The Global Warming Solutions Act
and
The Climate Action Plan

All Legislator Meeting
December 8, 2021

Julie Moore, PE, Secretary
Vermont Agency of Natural Resources
Why is Action Needed?
Since the 1970s:

2°F increase in summer
4°F increase in winter

Average air temperatures have increased

Spring now arrives two weeks earlier

Winter starts one week later

Annual precipitation in Vermont has increased by almost 7 inches.

Days with more than 1 inch of rain occur almost twice as often as they did 50 years ago.
Global Warming Solutions Act (GWSA), Act 153 of 2020:

- Enacted: September 23, 2020
- First meeting of the Vermont Climate Council: November 20, 2020
- Initial Climate Action Plan adopted: December 1, 2021
GWSA Charge to the Climate Council

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, adaptation, and resilience on natural [and] 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.
The Climate Action Plan

**GHG mitigation (Section 592(b))**

"...the specific initiatives, programs, and strategies, including regulatory and legislative changes, necessary to achieve the State’s greenhouse gas emissions reduction requirements..."

**Adaptation, resilience and sequestration (Sec. 592(c))**

"...build and encourage climate adaptation and resilience of Vermont communities and natural systems..."

**Suite of actions necessary to achieve...**
- Legislature
- ANR (rulemaking)

**Additional actions**
- VCC

**Suite of actions consistent with...**
- Legislature
- ANR (rulemaking)
- VCC

“test” established in GWSA for required elements of CAP
CAP Organized into Five Impact Areas

- **Cutting Climate Pollution**
  Reducing emissions from transportation, buildings, energy and products.

- **Capturing Carbon**
  Removing carbon from the air and storing it in soil or plants.

- **Resilient Working and Natural Lands**
  Preparing farms, forests and ecosystems for climate change.

- **Cross-Cutting Solutions**
  Investing in communities and workforce development.

- **Vital Communities**
  Protecting people and infrastructure from climate impacts.
Cutting Climate Pollution

Reducing emissions from transportation, buildings, energy and products.
GWSA Emission Reduction Requirements

- **GWSA requirement: 26% reduction below 2005 levels by 2025**
- **GWSA requirement: 40% reduction below 1990 levels by 2030**
- **GWSA requirement: 80% reduction below 1990 levels by 2050**

Efficient Transit and Electric Vehicles

- Provide incentives to help Vermonters purchase electric vehicles
- Build more charging stations for electric vehicles
- Join the Transportation and Climate Initiative Program (TCI-P) when regional market viability exists**
  - TCI-P would cap emissions from transportation fuel in the region and invest funds from the sale of carbon allowances to reduce emissions
  - “As of the date of the adoption of this CAP, the future of the TCI-P is uncertain, and it is not immediately clear how Vermont’s adoption of the action to participate in the TCI-P would be implemented without partnership from other states in the region.”
- Adopt California’s Advanced Clean Car and Clean Truck Rules
  - Requires manufacturers to sell an increasing number of zero-emission vehicles thru 2035.
  - Implemented thru ANR-led rulemaking
    - GWSA requires rules to be filed with ICAR by July 1, 2022

**non-consensus item
Efficient Transit and Electric Vehicles

- 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)
Efficient Transit and Low- and Zero-Emission Vehicles (ZEVs)

<table>
<thead>
<tr>
<th>Transportation</th>
<th>2025</th>
<th>2030</th>
</tr>
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<tbody>
<tr>
<td>Number of EVs</td>
<td>43,000</td>
<td>166,000</td>
</tr>
<tr>
<td>EV Share of Sales</td>
<td>40%</td>
<td>&gt;80%</td>
</tr>
<tr>
<td>VMT Reduction from Baseline</td>
<td>1.9%</td>
<td>3.5%</td>
</tr>
<tr>
<td>EV share of VMTs</td>
<td>8%</td>
<td>29%</td>
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<tr>
<td>EV Managed Charging</td>
<td>27%</td>
<td>50%</td>
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</table>

Of the nearly 433,000 vehicles registered in Vermont (428,000 cars; 105,000 light-duty trucks), currently about 1% (<5,000) are ZEVs
Better Buildings and Homes

- Expand weatherization (“weatherization at scale”)
- Develop and implement a Clean Heat Standard
  - Performance standard driving transition to less carbon-intensive heating practices
- Incentivize adoption of clean, energy-efficient heating options, such as heat pumps and modern wood heat
- Institute a rental property efficiency standard (RPES)
- Regularly update and ensure compliance with the statewide residential building energy code
## Better Buildings and Homes

<table>
<thead>
<tr>
<th>Residential</th>
<th>2025</th>
<th>2030</th>
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<tbody>
<tr>
<td>Homes Weatherized</td>
<td>48,000</td>
<td>120,000</td>
</tr>
<tr>
<td>Heat Pumps Installed</td>
<td>78,041</td>
<td>142,851</td>
</tr>
<tr>
<td>Heat Pump Water Heaters Installed</td>
<td>63,247</td>
<td>136,558</td>
</tr>
<tr>
<td>Homes with Biofuels</td>
<td>19,324</td>
<td>29,823</td>
</tr>
</tbody>
</table>
Weatherization at Scale

Weatherization at Scale Trajectory - Cumulative Total

Through 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030

30,000 32,500 36,000 41,000 48,000 57,500 69,500 84,000 101,000 120,000
Clean, Reliable Energy

• Shift away from fossil fuels and fossil fuel-dependent equipment
• Pursue 100% Carbon-free or renewable electricity by 2030
  • Up from current goal of 75% by 2032
  • Total demand for electricity is expected to double from roughly 5.5 TWh in 2020 to more than 12 TWh by 2050
• Enable all Vermonters to choose electrification
  • Upgrade electrical service in homes/businesses
• Invest in load management and grid optimization
Modeled Electricity Demand in Vermont, thru 2050
Other Greenhouse Gas Reduction Opportunities

- Improve manure management and implement methane capture on farms
- Reduce emissions of refrigerants with high global-warming potential
- Reduce emissions of fluorinated gases from semiconductor manufacturing
- Ensure flares are operational at all existing municipal wastewater digesters
GWSA Requires Aggressive Scale and Pace
GWSA Requires Aggressive Scale and Pace

- 2025: 7,380 MMT
- 2030: 5,180 MMT
- 2050: 1,730 MMT
Resilient Working and Natural Lands

Preparing farms, forests and ecosystems for climate change.
Resilient working and natural lands

• Invest in agricultural and working lands management practices that mitigate emissions and improve resilience
  • Many of the same practices that are important for clean water are also beneficial for climate (i.e., cover crops, reduced tillage, expanded buffers, managing for resilient forests)
• Expand nature-based solutions and understanding of traditional ecological knowledge (TEK)
  • Invest in strategic conservation
  • Promote healthy, connected river corridors, floodplains, and wetlands
• Support and empower Vermont’s natural and working lands owners, managers, and caretakers, and expand local markets
Vital Communities

Protecting people and infrastructure from climate impacts.
Vital Communities

- Prioritize planning practices and investments that help Vermont communities prepare for climate impacts
  - Develop a climate toolkit
  - Update land-use policies to better support adaptive, resilient, compact settlement
- Increase resilience of key infrastructure (transportation, energy, communications, water/wastewater)
- Support the reduction of municipal, school district, residential, university, and hospital fossil fuel use
- Ensure all have access to safe, accessible, energy efficient, and affordable housing
Capturing Carbon

Removing carbon from the air and storing it in soil or plants.
Capturing Carbon

• Develop and implement programs which incentivize management practices which maintain or increase carbon storage
  • Changes to Use Value Appraisal (UVA) program **
  • Carbon markets
  • Payment for ecosystem services

** non-consensus item
Estimated Forest Acreage in Vermont

(Kosiba, 2021)
Estimated Cropland Acreage in Vermont

(Crop Description)
- HAY, (EXCL ALFALFA)
- HAYLAGE, (EXCL ALFALFA)
- CORN (grain + silage)
- HAYLAGE, ALFALFA
- HAY, ALFALFA
- Minor grains + soy
- VEG. (incl. sweet corn)

(Program)
- CENSUS
- INTERPOLATED
- SURVEY

(USDA NASS, 2021)
Cross-Cutting Solutions

Investing in communities and workforce development.
Cross-Cutting Solutions

- Support compact settlement patterns
  - Infrastructure investments, tax incentives
  - Regulatory changes (Act 250, designated centers, local zoning)
  - No net loss of natural or working lands **
  - State land-use policy/plan **
- Ensure state government, community and partner capacity needed to support implementation
- Establish statewide environmental justice policy
- Expand training and resources for workforce development
- Launch comprehensive climate education programs
- Encourage personal actions

** non-consensus items
What Will You Find in the CAP?

- GWSA established a suite of ambitious goals and requirements
- VCC developed a broad and far-reaching set of recommendations
- Initial Climate Action Plan identifies:
  - 26 pathways
    - Written broadly; high-level
  - 64 strategies
    - Statement of measurable activity
  - 234 specific action steps
    - Operational tasks
With the CAP Adopted, What Happens Now?

VCC
• Develop strategies for transportation sector GHG emissions reductions
• Make recommendations for utilization of ARPA funds to Legislature and the Governor
• Request budget to support further technical analyses/study
• Continue to prioritize work needed to build equity into climate action and ensure a just transition

ANR
• Complete Pathways Analysis
• Initiate rulemaking re: CA Clean Car & Truck standards

JFO
• Prepare “…an analysis of the economic, budgetary, and fiscal costs and benefits of the Plan…”

Legislature
see next slide

It is essential to extend the VCC’s commitment to co-creation of and broad-based public engagement in building out the policies and programs needed to implement the CAP
With the CAP Adopted, What Happens Now?

- Activity largely moves back into the Legislature to:
  - Identify a suite of high-impact policy priorities that will support durable environmental outcomes
    - Weigh investments in GHG emissions reductions against the tangible steps to lessen the effects of climate change on Vermonter
  - Fully appropriate ARPA funds for climate action
    - Identify opportunities to utilize one-time monies to buttress and/or augment federal funds to achieve the speed and scale of implementation actions required by the GWSA
  - Understand additional analyses and contractor support needed to fully achieve the requirements of the GWSA, including:
    - Advancing improvements to the emissions inventory and carbon budget
    - Establishing an approach for data collection and management to track progress
    - Creating a municipal climate toolkit, including vulnerability index
    - Continuing and expanded public outreach and engagement
  - Ensure diverse appointments to the Council as vacancies arise, and support those appointees with just compensation