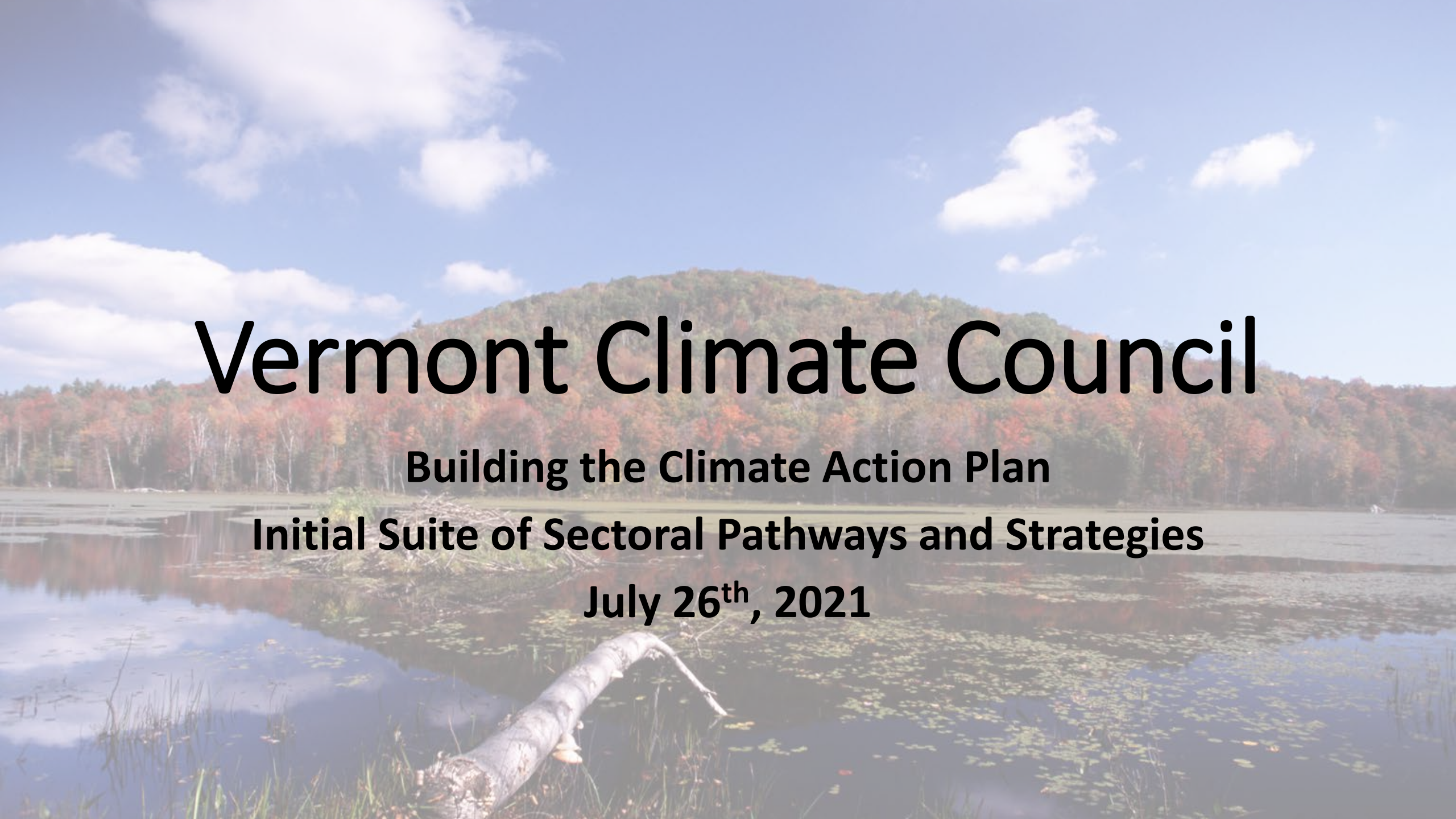


Vermont Climate Council

Building the Climate Action Plan

Initial Suite of Sectoral Pathways and Strategies

July 26th, 2021

Vermont Climate Council

Buildings Task

Cross-Sector Mitigation Subcommittee

Task Leads: Christine Donovan and Dave Farnsworth

Global Warmings Solutions Act

Vermont Climate Action Plan Requirements

1. Reduce greenhouse gas emissions from the transportation, building, regulated utility, industrial, commercial, and agricultural sectors;
2. Encourage smart growth and related strategies;
3. Achieve long-term sequestration and storage of carbon and promote best management practices to achieve climate mitigation, adaption, and resilience on natural working lands;
4. Achieve net zero emissions by 2050 across all sectors;
5. Reduce energy burdens for rural and marginalized communities;
6. Limit the use of chemicals, substances, or products that contribute to climate change; and
7. Build and encourage climate adaptation and resilience of Vermont communities and natural systems.

Global Warmings Solutions Act
Clear Sequence of Work

1. Five Subcommittees Defined in Statute to Develop the Work
   - Rural Resilience and Adaptation, Agriculture and Ecosystems, Cross Sector Mitigation, Just Transitions and Science and Data
2. Each Subcommittee following Clear Sequence of Work
   - Inventory existing programs to meet GWSA requirements
   - Identify, analyze and evaluate new strategies/programs needed to meet GHG requirements
   - Develop financing strategies for actions ready to implement
3. Develop monitoring strategy for assessing
4. Identify rules to be adopted (by ANR) by 2022
5. Adopt the Vermont Climate Action Plan by Dec 1, 2021 and update the Plan every four years thereafter.

Framework for Climate Action Plan

Pathways → Strategies → Actions

Cross-Sector Mitigation, Agriculture and Ecosystems and Rural Resilience and Adaptation

- A **pathway** is a high-level means of achieving GHG emissions reductions or adaptation, resilience, and sequestration goals. While written broadly, pathways should be stated specifically enough so that it is possible to assess whether progress has been made in achieving them.
- A **strategy** is a statement of measurable activity, a benchmark, to be reached in pursuit of the pathway. Strategies should be measurable and are a more specific subset of pathways.
- **Actions** are the "operational" tasks that the state will undertake to meet the pathways and strategies. Actions may be written around existing, or propose new, policies, programs, projects, initiatives, plans, etc. ***These will be further developed in the coming months, informed by public engagement and technical analyses.***

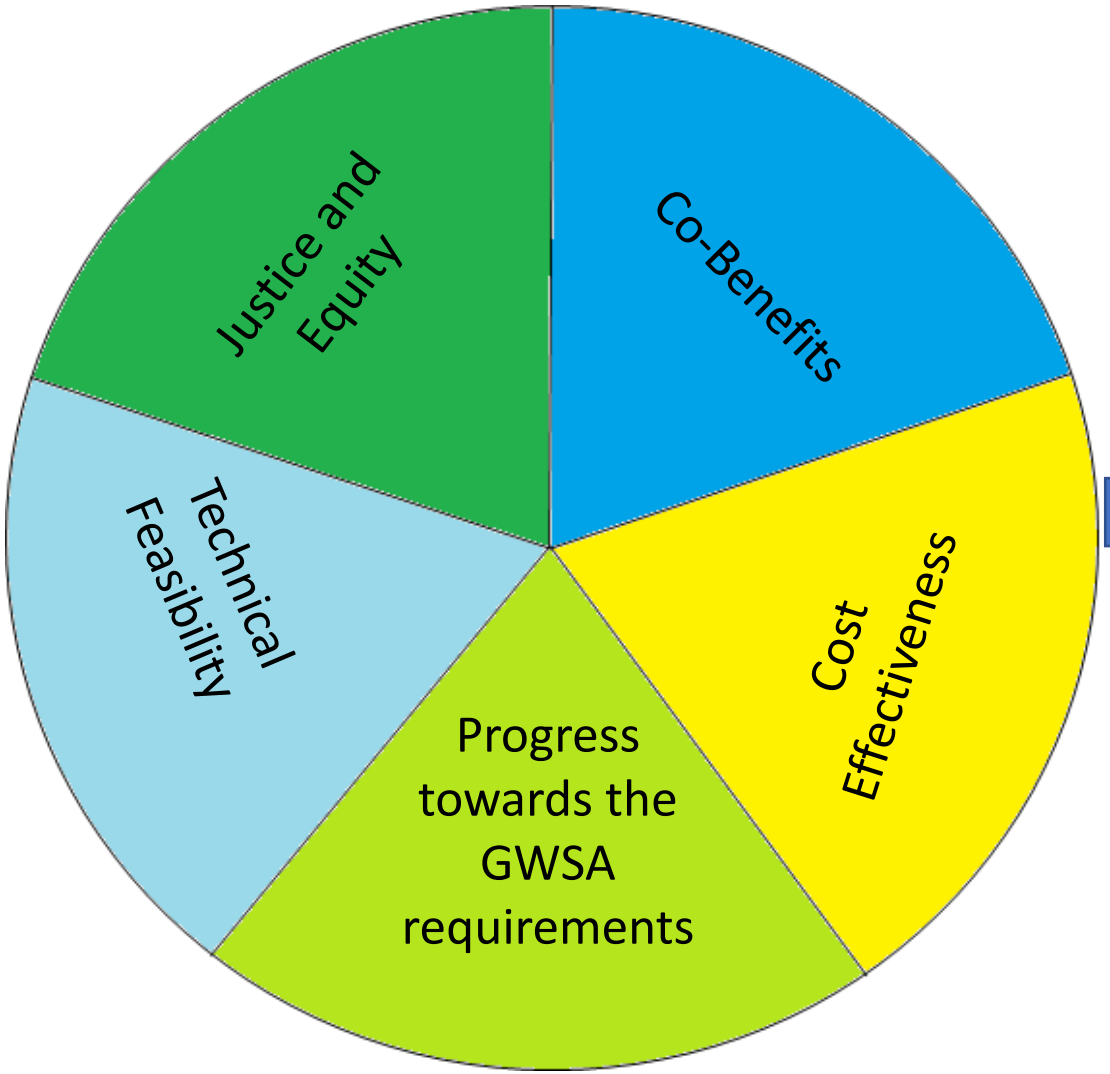
Leading with Equity as a Core Component

The term “Just Transitions” is a way of framing for government and business action on climate change. Its work encompasses both public policies and business action to deal with the impacts of industry transition away from greenhouse gas emissions for jobs and livelihoods (the transition "out") and aims to generate the low or zero greenhouse gas emission jobs and livelihoods of a sustainable society (the transition "in"). Guiding Principles for a Just Transition, June 2021

Guiding Principles for a Just Transition

- Inclusive, Transparent & Innovative Engagement
- Accountable & Restorative
- Moving at the Speed of Trust
- Solidarity
- The Most Impacted First
- Supports Workers, Families & Communities

Climate Action Plan



Short term priorities

Long term priorities

Mitigation Strategies (emissions reduction)

Sequestration Strategies

Resilience and Adaptation Strategies

Process to Date

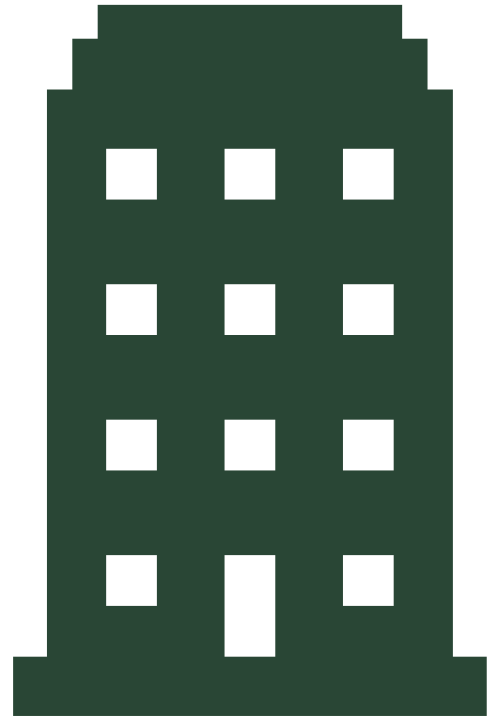
1. Scope of Work Refined for Subcommittees
2. Subcommittee membership developed - technical expertise and diversity considered
3. Initial Ideas Explored by Task Leads
4. Presentation and Discussion
5. Pathways Presented

Buildings Task Leads

- Christine Donovan
- Dave Farnsworth

Developed with input from

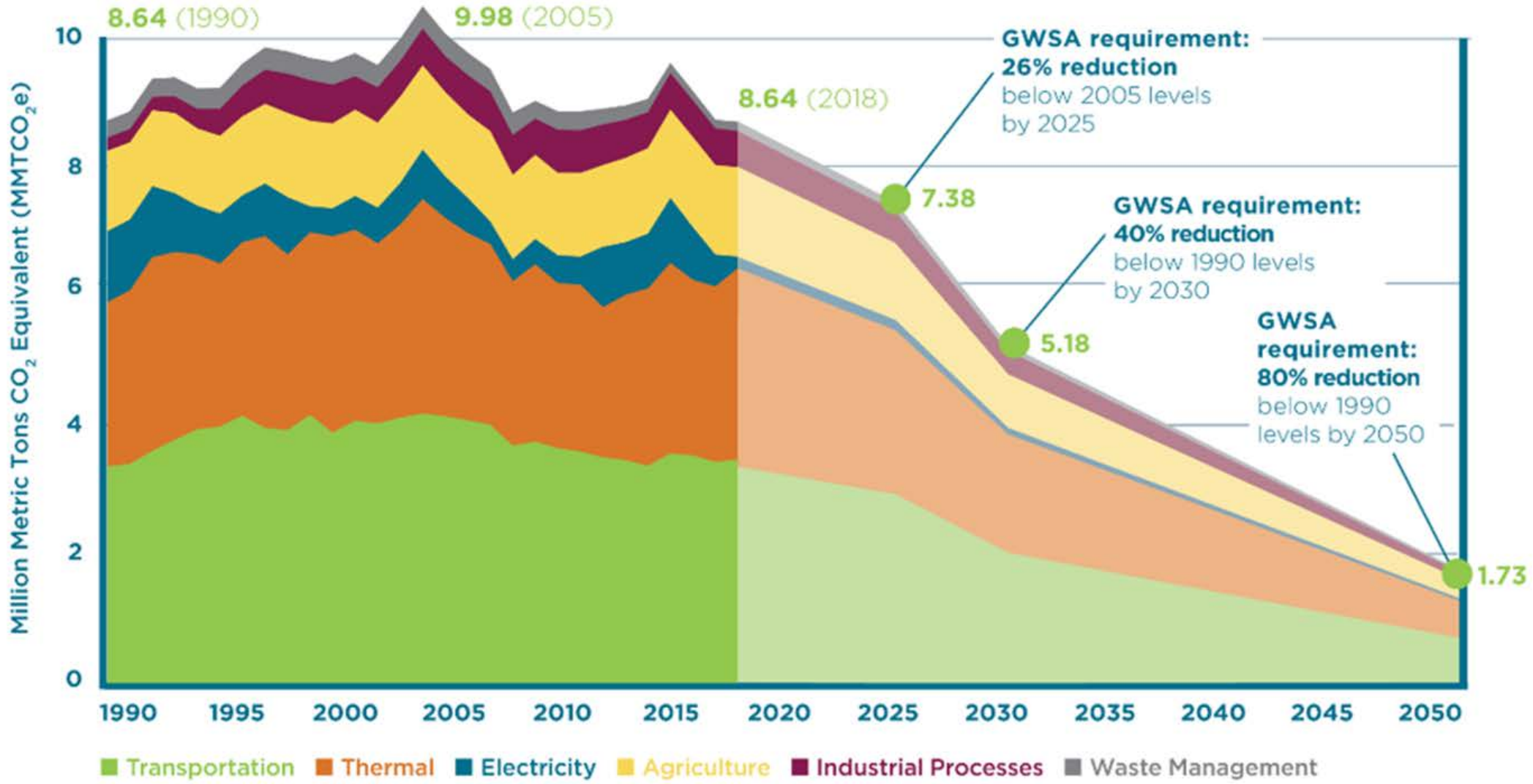
- Department of Public Service, Vermont Gas Systems, Energy Action Network, Energy Futures Group, Green Mountain Power, Richard Cowart, and other members of the public
- In addition, we are collaborating with the Department of Public Service on a CEP and CAP-focused Buildings-focused Technical Workshop with 30+ Buildings Experts from Vermont and beyond in August and a subsequent Stakeholder Engagement Workshop to be held in September



Process Steps Ahead

1. Participation
2. Public engagement
3. Meetings
4. Public comment
5. Workshop
6. Presentation

GWSA Emission Reduction Requirements

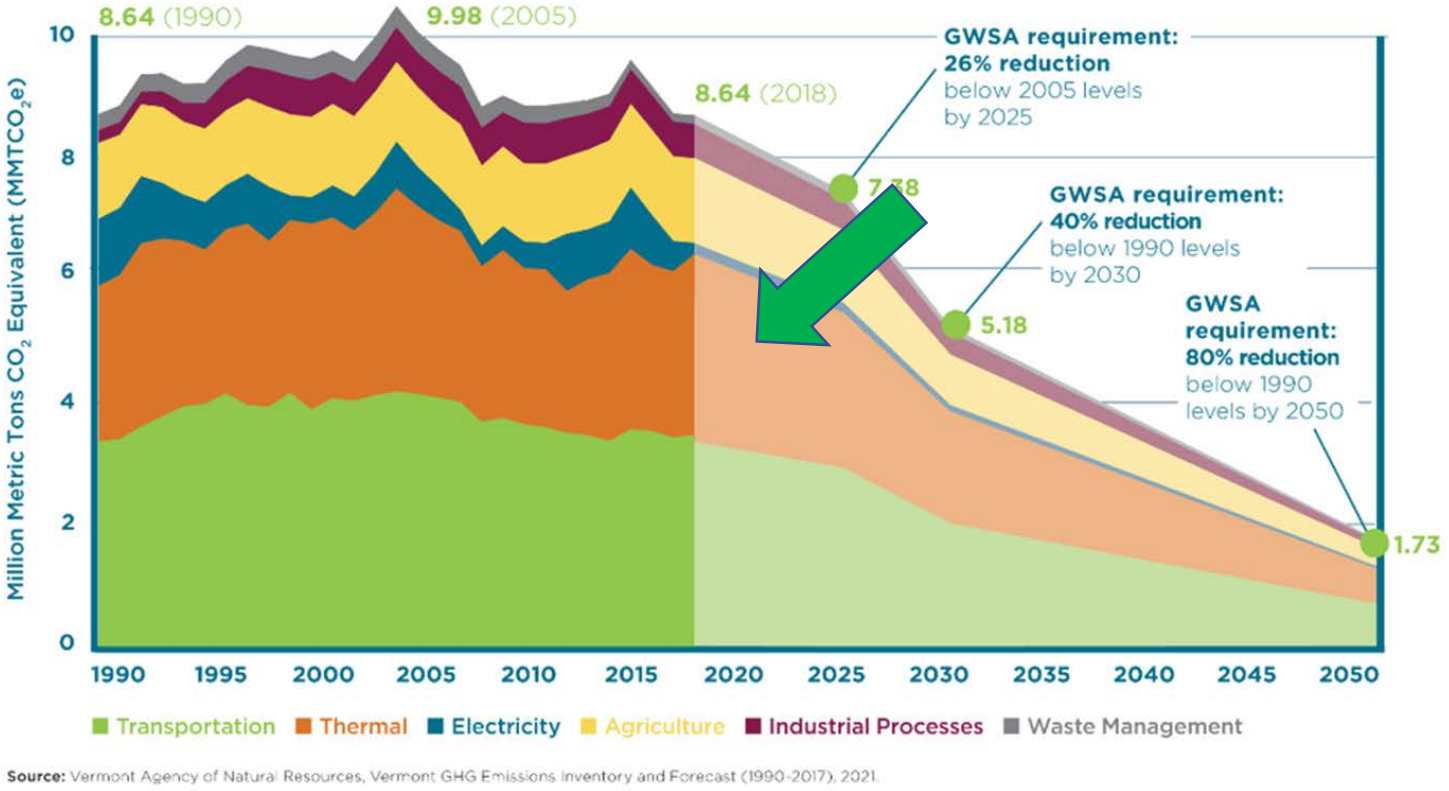


Source: Vermont Agency of Natural Resources, Vermont GHG Emissions Inventory and Forecast (1990-2017), 2021.

Building Task Focus

- *Improving the efficiency of building stock & heating/cooling appliances; and*
- *Lowering the carbon content of the fuels that they use*

The orange band is what we are addressing with these proposals



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

Highest Impact Thermal Measures (EAN)

Pathway / Method	2018	2025	2030	2050
Wx – Residential (units)	**27,186**	**80,000**	**148,102**	**262,767**
Heat Pumps – Heating & Cooling (units)	**13,770**	**70,000**	**200,000**	**250,000**
Heat Pumps – Water Heating (units)	**9,510**	**50,000**	**200,000**	**200,000**
Advanced Wood Heating (units) Commercial	**0,231**	**1,586**	**3,205**	**6,441**
Residential	**20,490**	**30,000**	**50,000**	**60,000**
Renewable Natural Gas (MMBTU)	**2,650**	**1,417,038**	**2,839,221**	**11347873**

Source: Energy Action Now, Emissions Reduction Pathways Model, April 2021

Buildings — Some Initial Thoughts

- Ensuring the equitable application of these pathways – if deemed suitable by the Council and affected communities – will require special attention to:
  - Program design
  - Workforce education, hiring, and training
  - Funding allocation

Climate Action Plan – recommended pathways and supporting initiatives

1. Improve Buildings – *Weatherization at Scale*
2. Improve Heating – *Clean Heat Standard*

Supporting Initiatives

- Rental Property Efficiency Standards
- State/Regional Appliance Standards
- State Agency GHG Planning
- Workforce Development and Education
- Better Use of Building Codes
- Tariffed On Bill Financing

Pathway #1 Weatherization at Scale

- Builds on existing expertise: Efficiency VT, Burlington Elec., VT Gas, Capstone, Efficiency Excellence Networks, and NeighborWorks
- Requires strong financial tools: e.g., On-Bill, Recovery Act $, VHFA, Clean Heat Standard
- Benefits: Vermont jobs, lower bills, better comfort & health
- Complementary Policies:
  - Rental Property Efficiency Standards
  - Appropriate Electricity Rate Design
  - State/Regional Appliance Standards
  - Building Labeling
  - Enforced Building Energy Codes

Large expansion of WX workforce is essential

Pathway #2 Clean Heat Standard (CHS)

- *A performance standard, applied to fossil heating fuel providers*
- *To help Vermonters convert to low-carbon fuels for space/water heating, and commercial heat*
- *Helps reduce up-front costs for heating/cooling appliances*
- *Ensures the needed pace of change*
- *Legislation necessary to fully implement*

How would it work?

- Applies to **wholesale fossil fuel sellers and VGS**
- **Clean Heat Percentage ramps up over time**, like the Renewables Standard on electric utilities, to meet GWSA goals
- Fuel Companies choose how to earn Clean Heat Credits (or buy them)
- **Options include:** Heat pumps, pellet stoves, wood chip boilers, biofuels, renewable natural gas, district heating, thermal solar, & more
- Retail fuel dealers, Efficiency VT, VGS, HVAC contractors can all **earn credits**
- **Customers choose** how and when they want to convert hot water and home heating systems