

**PRELIMINARY RECOMMENDATIONS OF THE
VERMONT CLIMATE ACTION COMMISSION
EXECUTIVE ORDER 12-17**

**Submitted to
Philip B. Scott,
Governor**

December 29, 2017

STATE OF VERMONT

EXECUTIVE DEPARTMENT

EXECUTIVE ORDER NO. 12-17

[Vermont Climate Action Commission]

WHEREAS, through the 2016 Comprehensive Energy Plan, Vermont has committed to reducing greenhouse gas emissions by at least forty percent below 1990 levels by 2030 and eighty to ninety five percent below 1990 levels by 2050, and meeting ninety percent of energy needs from renewable sources by 2050; and

WHEREAS, while significant progress has been made in reducing greenhouse gas emissions from the electricity sector through the partnership of the nine Northeast states that form the Regional Greenhouse Gas Initiative, comparable emissions reductions from other sectors that contribute to more than ninety percent of greenhouse gas emissions in Vermont have not been achieved; and

WHEREAS, the State must work with a range of perspectives to develop a strategy to reduce greenhouse gas emissions and combat climate change that addresses these fundamental principles:

- solutions that reduce greenhouse gas emissions must spur economic activity, inspire and grow Vermont businesses, and put Vermonters on a path to affordability;
- the development of solutions must engage all Vermonters, so no individual or group of Vermonters is unduly burdened; and
- programs developed to reduce greenhouse gas emissions must collectively provide solutions for all Vermonters to reduce their carbon impact and save money.

NOW THEREFORE, BE IT RESOLVED, that I, Philip B. Scott, by virtue of the authority vested in me as Governor, do hereby re-affirm Vermont's commitment to reduce greenhouse gas emissions from all sectors of the economy and create the Vermont Climate Action Commission to develop effective actions to meet those goals:

I. Commission Charge and Process

The Commission shall have the following duties and responsibilities:

- A. By July 31, 2018, draft and recommend, for the Governor's consideration, an action plan aimed at reaching the State's renewable energy and greenhouse gas reduction goals while driving economic growth, setting Vermonters on a path to affordability, and ensuring effective energy transition options exist for all

Vermonters. The plan shall include specific actions recommended by the Commission to:

- (i) implement the long-term policy goals of the Vermont Comprehensive Energy Plan;
 - (ii) reduce greenhouse gas emissions from all sectors, including those sectors not addressed in the Vermont Comprehensive Energy Plan; and
 - (iii) stimulate or support investment in the development of innovative technologies and strategies that have significant potential to reduce greenhouse emissions in Vermont.
- B. Hold public scoping sessions to inform the recommendations of the action plan.
- C. On or before December 31, 2017, evaluate existing State Executive Orders which are designed to address climate change issues and recommend, for the Governor's consideration, updates, modifications or sunset provisions.
- D. Convene a Technical Advisory Group to provide additional expertise and analysis of technical issues that may be required to fulfill the Commission Charge. The Technical Advisory Group shall consist of persons available to the Commission on an as-needed basis to provide expertise in climate science; emission quantification; public health; transportation; energy generation, transmission, and storage; energy markets; banking; insurance; regional planning; building design and operation; and any other expertise the Commission deems appropriate.

II. Composition

The Committee shall consist of twenty-one members, with representatives from the named sectors listed below to be appointed by the Governor:

- A. the Secretary of the Agency of Natural Resources or designee;
- B. the Secretary of the Agency of Commerce and Community Development or designee;
- C. the Commissioner of the Department of Public Service or designee;
- D. the Secretary of the Agency of Transportation or designee;
- E. one representative from the Agriculture sector;
- F. one representative from the Clean Energy sector;
- G. one representative from the Commercial Hauling or Trucking sectors;
- H. one representative from the Construction or Development sectors;

- I. one representative from an Energy Utility;
- J. one representative from the Energy Efficiency sector;
- K. one representative from a statewide Environmental Organization;
- L. one representative from the Forestry or Forest Products sectors;
- M. one representative from the Fuels sector;
- N. one representative from Local Government;
- O. one representative from the Manufacturing sector;
- P. one representative from the Research and Development sector;
- Q. one representative from the Rural Development sector;
- R. one representative from a Small Business;
- S. one representative from the Transportation Demand Management sector;
- T. one representative from the Vermont Community Action Partnership; and
- U. one Vermont student currently enrolled at a Vermont academic institution.

III. Chair of Commission and Commission Support

The Chair of the Commission shall be the Secretary of the Agency of Natural Resources or designee. The Chair shall name a Co-Chair and may name an Executive Committee to assist him or her with managing the Commission Charge.

The Commission shall have the administrative, technical, and legal assistance of the Agency of Natural Resources. The Commission shall have technical assistance from the Department of Public Service; the Agency of Commerce and Community Development; and the Agency of Transportation.

IV. Authority of Agencies

This Executive Order shall not limit the independent authority of a State agency to promulgate regulations related to greenhouse gas emissions and climate change in Vermont.

V. Effective Date

This Executive Order supersedes and replaces Executive Order No. 15-12 dated December 28, 2012 (codified as Executive Order 10-40). This Executive Order shall take effect upon signing.



WITNESS my name hereunto subscribed and the Great Seal of the State of Vermont hereunto affixed at Montpelier this 20th day of July, 2017.

A handwritten signature in black ink, appearing to read "Philip B. Scott", is written over a horizontal line.

Philip B. Scott
Governor

By the Governor:

A handwritten signature in black ink, appearing to read "Brittney L. Wilson", is written over a horizontal line.

Brittney L. Wilson
Secretary of Civil and Military Affairs

Executive Order No. 12-17

Executive Summary

On July 20, 2017, Governor Phil Scott created the Vermont Climate Action Commission (“the Commission”) via Executive Order (EO) 12-17. The Governor charged the Commission with developing an action plan by July 31, 2018 and to develop at least three recommendations by January 1, 2018. Additionally, EO 12-17 charges the Commission with evaluating current climate change related executive orders. This report serves to answer the latter two responsibilities of the Commission.

Through EO 12-17, the Governor charged the Commission with providing tangible and meaningful recommendations to move Vermont forward to meeting the aggressive climate change goals of our State.

In developing solutions to advance Vermont’s climate change mitigation efforts, EO 12-17 charges the Commission with the following guiding principles:

1. solutions that reduce greenhouse gas emissions must spur economic activity, inspire and grow Vermont businesses, and put Vermonters on a path to affordability;
2. the development of solutions must engage all Vermonters, so no individual or group of Vermonters is unduly burdened; and
3. programs developed to reduce greenhouse gas emissions must collectively provide solutions for all Vermonters to reduce their carbon impact and save money.

The Commission consists of the following membership:

1. Peter Walke, Chair, Deputy Secretary of the Agency of Natural Resources
2. Paul Costello, Co-Chair, Vermont Council on Rural Development, representing the rural development sector
3. Michael Schirling, Secretary of the Agency of Commerce and Community Development
4. June Tierney, Commissioner of the Department of Public Service
5. Michele Boomhower, designee of the Secretary of the Agency of Transportation
6. Marie Audet, Audet’s Blue Spruce Farm, representing the agriculture sector
7. Linda McGinnis, Energy Action Network, representing the clean energy sector
8. Joe Fusco, Casella, representing the commercial hauling or trucking sectors
9. Bob Stevens, Stevens and Associates, representing the construction or development sectors
10. Kristin Carlson, Green Mountain Power, representing energy utilities
11. Mary Sprayregen, Vermont Energy Investment Corporation, representing the energy efficiency sector
12. Johanna Miller, Vermont Natural Resources Council, representing a statewide environmental organization
13. Peter Bourne, Bourne’s Energy, representing the fuels sector
14. Liz Gamache, Mayor of St. Albans, representing local government
15. Adam Knudsen, Dynapower, representing the manufacturing sector
16. Bill Laberge, Grassroots Solar, representing small businesses
17. Bethany Fleishman, Vital Communities/Upper Valley Transportation Management Association, representing the transportation demand management sector

18. Tom Donahue, BROCC Community Action in Southwestern Vermont, representing the Vermont Community Action Partnership
19. Stuart Hart, Co-Director, Sustainable Innovation MBA program, UVM Grossman School of Business, representing the research and development sector
20. Harrison Bushnell, U-32 High School Senior, representing Vermont students
21. Robert Turner, representing the forestry and forest products sectors

The Commission's work has been and will continue to be supported by a Technical Advisory Group who provided input and additional research or expertise at the request of the Commission.

The Commission began meeting in August 2017 and held four Commission meetings prior to the submission of this report. After the first meeting, the Commission held four public scoping sessions around the state to solicit input from the public on how to answer EO 12-17's charge. In addition to the public meetings, the Commission has maintained a website with an online submission tool along with an email address for the public to submit ideas and comments. Those ideas continue to be submitted and evaluated.

The Commission developed the below recommendations through the work of eight subcommittees. The subcommittees were divided into two categories, sector-specific and cross-cutting. Each Commission member served on one sector-specific and one cross-cutting subcommittee. Those subcommittees then presented proposals to the full Commission for consideration. The Commission sought consensus on all recommendations, but agreed at the outset that two thirds approval was sufficient to forward a recommendation to the Governor.

The recommendations outlined below and described in greater detail in the body of the report reflect the preliminary work of the Commission. Between now and July 31, 2018, the Commission will continue to evaluate policy solutions and suggest additional action steps. The preliminary recommendations of the Commission are as follows:

1. Support Advanced Wood Heat (21 for; none against)
2. Increase Pace of Weatherization (21 for; none against)
3. Study All Regulatory and Market Decarbonization Mechanisms (20 for; 1 against)
4. Foster the Climate Economy (21 for; none against)
5. Electrify the Transportation System (21 for; none against)

The Commission also evaluated the existing climate change-related EOs still valid to determine whether those should be modified, continued, revoked, superseded, or sunset. The Commission considered the following EOs:

- EO 01-11 Council on Energy and the Environment
- EO 08-11 Vermont Housing Council
- EO 05-16 Climate Change Considerations in State Procurements

The Commission voted unanimously to recommend that the Governor continue Executive Orders 08-11 and 05-16 unchanged and to revoke Executive Order 01-11.

Executive Summary..... v

I. Commission Purpose, Charge, and Composition..... 2

II. Commission Process 5

 A. Commission Meetings..... 5

 B. Subcommittee Meetings..... 7

 C. Public Scoping Meetings and Public Comment..... 7

III. Executive Order Review 8

IV. Recommendations 8

 A. Recommendation 1: Support Advanced Wood Heat..... 9

 B. Recommendation 2: Increase Pace of Weatherization 10

 C. Recommendation 3: Study All Regulatory and Market Decarbonization Mechanisms11

 D. Recommendation 4: Foster the Climate Economy 12

 E. Recommendation 5: Electrify the Transportation System..... 13

Commission Purpose, Charge, and Composition

Climate change is one of the most pressing environmental, social, and economic concerns of our time. In Governor Phil Scott’s words, “Climate change has acted as “a disruptive force on Vermonters and our economy, (and) the question we have to answer today is whether we’re going to let the impacts of a changing climate threaten our people and our economy, or are we going to harness the innovative minds of Vermonters to lead the growing climate-change economy.”¹

Under the 2016 Comprehensive Energy Plan (CEP), Vermont established the long-term goals of reducing Vermont’s greenhouse gas (GHG) emission by 80-95 percent and increasing Vermont’s renewable energy portfolio to 90 percent by 2050. According to the most recent Vermont Agency of Natural Resources (ANR) Greenhouse Gas Emission Inventory, Vermont has significant work left to do to meet those goals.²

Vermont has been a national leader in addressing GHG emissions (See Figure 1). Emissions are down since the peak in 2004, but the most recent complete data (2013) suggests Vermont’s GHG emissions are higher than they were in 1990 and have ticked up in recent years (See Figure 1). There is significant data lag in evaluating GHG emissions, so understanding the impact of recent changes is difficult across the entire Vermont economy.

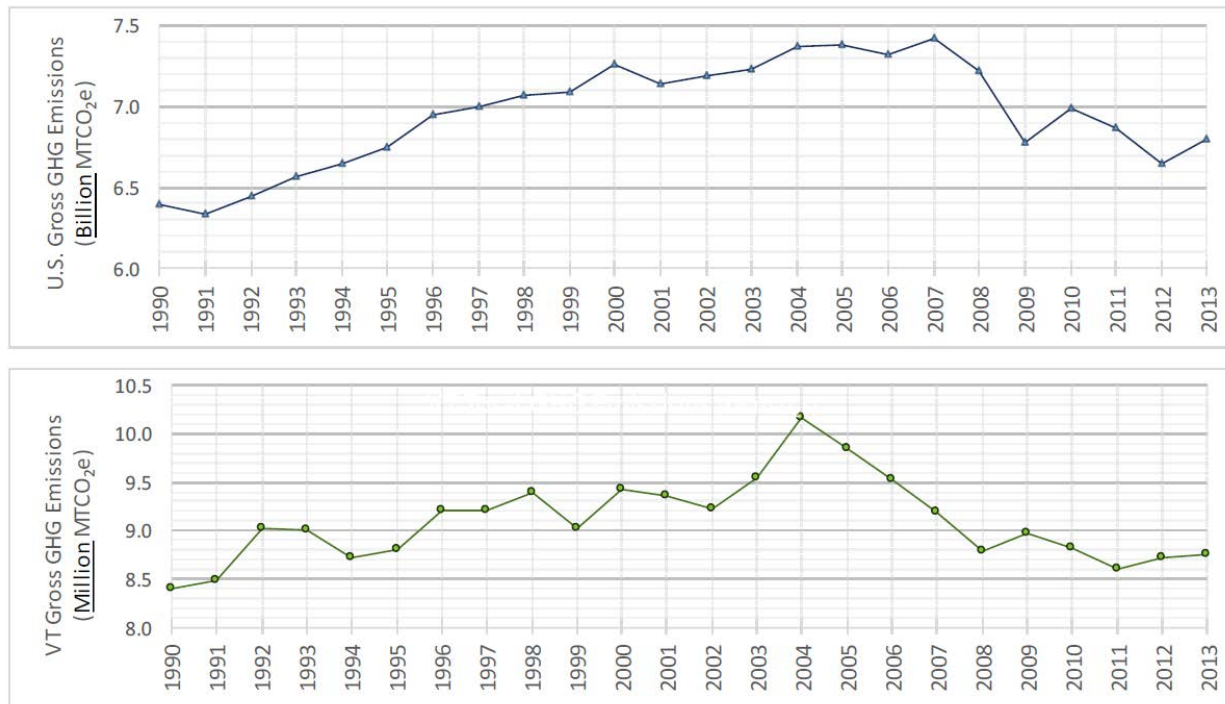


Figure 1: Vermont and the U.S. – Historical Gross GHG Emissions Comparison (1990 – 2013)³

¹ As quoted in Polhamus, Mike. “Scott’s New Climate Group Aims to Cut Costs, Promote Business.” VTDigger. July 20, 2017. Available: <https://vtdigger.org/2017/07/20/scotts-new-climate-group-aims-cut-costs-promote-business/>

² Vermont Greenhouse Gas Inventory Update (1990-2013): http://dec.vermont.gov/sites/dec/files/aqc/climate-change/documents/_Vermont_Greenhouse_Gas_Emissions_Inventory_Update_1990-2013.pdf

³ U.S. data source: [Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2014](#) (April 15, 2016).

Vermont GHG emissions come from multiple sectors. The most recent data show that the transportation sector is the largest contributor to greenhouse gases, followed by building energy use and the power production sector. Additional contributors include the industrial, agriculture, and waste sectors (See Figure 2).

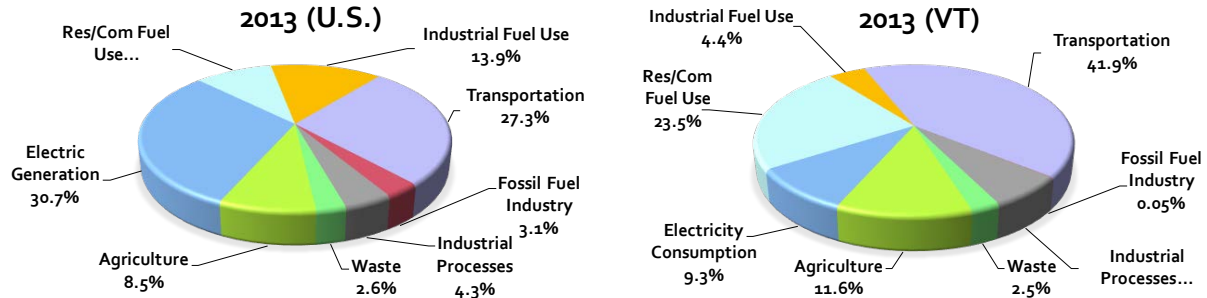


Figure 2: Sector Emissions Contribution Percentages Comparison (2013) - U.S. and Vermont⁴

To continue Vermont’s efforts to combat climate change and meet the state’s renewable energy goals, Governor Scott created the Vermont Climate Action Commission, a 21-member body, through Executive Order 12-17 (EO 12-17) to provide tangible and meaningful recommendations to move Vermont forward to meeting the aggressive climate change goals of our State.

In developing solutions to advance Vermont’s climate change mitigation efforts, EO 12-17 charges the Commission with the following guiding principles:

4. solutions that reduce greenhouse gas emissions must spur economic activity, inspire and grow Vermont businesses, and put Vermonters on a path to affordability;
5. the development of solutions must engage all Vermonters, so no individual or group of Vermonters is unduly burdened; and
6. programs developed to reduce greenhouse gas emissions must collectively provide solutions for all Vermonters to reduce their carbon impact and save money.

The Commission consists of the following membership:

22. Peter Walke, Chair, Deputy Secretary of the Agency of Natural Resources
23. Paul Costello, Co-Chair, Vermont Council on Rural Development, representing the rural development sector
24. Michael Schirling, Secretary of the Agency of Commerce and Community Development
25. June Tierney, Commissioner of the Department of Public Service
26. Michele Boomhower, designee of the Secretary of the Agency of Transportation
27. Marie Audet, Audet’s Blue Spruce Farm, representing the agriculture sector
28. Linda McGinnis, Energy Action Network, representing the clean energy sector
29. Joe Fusco, Casella, representing the commercial hauling or trucking sectors

<https://www.epa.gov/sites/production/files/2017-04/documents/us-ghg-inventory-2016-main-text.pdf>

⁴ Source: EPA [Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2014](https://www.epa.gov/sites/production/files/2017-04/documents/us-ghg-inventory-2016-main-text.pdf) (redistributed to match VT sector categories).

<https://www.epa.gov/sites/production/files/2017-04/documents/us-ghg-inventory-2016-main-text.pdf>

30. Bob Stevens, Stevens and Associates, representing the construction or development sectors
31. Kristin Carlson, Green Mountain Power, representing energy utilities
32. Mary Sprayregen, Vermont Energy Investment Corporation, representing the energy efficiency sector
33. Johanna Miller, Vermont Natural Resources Council, representing a statewide environmental organization
34. Peter Bourne, Bourne's Energy, representing the fuels sector
35. Liz Gamache, Mayor of St. Albans, representing local government
36. Adam Knudsen, Dynapower, representing the manufacturing sector
37. Bill Laberge, Grassroots Solar, representing small businesses
38. Bethany Fleishman, Vital Communities/Upper Valley Transportation Management Association, representing the transportation demand management sector
39. Tom Donahue, BROCC Community Action in Southwestern Vermont, representing the Vermont Community Action Partnership
40. Stuart Hart, Co-Director, Sustainable Innovation MBA program, UVM Grossman School of Business, representing the research and development sector
41. Harrison Bushnell, U-32 High School Senior, representing Vermont students
42. Robert Turner, representing the forestry and forest products sectors

EO 12-17 details the charge and outcome of the Commission as follows:

1. By July 31, 2018, draft and recommend, for the Governor's consideration, an action plan aimed at reaching the State's renewable energy and greenhouse gas reduction goals while driving economic growth, setting Vermonters on a path to affordability, and ensuring effective energy transition options exist for all Vermonters. The plan shall include specific actions recommended by the Commission to:
 - (i) implement the long-term policy goals of the Vermont Comprehensive Energy Plan;
 - (ii) reduce greenhouse gas emissions from all sectors, including those sectors not addressed in the Vermont Comprehensive Energy Plan; and
 - (iii) stimulate or support investment in the development of innovative technologies and strategies that have significant potential to reduce greenhouse emissions in Vermont.
2. Hold public scoping sessions to inform the recommendations of the action plan.
3. On or before December 31, 2017, evaluate existing State Executive Orders which are designed to address climate change issues and recommend, for the Governor's consideration, updates, modifications or sunset provisions.
4. Convene a Technical Advisory Group to provide additional expertise and analysis of technical issues that may be required to fulfill the Commission Charge. The Technical Advisory Group shall consist of persons available to the Commission on an as-needed basis to provide expertise in climate science; emission quantification; public health; transportation; energy generation, transmission, and storage; energy markets; banking; insurance; regional planning; building design and operation; and any other expertise the Commission deems appropriate.

The Technical Advisory Group has been formed on a rolling basis and will continue to evolve as needed to meet the Commission's charge. All participation in the TAG is voluntary, and the Commission has and will seek out the TAG's perspective and expertise as needed to fulfill its charge. The TAG membership as of the date of this report is as follows:

1. Annette Smith (Co-Chair)
2. Kevin Jones (Co-Chair)
3. Bob Amelang
4. Henry Bonges
5. Edward Cameron
6. Olivia Campbell-Anderson
7. Karen Horn
8. Sarah Jackson
9. Ellen Kahler
10. Ben Luce
11. James Maroney, Jr.
12. Erik Phillips-Nania
13. Jason Schafer
14. Jim Stiles
15. Rick Wackernagel
16. Richard Watts
17. Steve Wright
18. Ryan Yoder
19. Eric Zencey

In addition to the requirement that the Commission develop an action plan by July 31, 2018, Governor Scott charged the Commission with developing at least three recommendations prior to January 1, 2018.

I. Commission Process

Since its first meeting in August, the Commission has worked to develop recommendations that meet EO 12-17's charge and the request by the Governor to provide him with three recommendations by December 31, 2017 that were ready for implementation in the near term. Much of the work the Commission has undertaken to date has been focused on that requirement. This report contains information on the work of the Commission to date and lays out five recommendations for the Governor's consideration. The ideas contained herein reflect a preliminary subset of the ideas in development and those that will emerge through the Commission's work. The Commission will continue to consider potential options prior to providing its action plan to the Governor on or before July 31, 2018.

A. Commission Meetings

The Commission met on the following dates prior to the submission of this report:

- August 15, 2017

- October 12, 2017
- November 9, 2017
- December 14, 2017

All meetings were held at the Vermont ANR offices in the National Life building in Montpelier. The public was invited to attend all meetings. The meetings and their agendas were posted on the Commission's website. Following the meetings, ANR staff posted minutes to the Commission's website.

During the August 15th meeting, the Commission discussed its charge, received an updated the Vermont GHG Emissions Inventory from ANR staff, received a briefing on the 2016 CEP from Public Service Department (PSD) staff. Additionally, Commissioners broke into four small groups to better understand and discuss what is working well in Vermont and where there is room for improvement in Vermont's GHG emission picture.

The Commission also agreed to a timeline for their work, including December and late Spring votes on the content of these preliminary and the July action plan recommendations to the Governor. The Commission agreed to attempt to reach consensus on its recommendations, but in the absence of consensus, a two thirds majority would constitute Commission endorsement.

Finally, during the initial meeting, the Commission agreed to form eight subcommittees, with each Commissioner serving on one sector-specific and one cross-cutting subcommittee:

Sector-specific subcommittees:

- Power Production, Distribution, and Use – Bill Laberge, Joey Miller, Mary Sprayregen, June Tierney, Kristin Carlson, and Adam Knudsen
- Commercial and Residential Buildings – Peter Bourne, Bob Stevens, Liz Gamache, Stu Hart, and Mike Schirling
- Transportation – Joe Fusco, Michele Boomhower, Bethany Fleishman, Linda McGinnis, and Harrison Bushnell
- Agriculture/Forestry/Waste/Industry – Paul Costello, Marie Audet, Robert Turner, Tom Donahue, and Peter Walke

Cross-cutting subcommittees:

- Access to Capital – Bob Stevens, Robert Turner, Kristin Carlson, June Tierney, and Mike Schirling
- Education, Communication, and Outreach – Joey Miller, Liz Gamache, Harrison Bushnell, Michele Boomhower, Marie Audet, and Tom Donahue
- Rural Solutions – Peter Bourne, Bill Laberge, Mary Sprayregen, Bethany Fleishman, and Peter Walke
- Research and Development / Non-emissions-based climate actions – Joe Fusco, Stu Hart, Linda McGinnis, Paul Costello, and Adam Knudsen

At the October 12th meeting, the Commission reviewed the public scoping meetings and the range of topics proposed and received an inventory of the ideas submitted to date through the public scoping meetings as well as through email and web submissions. That list of proposals has been regularly updated on the Commission's website for Commission members and the public to access.

At the October 12th and November 9th, the Commission dedicated the majority of its time to working within the subcommittees to identify, evaluate, and add detail to ideas considered for inclusion in this report. By the November meeting, the subcommittees briefed the full Commission on the main concepts they would likely put forward to the Commission for consideration for inclusion in this report.

Additionally, at the November meeting, the currently active climate change-related EOs were presented to the Commission. Discussion was held, but a vote on which action to recommend for each EO was tabled until the December meeting where a final discussion and vote was held on how to resolve each EO.

At the December 14th meeting, the Commission's primary focus was to review draft proposal from the eight subcommittees, determine which changes were necessary to move toward consensus, and to vote on the amended proposals for inclusion in this report. The Commission reviewed seven recommendations and determined five (with agreed upon amendments) were appropriate for recommending to the Governor at this time. The Commission also voted on what action to recommend to the Governor for each of the three active climate change-related EOs.

B. Subcommittee Meetings

Each subcommittee met during the October and November Commission meetings. Each subcommittee determined what additional work was required to meet its charge. When those subcommittees met outside the regularly scheduled Commission meetings, they were noticed on the Department of Libraries website and the Commission's website at least forty-eight hours in advance.

Those meetings were held in order to vet and develop recommendations for consideration by the entire Commission. The subcommittees were not designed to provide direct recommendations to the Governor any other person or body prior to a hearing by the full Commission.

C. Public Scoping Meetings and Public Comment

The Commission held four public meetings in September and early October, 2017. Commission held those meetings in geographically diverse locations, providing access to a public scoping session within a reasonable drive for all Vermonters. The meetings were held in the following locations on the following dates:

- St. Johnsbury, September 14, 2017
- Manchester, September 21, 2017
- St. Albans, September 28, 2017
- Brattleboro, October 5, 2017

In addition to providing the public the opportunity to raise recommendations to the Commission through the scoping sessions, the Commission has maintained a website and email address to facilitate additional public input. All of the ideas gathered have been regularly added to a list and posted online. Additionally, a complete archive of the email and web form submissions has been regularly updated and added to the website: http://anr.vermont.gov/about_us/special-topics/vermont-climate-action-commission

III. Executive Order Review

EO 12-17 asked the Commission to review the existing climate change EOs still valid to determine whether those should be modified, continued, revoked, superseded, or sunset. EO 12-17 superseded EO 15-12 in its creation.

The EOs considered by this Commission include:

- EO 01-11 Council on Energy and the Environment
<https://vermont.access.preservica.com/file/sdb%3AdigitalFile%7C53f4741d-aef3-496c-a6f2-77577cebaa52/>
- EO 08-11 Vermont Housing Council
<https://vermont.access.preservica.com/file/sdb%3AdigitalFile%7C0406107d-9720-42ee-a123-3115e022e330/>

EO 05-16 Climate Change Considerations in State Procurements

<https://vermont.access.preservica.com/file/sdb%3AdigitalFile%7Cd2807618-3bc0-4e50-9a12-ba5efeb5b58e/>

The Commission voted unanimously to recommend that the Governor continue Executive Orders 08-11 and 05-16 unchanged and to revoke Executive Order 01-11.

IV. Recommendations

The Vermont Climate Action Commission has been considering potential options for action in the next year that would advance Vermont's ability to achieve its 2050 goals of 80-95 percent GHG emissions reductions and 90 percent renewable energy in line with EO 12-17's charge. The recommendations contained in this report reflect an initial set of near-term opportunities to make progress in impacting Vermont's GHG emissions.

The Commission looks forward to continuing its work in evaluating, generating, and developing additional recommendations. The Commission values the input provided to date and hopes all Vermonters will continue to provide recommendations for the Commission's consideration and potential inclusion in the July 31, 2018 action plan. These recommendations reflect the hard work of the individual subcommittees and collaboration amongst subcommittees. While not a recommendation in

and of itself, the Commission wanted to make clear its support for universal high-speed internet as an enabling technology to make energy transformation possible in many sectors and to encourage smart growth economic development in Vermont.

The Commission has identified five recommendations for the Governor's consideration:

1. Support Advanced Wood Heat (21 for; none against)
2. Increase Pace of Weatherization (21 for; none against)
3. Study All Regulatory and Market Decarbonization Mechanisms (20 for; 1 against)
4. Foster the Climate Economy (21 for; none against)
5. Electrify the Transportation System (21 for; none against)

A. Recommendation 1: Support Advanced Wood Heat

Advanced wood heating (AWH) represents a tremendous opportunity to transition Vermonters from petroleum-based heating systems, keep Vermont's heating expenditures local, and supporting the working landscape while reducing Vermont's GHG emissions. Upfront capital investment requirements and the fluctuating (currently low) price of petroleum heating fuels present major hurdles to achieve the State Wood Energy Team's (SWET) goal for wood to provide 35 percent of Vermont heating by 2030.

The closing of paper mills throughout the Northeast has led to a low-grade wood market crisis. Without outlets for low-grade wood, forests become vulnerable to development pressures and our forest products economy vulnerable to atrophy. Recent data have documented a decline in forested acres for the first time in more than a century. While small, the trend has important climate change implications. Currently, over 50 percent of our GHG emissions are sequestered by our forests. Keeping working forests forested is an essential climate mitigation strategy. The advancement of modern wood heat can be a part of filling the financial hole left behind by these mill closures.

In collaboration with the SWET, Renewable Energy Vermont and the Biomass Energy Resource Center (BERC) at VEIC are currently working on a draft Roadmap to lay out what 35 percent heating share by 2030 looks like. The project is still in draft form and has analyzed several pathways. One pathway suggests that Vermont will need to install 70,000 pellet stoves, 11,000 residential AWH systems, 2,700 commercial and institutional pellet boilers, and 280 woodchip boilers. As of 2016, Vermont only had 377 residential AWH systems, 100 commercial and industrial pellet boilers, and 62 woodchip boilers. The value to Vermont of achieving that goal is significant, however. For instance, if we reach meet this goal:

- Vermonters will displace the equivalent of 40 million gallons of heating oil. Reaching the goal would avoid approximately \$75 million leaving Vermont's economy every year because of heating expenses.⁵

⁵ This is a conservative figure calculated with the assumption that the price of fuel oil will return to \$3.00 a gallon and that 341,463 tons of pellets (at \$319 per ton) would be needed to offset the BTU requirements of the fuel oil. According to BERC's analysis, only 22 cents of every dollar spent on fuel oil stays in Vermont's economy as opposed to 80 cents per dollar for wood heat (Heating the Northeast with Renewable Biomass, A Vision for 2025, 2010, https://www.biomassthermal.org/resource/pdfs/heatne_vision_full.pdf p.35, based on EIA data). Given that many

- Up to 580 new jobs will be created by Vermont businesses.⁶

Given the significant progress that must be made, the State should develop tools for Vermonters to overcome these challenges and encourage the market expansion of clean AWH systems for Vermont's school, institutions, businesses, and homes. Doing so will lead to an immediate and sustained positive impact on Vermont's economy. The most pressing need is the development of long-term, sustainable funding and financing incentives to enable Vermonters to switch to AWH and support the Vermont economy while increasing the use of renewable energy. The Commission supports the continued work of the SWET to address additional barriers to market expansion of efficient, renewable AWH systems.

The recommendations contained below reflect both a short-term step and a mid-to-long-term recommendation, where appropriate:

1. Fund School Construction Aid for AWH Projects.
 - a. Short-term: The Commission encourages the commitment of available capital funds through the Capital Bill Budget Adjustment process for the FY18/19 Capital Bill to school AWH projects and the necessary statutory changes to develop a long-term funding process for school AWH projects.
 - b. Mid to Long-Term: The Commission recommends the development of a sustained, long-term funding process for school AWH projects
2. Invest in Residential and Commercial AWH Projects.
 - a. Short-term: The Commission encourages the commitment of available resources, through the FY18 Budget Adjustment and/or FY19 Budget, to continue existing AWH incentives as they are due to run out of funds within the next six months.
 - b. Mid to Long-Term: The Commission also recommends the development of a sustained commitment to AWH incentives for residential and commercial projects.
3. Invest in Residential Woodstove Changeout Program.
 - a. Short-term: The Commission encourages the commitment of available resources, through the FY18 Budget Adjustment and/or FY19 Budget, to restart the State's woodstove changeout program.
 - b. Mid to Long-Term: The Commission also recommends the development of a sustained commitment to AWH incentives for residential and commercial projects
4. Finally, the Commission recommends that Vermont exempt AWH equipment from Sales and Use Tax.

B. Recommendation 2: Increase Pace of Weatherization

Fuel use in Vermont's buildings account for 23.5 percent of GHG emissions. The state also has a significant stock of older residential buildings that contribute to an inefficient use of building energy for heating and cooling. Many Vermonters live in homes that are poorly insulated, sealed, and ventilated,

larger users in Vermont are burning wood chips, which are significantly less expensive than pellets, the amount will likely be considerably higher.

⁶ According to one scenario for reaching the 35 percent by 2030 goal developed in the Draft BEREC Roadmap

unnecessarily increasing their monthly out-of-pocket home heating costs and causing health issues. Weatherizing homes reduces fuel use (and associated GHG emissions) and immediately saves Vermonters money.

The primary challenge, especially for low and moderate income (LMI) residents, is the upfront cost of weatherization investments. In 2007, Vermont set a goal of weatherizing 20,000 low income homes by 2020. Based on current trends, Vermont will fall 6,000 homes short of that goal. The state has been working to achieve that objective, primarily through the State Weatherization Assistance Program (SWAP). The SWAP program, which provides full weatherization services from initial consult to construction relies primarily on proceeds from the Gross Receipts Tax on fuel oil.

LMI Vermonters spend a disproportionate amount of their earnings on home energy, so the Commission recommends rapidly increasing the pace of home weatherization. The Commission recommends that a portion of the revenue dedicated to the SWAP be leveraged to initiate a revenue bond to scale up weatherization actions immediately. The Commission recognizes that such bonding would need to be in the financial interest of the state, including its long-term bond rating, and be done with a plan for long-term funding for the SWAP program. The Commission also understands that significant financial analysis is necessary to determine what level of bonding is appropriate. Further, significantly advancing weatherization activities will require an expanded workforce, which will take time to develop, so the surge in weatherization should be scaled based on effective delivery of services. These considerations should be factored in by policymakers as they evaluate the potential for a revenue bond.

C. Recommendation 3: Study All Regulatory and Market Decarbonization Mechanisms

To ensure global temperature rise remains no greater than two degrees Celsius above pre-industrial levels, the entire global population will need to transform its relationship with energy use. A wide spectrum of policy mechanisms that aim to enable those choices and reduce GHG emissions have been investigated and implemented by nations, regions, states, and provinces around the world. In the northeast, Vermont is part of a regional cap and trade program that has effectively reduced GHG from the electric power production sector.

Whether any of those policy approaches would effectively reduce GHG emissions in Vermont while spurring economic innovation, making Vermont more affordable, creating jobs, protecting the most vulnerable, and ensuring all Vermonters have the ability to be part of the climate solution remains an open question. The conversation has not been informed by a complete review and understanding of the impacts, both positive and negative, of different policies implemented nationally, regionally, or in Vermont alone.

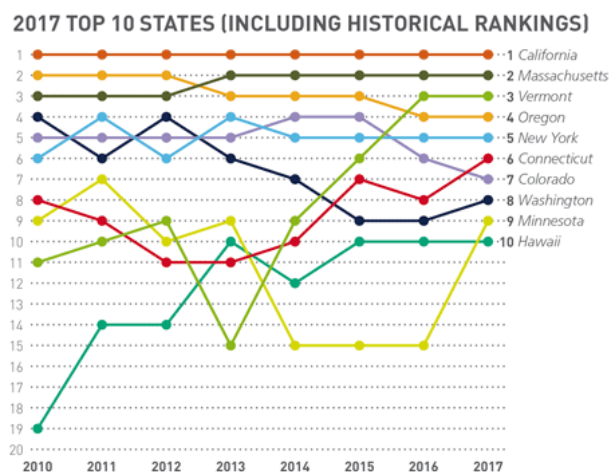
To answer that question, the Commission recommends an independent, non-partisan evaluation of the full spectrum of regulatory and market-based approaches to reducing GHG, including carbon pricing mechanisms, carbon market opportunities, and regulatory control policies. The Commission recommends the Legislature's Joint Fiscal Office contract that study with a well-respected, independent research organization to provide Vermonters with the information needed to make informed decisions.

The ultimate utility of such a study will largely depend on how it is framed, the questions that it asks, and the assumptions it makes. The Commission offers to provide a small working group made of a subset of its members to assist in the scoping of the study, if desired.

D. Recommendation 4: Foster the Climate Economy

The clean energy sector is the fastest growing jobs sector in the state, reaching an all-time high in 2017 representing 6 percent of the State’s workforce (compared to just 2 percent for the nation). Since 2013, clean energy employment has grown by 29 percent, which amounts to just over 19,000 jobs that are at least in part clean-energy related. This means that about one in every 16 working Vermonters is at least partly employed in the clean energy industry. Of these workers, about 64 percent spend all their time on the clean energy related business activities, translating to roughly 12,200 “full-time” clean energy jobs. The state is now home to 3,751 establishments conducting clean energy work, and 18 percent increase since 2016.⁷ Importantly, more clean energy jobs means more customers for other Vermont businesses.

To continue to harness this economic activity, Vermont needs to support existing businesses and attract more entrepreneurs, new ventures, and jobs that solve for both sound environment and sound economy for the ultimate sustainability of our state’s population. At the same time, efforts to create climate ventures and jobs will help address affordability and be inclusive of the state’s most vulnerable, by simultaneously addressing affordability and advancing an economy that provides for all.



Source: U.S. Clean Tech Leadership Index, Clean Edge, Inc.
 Figure 3: 2017 U.S. Clean Tech Leadership Index

Vermont will compete with other states to attract new and retain existing business ventures and retain a trained workforce. To enable Vermont to continue to be an economic leader and job creator in this sector, the Commission recommends identifying, analyzing and implementing economic development incentives and policies that would grow existing Vermont climate economy businesses, increase investment in climate economy businesses and attract new climate economy businesses to Vermont. The Commission specifically discussed the following possibilities, but encourages the Legislature and Governor to do a thorough review of which of these incentives or additional incentives might be most effective:

1. Change Capital Gains Tax policy so that in-state and out-of-state investors in VT climate businesses get preferred tax treatment. This would be particularly effective in line with a) a “Milk Money” financial market that allows smaller investments of regular Vermonters to spur business growth in the sector and b) other vehicles to draw external investment to Vermont businesses.

⁷ Clean Energy Development Fund. Clean Energy Industry Report 2017

2. Change Corporate Income Tax policy to support existing enterprises and incentivize new business that add new jobs in Vermont. Climate businesses that create new climate jobs that contribute to GHG reductions would be eligible for preferred tax treatment with a multi-year tax credit for increases in employment at a business.
3. Build an R&D Investment Tax Credit for businesses that invests in creating and growing innovative new climate economy products in Vermont; encouraging them to grow and to keep creative job-force development infrastructure here.
4. Develop a public/private partnership of state and businesses to provide student loan repayment and climate economy education tax credits to reduce the cost of higher education and attract workforce and entrepreneurs in fields supporting the development of Vermont's climate economy.
5. Provide a state contract bid adjustment for Vermont-based climate businesses that support climate jobs and GHG reductions through their work.

E. Recommendation 5: Electrify the Transportation System

Transportation is the single largest contributor to Vermont's GHG emissions of all sectors (47 percent). Reducing GHG emissions will require Vermont and Vermonters to reimagine their personal and business transportation needs and how to pay for the transportation system. Vermonters collectively spent over \$1 billion on transportation energy in 2015. Driving on electricity could cut this cost by 65 percent to about \$350 million, with more of the electricity dollars staying local to Vermont.

These recommendations come as Vermont is considering how to allocate the funds associated with the settlement the federal government agree to with Volkswagen (VW) to mitigate the impact of its installation of software "defeat devices," which allowed the subject vehicles to emit, in some cases, forty times the allowed emissions standard for nitrogen oxides. Vermont's allocation of the federal trust is \$18.7 million, with electric vehicle (EV) charging infrastructure eligible for 15 percent (\$2.8 million) and the replacement or repowering of eligible heavy-duty equipment accounting for the remainder.

Recent studies on climate and energy in Vermont have identified plug-in EVs as a key pathway to meeting long-term goals, given how many Vermonters still travel long distances to get to jobs and services. Meeting Vermont's 2016 CEP illustrative goal of 10 percent renewably powered transportation would require about 45,000 EVs in Vermont by 2025—a major increase from the current 2,000.

EVs powered by renewable energy will provide major reductions in Vermonters' GHG emissions while also lowering annual household transportation expenses. Under the Renewable Energy Standard's Tier III (for energy transformation projects), electric utilities have begun to offer consumer incentives in partnership with Vermont dealers. Those incentives have led to a significant increase in EV purchases, but more needs to be done to meet emission reduction goals from the transportation sector.

Three principal barriers to accelerated EV adoption are: i) lack of sufficient charging station infrastructure; ii) lack of general awareness about the benefits of switching to EVs and how to do it affordably; and iii) the upfront costs of EVs (including used EVs) are not generally accessible to LMI

Vermonters and rural Vermonters (who depend the most on personal vehicles to get to work, school and other essential travel).

A fourth concern is cross-cutting in character and relevant to the above three barriers listed is the price of electric service in relation to the costs. The pricing barrier is a matter of rate design. Rate design is used by regulators and utilities to configure prices in ways that allow the utility to recover costs and send sound economic signals to consumers to manage their consumption patterns. Increasingly, technology is enabling rate design to help encourage effective management of customer loads.

Finally, most of Vermont's charging infrastructure has been funded either by electric utilities or by various government programs. In the future, the expectation is that equipment will begin to be owned and maintained by private entities. Under current Vermont law, any entity reselling electricity to consumers (outside of campgrounds) would need to be regulated as an electric utility, which is a significant barrier to entry.

Additionally, the buses that travel our streets – both transit buses and school buses – show how our rural state has worked to provide transit and other transportation choices that help people get where they need to go. At the same time, the diesel buses that make up most fleets emit multiple air pollutants that can lead to health impacts for children, drivers, and community members. Electric buses are currently more expensive than their electronic counterparts, but even without upfront capital assistance, have a positive return on investment under current energy price projects

The Commission proposes a multi-pronged effort to increase the electrification of the transportation sector and to expand public transit options for all Vermonters, building upon the existing progress to date. By focusing on rural and LMI Vermonters, the Commission's recommendations help ensure that all Vermonters can benefit from the transformation of the transportation sector. The availability of the VW Settlement funds provides a rare opportunity to jumpstart this transformation in a significant way. Specifically, the Commission endorsed the following recommendations:

1. Expand public charging infrastructure to all Vermonters: Maximize VW settlement set-aside for charging stations (15 percent) to ensure fast-charging infrastructure accessibility within 30 miles of every Vermonter.
2. Modernize EV charging network. Remove statutory barriers to allow owners and operators of charging stations to sell electricity. Promote a proceeding before the PUC to remove barriers to EV charging in rate designs.
3. Encourage flexible EV leasing programs. The State of Vermont should partner with stakeholders to enable low-cost, low-commitment EV leasing programs in an effort to increase adoption, reduce barriers to entry, create good paying jobs, and bolster a resale market of used EVs.
4. Jumpstart electrification of public transit and school buses. The Commission recommends using VW settlement funds to jumpstart a transition from diesel to electric transit using bulk purchase to bring down costs per bus, and to pilot school bus electrification. The Commission recommends that all VW settlement funding decisions be made on the basis of the net present value of lifespan costs/benefits and their leverage in transforming the marketplace to further

reduce future emissions.

5. Explore public transit options: Examine methods to expand public transit offerings with existing vehicles, with particular emphasis on rural areas through combining public transit and school bus use.
6. Boost consumer awareness: Expand EV public outreach/education activities, including partnerships with auto dealers, signage/education on public transit vehicles, and awareness-building of legislators.