Climate Action Office: Senate Natural Resources and Energy

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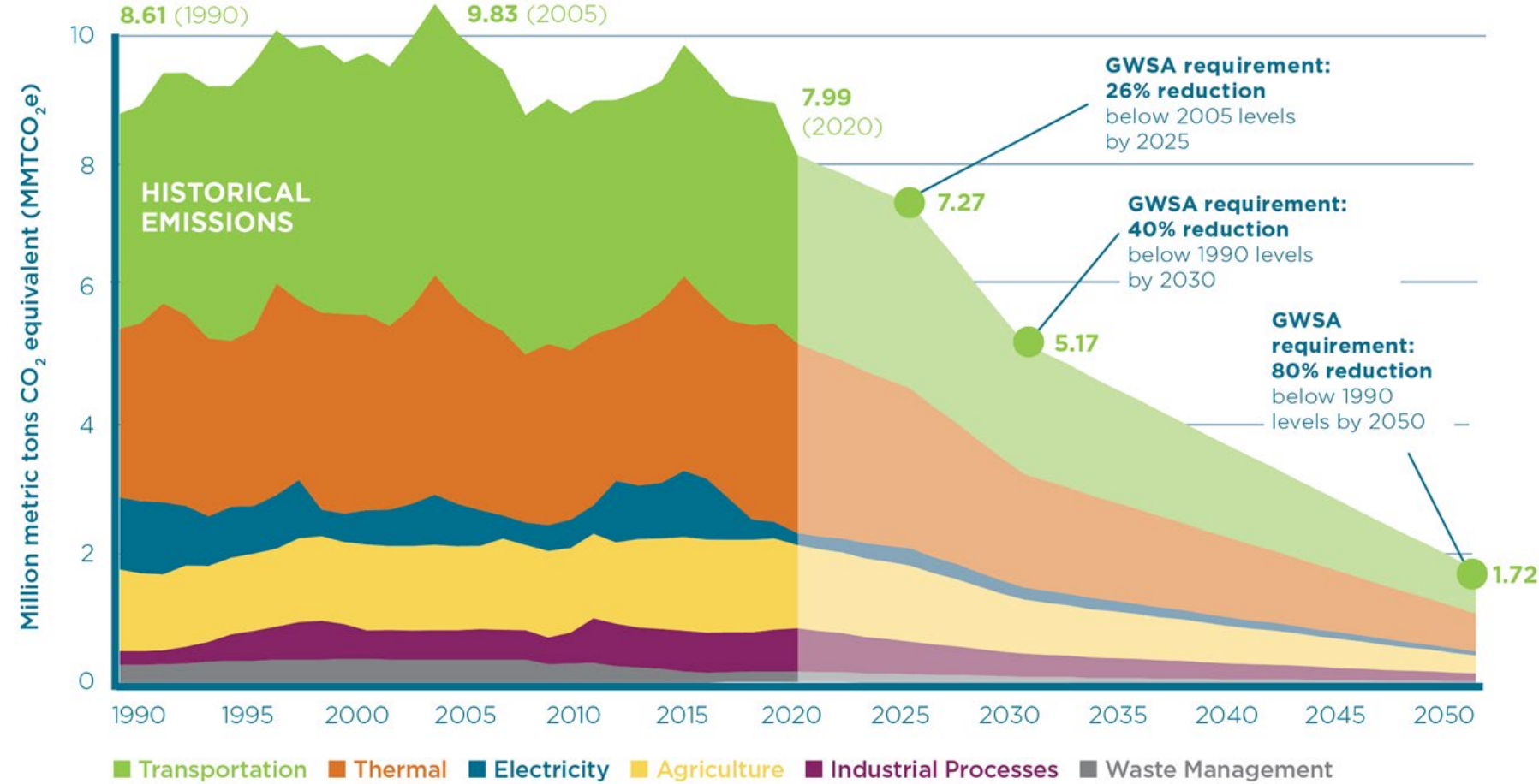AGENCY OF NATURAL RESOURCES

Outline

- Current Emissions
  - 2020 GHG Inventory

- Projected Emissions
  - Baseline Update

- What else are we doing to track and make progress on emission reductions
  - Measuring and Assessing Progress Tool
  - New Federal Funding Sources

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GHG Inventory

- Inventory of anthropogenic (human caused) greenhouse gas (GHG) emissions for Vermont

  - Transportation, Residential/Commercial/Industrial (RCI) fuel use, Electricity generation (consumption based), Industrial Processes, Agriculture, Waste and Wastewater

  - Does not include biogenic CO_2 in gross totals per IPCC inventory guidelines (estimated separately for several sectors)

- Uses available activity data (e.g. fuel sales), emission factors, and various process assumptions to estimate GHG emissions

- Inventory relies on several federal datasets and EPA tools and therefore lags several years behind the calendar year when the emissions occurred

- Newest released inventory (1990 – 2020) was published in March of 2023

- GHG Inventory is identified in the Global Warming Solutions Act as being the metric for determining whether the Act's GHG emissions requirements have been achieved.

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GHG Inventory

Vermont's historical GHG emissions and future requirements

8.61 (1990) 9.83 (2005)

7.99 (2020)

GWSA requirement: 26% reduction below 2005 levels by 2025

7.27

GWSA requirement: 40% reduction below 1990 levels by 2030

5.17

GWSA requirement: 80% reduction below 1990 levels by 2050

1.72

HISTORICAL EMISSIONS

Y-axis: Million metric tons CO_2 equivalent (MMTCO$_2$e)

X-axis: 1990, 1995, 2000, 2005, 2010, 2015, 2020, 2025, 2030, 2035, 2040, 2045, 2050

Legend: ■ Transportation ■ Thermal ■ Electricity ■ Agriculture ■ Industrial Processes ■ Waste Management

Source: Vermont Agency of Natural Resources, Vermont GHG Emissions Inventory and Forecast: 1990-2020, 2023. **Notes:** There is a small amount of emissions from the "fossil fuel industry" category (i.e. fugitive emissions from fossil gas pipelines in VT), accounting for 0.3% of Vermont's overall emissions in 2020, that does not show up on this graph. The ANR projections for 2025 and 2030 are from Vermont's 1990-2020 GHG inventory, published in 2023, and reflect a business-as-usual scenario, including the impact of ACCII.

ENERGY ACTION NETWORK

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Projected Emissions

2021 – Vermont Pathways 2.0 Report

- Used to develop initial Climate Action Plan (CAP)
- Economy-wide Scenarios
  - Baseline (or BAU) – point of reference for scenarios
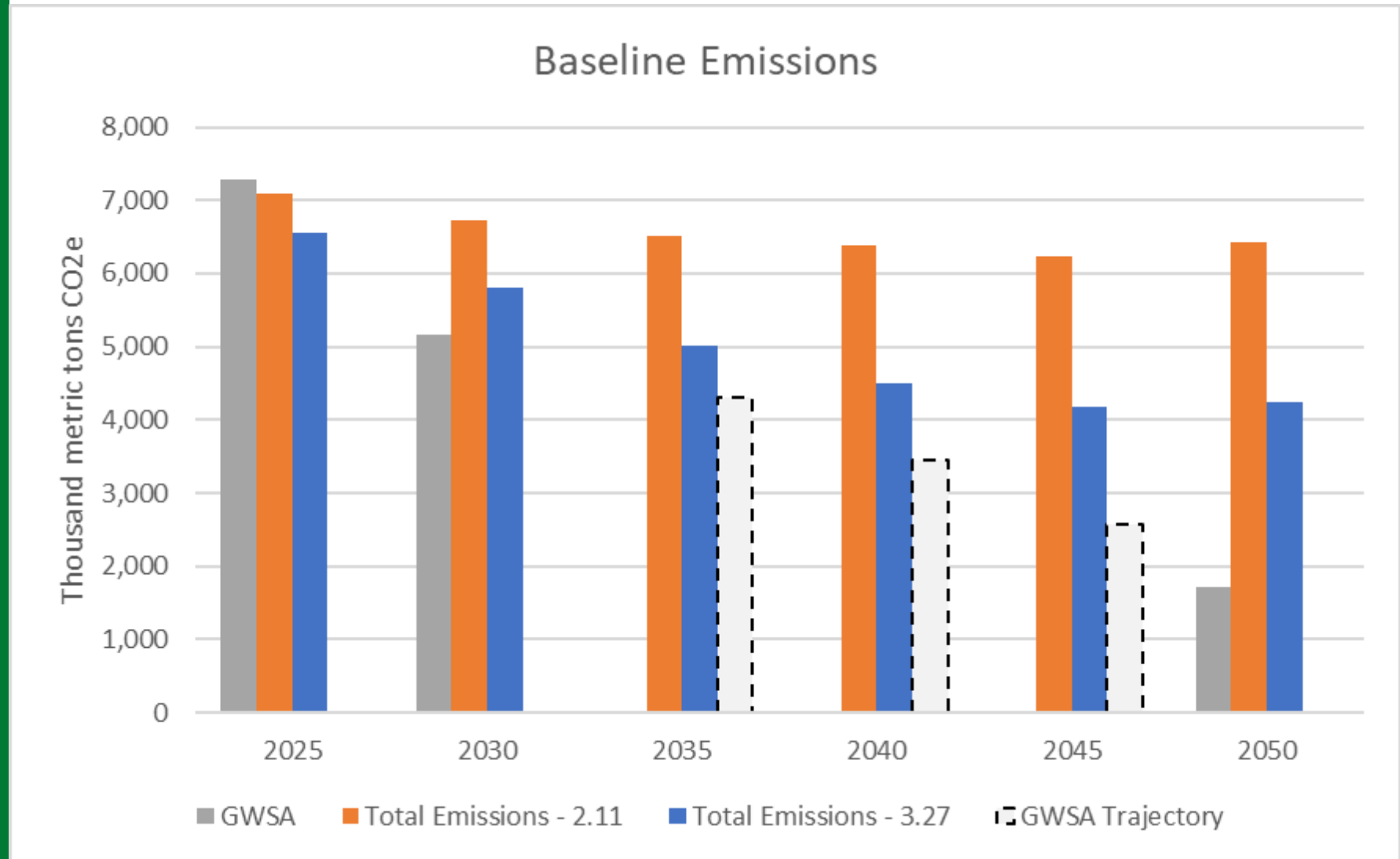 - CAP mitigation – achieves GWSA reductions

2023 - Analysis of Buildings / Thermal Energy Sector Emissions Reduction Policies for Vermont (Pathways 3.27)

- Comparison of policies for reducing emissions in this sector
- Scenarios
  - Updated Economy-wide Baseline
  - 3 additional scenarios examining 4 policy options specific to Buildings/Thermal Energy Sector
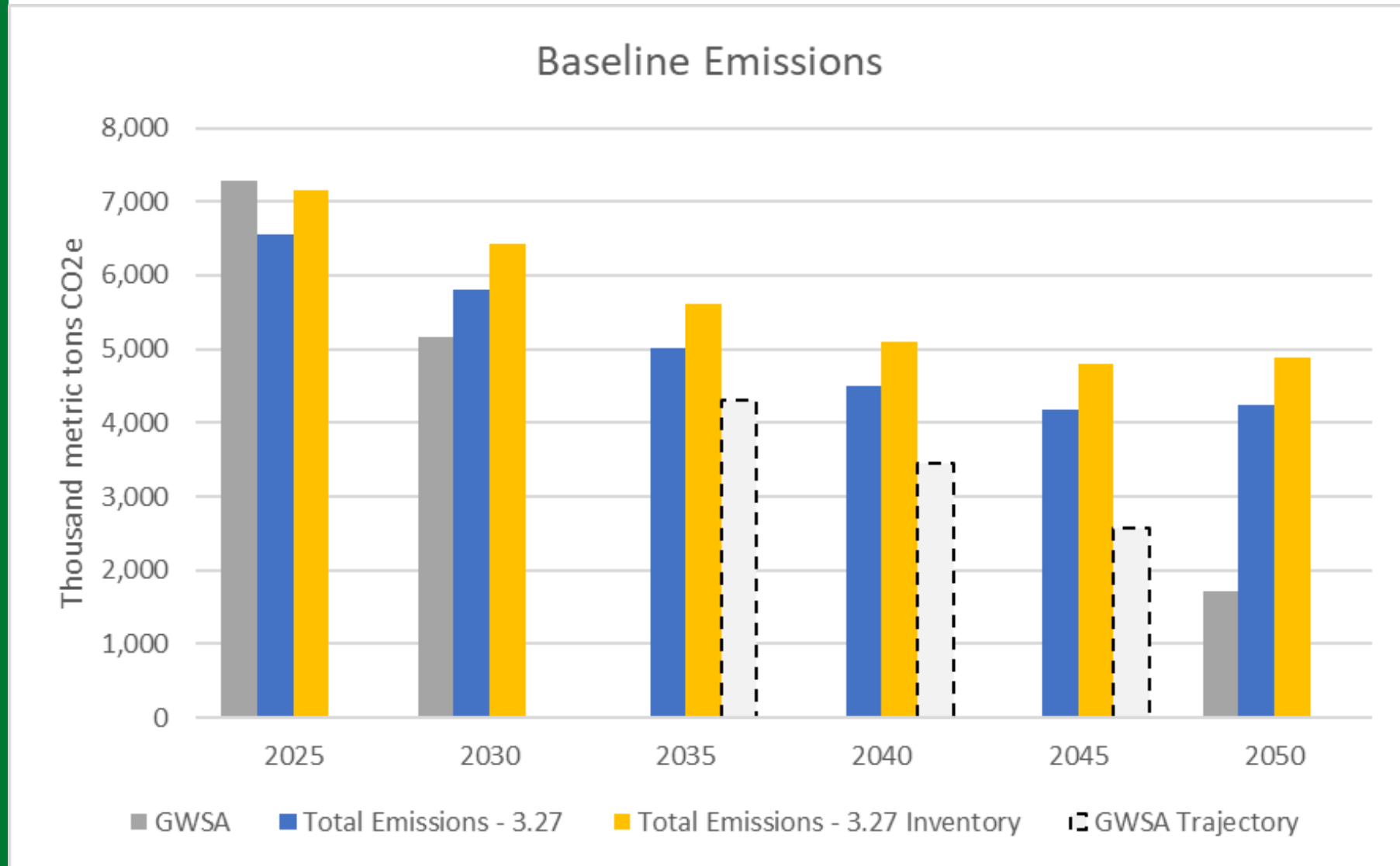
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Pathways 2.0 Baseline Emissions

Baseline Emissions

Legend: GWSA | Total Emissions - 2.11 | GWSA Trajectory

Pathways 2.0 v. 3.27 Baseline Emissions

Baseline Emissions

Thousand metric tons CO2e — years 2025, 2030, 2035, 2040, 2045, 2050

Legend: GWSA, Total Emissions - 2.11, Total Emissions - 3.27, GWSA Trajectory

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Pathways 3.27 Ag Unadjusted Emissions

Pathways 3.27 v. GWSA

	Pathways 3.27 2025	GWSA 2025	Pathways 3.27 2030	GWSA 2030
Agriculture	1,203.0	1,153.3	1,220.0	819.1
Electricity Generation	135.4	255.4	134.27	181.4
R/C/I	2,195.5	2,422.0	1,845.5	1,720.0
Residential	947.6	1,301.6	662.9	924.4
Commercial	841.8	757.9	754.4	538.2
Industrial	406.1	362.5	406.5	257.4
Industrial Processes	568.4	486.0	583.4	345.2
Transmission and Distribution	20.3	24.7	18.7	17.6
Transportation	2,912.8	2,800.9	2,510.1	1,989.2
Waste	124.9	131.8	126.3	93.6
TOTAL	7,160.3	7,274.2	6,416.6	5,166.0
		- 113.9		+ 1,250

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Pathways 3.27 Updates

General

- Fuel/energy prices based on 2023 Annual Energy Outlook

- Added a biofuel blending target for heating oil consistent with NY statute

- Calibrated commercial, industrial and transportation energy use through 2021 with State Energy Data System (SEDS) data

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Pathways 3.27 Updates

Buildings

- Increased the number of projected residential weatherization projects based on Efficiency Vermont and DCF's Office of Economic Opportunity forecasts

- Increased projected heat pump shares based on impacts of Efficiency Vermont rebate program and the Inflation Reduction Act

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Pathways 3.27 Updates

Buildings

- Reduced the share of heating load met by single and double-headed heat pumps

- Introduced heat pump water heaters, air-to-water heat pumps, and advanced pellet boilers into baseline

- Updated historical space heating, water heating, and cooking technology shares

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Pathways 3.27 Updates

Transportation

- Incorporated VT adoption of Advanced Clean Cars II / Advanced Clean Trucks

- Updated Vehicle Distance Travelled estimates for 2020, 2021

- Updated the number of EVs and PHEVs on the road at the beginning of 2023

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Next Steps

Continuing Updates

ANR plans contract for continuing updates to and support for Vermont Pathways model

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Measuring and Assessing Progress (MAP) Tool

- GHG Inventory has limited ability to quantify impact of individual initiatives in reducing GHG emissions and, therefore, estimate cost effectiveness

- ANR is working on the development of a Measuring and Assessing Progress (MAP) Tool

- MAP Tool will track specific practices; will not replace the GHG Inventory
  o Will incorporate more refined fuel-type data now being collected by the Tax Department

- MAP Tool will track more than emissions indicators → things like **resilience, adaptation and community engagement metrics**

- RFP Closed in November 2023 for Phase 1

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Federal Funding Opportunities

A Comprehensive Approach to Addressing Climate Change
- Reduce Emissions
- Capture & Store Carbon
- Adapt & Build Resilience

What is the Climate Pollution Reduction Grant?

- One-time, competitive process for $4.6 billion in federal Inflation Reduction Act funds
  - Vermont likely to apply for ~$90 million
- Eligible actions must show a measurable reduction in climate pollution
- Actions solely focused on adaptation and resilience are not eligible, but many actions have co-benefits
- Prioritization for this process has focused on:
  - Demonstrating lack of funding elsewhere
  - Benefits Vermonters in an equitable way
  - Alignment with Vermont's Climate Action Plan
  - Quantifiable emissions benefits

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Natural & Working Lands

- Expanded wetland restoration
- Land conservation focused on increasing natural land cover
- Giving farmers and forestland owners tools and funding to reduce and capture emissions
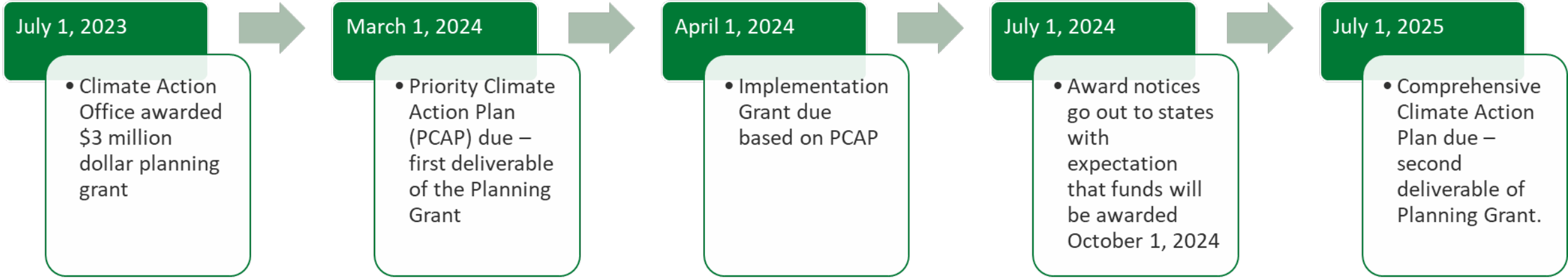
Transportation

- Heavy truck purchase rebates complemented with technical assistance
- Reduce idling of trucks and fleet vehicles like police cars
- Focus on housing development that reduces travel

Buildings & Heating

- Thermal Energy Coaching
- More funding for weatherization and switching from fossil fuels to electricity
- Helping towns and cities make more upgrades to public buildings

Solid Waste

- Increase recycling and composting at schools
- Reduce high-impact emissions from systems and appliances
- Help solid waste facilitates recycle more and operate more efficiently

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Federal Funding Opportunities

July 1, 2023
- Climate Action Office awarded $3 million dollar planning grant

March 1, 2024
- Priority Climate Action Plan (PCAP) due – first deliverable of the Planning Grant

April 1, 2024
- Implementation Grant due based on PCAP

July 1, 2024
- Award notices go out to states with expectation that funds will be awarded October 1, 2024

July 1, 2025
- Comprehensive Climate Action Plan due – second deliverable of Planning Grant.

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Thank you

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For more information, please go to our website: https://climatechange.vermont.gov

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