



Vermont

Governor's Commission on Climate Change

www.vtclimatechange.us

Cross-Cutting (CC) Technical Work Group
Summary List of Policy Options

	Policy Option	GHG Reductions (MMtCO ₂ e)			Net Present Value 2008-2020 (Million \$)	Cost-Effectiveness (\$/tCO ₂ e)	Level of Support
		2012	2020	Total 2008-2020			
CC-1	GHG Inventories and Forecasts	<i>Not Quantified</i>					Unanimous Consent
CC-2	GHG Reporting	<i>Not Quantified</i>					Unanimous Consent
CC-3	GHG Registry	<i>Not Quantified</i>					Unanimous Consent
CC-4	Public Education and Engagement	<i>Not Quantified</i>					Unanimous Consent
CC-5	Adaptation	<i>Not Quantified</i>					Unanimous Consent
CC-6	Options for GHG Goals or Targets	<i>Not Quantified</i>					Pending
CC-7	The State's Own GHG Emissions	<i>Not Quantified</i>					Pending
	SECTOR TOTAL AFTER ADJUSTING FOR OVERLAPS						
	REDUCTIONS FROM RECENT POLICY ACTIONS						
	SECTOR TOTAL PLUS RECENT POLICY ACTIONS						

CC-1. GHG Inventories and Forecasts

Policy Description

Greenhouse gas (GHG) emissions inventories and forecasts are essential to understanding the magnitude of all emission sources and sinks (both anthropogenic and natural), the relative contribution of various types of emission sources and sinks to total emissions, and the factors that affect trends over time. The initial use for inventories and forecasts will be to inform state leaders and the public on statewide trends, opportunities for mitigating emissions or enhancing sinks, and verifying GHG reductions associated with implementation of Vermont's Climate Action Plan. However, it is expected that other uses of the data will be identified as the program evolves. The responsibility for preparing GHG inventories and sinks should reside with the Department of Environmental Conservation (DEC), which has the expertise needed to systematically compile information on GHG sources and sinks using established methods and data sources. Other state agencies as well as private facilities (sources) will need to provide data to DEC on a periodic basis. This function should be integrated with existing DEC emissions inventory program as seamlessly as possible. The GHG inventory and forecast will be an on-going effort that will improve over time based on improvements to the accuracy and completeness of GHG emissions data.

Policy Design

The Cross Cutting (CC) issues Technical Working Group (TWG) recommends that Vermont institute a formal GHG inventory and forecast function within the DEC, to be assisted by other state agencies as needed. Additional information regarding key program characteristics can be found in the *GHG Inventories and Forecasts Design Options Matrix*.

Goals:

- Develop a periodic, consistent, and complete inventory of emission sources and sinks and an accompanying forecast of future GHG emissions in at least 5 and 10 year increments, out to and including 2030 (and eventually beyond). The GHG forecast should reflect projected growth as well as the implementation of scheduled policy options, and should, through differences year-to-year, provide a basis for documenting and illuminating trends in state GHG emissions.
- Inventory all natural and man-made emissions generated within the boundaries of the state (i.e., a production-based inventory approach) as well as emissions associated with energy imported and consumed in the state (i.e., a consumption-based inventory approach).

Timing: This function should be implemented as soon as possible as allowed by current funding and enhanced over time.

Parties Involved: All GHG emission sources and sinks (both anthropogenic and natural) should be included in the inventory and forecast. Therefore, the owners, facility operators, and land managers of these sources as well as relevant state agencies and inventory and registry experts are potential parties involved.

Implementation Mechanisms

None Cited.

Related Policies/Programs in Place

Vermont DEC periodically develops GHG inventories in keeping with the Vermont Climate Neutral Working Group and the state's commitments under the New England Governors/Eastern Canadian Premiers Climate Change Action Plan.

Types(s) of GHG Reductions

Establishing a GHG inventory and forecasting function within state government will assist in the tracking, management, and ultimately reduction of GHG emissions; it will not reduce GHG emissions itself per se. Public disclosure of emissions may encourage reductions by sources.

Estimated GHG Savings and Costs per MtCO₂e

This option could be considered an administrative and enabling function of the Climate Action Plan (including enabling any future cap and trade options) and will incur overhead costs but not directly reduce emissions per se except where these data motivate reductions for public relations by individual companies or sources.

Data Sources: Many.

Quantification Methods: Several will be designed to follow standard, comparative and accepted approaches that allow eventual exchange/sale of emission credits.

Key Assumptions: Not quantified.

Key Uncertainties

Adequacy of on-going funding for a statewide GHG inventory and forecasting function.

Additional Benefits and Costs

None Cited.

Feasibility Issues

None Cited.

Status of Group Approval

Approved

Level of Group Support

Unanimous consent

Barriers to Consensus

None

CC-2. State Greenhouse Gas Reporting

Policy Description

GHG reporting is the measurement and reporting of GHG emissions by sources to a state entity in order to support tracking and management of emissions. GHG reporting can help sources identify emission reduction opportunities. By moving “up the learning curve” concerning their GHG emissions, reporting can help sources reduce their risks associated with possible future GHG reduction requirements. Tracking and reporting of GHG emissions will also help in the preparation of periodic state GHG inventories. GHG reporting is a precursor for sources to participate in GHG reduction programs, opportunities for recognition, a GHG emission reduction registry, and to secure “baseline protection.” Further, collaboration with other states in the development of a GHG reporting program could enable Vermont to influence the development of GHG reporting practices throughout the region and nation and build consistency and reciprocity with other state or regional GHG reporting programs.

Policy Design

The CC TWG recommends that Vermont institute a GHG emissions reporting program. Additional information regarding key program characteristics can be found in the *GHG Reporting Design Options Matrix*.

- Subject to consistently rigorous quantification, GHG reporting should not be constrained to particular sectors, sources, or approaches, in order to encourage GHG mitigation activities from all quarters.
- GHG reporting should be phased in by sectors as standardized quantification protocols, base data, and tools become available, and as responsible parties become clear. All entities (including the state, municipalities, and other jurisdictions) should be allowed to report GHG emissions associated with their own activities and any programs they may implement to reduce GHG emissions.
- Reporting should be applicable to all sources (e.g., combustion, processes, vehicles, etc.) but common sense should apply regarding de minimis emissions.
- The goal should be reporting of GHG emissions on an organization-wide basis within Vermont, but with greatest possible detail by facility in order to facilitate baseline protection.
- Reporting should occur annually on a calendar-year basis for all six traditional GHGs and, to the extent possible, for black carbon.

- Reporting of direct emissions¹ should be required; reporting of emissions associated with purchased power and heat² should be phased in, and voluntary reporting of other indirect emissions³ should be allowed.
- Every effort should be made to maximize consistency with federal, regional, and other states' GHG reporting programs.
- GHG emissions reports should be verified through self-certification and VT DEC spot-checks; to qualify for future registry purposes, reports should undergo third-party verification.
- Reporting of emissions from GHG reduction projects should qualify for reporting, when they are identified as such and adhere to equally rigorous quantification standards.
- The reporting program should provide for appropriate public transparency of reported emissions.

Goals: Implementation of a Vermont GHG Reporting Program as early as possible.

Timing: As soon as possible, preferably by 2008.

Parties Involved: Universal.

Implementation Mechanisms

Reporting protocols, opportunities, and, in the case of mandatory reporting, underlying regulatory requirements.

Related Policies/Programs in Place

Many sources in Vermont report criteria pollutant emissions in order to comply with various federal and state regulatory programs. Most electric generating units are also required to report CO₂ emissions to the Energy Information Administration (EIA). Some sources may report GHG emissions on a voluntary basis to federal, state, or privately-run programs. Otherwise, there is no broad, statewide GHG reporting program in Vermont.

Types(s) of GHG Reductions

GHG reporting is an enabling policy to encourage management, and ultimately reduction, of GHG emissions. It does not reduce GHG emissions itself per se.

Estimated GHG Savings and Costs per MtCO₂e

The reporting of GHGs under this policy option would help position Vermont entities for participation in an emissions trading program should one develop in the future, leading to cost savings. Although establishment of a credible reporting program is essential for participating in a trading program, these elements do not reduce GHG emissions themselves.

¹ Defined as "Scope 1" emissions in the *GHG Protocol*.

² Defined as "Scope 2" emissions in the *GHG Protocol*.

³ Defined as "Scope 3" emissions in the *GHG Protocol*.

Key Uncertainties

Uncertainties exist with respect to quantification of some GHG emissions from some sources, but standard quantification protocols are rapidly being developed and accepted widely. There remain significant uncertainties with respect to how various state, regional, and/or federal GHG reporting programs may develop.

Additional Benefits and Costs

Not applicable.

Feasibility Issues

None Cited.

Status of Group Approval

Approved

Level of Group Support

Unanimous consent

Barriers to Consensus

None

CC-3. State Greenhouse Gas Registry

Policy Description

A GHG registry enables uniform measurement and recording of GHG emissions reductions in a central repository. Typically, a registry also includes transaction ledger capability in order to support tracking, management, and ownership of emission reductions. Registries can help encourage sources to undertake GHG reduction efforts, enable recognition for such actions, provide baseline protection, and support the crediting of early GHG mitigation actions. A registry can also provide a mechanism for regional, multi-state, and cross-border cooperation. Subject to appropriately rigorous quantification standards, participation in a GHG registry should be open to all sectors, sources, or approaches in order to encourage GHG mitigation activities of all types from all quarters. In particular, a GHG registry should be able to incorporate activities associated with all of the options that the GCCC-PG recommends, whether reflective of reductions in emissions of GHGs or increases in biological or geological sequestration of carbon.

Policy Design

The CC TWG recommends that Vermont actively engage with other states in developing a regional or national GHG registry that will comprehensively meet the state's needs. If developing regional or national multi-state registries do not initially include all of the state's preferred criteria, Vermont should still join and participate to the greatest extent possible, and work to develop whatever additional registry capacity is necessary to meet the remaining needs of Vermont sources (e.g., registration of carbon sequestered due to reforestation). Together, these approaches should cover all policy options that the Governor's Commission on Climate Change-Plenary Group (GCCC-PG) recommends, provide adequate quality verification, and allow project-level reporting. Costs should be borne primarily by participants. Recommendations for key registry design characteristics build off the GHG Reporting policy option (CC-2). Key elements important to Vermont include the characteristics below. Additional information regarding important program characteristics is included in the *GHG Registry Design Options Matrix*.

- Geographic applicability at least at the statewide level and as broadly (i.e., regionally or nationally) as possible.
- Inclusion of as broad an array of sectors, sources, facilities, and approaches as possible.
- Allowing sources to start as far back chronologically as good data exists, as affirmed by third-party verification, and allowing registration of project-based reductions or "offsets" that are equally rigorously quantified.
- Incorporating adequate safeguards to ensure that reductions are not double-counted by multiple registry participants, and providing appropriate transparency.

- Striving for maximum consistency with other state, regional, and/or national efforts; greatest flexibility as GHG mitigation approaches evolve; and providing guidance to assist participants.
- Allowing the state and its political subdivisions to be valid participants for registering reductions associated with their programs, direct activities, or efforts, including the registration of emission reductions associated with the stationary and mobile sources they own, lease, or operate. Similarly, the state and its political subdivisions should also be allowed to participate in emission trading if and when such a program is developed and authorized. Revenues associated with the sale of any emission reduction credits generated by the state or its political subdivisions could be used to support the GHG emission inventory, forecasting, reporting, and registry functions within state government.

Goals: Participation in a regional or national multi-state registry as described above.

Timing: As soon as possible after a GHG reporting program is operating.

Parties Involved: Coverage should include all entities that can verify ownership of GHG emission reductions.

Implementation Mechanisms

Implementation of this program should probably be led by VT DEC. Costs should be shared by participants benefiting from the registry.

Related Policies/Programs in Place

Vermont is participating in regional and national multi-state efforts to develop a GHG registry.

Types(s) of GHG Reductions

A GHG registry is an enabling function for recording GHG reductions; it does not generate emission reductions in and of itself.

Estimated GHG Savings and Costs per MtCO_{2e}

Not applicable.

Key Uncertainties

There remain significant uncertainties with respect to how various state, regional, and/or federal GHG registry programs may develop. Involvement in early registry implementation – as issues are deliberated among states – will advantage Vermont in their ultimate outcome.

Additional Benefits and Costs

None Cited.

Feasibility Issues

None Cited.

Status of Group Approval

Approved

Level of Group Support

Unanimous consent

Barriers to Consensus

None

CC-4. State Climate Public Education and Engagement

Policy Description

Public education and engagement proposed by the GCCC-PG will be the foundation for long-term success of all the mitigation actions advanced in the State of Vermont. It is vital to foster a broad awareness of climate change problems and effects (including co-benefits, such as clean air and public health) and to encourage action among the State's citizens.

Public education, marketing and engagement efforts should integrate with and build upon existing efforts involving climate change and related issues in the state. In the past ten years many diverse, forward-looking groups have advanced activities and initiatives in Vermont, led by professionals and citizens who are aware that climate change is a critical problem. Statewide coordination and resources including an interactive website are needed to support, expand, and institutionalize these broad educational activities that are already underway in support of greenhouse gas emissions reductions.

In all these activities, every effort should be made to engage the public through transferable marketing-oriented frameworks that can provide measurable year-to-year results.

Policy Design

The CC TWG recommends the four policies below to develop and implement a unified, proactive approach to public education and engagement to build capacities for behavior change in the diverse audiences in the state including, but not limited to, municipalities, community-based organizations; non-governmental organizations; general public, younger generations; and the commercial, industrial, and economic sectors.

- Develop and maintain a strong web-based presence to provide critical support to the many broad educational activities already underway. A State-level interactive web site could: (1) improve community-leader, policy-maker and community-based organizational access to useful resources and services; (2) provide tools and resources that support a growing network of groups and project activities; (3) advance a state-wide marketing brand to encourage behavior change and advancement of shared goals; and (4) coordinate state-wide activities on climate change and all related energy activities.

This interactive website could host the following:

- A calendar of community level events, educational programs open to the public and specific sectors.
- An educational 'climate change' library with links.
- A catalog of documents relevant to Vermont's plans and legislation for discussion.

- Several managed forums for discussion: one for input to Vermont’s plans and legislation; and a second for the general exchange of ideas, technical solutions, success stories and needs in Vermont.
- An interactive directory of energy and climate change groups/entities to communicate contemporary planning and project activities at the municipal and regional levels.
- Emissions calculator tools (e.g., 10% Challenge at www.10percentchallenge.org) for individual households and businesses to estimate their emissions.
- A listing of rebates and tax credits available related to energy efficiency improvements.
- A marketing and promotional kit for use by interested entities and community-based groups to help raise public awareness, motivate behavior change and educational outreach activities.
- Recognition program including awards for GHG emissions reductions.
- Establish a state funding mechanism to help subsidize coordinated education, engagement, marketing, and technical assistance programs including, but not limited to:
 - Vermont Energy Education Program – currently funded in part by the Department of Public Service, which provides in-depth science based in-school programs on energy efficiency and climate change at all levels – www.veep.org.
 - 10% Challenge – a voluntary civic-outreach program to encourage households, businesses, and institutions to reduce greenhouse gas emissions by at least 10 percent – www.10percentchallenge.org.
 - Vermont Energy and Climate Action Network – encourages and supports energy committee project efforts in every community.
 - Vermont High Performance Schools Initiative – www.vthps.org.
 - Vermont Land Use Education & Training Collaborative – www.vpic.info.
- Identify and establish climate change “best practices” for public and private use in all sectors of the economy, with particular emphasis on integrating “best practices” into public school design, construction, and operations in order to help educate students, staff and parents about sustainable building environments.⁴
- Encourage, foster and promote the research and academic excellence necessary to advance statewide solutions to climate change. Suggested examples include: (1) developing university "Centers of Excellence" to advance technical solutions to climate problems, and (2) encouraging faculty, staff and student energy teams and student-led projects and initiatives as modeled by the Vermont Campus Energy Group – www.vceg.net.

⁴ Refer to the 2006 Legislative School Constructions Standards Committee and the Vermont High Performance Schools Initiative endorsement of the Northeast High Performance Schools Protocol (as amended) to establish and advance performance-based design and construction standards in Vermont schools.

Goal: Build an informed and involved public to help reverse the growth in greenhouse gas emissions via a coordinated collaborative of education and outreach partners. Specific objectives include:

- To raise awareness among policy-makers, regulators, staff and community leaders to encourage everyone to implement climate actions in their personal and professional lives.
- To develop the education, engagement, and marketing frameworks, infrastructure and tools to encourage action, leadership, role models and shared success stories.
- To support local public education and engagement efforts to advance sustainable community-based projects.
- To integrate climate change into educational curricula, post-secondary degree programs, and professional licensing programs.

Timing: Public education and outreach efforts should commence now.

Parties Involved: In collaboration with the VT Agency for Natural Resources (ANR), a State Climate Change Advisory Group including business, government, nongovernmental organizations, and citizen advocacy representatives should be formed to help guide a coordinated effort moving forward.

Implementation Mechanisms

Implementation mechanisms for this policy include the early establishment of an Advisory Group to be responsible for guidance and oversight of the public education and engagement programs on climate change. Creating this advisory group would leverage the brain trust within the state on climate change and ensure credibility of information as well as participation. It would also serve to leverage available resources to implement engagement programs to work collectively towards reduction goals.

Members of this independent advisory group should have broad representation and include stakeholders from, but not limited to: business, including industry and trade groups; government, including local, regional and state agencies; and nonprofit organizations, including citizen advocacy groups on health, the environment, land use and transportation.

The group, with the suggested title “State Climate Change Advisory Group,” will:

- Develop priorities and a social marketing plan to encourage behavior change to meet reduction goals.
- Provide guidance and oversight to state officials and legislators to help inform, plan and implement a web-based framework to facilitate communications.
- Research and synthesize the other suggested statewide policies to ensure that a unified and multi-layered marketing brand is coordinated, implemented and maintained.
- Define and carry out social marketing strategies with broad ethical goals to ensure the content of the education and engagement programs provides impartial technical information as well as achievable mitigating measures to reach targeted reduction goals.

A Public Education and Engagement Framework should be based on an ethical model of social marketing to develop a consistent brand identity framed with market data to adapt messaging to different user groups within Vermont. Once created, this would establish a recognizable identity around climate change and connect individuals to the broader goals of the state's reduction strategies.

A benchmarking system is necessary to measure and track barriers and opportunities for behavior change. This can be done through surveys that measure successes of greenhouse gas reduction strategies in the public sector.

A consistent messaging strategy will be critical to the public's ability to make lifestyle changes that reduce emissions. For example, transportation is the biggest barrier to the state's reduction goals and affects all Vermont citizens across many levels and sectors including the agriculture sector of the economy.

Public education, marketing and engagement program development recommended under this policy option must be directly connected to and support greenhouse gas reduction goals established in other policy areas recommended by the Technical Working Groups including (but not limited to): all of the Transportation and Land Use policy options; Energy Supply and Demand policy options ESD-8, ESD-9 and ESD-10; and Agriculture, Forestry and Waste Management policy options AFW-1, AFW-4, AFW-8, AFW-9 and AFW-10.

Related Policies/Programs in Place

Within Vermont numerous related programs are underway:

- Vermont Energy Education Program [www.veep.org].
- Vermont Campus Energy Group [www.vceg.net].
- Vermont Energy and Climate Action Network [see <http://www.vnrc.org/article/view/9452/1/625>].
- 10% Challenge [www.10percentchallenge.org].
- Vermont High Performance Schools Initiative [www.vthps.org].
- Association of Vermont Recyclers [www.vtrecyclers.org].
- Climate Action toolkit [http://www.cleanaircoolplanet.org/toolkit/component/option.com_frontpage/Itemid,125].
- Vermont Green Building Network [www.vgbn.org].
- Vermont Earth Institute [www.vt.earth.institute@valley.net].
- Vermont Energy Investment corporation and Efficiency Vermont [www.veic.org] and [www.encyvermont.org].
- Vermont Interfaith Power & Light [www.vtipl.org]

Types(s) of GHG Reductions

Not applicable.

Estimated GHG Savings and Costs per MtCO₂e

Not applicable.

Key Uncertainties

None cited.

Additional Benefits and Costs

None cited.

Feasibility Issues

None cited.

Status of Group Approval

Approved

Level of Group Support

Unanimous consent

Barriers to Consensus

None

CC-5. Adaptation

Policy Description

Due to the existing build-up in the atmosphere of GHGs that has already occurred, Vermont will experience effects of climate change for years to come, even if immediate action is taken to reduce its future GHG emissions. Some climate impacts could substantially affect Vermont's economy and quality of life. Thus, it is essential that the state develop a plan to manage the projected impacts of global warming while broader mitigation efforts to lower atmospheric concentrations world-wide are being developed and implemented.

Policy Design

The CC TWG recommends that while taking action to reduce GHG emissions in Vermont, the state should develop, adopt, and implement a state Climate Change Adaptation Plan that includes identification of (a) potential short-term, mid-term, and long-term impacts of climate change scenarios likely to affect the state, and (b) implementation mechanisms for addressing these impacts. The state should create a Commission on Adaptation to Climate Change to develop a state Climate Change Adaptation Plan within one year of establishment of the Commission. The Commission should involve and coordinate with all appropriate state and local agencies, organizations, and institutions (e.g., universities) to ensure that all potential impacts are identified in the plan. The Commission should also enlist the expertise of all appropriate state and local agencies, organizations, and institutions in developing and implementing measures for mitigating these impacts. The state should provide funding to support development and on-going revision to the state Climate Change Adaptation Plan, including, but not limited to funds to support the cost-benefit analysis needed to guide and inform the development and implementation of the Plan and to cover expenses incurred by the Commission and Commission members.

The Plan should be reviewed and updated on a periodic basis (every 5-10 years) to expand or refine the Plan as necessary, to improve implementation of the Plan, and to incorporate new information as it becomes available.

The state Climate Change Adaptation Plan should include at least the following key elements:

- Comprehensive identification of potential short-term, mid-term, and long-term impacts associated with climate change in Vermont.
- Recommended steps to minimize risk to humans, natural and economic systems, water resources, temperature-sensitive populations and systems, energy systems, transportation systems, communications systems, vital infrastructure and public facilities, and natural lands (such as wetlands, forests, and farmland), and all other identified and affected sectors or areas of concern throughout the state.

- Coordination of response efforts through the appropriate state, local, and federal agencies, organizations, or other entities or initiatives.
- Characterization of the potential risks and costs of inaction, characterization of the potential costs, benefits, and co-benefits associated with specific policy and program actions, and establishment of time- and program-based goals.
- Use of cost-benefit analysis to guide and inform the development and implementation of the state Climate Change Adaptation Plan. The analysis should include, but not be limited to, an examination of the benefits and costs of adaptation measures or responses relative to a “status quo” or no-action approach, and the resources needed to implement adaptation measures in the plan. The results of the cost-benefit analysis should also be used to set priorities for addressing short-term, mid-term, and long-term impacts of climate change on citizens, ecosystems, and the economy of Vermont.
- Creation of a scientific strategy, engaging the environmentally-aware public, educational institutions and state agencies for the monitoring of climate and ecological trajectories in Vermont to inform updates to the Adaptation Plan.
- Adaptation measures that also mitigate greenhouse gas emissions should be given priority in the state Climate Change Adaptation Plan.

Goals: Create a state-sanctioned Commission on Adaptation to Climate Change to develop a comprehensive state Climate Change Adaptation Plan identifying opportunities to address adaptation issues and risks, and recommending tangible, implementable measures to mitigate these issues and risks to Vermont citizens. Conduct cost-benefit analyses comparing the potential costs of a “status quo” approach as opposed to implementing the recommendations proposed in the Climate Change Adaptation Plan. Prioritize recommendations in the adaptation plan – based on the certainty and severity of adverse impacts to citizens, ecosystems and local economies. Development of the plan should: (a) involve all affected agencies and entities at all levels of government; (b) engage all affected sectors and interests; and (c) provide for periodic review and update concerning adaptation risks, responses, and opportunities in the state.

Timing: The Commission should be established as soon as possible. The development of a state Climate Change Adaptation Plan should be completed within one year of establishing the Commission. benefit-cost analyses noted above should be conducted as a component of the plan. Parallel public education and outreach efforts regarding adaptation should commence immediately. “Low-hanging fruit” opportunities should be addressed as rapidly as feasible (even before the Commission is established, if possible), and pro-active adaptation initiatives should commence within the next 2-3 years.

Parties Involved: The Commission on Adaptation to Climate Change should involve and coordinate with all appropriate state and local agencies, organizations, and institutions (e.g., universities) to ensure that all potential impacts are identified and to ensure the successful development and implementation of the plan.

Implementation Mechanisms

- State Climate Change Adaptation Strategy. Subgroups should be formed under the Commission on Adaptation to Climate Change to address specific issues and sectors, such as societal infrastructure, agricultural and forest resources, recreational and ecological sectors.
- Public education and engagement. The involvement of the public, citizens groups, schools and colleges in the monitoring of climate and ecological trajectories in Vermont is needed to inform and update the State Adaptation Plan.
- Development of policy recommendations as necessary.
- Establishment of financial structures and creation of markets that are likely to thrive under anticipated climate impacts.

Related Policies/Programs in Place

State and local emergency management response plans are in place, which address short-term responses to natural disasters (e.g., violent storms). To the extent possible, measures recommended in the Climate Change Adaptation Plan should assist and complement these existing state and local efforts. The Vermont Institute of Natural Science (www.vinsweb.org) engages the public in the active monitoring of the environment, particularly with regard to birds and butterflies.

Type(s) of GHG Reductions

Not applicable.

Estimated GHG Savings and Costs per MtCO_{2e}

Not applicable.

Key Uncertainties

Some impacts of climate change such as species migration precipitation impacts are certain, but their specific timing and magnitude remains unclear. Other impacts are less certain and may have significant variability.

Additional Benefits and Costs

- Innovative early adaptation responses to climate change impacts can be designed to:
 - Help prevent and/or reduce costs associated with future catastrophic events and long-term climate change impacts.
 - Direct future public and private investment more effectively.
 - Ensure preparedness to help avoid extensive cost implications to state, county, city and federal agencies.
- Early preparedness can raise public awareness and encourage further greenhouse gas mitigation efforts, which can drive economic opportunities for alternative fuels, agriculture, forestry, and advanced technologies.

Feasibility Issues

None Cited.

Status of Group Approval

Approved

Level of Group Support

Unanimous consent

Barriers to Consensus

None

CC-6. Options for State Greenhouse Gas Goals or Targets

Policy Description

The GHG reduction goals established by the Executive order # 07-05 and the Vermont Legislature were to reduce GHG emissions from Vermont with this timetable: 25% below 1990 levels by 2012, 50% below 1990 levels by 2028, and 75% below 1990 levels by 2050. The policy options being considered by the GCCC-PG principally address the 2012 short-term goal and the 2028 medium-term goal because of the difficulty in quantifying policy options as far out as 2050.

Based on quantification of the policy options being considered by the PG, the short-term goal, a 25% reduction by 2012, appears to no longer be attainable on a state-wide basis, because of the short time frame between now and 2012.⁵ Although it may no longer be feasible to achieve a statewide 25% reduction by 2012, the policy options considered by the PG appear to be able to achieve (and potentially far exceed) the 50% reduction goal by 2028. The Policy Options detailed by the four technical working groups (Agriculture, Forestry, & Waste Resource Management, AFW; Energy Supply and Demand, ESD; Transportation and Land Use, TLU; Cross-Cutting Issues, CC) include policies that would reduce GHG emissions at low net cost, in many cases with substantial net savings because of the high cost of fossil fuels. Implementation would bring significant economic benefits to the Vermont economy, both by reducing fuel costs through efficiency measures, by reducing the export of capital from the state; and by stimulating the Vermont economy through the creation of jobs in energy efficiency and renewable energy development.

Policy Design

The Plenary Group recommends that Vermont comport with the Governor's and Legislature's 2012 and 2028 goals for all practical purposes by constraining cumulative GHG emissions to the area under the curve represented by these goals. This can be accomplished through reductions greater than the specified 2028 targets in order to compensate for any shortfall in 2012. Because the atmospheric lifetime of GHGs is long (decades to centuries), the cumulative burden of GHG emissions determines the degree of climate impact this century, so this approach makes sense. Additionally, the Plenary Group recommends no further delays in implementing GHG emissions reductions in order to avoid the need for steeper reductions in the future.

Vermont has historically been a leader in reducing GHG and other pollutants nationwide. Vermont's per capita GHG emissions currently stand at nearly half the national average, and are on track to drop further as RGGI, the Clean Car program, and other initiatives take effect. To

⁵ State government, through its Climate Neutral Working Group, is implementing a plan for achieving the 2012 goal. State government, however, represents only a few percent of Vermont's total emissions.

help maintain this achievement and make similar progress in the future, the Plenary Group recommends that a senior advisory body (e.g., the “State Climate Change Advisory Group” suggested in policy option CC-4) be formed to help guide and coordinate implementation strategies for GHG reduction policies including regulatory and non-regulatory initiatives.

A summary of the major current sources of GHG emissions in Vermont and the significant options for emission reductions policy options considered by the Plenary Group – as assessed by the CC TWG in considering this policy option – is attached as a separate annex to this policy option.

Goals: As noted above

Timing: ASAP

Parties Involved: State Government, municipalities, citizen’s groups, NGOs, commercial, industrial, and economic sectors.

Implementation Mechanisms

The policy option descriptions from the individual TWGs suggest specific implementation mechanisms.

Many are regulatory, requiring executive action or further legislation. However, the very scale associated with comprehensively addressing climate change suggests that there are essential non-regulatory aspects to implementation as well, such as education and engagement of the general public, municipalities, and the commercial, industrial, economic and educational sectors in the state at many levels (as discussed further in CC-4).

In all sectors, improvements in energy efficiency directly reduce fuel costs, giving rapid payback on investment to the user. However, funding the upfront costs of efficiency measures is likely to require a diverse range of innovative funding mechanisms and incentives to ensure sufficiently rapid penetration of the market to achieve the 2028 goals of a 50% reduction in GHG emissions from the state.

Related Policies/Programs in Place

GHG emission reduction goals have been established by Governor Douglas and the Vermont General Assembly.

Types(s) of GHG Reductions

All

Estimated GHG Savings and Costs per MTCO₂e

Not applicable

Key Uncertainties

None Cited

Additional Benefits and Costs

None Cited.

Feasibility Issues

None Cited.

Status of Group Approval

Pending.

Level of Group Support

TBD.

Barriers to Consensus

TBD.

CC-7. The State's Own GHG Emissions

Policy Description

State government is responsible for providing a multitude of services for the public that are delivered through very diverse operations and result in wide-ranging GHG emission activities. State government can take the lead in demonstrating that reductions in GHG emissions can be achieved through analysis of current operations, identification of significant GHG sources, and implementation of changes in technology, procedures, behavior, operations, and services provided. The state also encourages and/or incepts reductions by others in a variety of ways.

The support of broad-ranging goals for GHG reductions for state government through the Climate Neutral Working Group (CNWG) will be helpful for setting an example and building expectations, with actual reductions realized at the agency level. Disaggregating the State's own GHG emissions to the agency level and showing the result in the biennial report from the CNWG on GHG reduction progress is an effective way to measure and manage the State's emissions. A multi-agency group oversees the on-going climate efforts of state agencies, providing direction, guidance, resources, shared approaches, and recognition to agencies and employees working to reduce the State's GHG emissions.

Policy Design

The State has established GHG reduction targets for its own GHG emissions. The State's GHG reduction goals are disaggregated to individual State agencies based on each agency's contribution to the initial GHG emissions inventory of the State's emissions. The Executive Order #14-03 establishes a baseline against which agency emission reduction activities will be measured and summarized in the annual reports.

Goals: Reduce GHG emissions from Vermont state operations by 25% by 2012; 50% by 2028 and, if practical using reasonable efforts, 75% by 2050.

Timing: Future annual reports should show further progress in reducing agency GHG reductions toward the State's emission reduction goals.

Parties Involved: Coverage should include all operations of all state agencies via the members of the Climate Neutral Working Group.

Implementation Mechanisms

- Implementation may be possible – or at least assisted – by current, parallel efforts to implement the 2005 Vermont Energy Plan.
- The State should lead by example by adopting best practices across the board to serve as a model for other emitters.

- The State should frame – and target – the emission reductions called for as continuous annual improvement efforts (e.g., reducing emissions ~3% per year over the long term).
- State procurement processes should contribute substantially in assisting agency emission reduction efforts.
- Education, outreach, and marketing efforts should apply to and engage the State as well as non-governmental sources. High performing agencies should receive public recognition as well. Ways to promote greater interaction and “cross-pollination” within and among state agencies should be developed.
- Agency progress in meeting the State’s reduction targets should be one of the yardsticks by which agency performance is measured.

Related Policies/Programs in Place

- State of Vermont Climate Neutral Working Group (CNWG).
- 2005 Vermont Energy Plan
- Act 250 requirements (e.g., Criteria 9F). Legislature asked Natural Resources Board to ensure GHG issues are considered.

Types(s) of GHG Reductions

Not applicable

Estimated GHG Savings and Costs per MtCO_{2e}

Not applicable

Key Uncertainties

Future growth rate in emissions, particularly after 2020, as well as the timing and scope of implementation of the GCCC-PG recommendations for specific policy options.

Additional Benefits and Costs

None Cited.

Feasibility Issues

None Cited.

Status of Group Approval

Pending.

Level of Group Support

TBD.

Barriers to Consensus

TBD.