

Evaluating Emissions from Vehicle Fleet Energy Efficiency and Alternative Fuel Programs in a Rural State

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Clean Cities: Strategies to Promote Energy Efficiency, Renewable Energy, & Clean Transportation



**Light-,
Medium-, and
Heavy-Duty
Vehicles**



**New Mobility
Choices &
Emerging
Transportation
Technologies**



**Idle Reduction
Measures &
Fuel Economy
Improvements**

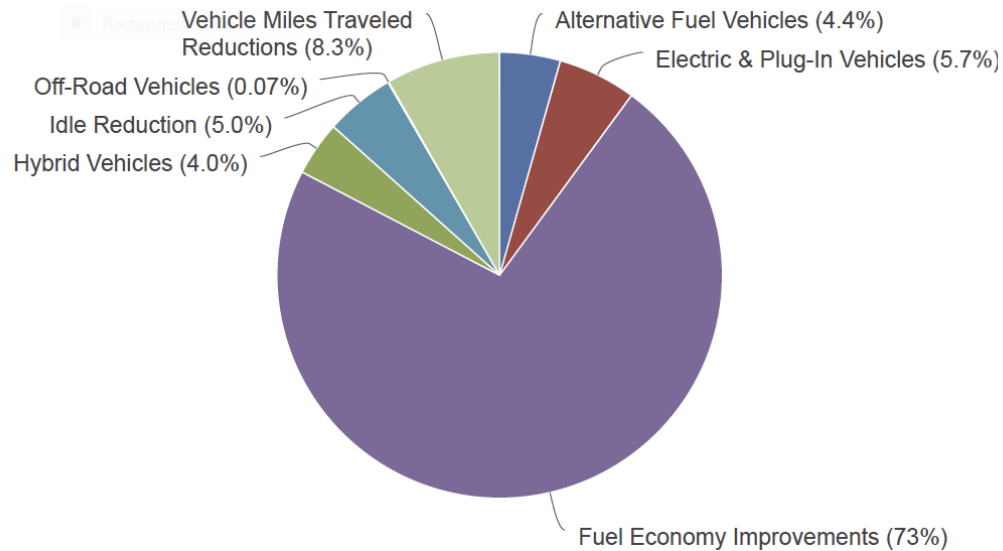


**Alternative &
Renewable
Fuels &
Infrastructure**

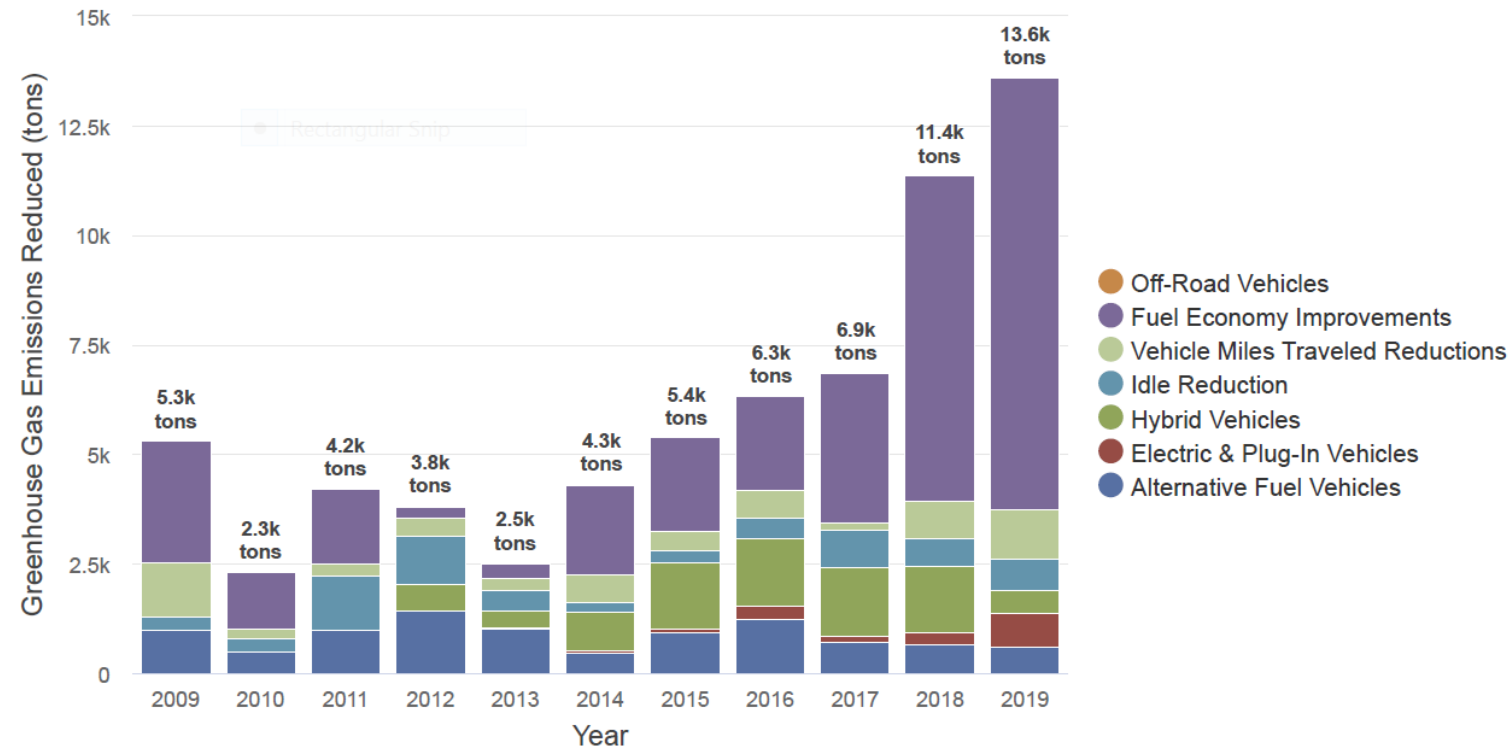


VT Clean Cities Emissions Reductions 2019

2019 Greenhouse Gas Emissions Reduced
13,618 tons



Historical Greenhouse Gas Emissions Reduced



What do Emissions Look Like in Vermont



<https://www.epa.gov/transportation-air-pollution-and-climate-change/>



<https://dec.vermont.gov/air-quality/>



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Vermont's GHG Emissions by sector (2016)

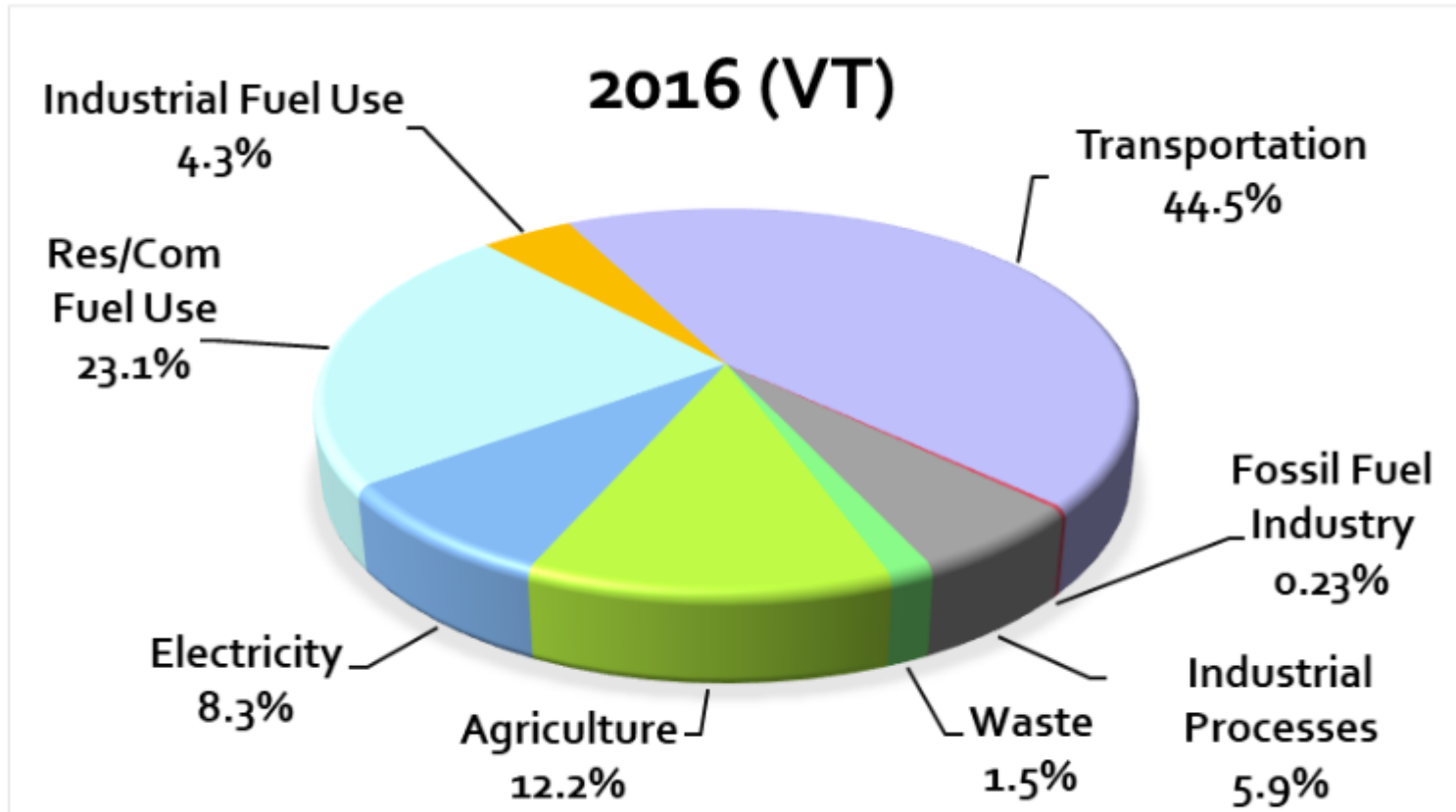


Figure ES-2: Vermont greenhouse gas emissions in 2016, percent contribution by sector.

https://dec.vermont.gov/sites/dec/files/aqc/climate-change/documents/_Vermont_Greenhouse_Gas_Emissions_Inventory_and_Forecast_1990-2016.pdf



Clean Cities Tools to Measure GHG Reductions

- IdleBox Tool Kit
 - Low-hanging fruit for fleets to implement.
- Alternative Fuels Data Center – Vehicle Cost Calculator
 - Great tool for passenger annual operating costs and vehicle CO2 emissions.
- AFLEET - **A**lternative **F**uel **L**ife-Cycle **E**nvironmental and **E**conomic **T**ransportation (AFLEET) Tool
 - Estimates petroleum use, GHG emissions, air pollutant emissions, & cost of ownership.
- Heavy-Duty Vehicle Emissions Calculator
 - Estimates vehicle operations NOx; PM25; well-to-wheel GHG emissions.



Anti-Idling

- UVM Emergency Management Pilot
 - By reduce idling of each UVM Police Services vehicle by two hours a day, the department could annually save: 2,760 gallons of fuel, 32 tons of CO2 emissions, and \$6,488 of fuel savings plus additional savings from reduced maintenance costs.
- Heavy-Duty Auxiliary Power Unit (APU)
 - 1 H-D reducing idling 210 minutes/day for 262 days/year
 - Saves 1 gallon/hour and 7.2 tons GHG/year



Light-Duty Passenger Vehicles

Annual
Emissions
(lbs CO₂)

14,397

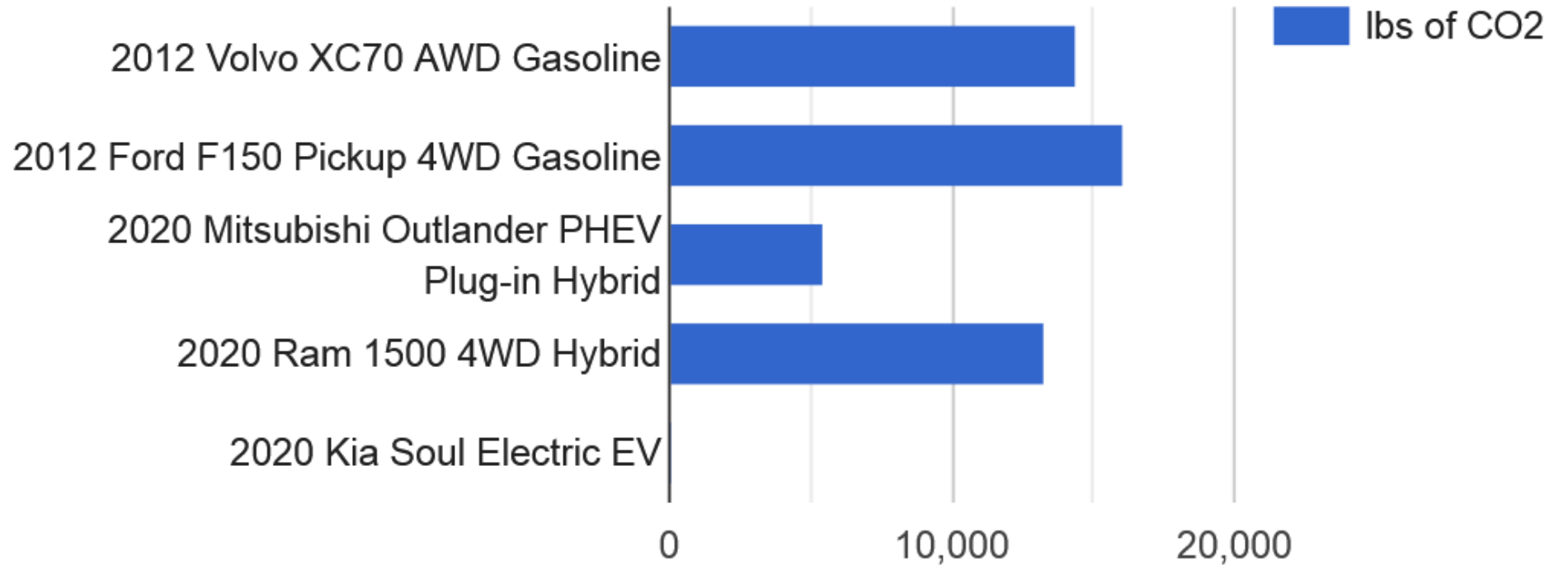
16,053

5,434

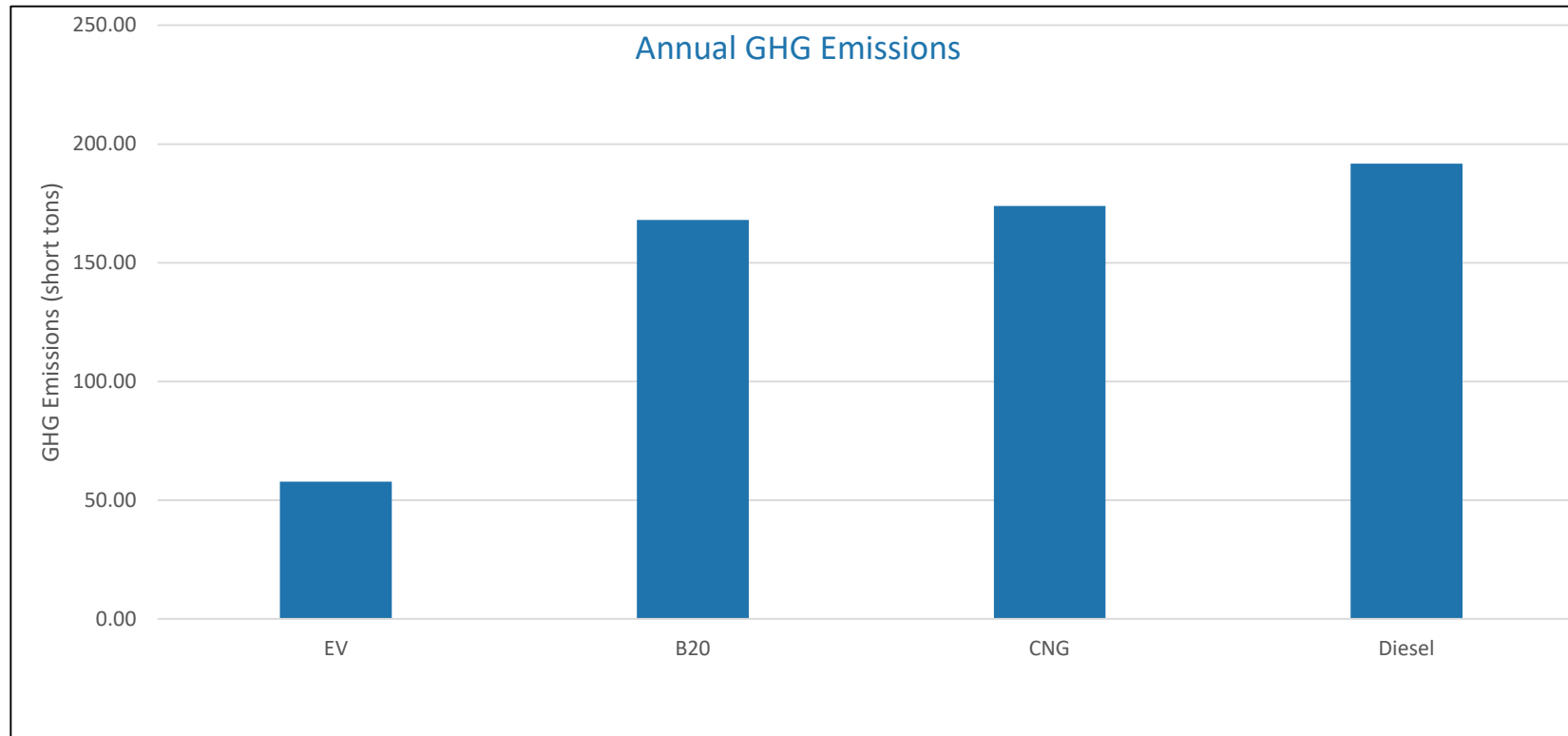
13,321

7

Annual Emissions (lbs CO₂)



Refuse Truck Comparisons

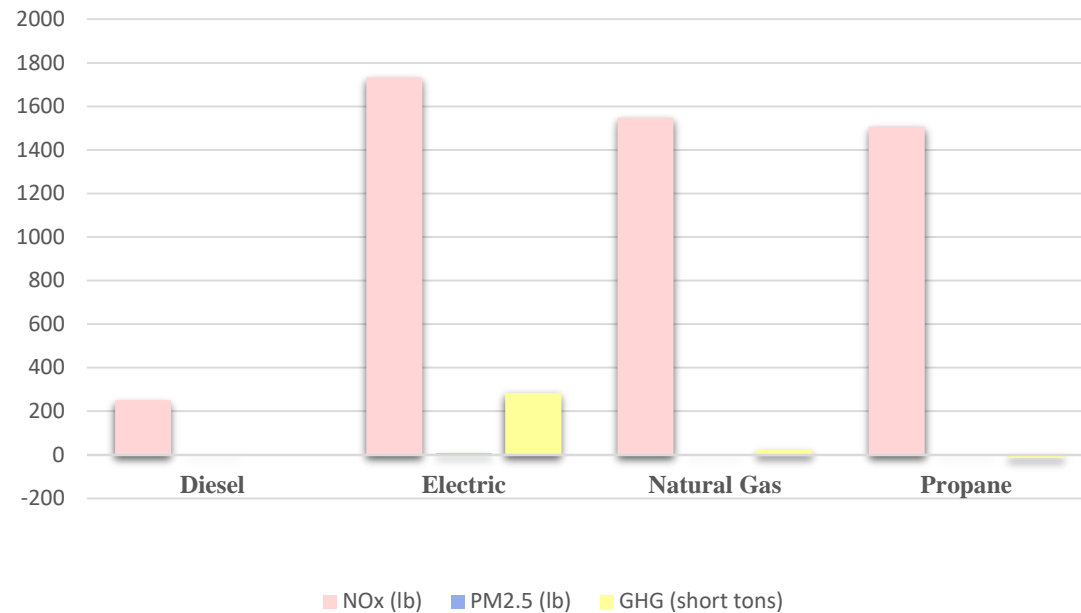


Fuel	GHG Emissions
EV	57.79
B20	168.11
CNG	173.99
Diesel	191.78



Electric School Buses

New Vehicle Lifetime Emission Benefit



New Vehicle Lifetime Emission Benefits				
Pollutant	Diesel	Electric	Natural Gas	Propane
NOx (lb.)	250.68	1733.35	1548.01	1506.82
PM2.5 (lb.)	1.04	6.46	1.04	0.44
GHG (short tons)	0	282.6	23.68	-13.57



Emissions Reporting in Rural VT: A Centralized Strategy?

- **Who?**
- **How?**
- **What tools?**



Emissions Reporting in Rural VT: What's Missing?

- **State policies**
- **Funding and incentives**
- **Improving data collection**
- **Capturing anti-idling measures**
- **Improving DMV database**
- **Researching all modes**
- **Integrating research funding**



Thank You

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