Vermont Climate Council Transportation Webinar

April 1, 2022

Agenda

12:00 PM	Convene/Welcome/Overview *David Plumb, Consensus Building Institute*
12:05 PM	Transportation Sector Presentation – (35 mins) *Julie Moore, Councilor, Secretary, Agency of Natural Resources* *Jared Duval, Councilor, Co-Chair Science and Data Subcommittee*
12:40 PM	Transportation Sector Next steps – (10 mins) *Johanna Miller, Councilor, Transportation Task Group Co-lead*
12:50 PM	Councilor's Clarifying questions - (10 mins) *David Plumb, Consensus Building Institute*
1:00 PM	Discussion – Council first (15 mins) and then Open to Public (15 mins) Framing questions: o What aspects seem most promising? What do you like most about the approach presented? o What would make it stronger? Is something crucial missing - a major policy option that would provide the needed emissions reductions?
1:30 PM	Adjourn

Vermont Climate Council Transportation Webinar

April 1, 2022

Julie Moore, Vermont Climate Council Member

- Secretary, Vermont Agency of Natural Resources
- Member, Science & Data subcommittee
- Member, Council Steering Committee

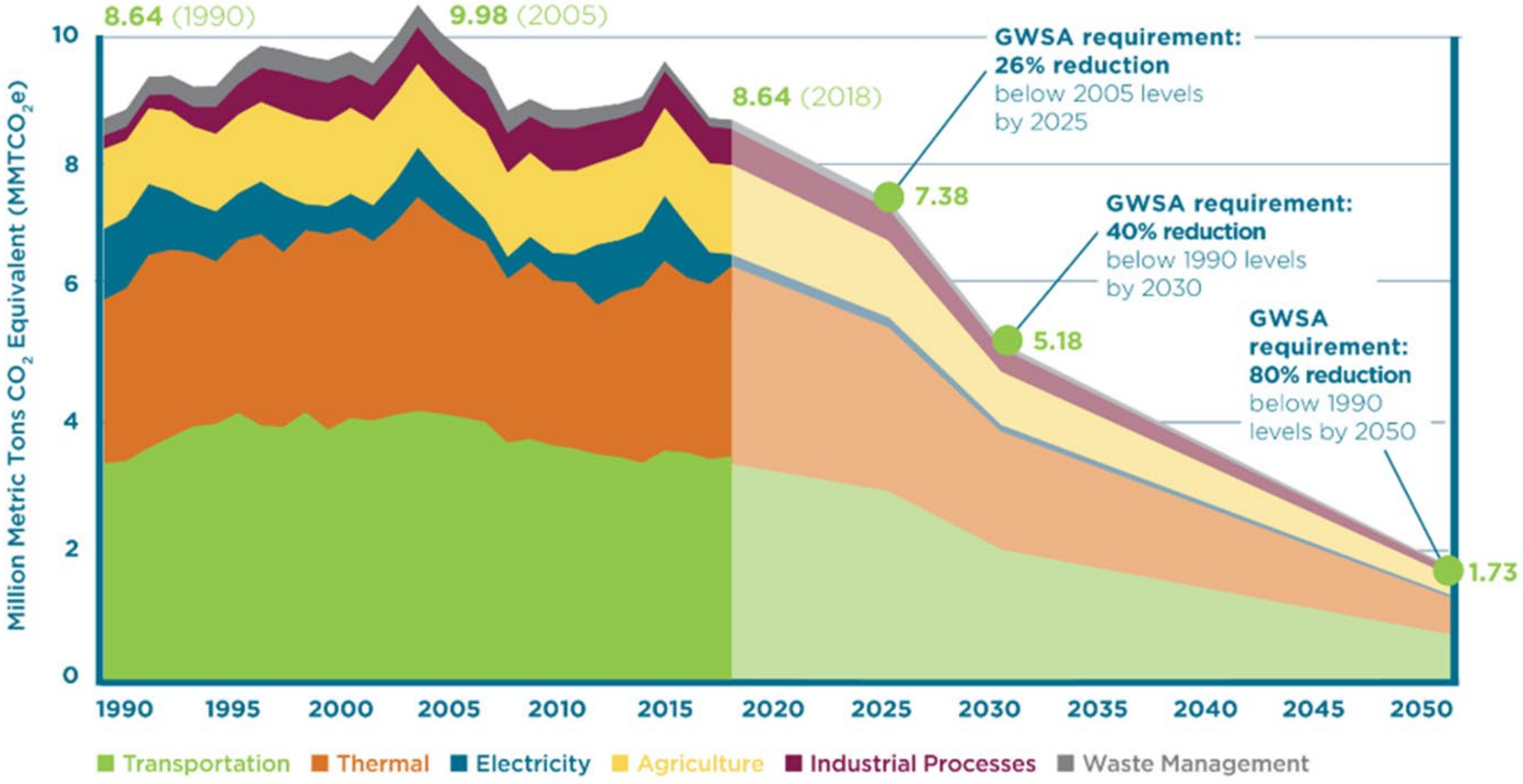
Jared Duval, Vermont Climate Council Member

- Appointed by the Senate Committee on Committees to represent a Vermont based organization with expertise in energy and data analysis
- Co-Chair, Science & Data subcommittee
- Member, Cross-Sector Mitigation subcommittee
- Member, Council Steering Committee

The Vermont Climate Action Plan

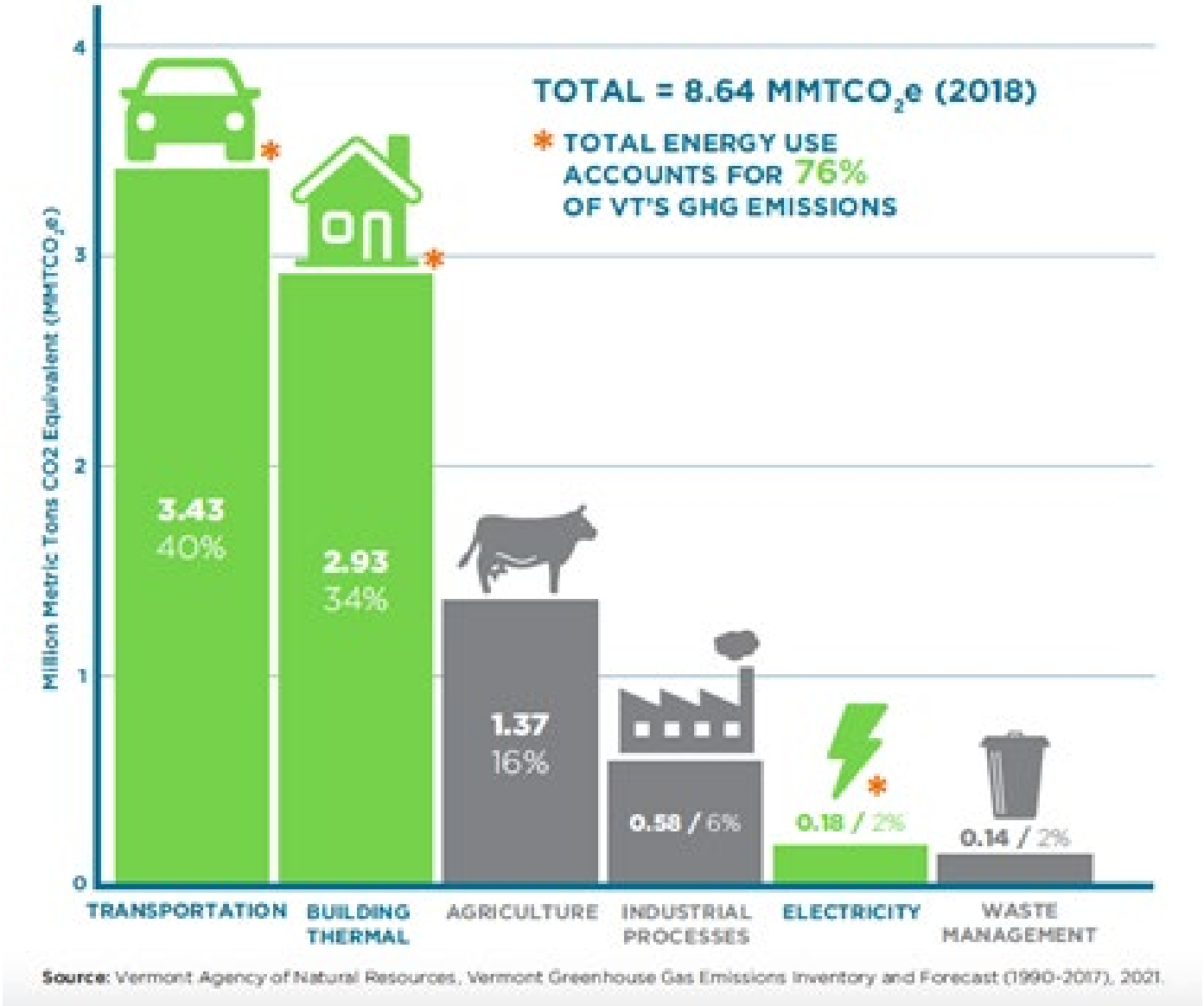
- ➔ Contains recommendations to the General Assembly for actions, as well as direction to the Agency for rules, to meet the GHG emission reduction requirements of the Global Warming Solutions Act. Specifically:
  - ◆ To cut climate pollution 40% below 1990 levels by 2030, which is approximately half of 2005 levels
- ➔ Prioritizes those who are most affected
- ➔ Must be updated at least every 4 years
- ➔ Creates a framework for measuring progress

Vermont's GHG Emissions Reduction Requirements

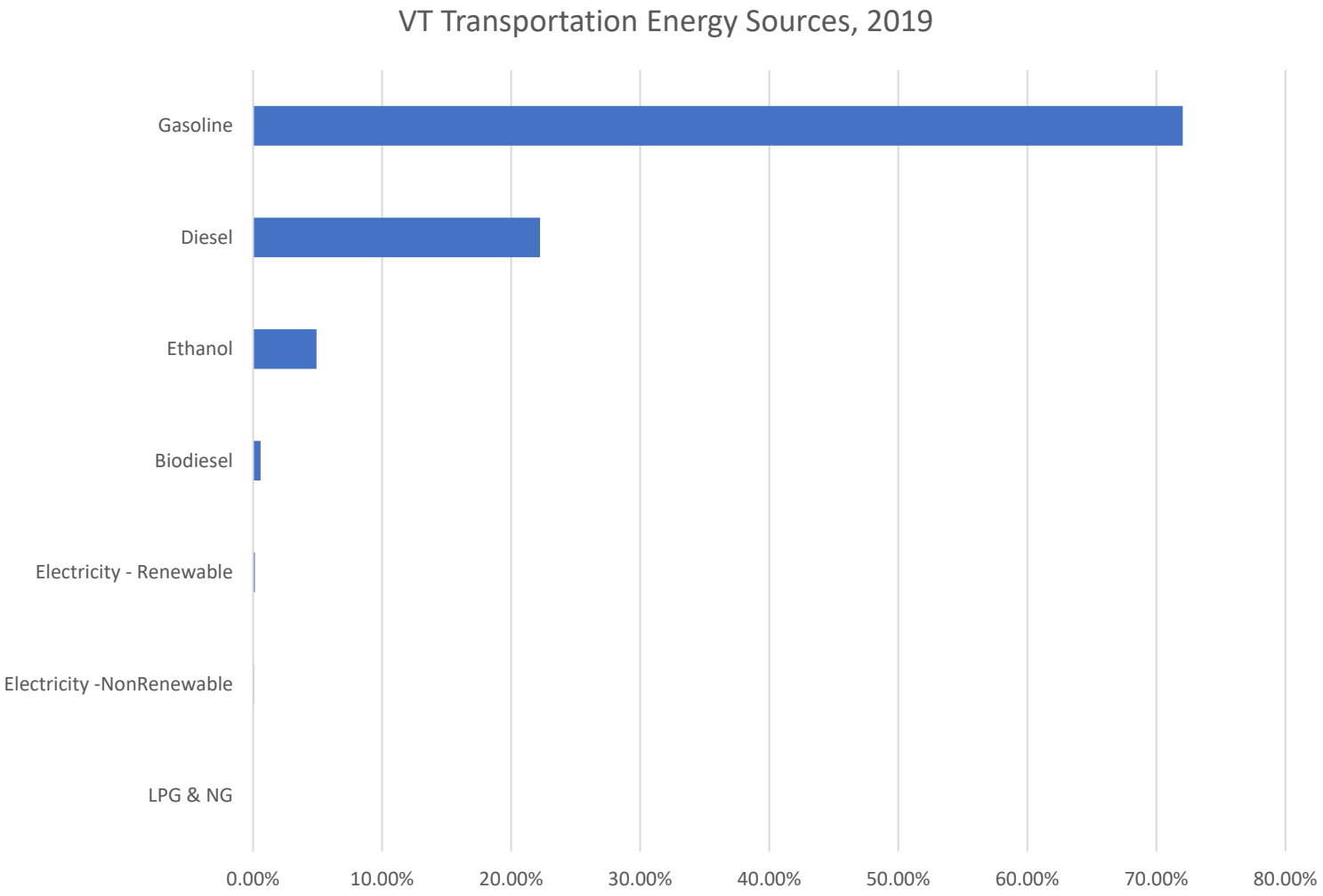


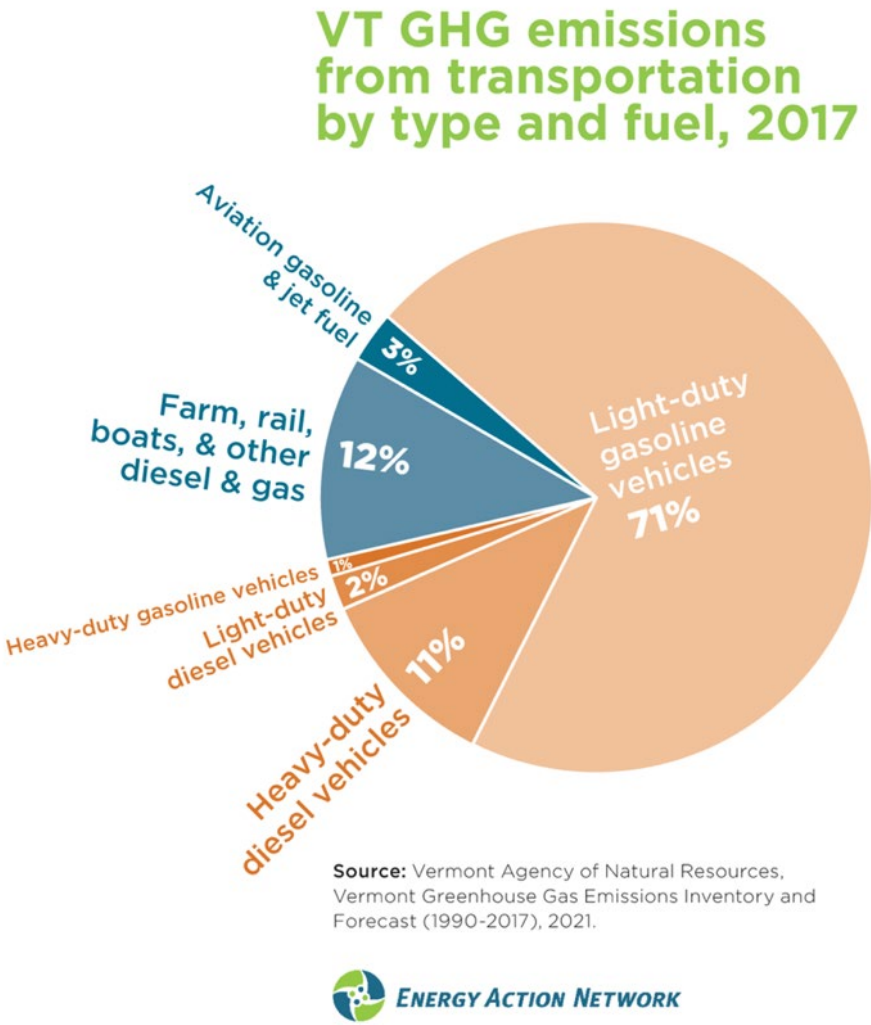
Source: Vermont Agency of Natural Resources, Vermont GHG Emissions Inventory and Forecast (1990-2017), 2021.

Vermont's GHG Emissions by Sector, 2018



95% of Vermont Transportation is Fossil-Based





Key Vermont Transportation Statistics

- Total Vehicle Miles Traveled (VMT) in VT, 2019: **7,350,000,000**
- Total registered vehicles in VT, 2019: **580,284**
  - Total Low- and Zero-Emission Vehicles (ZEVs) registered in VT, 2021: **6,585**
- Avg. VMT per registered vehicle in VT, 2019: **12,666**
- Avg. VT Fleet Fuel Efficiency, 2019: **23 miles per gallon (MPG)**
- Avg. Gallons/VT vehicle per year, 2019: **551**
- Avg. Annual Vehicle Fuel Cost @ $3/gallon**: $1,653**
- Avg. Annual Vehicle Fuel Cost @ $4/gallon**: $2,204**
- Avg. GHG emissions per VT vehicle/ year, 2019: **4.9 metric tons**

Current Transportation Sector Emissions, Policies and Programs in Vermont

- 2021 transportation emissions
  - Based on preliminary data, emissions in the transportation sector in 2021 are *estimated* to be **2.93 MMTCO$_2$e**, down from 3.43 MMTCO2e in 2018
  - Current events and recent trends to consider:
    - Reduced VMT due to COVID-19 affecting transportation needs and choices
    - Change in vehicle choice resulting in more fuel-efficient vehicles
- Current transportation emission reduction policies and programs
  - Advanced Clean Cars I – GHG and criteria emission standards, ZEV requirements
  - Federal fuel economy standards (CAFE) amendments (increased stringency)
  - State, Federal, and Utility EV incentives
  - State and Federal EVSE public investment
  - Smart growth/VMT reduction policies and programs

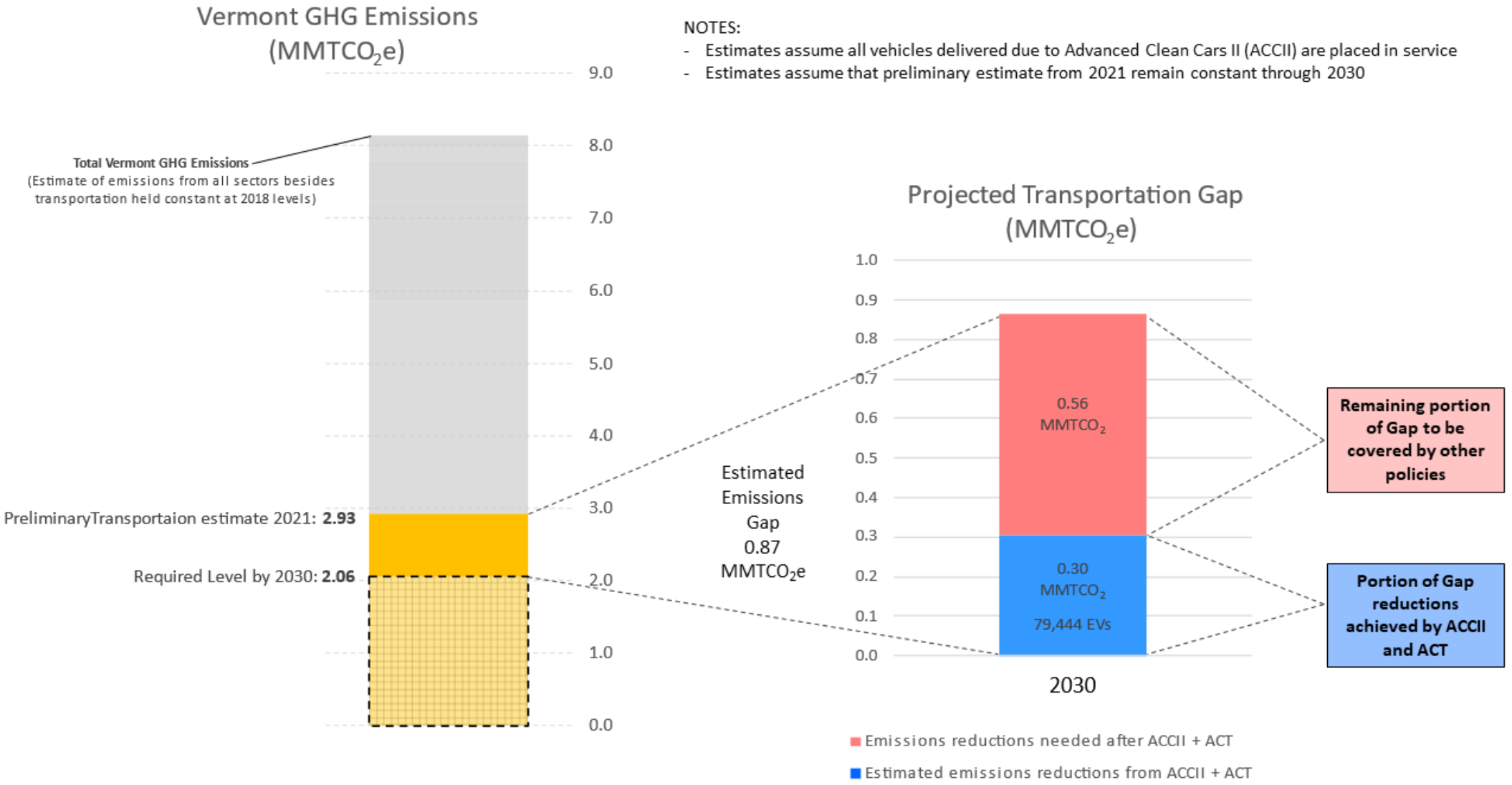
Climate Action Plan (CAP) - Transportation Strategies

- Provide incentives to help Vermonters purchase electric vehicles
- Build more charging stations for electric vehicles
- Adopt California's Advanced Clean Car and Clean Truck Rules (implementation beginning in 2026)
  - Advanced Clean Cars II: more stringent emission standards, requirement for auto-manufacturers to deliver more ZEVs (100% by 2035)
  - Advanced Clean Trucks: auto-manufacturers requirement to place more medium- and heavy-duty ZEVs in service in Vermont, depending on vehicle size
- Electrify medium and heavy-duty vehicle auxiliary systems (i.e., bucket trucks and electric transport refrigeration units)
- Create infrastructure that supports more walking, biking, public transit options
- Educate drivers on benefits of electrification and other transportation options to reduce vehicle miles traveled (VMT)

Transportation Sector Emissions in Vermont

- How will (proposed) ARPA/IIJA investments in transportation electrification impact emissions between now and 2030?
  - ARPA: $37M
    - EV incentives
    - Charging infrastructure
  - IIJA: $21M+
    - Charging infrastructure
- How will adopting California's Advanced Clean Car and Clean Truck Rules impact emissions in the transportation sector?
  - Reduce emissions by making more ZEVs available for Vermonters to purchase
  - These policies will not guarantee that vehicles are placed in service (for ACCII) by Vermonters or on Vermont roads
  - Complimentary policies will be critical to achieve estimated emission reductions
- What additional work is needed to reduce emissions and meet the 2030 requirement for the transportation sector?

Transportation Sector Emissions in Vermont



Where VT Stands on Transportation Policy

- Unlike the electricity sector (Renewable Energy Standard (RES)) and, hopefully soon, the thermal sector (Clean Heat Standard (CHS)), **Vermont's transportation sector—our most polluting sector—lacks a primary or lead policy or regulatory framework to provide the lion's share of needed emissions reduction and help ensure, with a high degree of confidence, that emissions reduction requirements are met.**

- The **Transportation and Climate Initiative Program (TCI-P)** was going to provide the largest share of emissions reduction in the transportation sector, until it fell apart days before the Climate Action Plan (CAP) was finalized.

Economy-wide or sector-wide policy options

Emissions Cap: Can be economy wide or sector specific. Requires reductions below cap, creating "pollution allowances" that need to be purchased by polluters, ratcheting down the number of allowances over time.

Performance Standard: Requires emissions reductions and creates "credits" for emissions reducing actions, with an increasing amount of emissions reducing activity over time.

Carbon Pollution Pricing: Puts a price on carbon pollution, aiming to reflect the environmental and societal costs of pollution in the price of fossil fuels, for instance.

Public investment, incentives: Key questions include: where do revenues come from? How to ensure stable and dedicated funding levels that provide market clarity over long-term (vs. short-term influx of federal dollars)?

Policy Approaches: A Spectrum of Confidence re: Ensuring Emissions Reduction Requirements Are Met

Carbon Pricing

Public Investment

Lower Confidence

Performance Standards

Emissions Cap

Higher Confidence

Emissions Caps

Degree of Confidence: Very high confidence due to emissions cap and the annual reduction mechanism, designed to reduce emissions by a known and required amount each year.

Equity: Whether progressive or regressive depends on design, including how revenues are used. In Cap & Trade scenario, need to be sure to avoid "pollution hotspots"

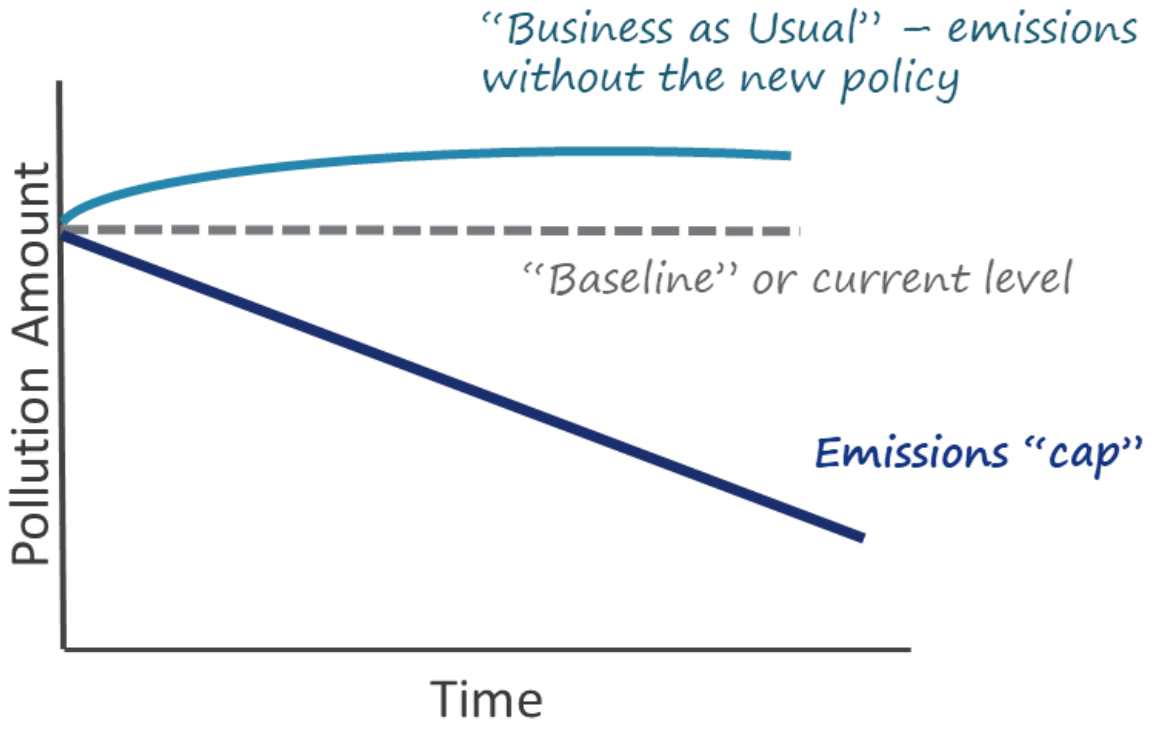
Where in Use?:

- Economy-wide: California, Quebec, and Nova Scotia (Western Climate Initiative (WCI))
- Electricity Sector: Northeast states (Regional Greenhouse Gas Initiative (RGGI)
- Note: this was the model for the proposed Transportation & Climate Initiative Program (TCI-P)

Variations:

- Cap and Invest (WCI, RGGI, TCI)
- Cap and Reduce (Oregon)
- Cap and Dividend (proposal)

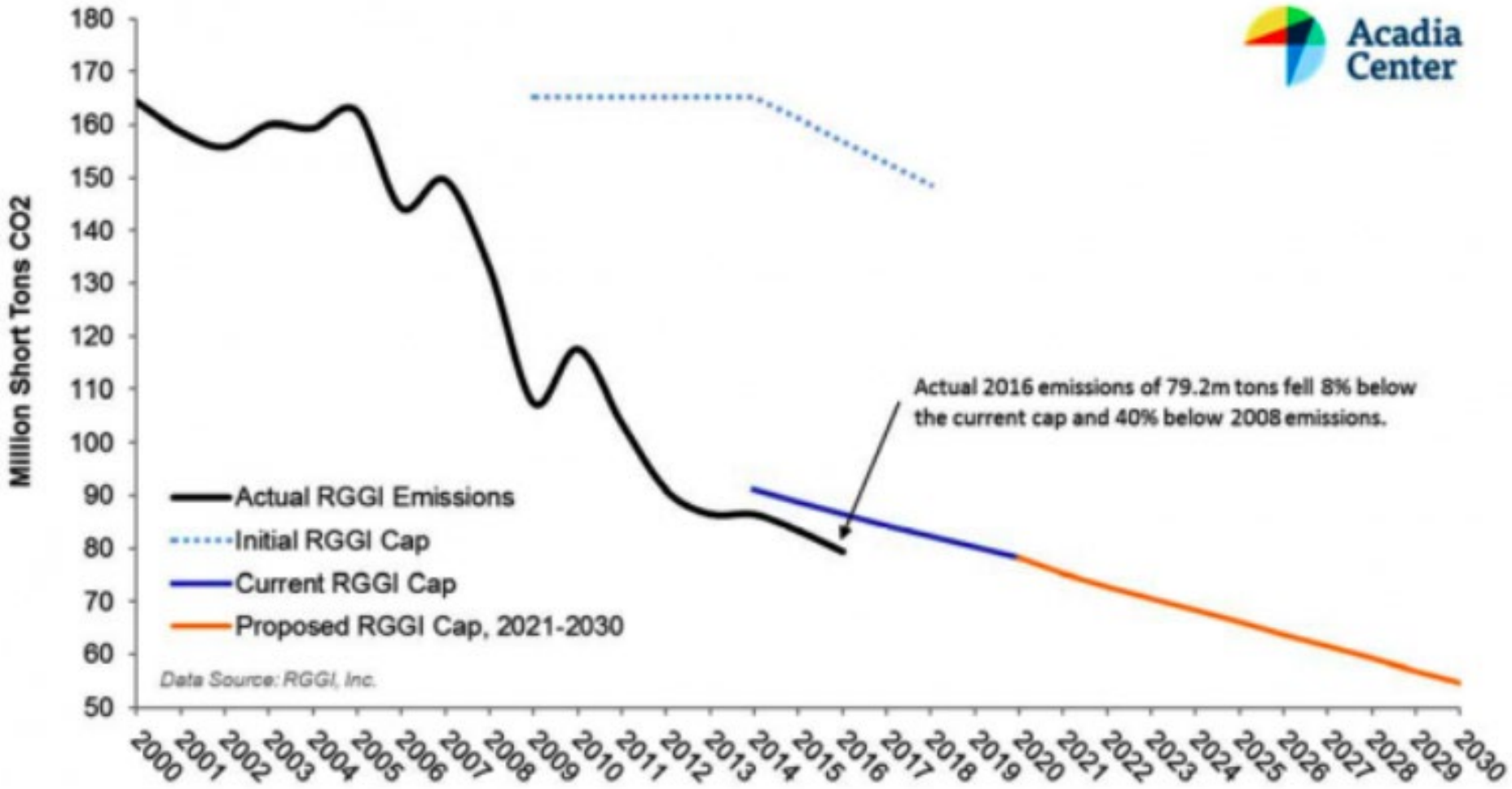
Emissions Caps



TRANSPORTATION & CLIMATE INITIATIVE
Of the Northeast and Mid-Atlantic States

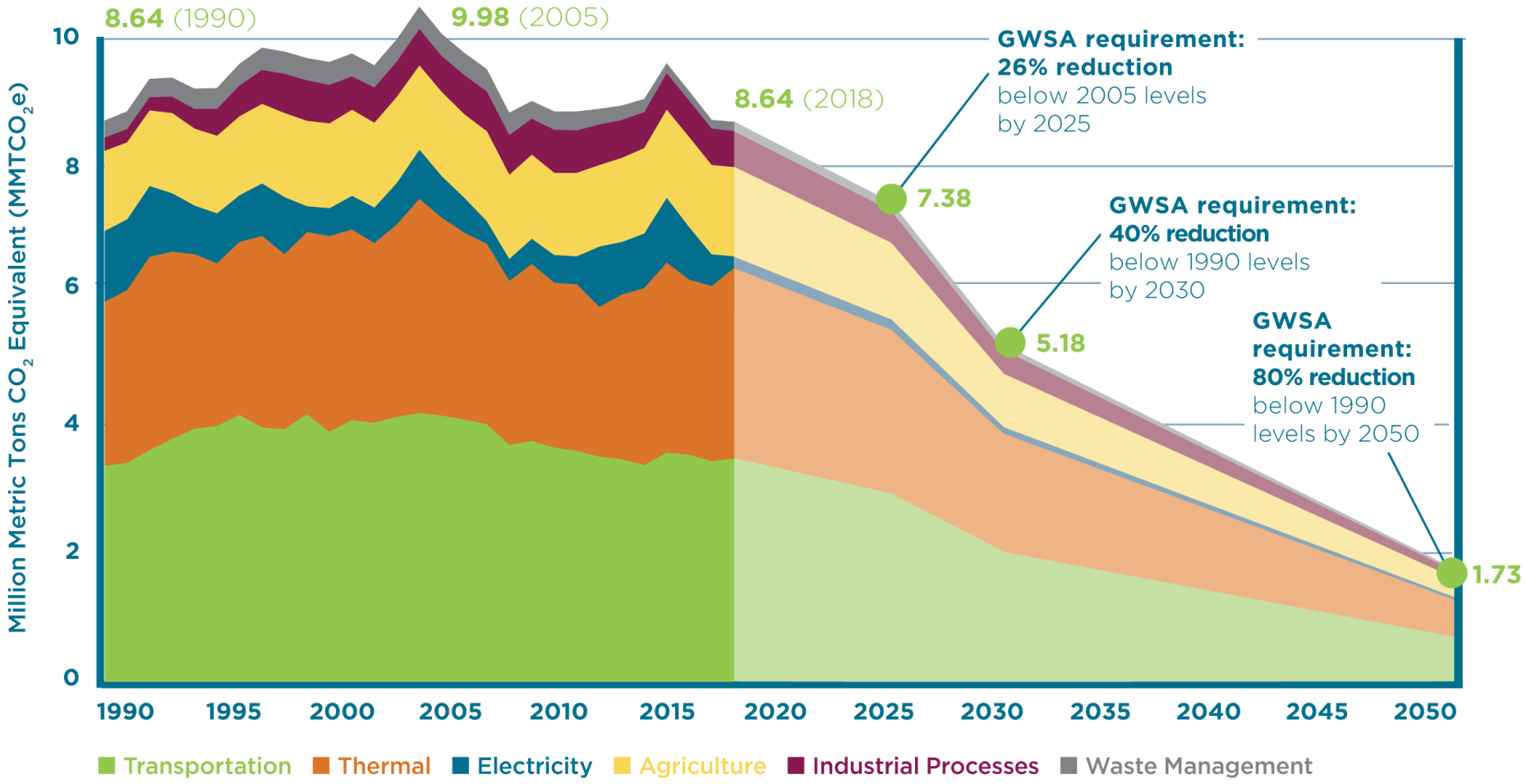
Emissions Caps

Figure 1: RGGI Caps and Actual Emissions



Emissions Caps vs. Performance Standards

Vermont's historical GHG emissions and future requirements



Source: Vermont Agency of Natural Resources, Vermont GHG Emissions Inventory and Forecast (1990-2017), 2021.

ENERGY ACTION NETWORK

Performance Standards

Degree of Confidence: High confidence when standard is tied to an emissions reduction requirement.

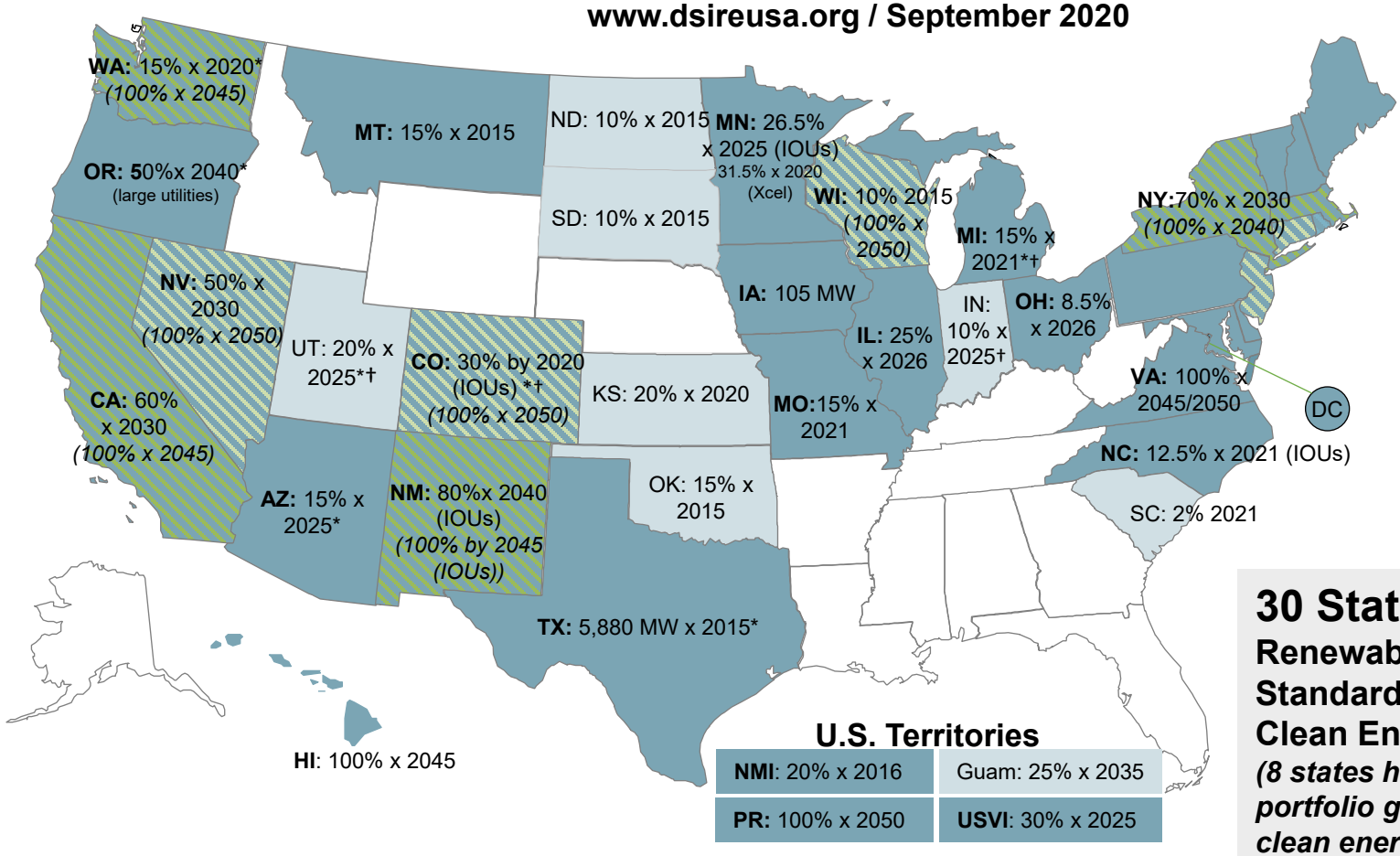
Equity: Whether progressive or regressive depends on design, including who the standard applies to and to what degree they push their cost of compliance onto others.

Where in Use?:

- Transportation Sector: Low Carbon Fuels Standard (California); Clean Fuels Program (Oregon); Clean Fuel Standard (Washington)
- Electricity Sector: Renewable Electricity Standards (RES) or Renewable Portfolio Standards (RPS) in 30 states.
- Energy Efficiency: Energy Efficiency Resource Standards in 25 states.
- Thermal Sector: Clean Heat Standard (Colorado and under consideration in VT).

Renewable & Clean Energy Standards

www.dsireusa.org / September 2020



ME: 100% x 2050
NH: 25.2% x 2025
VT: 75% x 2032
MA: 35% x 2030 + 1% each year thereafter (new resources) 6.7% x 2020 (existing resources) *(80% x 2050)*
RI: 38.5% x 2035; 100% x 2030 Goal
CT: 40% x 2030; *(100% x 2040)*
NJ: 50% x 2030; (*100% x 2050)*
PA: 18% x 2021†
DE: 25% x 2026*
MD: 50% x 2030
DC: 100% x 2032

U.S. Territories

NMI: 20% x 2016	Guam: 25% x 2035
PR: 100% x 2050	**USVI**: 30% x 2025

30 States + DC have a Renewable Portfolio Standard, 5 states have a Clean Energy Standard
(8 states have renewable portfolio goals, 5 states have clean energy goals)

Renewable portfolio standard
Renewable portfolio goal
Clean energy standard
Clean energy goal

* Extra credit for solar or customer-sited renewables
† Includes non-renewable alternative resources

Energy Efficiency Resource Standards (and Goals)

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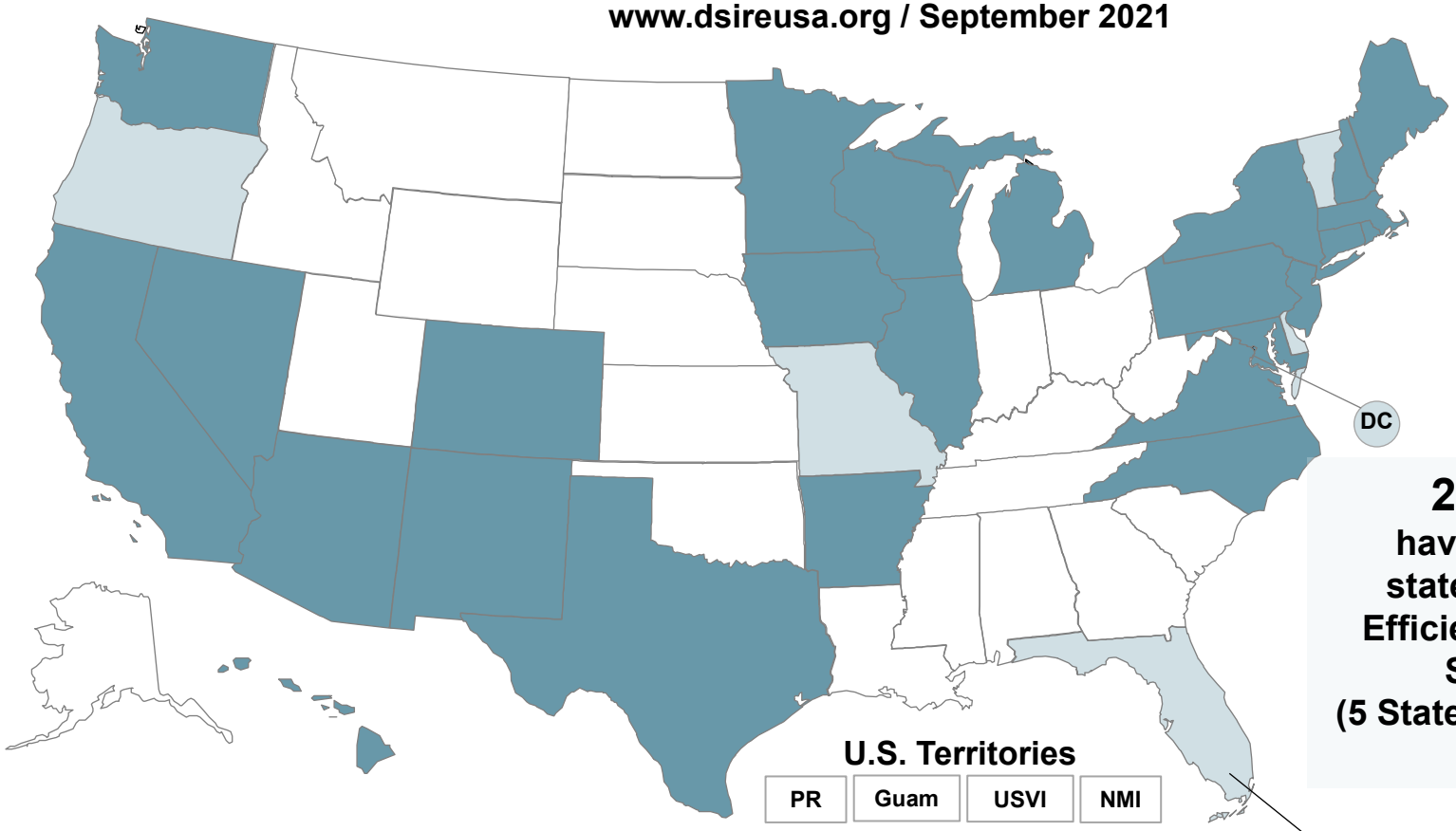


25 States
have mandatory statewide Energy Efficiency Resource Standards
(5 States and D.C. have Goals)

States with an Energy Efficiency Resource Standard

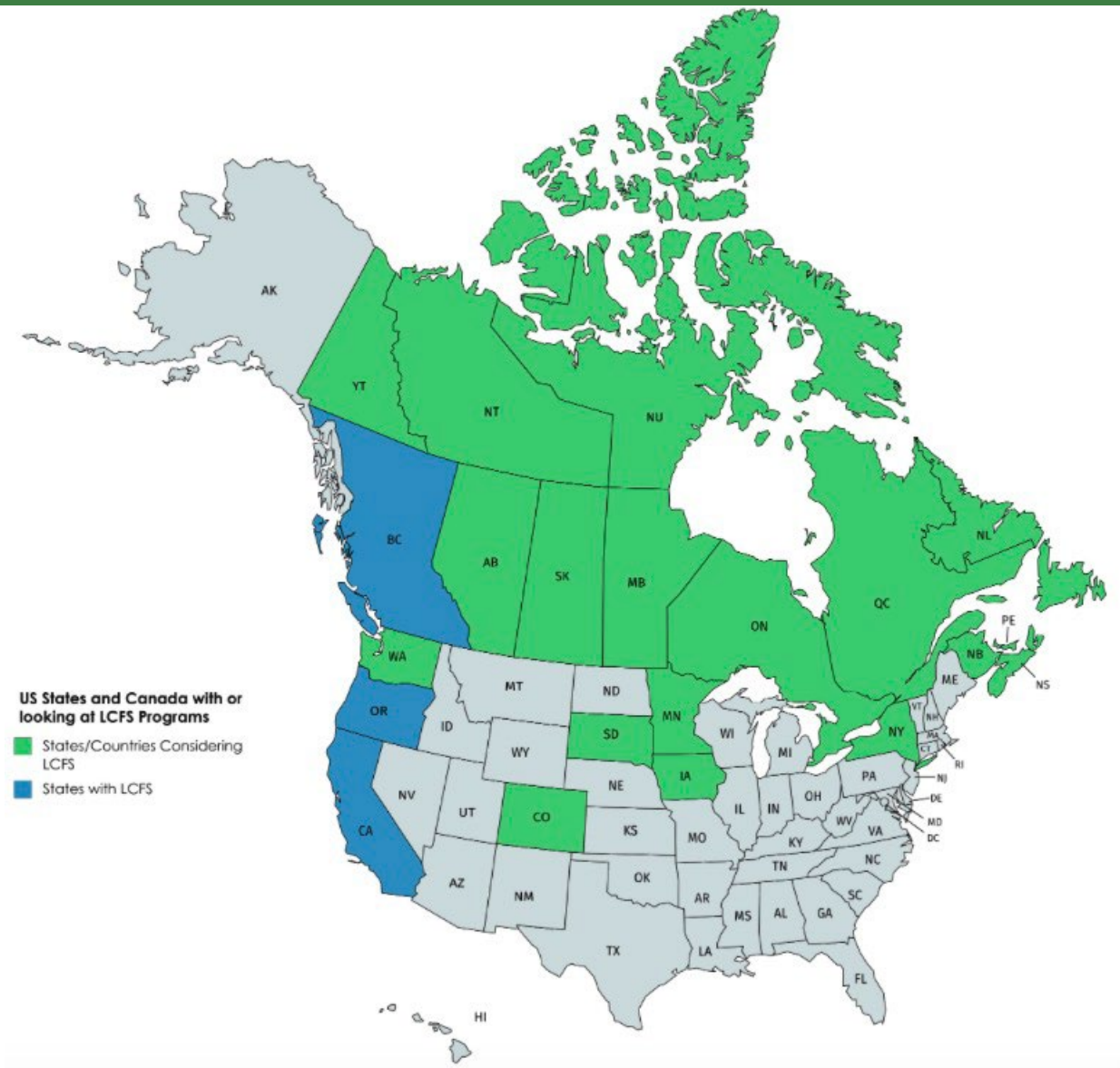
States with an Energy Efficiency Resource Goal

No State Standard or Goal

Florida met its efficiency goals and no EERS programs are in place.

Performance Standards - Transportation

Three U.S. states – California, Oregon, and Washington – along with the Canadian province of British Columbia have performance standards (Low Carbon Fuel Standards) for their transportation fuel sectors, with many more states and Canadian provinces considering joining them.



Carbon Pricing (Carbon Pollution Taxes or Fees)

Degree of Confidence: Generally provides a higher degree of certainty re: prices, somewhat less certainty on total revenues, and a much lower degree of certainty re: actually achieving emissions reductions.

Equity: Whether progressive or regressive depends on design, including how revenues are used.

Where in Use?: 23 countries around the world but not by any U.S. States

Climate Action Plan (CAP) Transportation Pathways

- Electrification - Light Duty
- Electrification - Heavy Duty
- Lower the carbon intensity of fuels/fuel switching
- Increase vehicle efficiency
- Reduce Vehicle Miles Traveled (VMT)
- Administration, coordination and implementation of programs, plans, and policies

Pathway Specific Policy/Regulatory Options - Examples

Electrification - Light Duty

- Advanced Clean Cars II (*planned adoption*)
- EV Incentives (*existing, planned expansion*)
- EV Supply Equipment (EVSE) or charging infrastructure (*existing, planned expansion*)
- Be ready to join TCI-P if regional market viability exists ***(*recommended in CAP, needs legislative adoption***)

Electrification - Heavy Duty

- Advanced Clean Trucks (ACT) (*planned adoption*)
- Advanced Clean Fleets (*not in CAP, possible option*)

Pathway Specific Policy/Regulatory Options – Examples Continued

Lower the carbon intensity of fuels/fuel switching

- Biofuel blending requirement (not in CAP, possible option)

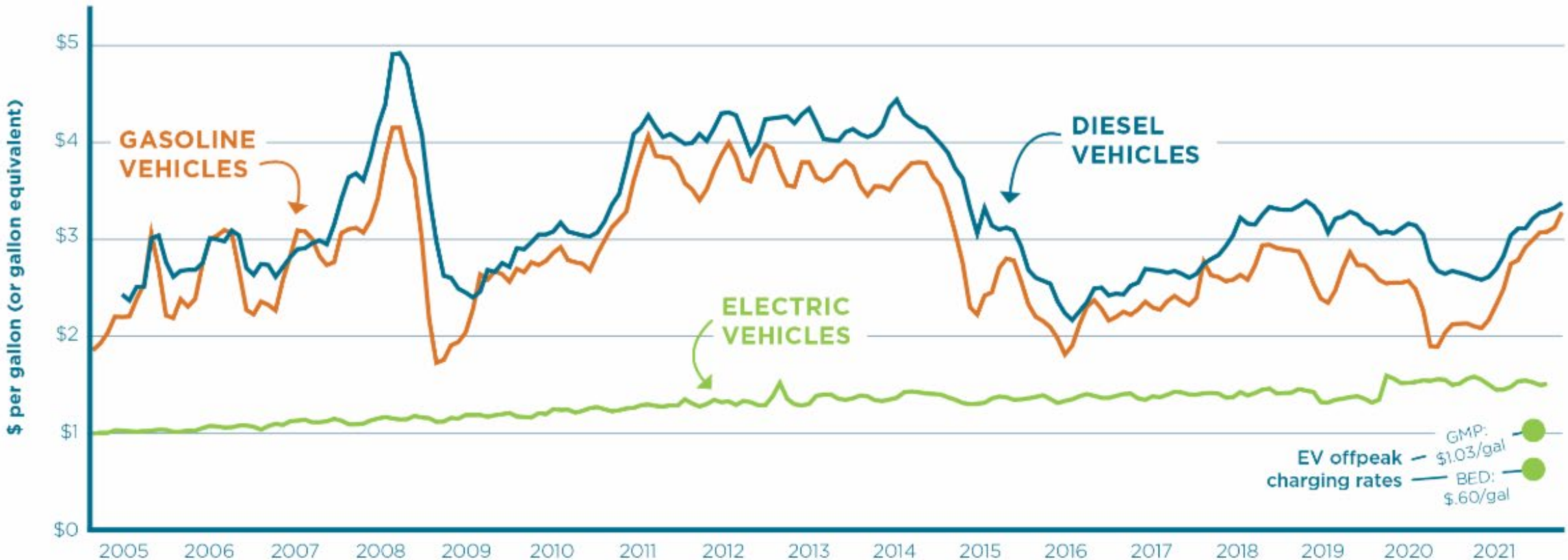
Increase vehicle efficiency

- Vehicle Efficiency Price Adjustment (aka True Cost Pricing for new vehicles or "Fee and Rebate" program) (***recommended in CAP, needs legislative adoption***)

Reduce Vehicle Miles Traveled (VMT)

- Transit, telecommuting, carpooling, etc.
- Land use policies (smart growth)

Comparison of Vermont transportation fuel costs, 2005–2021



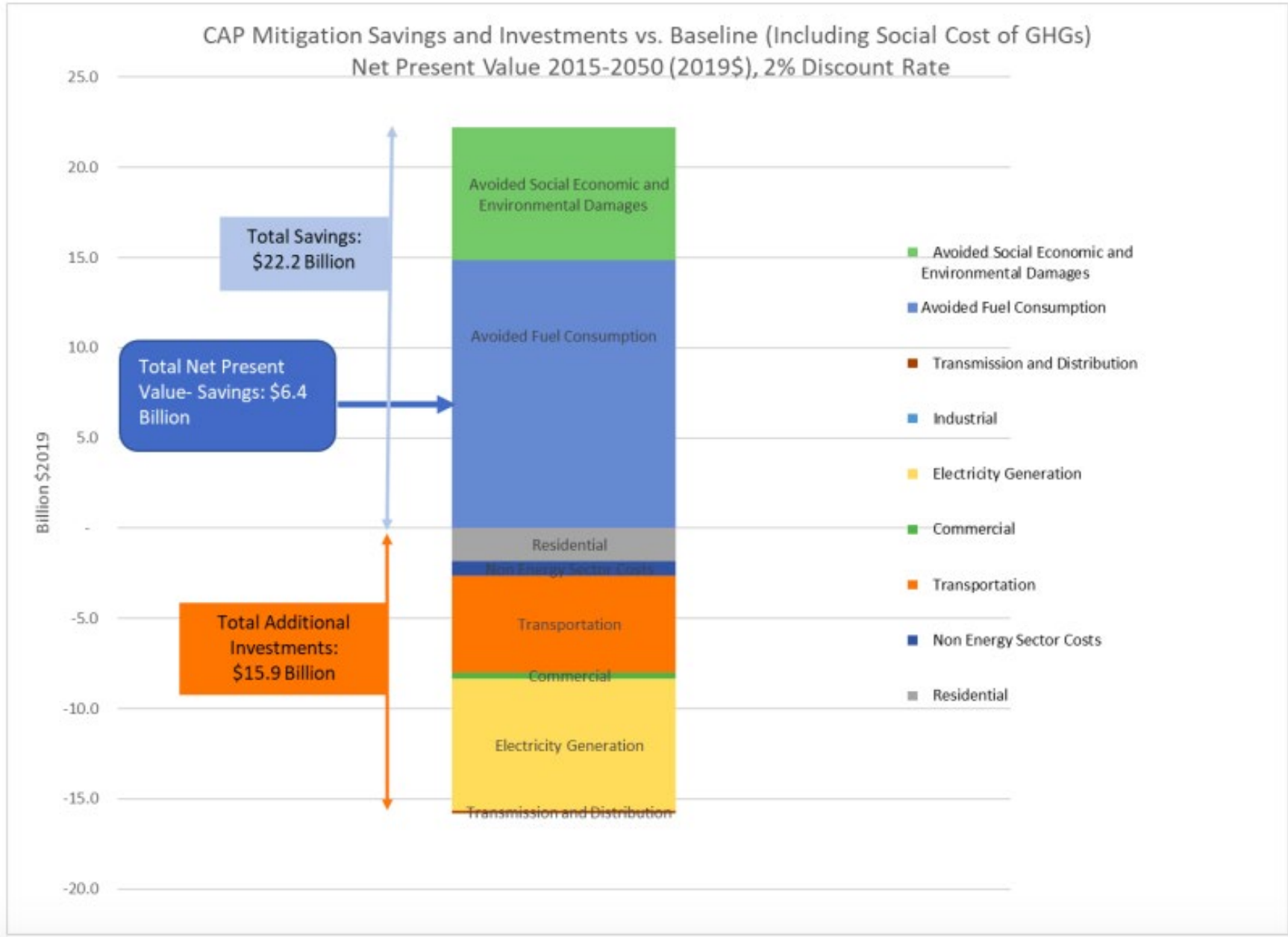
Sources: Gas and Electric — Drive Electric VT (via EIA); Diesel — Vermont Agency of Transportation (VTrans).

Average annual fossil fuel spending in VT, 2009–2018

Source: Vermont Agency of Commerce and Community Development. 2021.

ENERGY FUTURES GROUP

CADMUS



Timeline and Next Steps: Public Engagement and Technical Analysis

- Initial Deep Dive Transportation Options Webinars – April/May
  - April 5th, 1:30 p.m. – Vermont Clean Cities Coalition – Clean Transportation Standard
  - Other Policy or Regulatory Approach(es) – Cap & Invest, Other (TBD – Your Input!)
  - *April 12th + April 13th – Climate Council public engagement events*
- Technical Analysis – RFP (mid April) and Consultant (hired early June) – Built from baseline of Advanced Clean Cars II/Advanced Clean Trucks (rulemaking ensuing)
- June 2022: Climate Council Meeting – Update on transportation work
- Summer 2022: Discourse + dialogue with technical consultant, as well as public engagement through the ACCII and ACT rulemaking process
- Early Fall – Stakeholder and further public engagement on draft technical analysis
- Mid-Late October – Final consultant technical analysis delivered; update and suggested recommendation to the Climate Council
- November – Climate Council deliberation and consideration of Climate Action Plan addendum to adopt