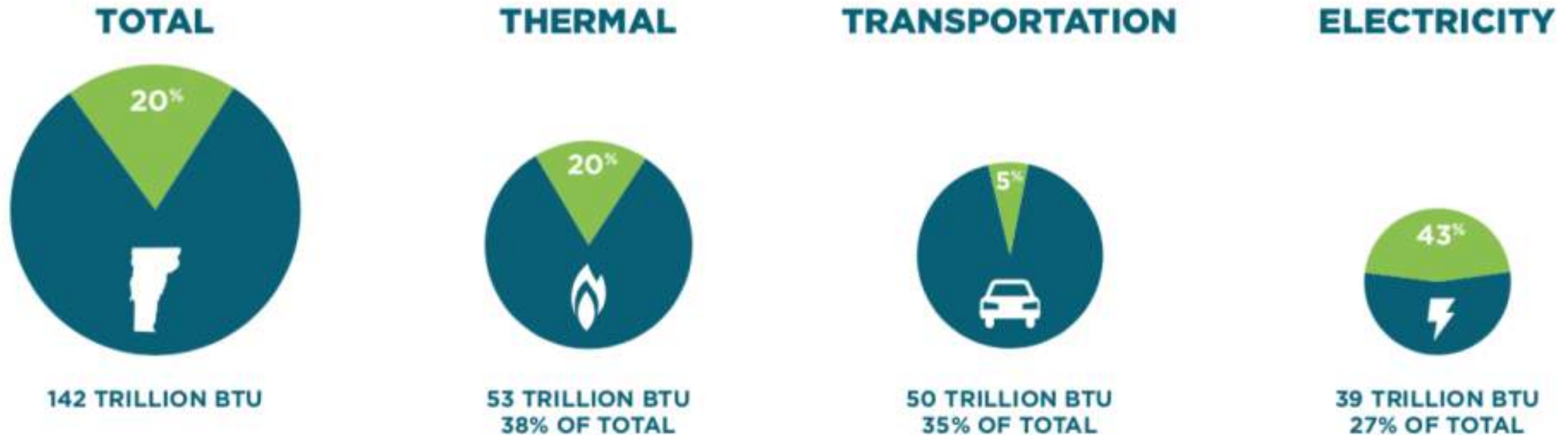
We've Made Real Progress but the Climb is About to Get A Lot Steeper...



First, Reduce Energy Use via Efficiency...



Total Energy: Not as Renewable As You Might Think...

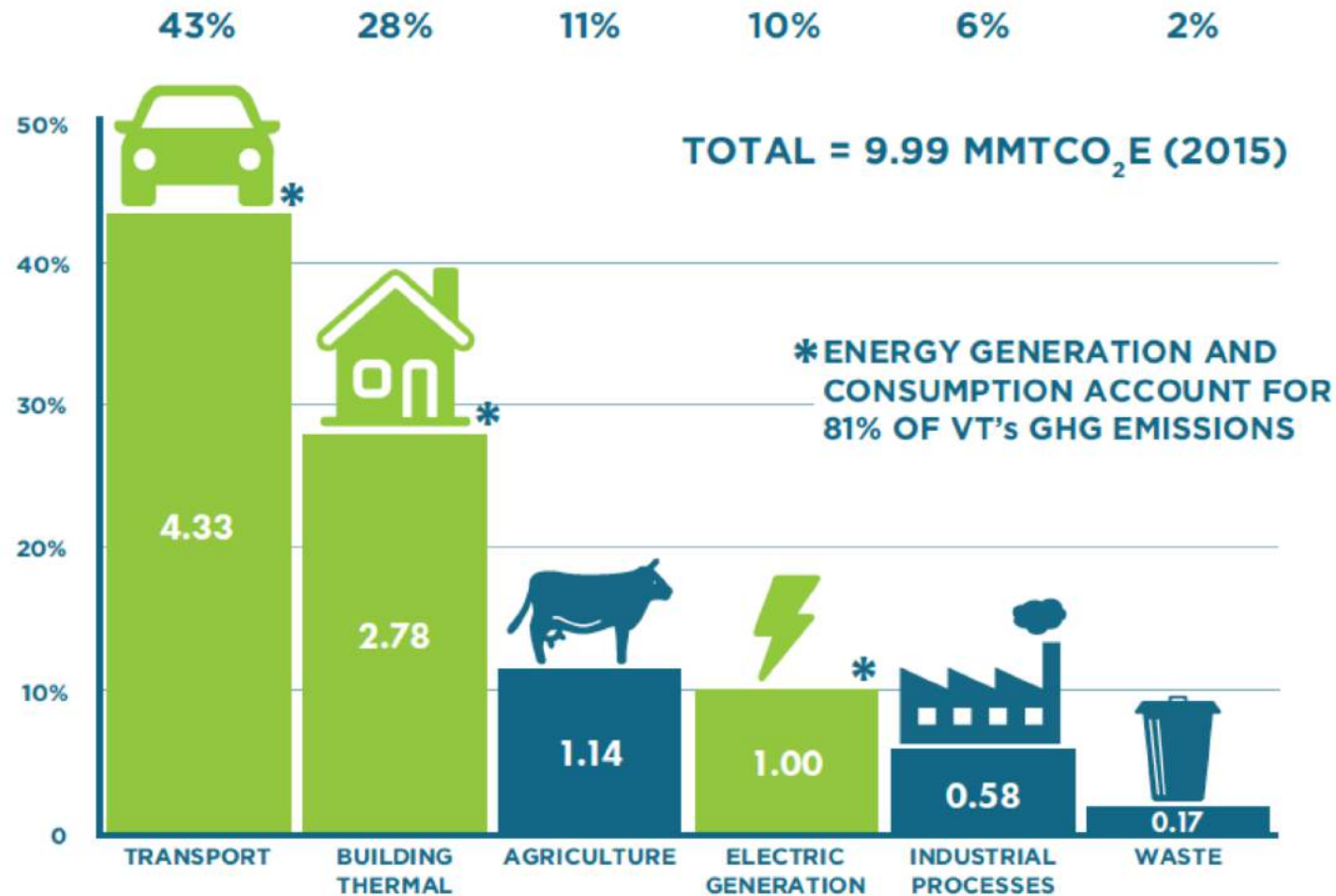


SOURCES: All data comes from EAN calculations based on Energy Information Administration, Public Service Department, and VTRANS sources. The sectoral pie charts reflect the calculations used for Vermont's Comprehensive Energy Plan. Electricity is calculated using Source Energy which takes into account efficiency and transmission losses that occur when converting energy sources (primarily fossil fuels) to electricity and bringing it to Vermont. Transportation and thermal are calculated using "Site Energy", which does not take these losses into account.



The Energy & Emissions Story

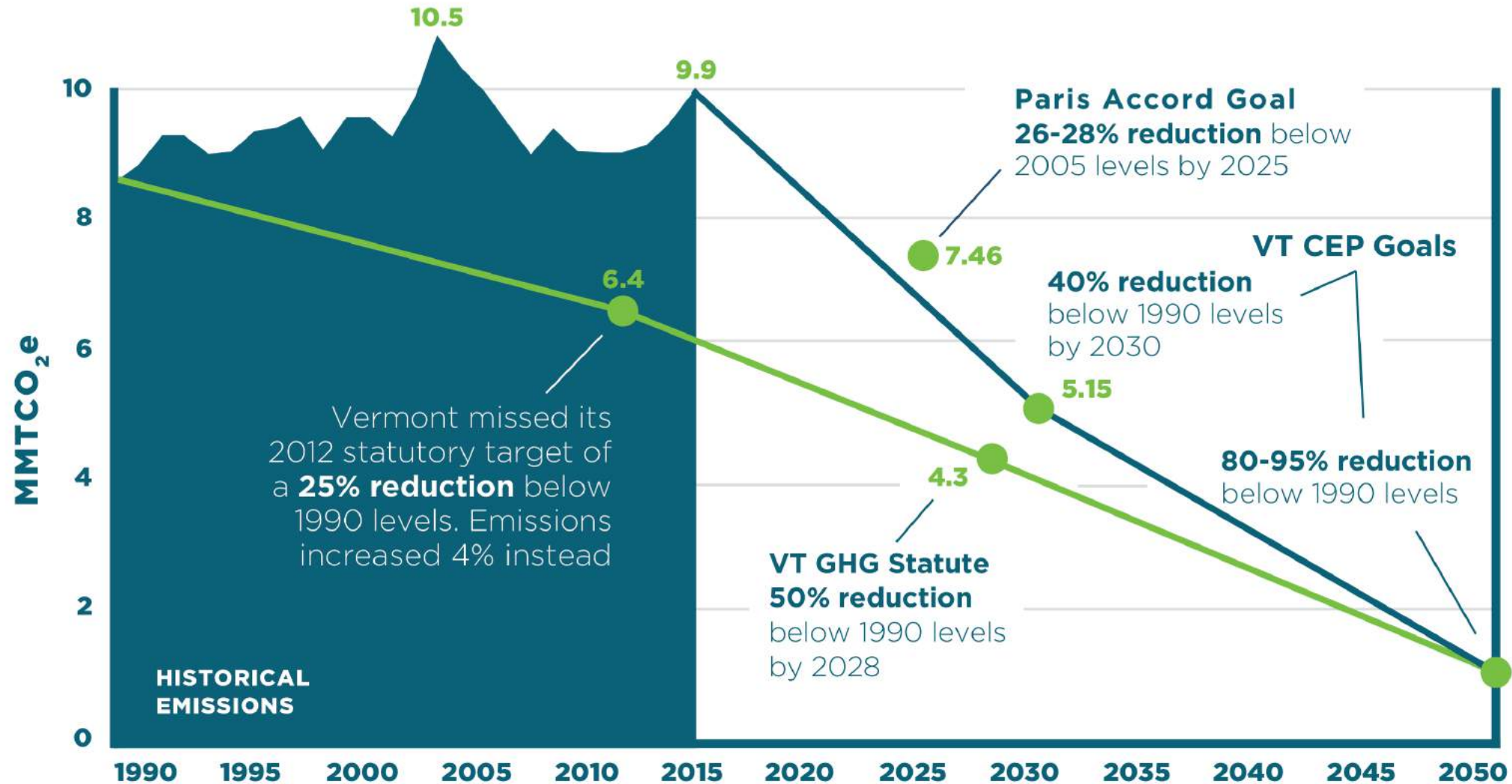
THE CLIMATE CONVERSATION IS AN ENERGY CONVERSATION



SOURCE: HISTORICAL AND CURRENT EMISSIONS FROM VERMONT AGENCY OF NATURAL RESOURCES: CLIMATECHANGE.VERMONT.GOV



VT's Greenhouse Gas Emissions are Increasing



HISTORICAL EMISSIONS FROM VERMONT AGENCY OF NATURAL RESOURCES: [CLIMATECHANGE.VERMONT.GOV](https://climatechange.vermont.gov)

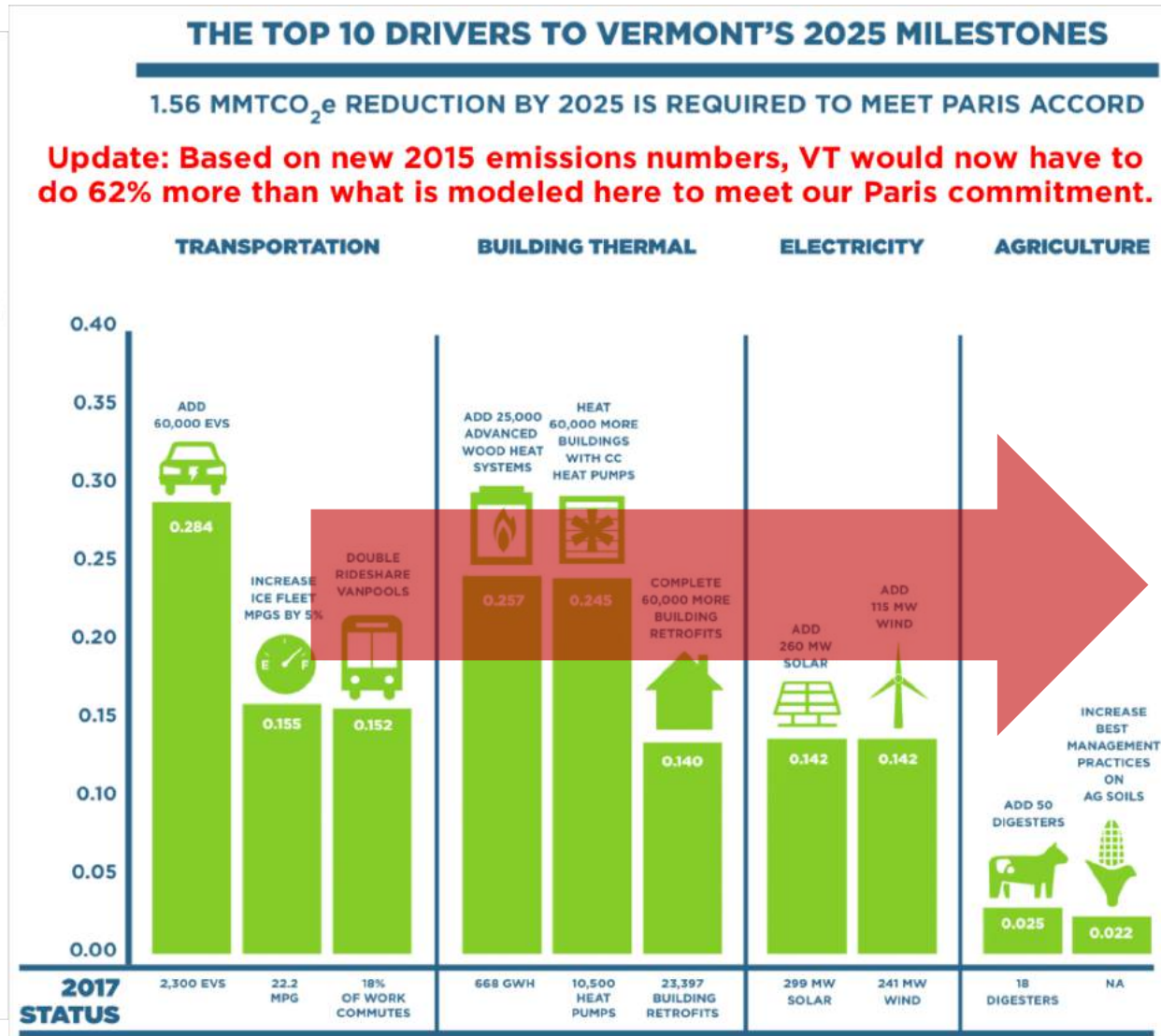


Pathway to 2025: Top Ten Drivers

Reaching Vermont's 2025 Milestones

The top 10 drivers to reach Vermont's energy and climate milestones are concentrated in the transportation and thermal sectors.

No single pathway or driver is sufficient. Getting to the Paris goal would require ALL of these drivers. If Vermont falls short on any one driver, it would need to compensate by making more progress with a different driver.⁸

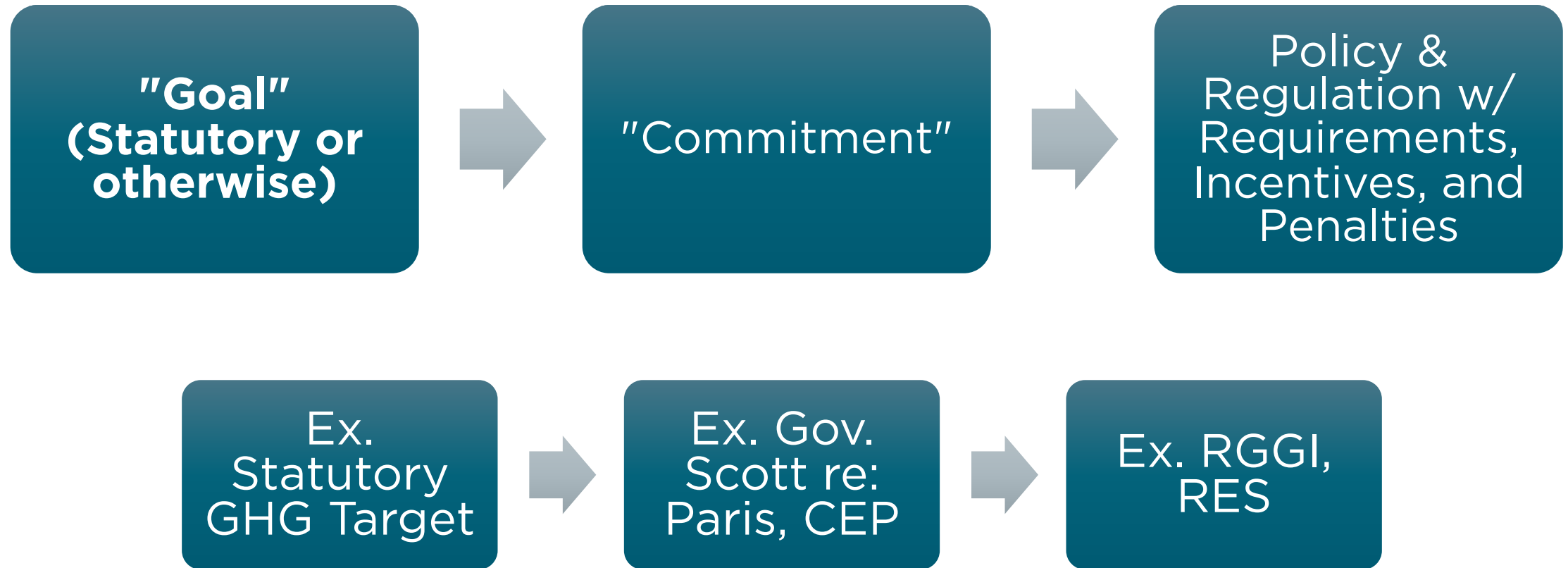


For Instance:

- 90,000 EVs
- 87,000 CCHPs
- 80,000 Wx
- 500 MW solar
- 200 MW wind
- 10% from other drivers

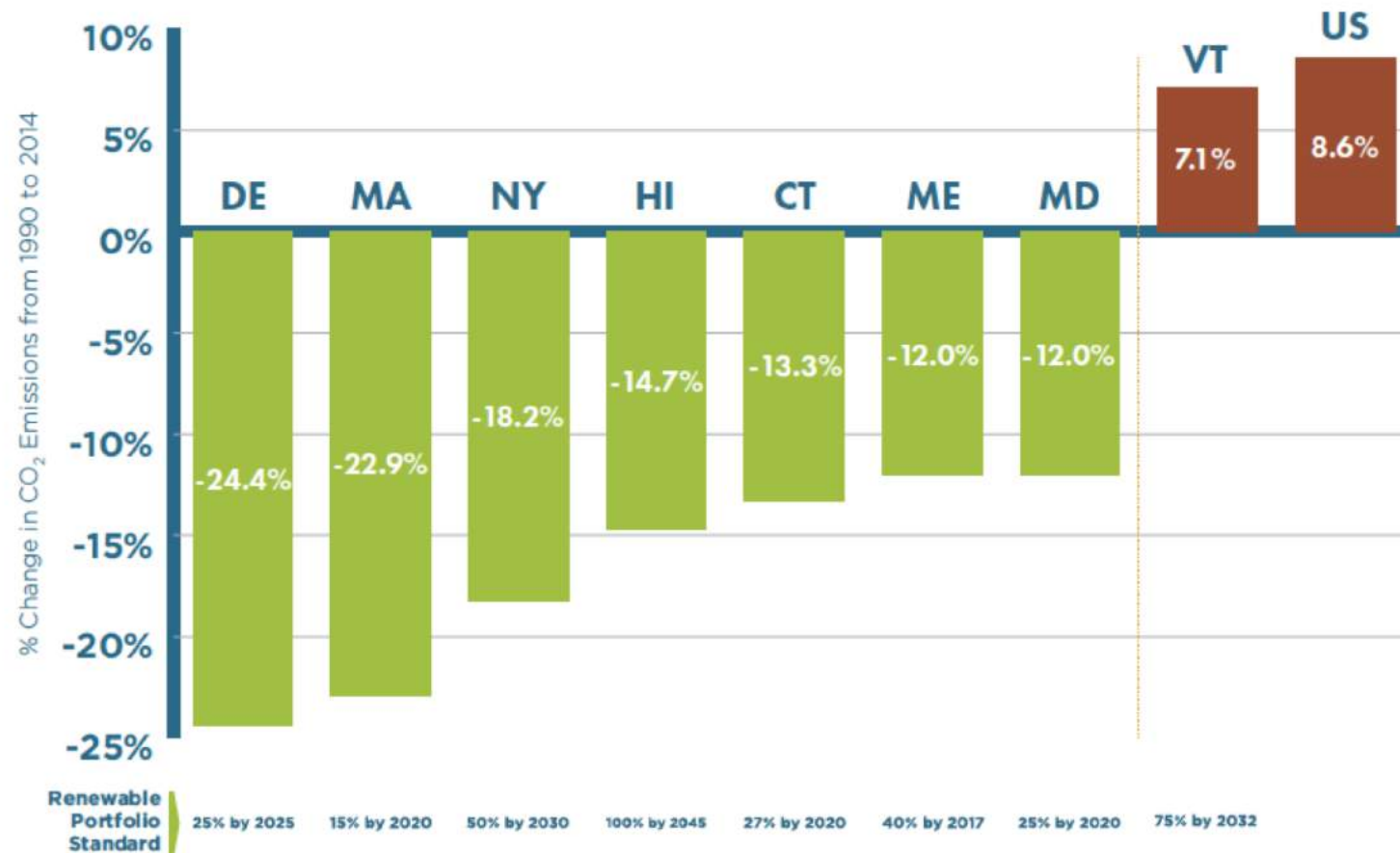


The Spectrum of Serious Action



States with the Largest CO₂ Emissions Declines 1990 – 2014

States with Double-Digit CO₂ Emission Declines, 1990-2014



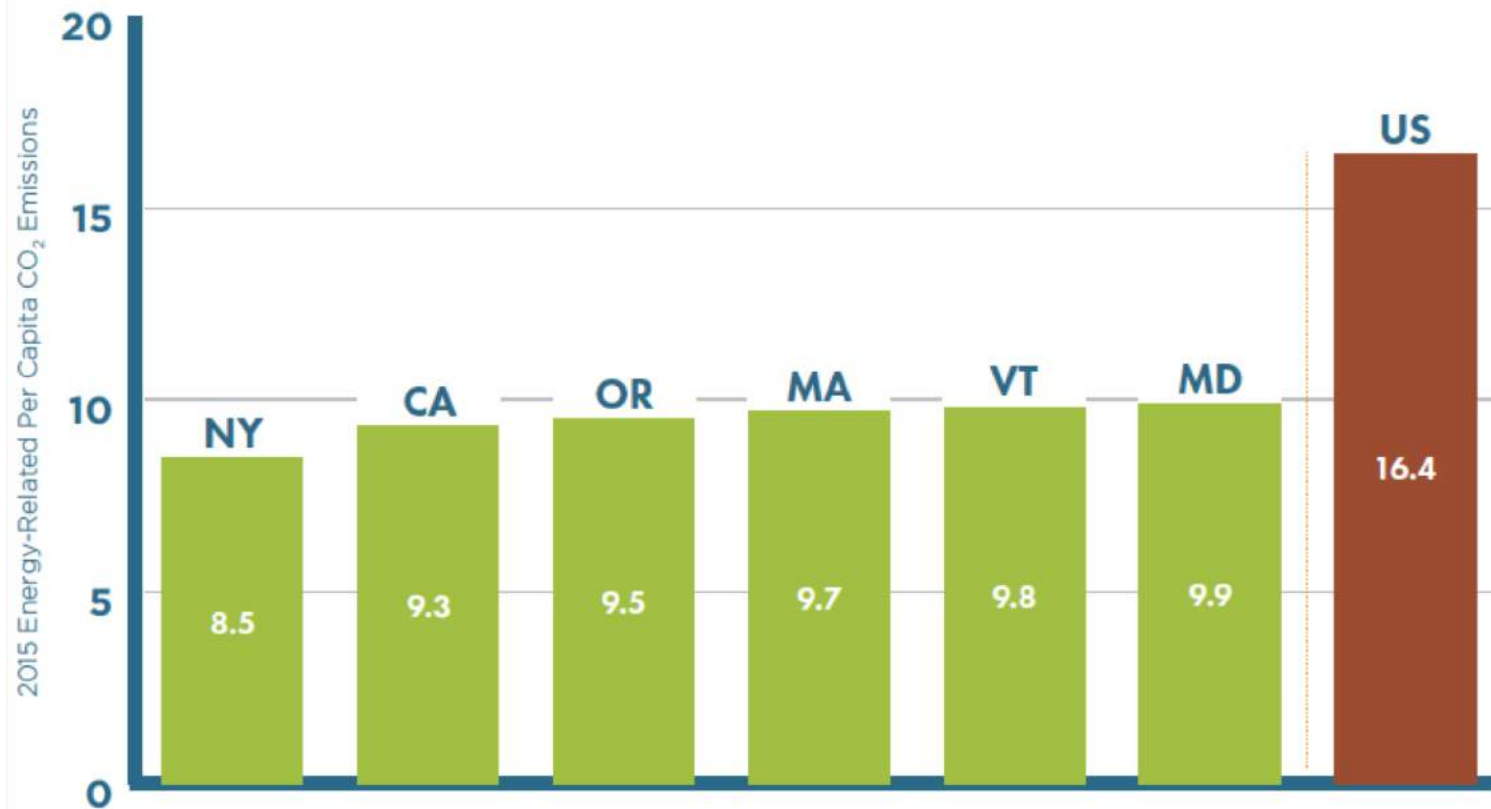
Source: EPA, https://19january2017snapshot.epa.gov/sites/production/files/2016-08/documents/co2ffc_2014.pdf.

Note: All states except Hawaii are members of the **Regional Greenhouse Gas Initiative**.



Vermont Has Low Per Capita Carbon Emissions...

**2015 Per Capita Energy-Related CO₂ Emissions:
States Below 10 Tons Per Person**

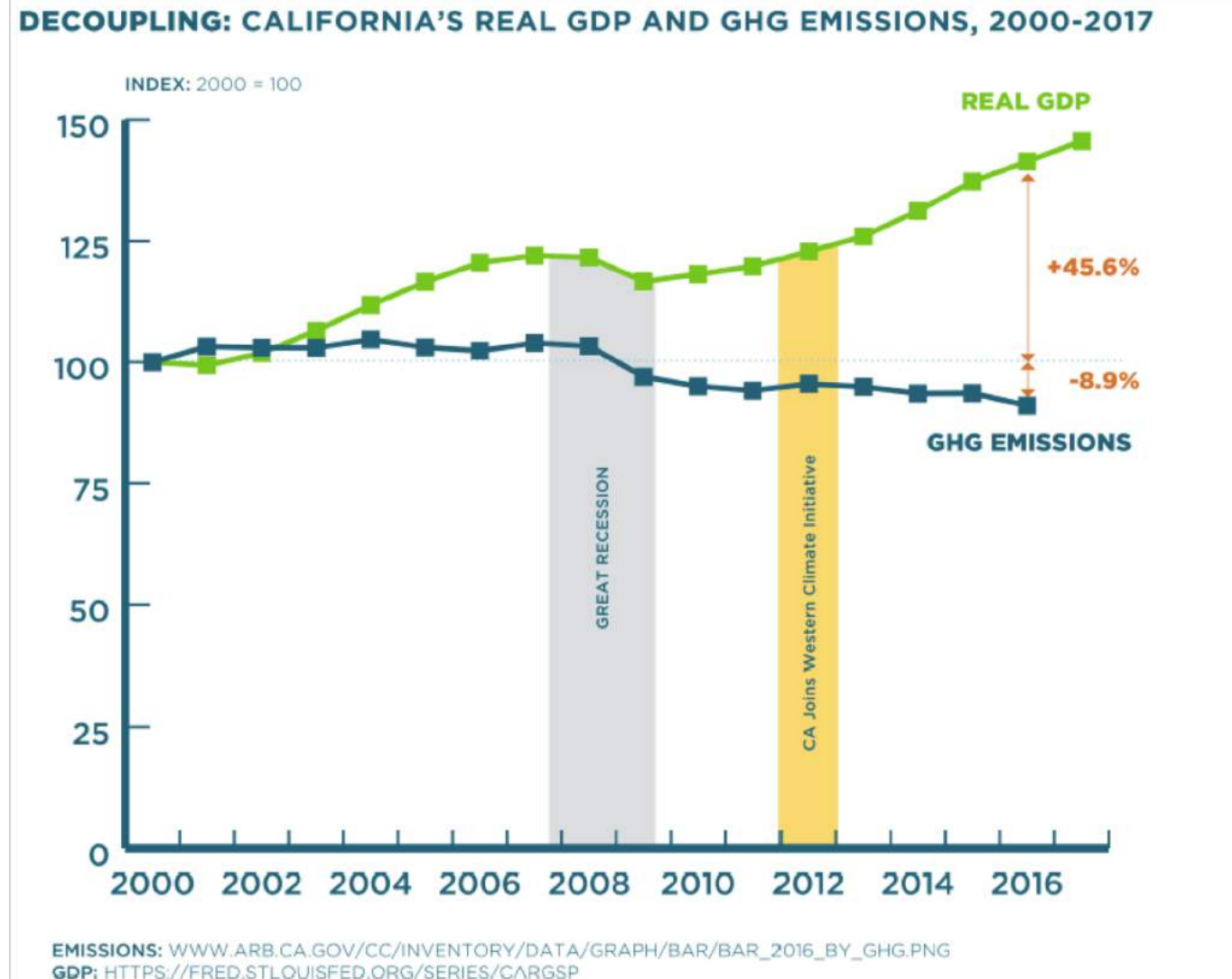


Source: EIA, *Energy-Related Carbon Dioxide Emissions by State, 2000-2015*, January 2018.

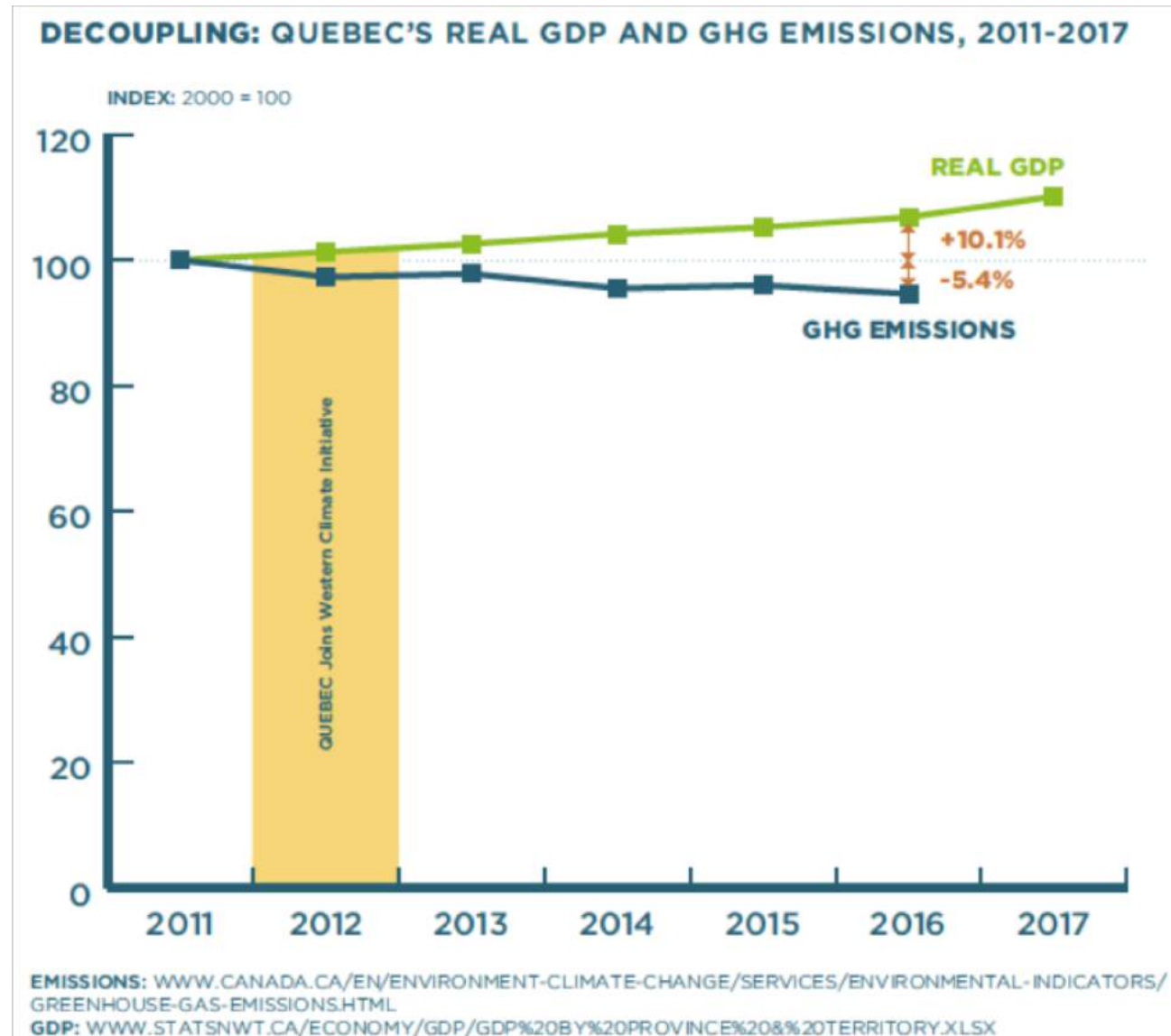
Note: In 1990, only two States had per capita CO₂ Emissions below 10 tons per person: Vermont (9.72) and Rhode Island (8.88).



One U.S. State Has Capped Carbon Economy-Wide...



...As Have Our Neighbors to the North



But Vermont?

DECOUPLING? VERMONT'S REAL GDP AND GHG EMISSIONS, 2000-2017



EMISSIONS: [HTTP://DEC.VERMONT.GOV/SITES/DEC/FILES/AQC/CLIMATE-CHANGE/DOCUMENTS/_VERMONT_GREENHOUSE_GAS_EMISSIONS_INVENTORY_UPDATE_1990-2015.PDF](http://dec.vermont.gov/sites/dec/files/aqc/climate-change/documents/_vermont_greenhouse_gas_emissions_inventory_update_1990-2015.pdf)
GDP: [HTTPS://FRED.STLOUISFED.ORG/SERIES/VTRGSP](https://fred.stlouisfed.org/series/VTRGSP)



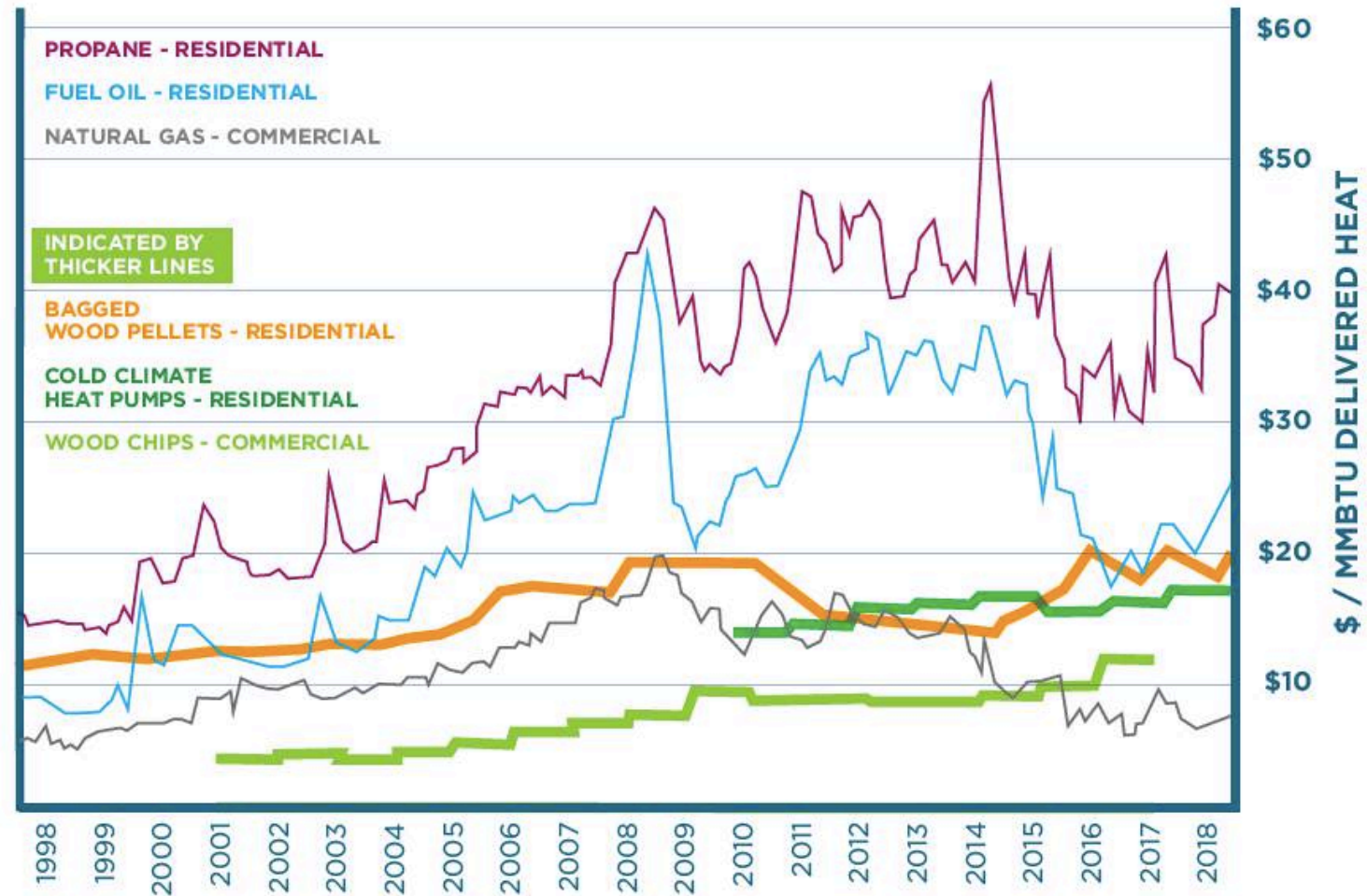
Vermonters Stand To Save

**Stable and
low-cost
renewables**

vs.

**Volatile
fossil-fuel
prices**

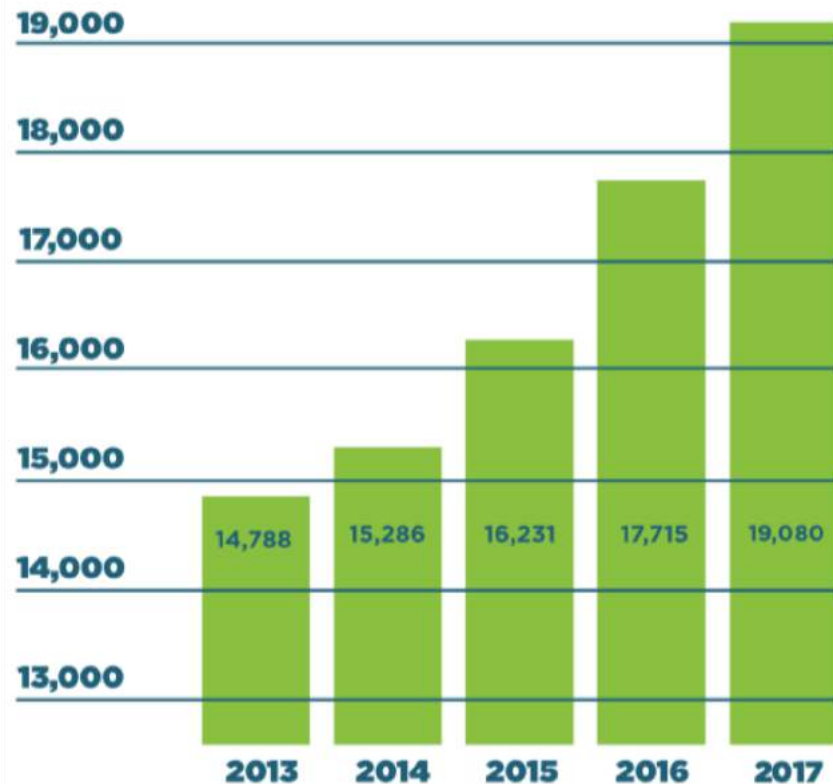
AVERAGE HEATING FUEL PRICING TRENDS (1998-2018)¹⁶



Vermont Stands to Grow

VERMONT CLEAN ENERGY JOBS²¹

Up 29% since 2013



**78¢ OF EVERY \$1
SPENT ON FOSSIL
FUEL LEAVES
VERMONT... NEARLY
\$1.5 BILLION PER
YEAR²²**

...but \$\$ spent on local renewables
creates more jobs for Vermont



The Two Stories of Vermont

Energy & Climate Leader

- 12% total renewable energy in 2010 to 20% as of 2017
- 5th lowest per capita CO₂ emissions of all US States
- Higher share of heating needs from wood than any other US State
- Most clean energy jobs per capita
- Most EV charging stations per capita

Energy & Climate Laggard

- New solar capacity declined 30% from 2016 to 2017
- GHG emissions have increased 16% since 1990
- 2nd highest per capita use of fuel oil for heating
- Clean energy jobs declined 2% from 2016-2017
- 95% dependent on fossil fuel for transportation



Energy transformation can't just be something for wealthier, coastal states...

<u>State</u>	<u>Median Household Income (2015)</u>	<u>Population Density (2015) (Per Sq. Mile)</u>
California	\$64,500	251
Vermont	\$56,990	67
Massachusetts	\$70,628	871
New York	\$60,805	421
US Average	\$56,515	86



Vermont's example matters
because the US needs
strong energy
transformation models for
rural, middle-income states



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