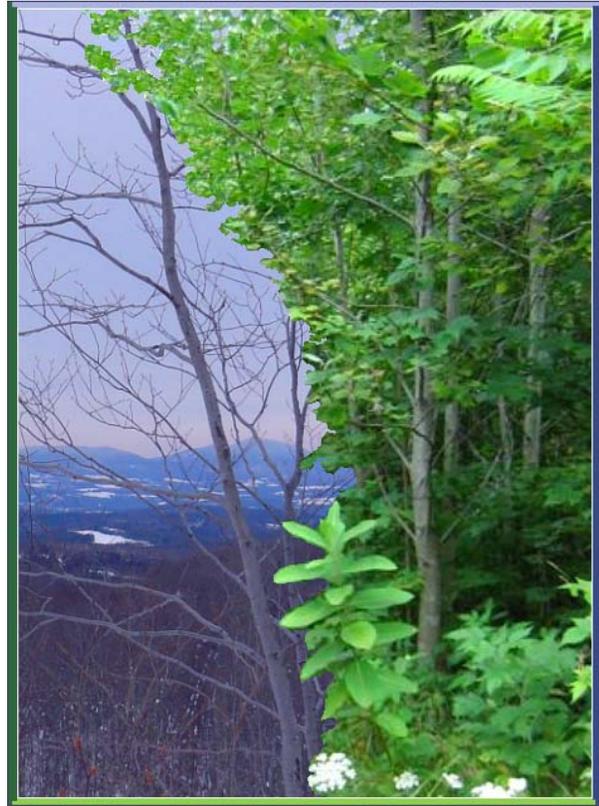


# *Climate Change Transition Team*



Proposed Draft Work Plans  
Developed from the Recommendations of  
The Governor's Commission on Climate Change (GCCC) Report



*September 2008*



# CLIMATE CHANGE TRANSITION TEAM REPORT

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## EXECUTIVE SUMMARY

Representatives from 4 state agencies (Agency of Natural Resources, Agency of Transportation, Agency of Agriculture Food & Markets & Department of Public Service), known collectively as the Climate Change Transition Team (CCTT) worked over the past 5 months to review the recommendations in the Governor's Commission on Climate Change (GCCC) Report (October 2007) and to develop work plans for each recommendation. The resulting report provides these draft work plans and also serves as a current inventory of ongoing activities and programs that either directly or indirectly address the climate change/GHG emission issue.

Of the over 260 action steps contained in the 38 GCCC recommendations, 90 (or approximately 35%) are currently being implemented at some level.

The CCTT developed the following recommendations based on the work of the past 5 months:

- **Maintain an Ongoing Workgroup:** Maintain an ongoing workgroup of individuals representing state agencies taking actions to address climate change.
- **Report Results of Actions:** Policies and actions implemented by state agencies resulting in greenhouse gas reductions from any Vermont sector should be reported to the working group to be included in an annual report.
- **Identify and Track Indicators:** Identify, track and report on indicators related to the major topics in the GCCC report
- **Biofuels Task Force:** Convene a group of individuals representing the various areas of expertise regarding biofuels to discuss, analyze and develop appropriate work plans for the use & / or production of biofuels in Vermont.
- **Establish a Vermont Climate Change Funding Source:** Establish a funding source to support climate change /GHG emission reduction activities in Vermont.

## ACKNOWLEDGEMENTS

This report would not have been possible without the cooperation and contribution of the following persons, to whom we extend our sincerest thanks:

*Rob Achilles  
Riley Allen  
Debra Baslow  
Phil Benedict  
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Veronica Metzner  
Dan Scruton  
Vicky Viens  
Sandy Wilmot  
Stephanie Zehler*

## **ABBREVIATIONS AND ACRONYMS**

AAFM – Vermont Agency of Agriculture, Food and Markets  
ACCD – Vermont Agency of Commerce and Community Development  
AFW – Agriculture, Forestry and Waste Management  
BGS – Vermont Department of Buildings and General Services  
CCTT – Climate Change Transition Team  
EEU – Energy Efficiency Utility  
ESD – Energy Supply and Demand  
DPS – Vermont Department of Public Service  
DSM – Demand-Side Management  
FCM – Forward Capacity Market  
GCCC – Governor’s Commission on Climate Change  
GHG – Greenhouse Gas  
PSB – Public Service Board  
RPS – Renewable Portfolio Standard  
SPEED – Sustainably Priced Energy Enterprise Development  
TLU – Transportation and Land Use  
VTANR – Vermont Agency of Natural Resources  
VTrans – Vermont Agency of Transportation

## INTRODUCTION

On December 13, 2007, Agency of Natural Resources Secretary George Crombie appointed Department of Environmental Conservation Air Pollution Division Director Dick Valentinetti to lead the Climate Change Transition team (CCTT) in the task of preparing a follow-up to the Governor's Commission on Climate Change (GCCC) report of October 2007. The follow-up report was to look at each of the 38 recommendations contained in the GCCC report and develop work plans for implementing these recommendations. In addition, Secretary Crombie asked that the greenhouse gas (GHG) emissions and economic data in the GCCC report be reviewed and if necessary refined using the best available data.

To accomplish this task, Director Valentinetti assembled a team of DEC staff: Carolyn Grodinsky, Winslow Ladue, Jeff Merrell, Elaine O'Grady and Brian Woods. This internal team was joined by the following representatives from across state government:

*Agency of Agriculture, Food and Markets:* Phil Benedict, Matt Kittredge

*Department of Public Service:* Riley Allen, Veronica Metzner, Dave Lamont

*VTrans:* Gina Campoli

*Department of Forests, Parks & Recreation:* Sandy Wilmot

The Climate Change Transition Team's first meeting was January 2, 2008. A draft report was delivered to Secretary Crombie on June 4, 2008. The final report was completed and published in September 2008.

## PROCESS

The team developed a three-step process to accomplish the task of developing work plans for the GCCC recommendations:

1. Based on the 38 recommendations and 262 implementation/action steps identified in the GCCC report, the team developed a template to gather information on the status of activities in each area. The template fields were:
  - Action Step Name
  - Existing Program(s) Related to Action Step
  - Why Action Needs to be taken
  - How (including additional research or other needs for implementing the Action)
  - Timeline for Implementation
  - Cost (Actual \$ or High, Medium, Low)
  - Who will the Action Step impact fiscally & programmatically (direct)
  - Potential impacts (indirect)
  - Potential co-benefits (indirect)
  - Lead Agency (and partners)
  - Measure(s) of success / goals (including GHG reduction)
  - Current status of Implementation Mechanism
  - Feasibility (High, Medium, Low ... or describe)

For each recommendation a lead agency was identified to prepare the templates (see Table 1 for list of recommendations and lead agencies). Participants were invited to revise and add action steps under each recommendation to more accurately reflect actual

or planned activities. The completed templates provided an inventory of existing and planned activities in support of the GCCC recommendations, and also identified areas where activities or programs would need to be developed in support of a particular recommendation

2. Once the templates were completed, team members used the information in them to develop outline work plans. This report contains 100 work plans. Work plan outlines included information on the activity; the authority (if any) needed to accomplish the activity; the resources necessary; an estimated total activity budget; and an outline schedule of tasks to accomplish the item.
3. A review of greenhouse gas equivalent savings and cost information was conducted. Calculated values were updated to accommodate more recent information. New calculations are provided for plug in hybrid automobiles and calculations are not included in cases where revised action steps differed greatly from those found in the original report.

**TABLE 1 – LIST OF GCCC RECOMMENDATIONS AND LEAD AGENCIES**

	<b>GCCC POLICY AREA</b>	<b>Lead State Agency in Work Plan Development</b>	<b>Other Relevant Agencies*</b>
<b>Energy Supply and Demand (ESD)</b>			
<b>ESD-1</b>	Evaluation and Continuation/ Expansion of Existing DSM for Electricity and Natural Gas	Public Service	
<b>ESD-2</b>	Evaluation and Expansion of DSM to Other Fuels	Public Service	
<b>ESD-3</b>	Building Efficiency Codes, Training, Tracking	Public Service	
<b>ESD-4</b>	Evaluate Potential for Contracting Nuclear Power	Public Service	
<b>ESD-5</b>	Support for Combined Heat and Power	Public Service	ANR, AAFM/25x25
<b>ESD-6</b>	Incentives and/or Mandate for Renewable Electricity	Public Service	ANR, AAFM/25x25
<b>ESD-7</b>	GHG Cap-and-Trade and/or GHG Tax	ANR	
<b>ESD-8</b>	Incentives for Clean Distributed Technologies for Electricity or Heat	Public Service	ANR, AAFM/25x25
<b>ESD-9</b>	Wind-Specific Support Measures	Public Service	ANR, AAFM/25x25
<b>ESD-10</b>	Hydro-Specific Support Measures	Public Service	ANR, AAFM/25x25
<b>Transportation and Land Use (TLU)</b>			
<b>TLU-1</b>	Compact and Transit-Oriented Development Bundle	ACCD / VTrans	ANR, BGS, Dept of Education
<b>TLU-2</b>	Alternatives to Single-Occupancy Vehicles (SOVs)	VTrans	Public Transit Providers
<b>TLU-3</b>	Vehicle Emissions Reductions Incentives	VTrans	ANR
<b>TLU-4</b>	Pay-as-You-Drive Insurance	ANR	BISHCA
<b>TLU-5</b>	Alternative Fuels and Infrastructure (LCFS)	ANR, Public Service	VTrans
<b>TLU-6</b>	Regional Intermodal Transportation System – Freight and Passenger	VTrans	ACCD
<b>TLU-7</b>	Commuter Choice/Commute Benefits	VTrans	ACCD
<b>TLU-8</b>	Plug-in Hybrids [part of TLU-5]	Public Service	ANR
<b>TLU-9</b>	Fuel Tax Funding Mechanism [TWG recommends examining as part of a funding package after reductions policies are chosen]	Not Assigned	Not Assigned

<b>Agriculture, Forestry and Waste (AFW)</b>			
<b>AFW-1</b>	Programs to Support Local Farming / Buy Local	Agency of Ag, Food & Markets	Forests, Parks & Rec.; ACCD
<b>AFW-2</b>	Agricultural Nutrient Management Programs	Agency of Ag, Food & Markets	ANR
<b>AFW-3</b>	Manure Management Methods to Achieve GHG Benefits	Agency of Ag, Food & Markets	ANR
<b>AFW-4</b>	Protect Open Space / Agricultural Land	Agency of Ag, Food & Markets	ANR
<b>AFW-5</b>	Forestry Programs to Enhance GHG Benefits <sup>1</sup>	ANR (Forests, Parks & Rec)	
<b>AFW-6</b>	Increased Forest Biomass Energy Use	ANR (Forests, Parks & Rec)	
<b>AFW-7</b>	Forest Protection – Reduced Clearing and Conversion to Non-Forest Cover	ANR (Forests, Parks & Rec)	
<b>AFW-8</b>	Expanded Use of Durable Wood Products (Especially From Vermont Sources)	ANR (Forests, Parks & Rec)	ACCD
<b>AFW-9</b>	Advanced/Expanded Recycling and Composting	ANR (Environmental Conservation)	
<b>AFW-10</b>	Programs to Reduce Waste Generation	ANR (Environmental Conservation)	
<b>AFW-11</b>	Waste Water Treatment – Energy Efficiency Improvements	ANR (Environmental Conservation)	
<b>AFW-12</b>	In-State Liquid Biofuels Production	Agency of Ag., Food & Markets, ANR	Public Service
<b>Cross-Cutting Issues (CC)</b>			
<b>CC-1</b>	GHG Inventories and Forecasts	ANR (Environmental Conservation)	
<b>CC-2</b>	GHG Reporting	ANR (Environmental Conservation)	
<b>CC-3</b>	GHG Registry	ANR (Environmental Conservation)	
<b>CC-4</b>	Public Education and Outreach	All State Agencies	
<b>CC-5</b>	Adaptation	All State Agencies	
<b>CC-6</b>	Options for Goals or Targets	ANR (with help from other agencies in data collection)	
<b>CC-7</b>	The State's Own GHG Emissions	BGS (CNWG)	Public Service

## RESULTS

Of the 262 action/implementation items identified in the GCCC report or as a result of this process, 90 of them are currently being implemented at some level. Following is a summary of the work performed by the CCTT, by sector as identified in the GCCC report:

### Energy Supply and Demand (ESD)

The Department of Public Service was the lead agency for 9 of the 10 recommendations in this area, and developed 34 work plans for action items identified under these recommendations. 12 work plans describe work that is currently ongoing at some level. Concurrent to this process the DPS was developing its Comprehensive Energy Plan (draft for public comment published May 2008). This plan examined ESD issues in more detail

than the CCTT effort, and identifies 6 priority policy initiatives for Vermont, the region and the nation to take to secure a more affordable, reliable and environmentally secure energy future. They are:

- Establishing and participating in well-formed regional and national markets for carbon/GHG;
- transforming the passenger vehicle fleet to higher mileage/lower emission vehicles;
- improving energy efficiency in buildings and homes;
- increasing regional cooperation and improving regional generation source diversity;
- establishing sound replacements to existing major electric power contracts; and
- increasing local and distributed energy generation infrastructure.

No template or work plan was created for ESD-7 (GHG Cap-and-Trade and/or GHG Tax) during the CCTT effort. However, as the Regional Greenhouse Gas Initiative (RGGI) evolves, it has the potential to broaden beyond the electricity generation sector into a multi-sector cap-and-trade program as described in ESD-7.

### **Transportation and Land Use (TLU)**

VTrans was the lead agency for 5 of the 9 TLU recommendations, and a relevant agency for two others. VTrans completed templates for 5 recommendations (TLU-1, 2, 3, 6 and 7), identifying 54 action steps, 35 of which have a related existing program and 12 (all in TLU-6) of which are in the planning stage. During internal discussions at VTrans that occurred as a result of participating in this process, VTrans initiated its own evaluation of Climate Change/GHG reduction issues and strategies. The results of this evaluation are presented in the "VTrans Climate Change Action Plan" (June 2008). This plan focuses on three areas: reduction of greenhouse gases from the transportation sector, protection of transportation infrastructure from the effects of climate change, and reduction in the agency's carbon footprint.

The template for TLU-4 (Pay-As-You-Drive Insurance) identified that current insurance regulations allow insurers to offer this product. Development of a more detailed work plan to encourage or provide incentives to insurers to offer this product in Vermont will require the assistance of the Department of Banking, Insurance, Securities and Health Care Administration (BISHCA)

Three work plans were developed to address the action steps identified in TLU-5 (Alternative Fuels and Infrastructure) and TLU-8 (Plug-In Hybrids). The Agency of Natural Resources was the lead agency for TLU-5, and the Department of Public Service was the lead agency for TLU-8.

A template for TLU-9 (GHG-Related Transportation Funding Mechanisms) was not developed.

## **Agriculture, Forestry and Waste Management (AFW)**

### ***Agriculture***

At the outset of this process the Department of Public Service published the "Vermont 25x'25 Initiative: Preliminary Findings and Goals" (January 2008). The 25x'25 Initiative is a national effort to achieve generation of 25% of electricity from renewable sources by the year 2025. Vermont has established a 25x'25 Steering Committee to oversee and guide progress towards this goal. The preliminary report addresses many of the issues identified in the GCCC report, including those related to agriculture such as energy crops and agricultural waste-to-energy production. This preliminary report is a first step in achieving the Vermont 25x'25 Initiative's goals. As a next step, the Vermont 25x'25 Initiative Steering Committee will develop a comprehensive roadmap and detailed work plan for achieving the Vermont 25x'25 energy production goals.

The GCCC report identified 27 action steps related to agriculture (AFW-1, 2, 3 and 4). Six work plans were developed addressing AFW-1 (Programs to Support Local Farming/Buy Local) which build on the strategies presented in the 25x'25 report. Three work plans were developed addressing AFW-2 (Agricultural Nutrient Management Programs). 19 action steps related to Agriculture were identified as ongoing at some level.

### ***Forestry***

Four recommendations (AFW-5, 6, 7, 8) relate to forested lands, forest management, and forest products. The VTANR Department of Forest, Parks and Recreation prepared templates for 23 action steps identified from the GCCC report and from their internal review of the GCCC. Of those 23 action steps, 14 were identified as existing or ongoing at some level. DFPR reviewed these action steps internally and identified 12 activities considered the highest priority activities for development of work plans (8 plans for ongoing activities and 4 for new activities). Evaluation criteria were:

1. Possible to implement over the next 1-3 years;
2. Cost effective solution to GCCC issues;
3. Essential to the success of GCCC implementation; and
4. Feasible according to FPR professional judgment.

Additional action items for carbon sequestration and forest adaptability will be pursued beyond the three-year time frame.

### ***Waste Management***

Two of the GCCC recommendations (AFW-9 [Advanced/Expanded Recycling and Composting] and AFW-10 [Programs to Reduce Waste Generation]) relate to

preventing waste generation (source reduction), and diversion (composting and recycling). ANR staff prepared 12 work plans to address these recommendations, two of which describe current activities. At the same time the Governor's Commission was meeting, ANR was convening a diverse group of stakeholders to develop a comprehensive Waste Prevention Plan. Stakeholders included Vermont businesses, manufacturers, schools, solid waste districts, citizens, environmental organizations, architects and contractors, legislators, and others. The result of this process is the report "Life Beyond Garbage: Vermont Waste Prevention and Diversion Strategies" (May 2008) which provides specific strategies that address many of the recommendations in the GCCC report. It also provides a foundation for future waste reduction efforts that will have associated greenhouse gas reduction effects.

### ***Water and Wastewater Treatment – Energy Efficiency***

AFW-11 addresses the issue of energy efficiency in water and wastewater treatment operations. The development of templates and work plans for water treatment facilities and wastewater treatment facilities was performed independently for each type of facility, and combined by ANR staff into 12 work plans for activities related to these areas.

### ***In-State Liquid Biofuels***

The final topic in the AFW sector was AFW-12 (In-State Liquid Biofuel Production. While identified as an AFW recommendation, the implementation of this recommendation (to consider incentives needed to increase biodiesel and ethanol production in Vermont) is a complex cross-cutting issue from the selection of feedstock through processing and end use that requires additional discussion by a group of experts from the state Agencies of Natural Resources, Agriculture, Transportation, Department of Public Service and the private sector.

### **Cross Cutting Issues**

Templates were developed for all seven cross-cutting issues identified in the GCCC report. Work plans for 20 activities were also developed. Eight of these activities are ongoing at some level.

### **Greenhouse Gas Emissions Reductions and Cost Data Review**

A review of greenhouse gas emissions reductions and cost-effectiveness information presented in the GCCC report was conducted to determine if updates could be made via this report. Results from this review are summarized in Table 2 below. Minor changes were made to 8 recommendations and include a first-time determination of carbon dioxide equivalent savings for plug in hybrid vehicles. Other changes generally reduce estimates of GHG savings and show slight increases in costs.

**TABLE 2 - REVISIONS IN CALCULATED GHG REDUCTIONS AND COST EFFECTIVENESS RESULTING FROM JUNE 2008 EVALUATION**

GCCC ID	Recommendation	October 2007 GCCC Report		June 2008 Update		Updated
		MMtCO <sub>2</sub> e GHG Reduction Total 2008 - 2028	Cost Effectiveness (\$/tCO <sub>2</sub> e)	MMtCO <sub>2</sub> e GHG Reduction Total 2008 - 2028	Cost Effectiveness (\$/tCO <sub>2</sub> e)	
<b>ESD-10</b>	Hydro-Specific Support Measures New Hydro, Scenario 2	2.4	-27	1.2	Net Savings	Reduced estimated developable instate hydro by about 1/2.
<b>TLU-8</b>	Plug-in Hybrids [part of TLU-5] <sup>1</sup>			0.06		New calculation
<b>AFW-2</b>	Agricultural Nutrient Management Programs	1.6	3	1.6	1.82	Updated fertilizer cost from 2004 to 2007 prices
<b>AFW-5</b>	Forestry Programs to Enhance GHG Benefits	1.3	3	1.3	14	Added cost for proposed action steps into per acre fee to develop management plans
<b>AFW-7</b>	Forest Protection – Reduced Clearing and Conversion to Non-Forest Cover	22	2	22	2	Added \$110,000 annual cost for new Action steps
<b>AFW-8</b>	Expanded Use of Durable Wood Products (Especially From Vermont Sources)	1.4				Calculation not available for alternative Action Steps
<b>AFW-9</b>	Advanced/Expanded Recycling and Composting	9.1	4	9.1		Calculation of cost-effectiveness not available at this time

<sup>1</sup> Estimated GHG Savings - Plug-in Hybrids

Data Sources:

The University of Vermont Transportation Research Center report “Plug-In Hybrid Vehicles and the Vermont Grid: A Scoping Analysis”, February 15, 2008.

Quantification Methods:

To estimate the GHG reductions associated with the use of plug-in hybrid vehicles (PHEV) we have made the following assumptions:

1. Annual average vehicle miles traveled are 12,379 miles.
2. Average fuel efficiency for a comparable internal combustion engine powered vehicle is 27.7 miles per gallon.
3. Average fuel efficiency for a PHEV is 40.4 miles per gallon and 3.49 miles per kWh.
4. Average usage consists of 60 percent electrical and 40 percent gasoline power.
5. Market penetration of PHEV is conservative with 25 vehicles in the first year, the number of rising to 1000 by 2017 and increasing at a rate of 17 % per year there after.

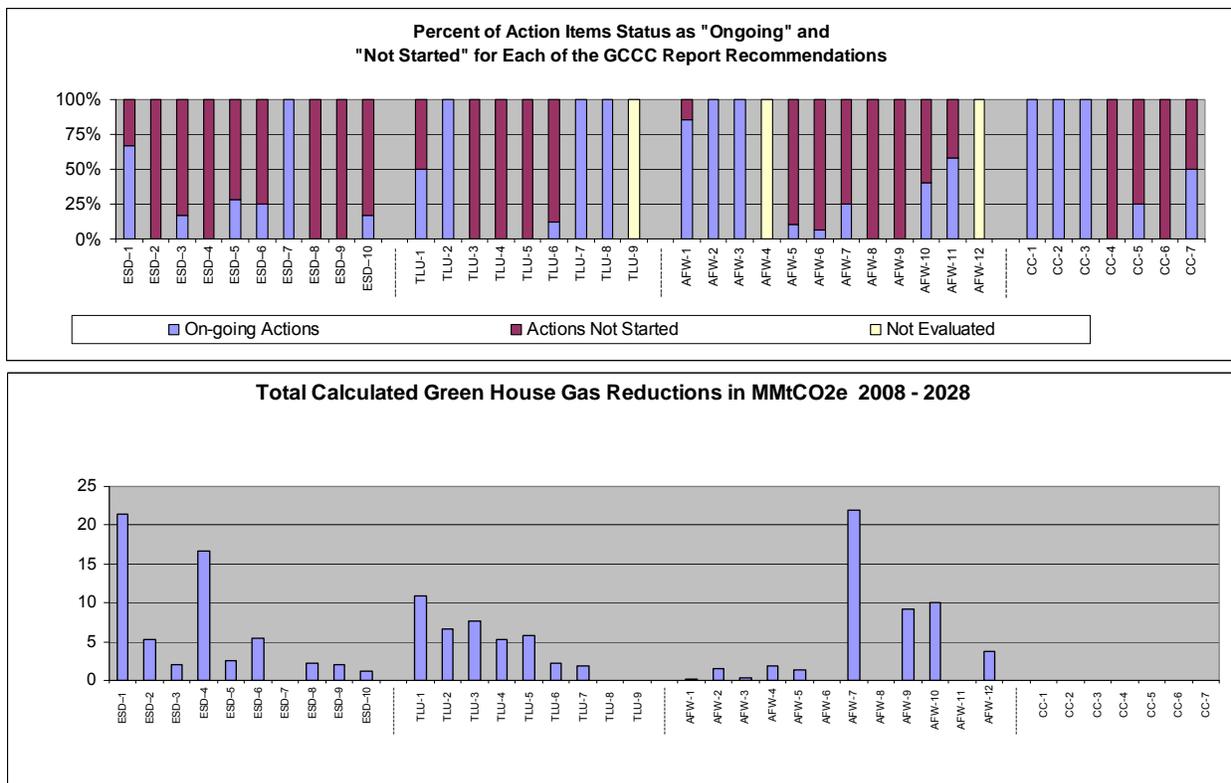
<b>AFW-11</b>	Waste Water Treatment – Energy Efficiency Improvements	0.14	-133	0.083	-133 Changed population served from whole State to those serviced by WWTFs
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This table illustrates some of the factors to be considered when evaluating action items for future implementation. Future implementation of action items should take into account multiple factors such as the greenhouse gas equivalent savings, current status of existing efforts, cost effectiveness and efficiency of actions items, and co-benefits resulting from a given action items. In some cases, the value of the co-benefits may be of equal importance to the greenhouse gas reductions for a given action item.

### Summary of Ongoing and Planned Actions

The top graph in Figure 1 (below) summarizes the status of action items for the 38 GCCC recommendations. The status is shown as the percentage of “Ongoing” and “Not Started” action items. For each recommendation the number of action items ranges from none supported to 19. As illustrated below, there are ongoing action items for 24 of the 38 GCCC recommendations. The bottom graph in Figure 1 shows the calculated GHG reductions for each of the 38 GCCC recommendations. For the 12 recommendations with projected total GHG reductions greater than 5 MMtCO<sub>2</sub>e for the period 2008-2028, 5 have ongoing actions.

**FIGURE 1 - GRAPHS OF STATUS OF ACTION ITEM IMPLEMENTATION AND TOTAL CALCULATED GREENHOUSE GAS REDUCTIONS.**



## RECOMMENDATIONS / NEXT STEPS

Based on the work performed in the preparation of this report, the CCTT recommends the following:

1. **Maintain an Ongoing Workgroup:** Maintain an ongoing workgroup of individuals representing state agencies taking actions to address climate change. Candidates for the core or initial group are the participants in the CCTT (VTANR, VTrans, AFFM, DPS) but wider participation by other state government departments and agencies should be pursued. This workgroup should be tasked with:
  - a. Coordinating with the various entities engaged in the climate change issue, including but not limited to the climate change oversight committee established in Act 209 (S.350) - AN ACT RELATING TO ENERGY INDEPENDENCE AND ECONOMIC PROSPERITY and the Vermont Climate Collaborative.
  - b. Coordinating planned state agency activities (as detailed in the various state agency plans referred to in this report) to address climate change,
  - c. Assisting in the creation of an annual summary report of current actions to reduce greenhouse gas generation, to raise awareness about climate change issues and to adapt to climate change.
  - d. Including in the annual report a summary of GHG reductions resulting from activities completed in the last year.
  - e. Recommending new actions to be taken to further address climate change.
2. **Report Results of Actions:** Policies and actions implemented by state agencies resulting in greenhouse gas reductions from any Vermont sector should be reported to the working group to be included in the annual report. This will enable the working group to maintain a comprehensive, qualitative database of information. Wherever feasible, quantitative information should also be made available to allow the working group to estimate the amount of GHG emissions reduced in the previous year, the amount of energy saved or produced, pollution reduced, public health benefit achieved, economic costs and benefits, co-benefits, other. Efforts should be made to identify data gaps, standardize and coordinate information / data collection, and reach consensus on various estimation methodologies.
3. **Identify and Track Indicators:** Identify, track and report on indicators related to the major topics in the GCCC report including but not limited to the indicators listed below. As above, efforts should be made to identify data gaps, standardize and coordinate information / data collection, and reach consensus on various estimation methodologies.
  - a. Energy Supply and Demand
    - i. Total annual GHG emissions reduced from Demand Side Management efforts
    - ii. Number of and total annual GHG emissions reduced from Combined Heat and Power systems operating.
    - iii. Total in-state generation of renewable energy (broken down by source)
  - b. Transportation and Land Development
    - i. Total annual vehicle miles traveled (VMT) in Vermont. VTrans, VTANR and DMV would coordinate data collection efforts. Sources include existing

- data from traffic counts, possible mileage and vehicle location data from motor vehicle inspections and registrations
      - ii. Annual data on the composition of the Vermont registered motor vehicle fleet (inc. make, model, vehicle type and fuel).
      - iii. Total annual number of gallons of fossil fuels and biofuels sold in Vermont for transportation and heating.
    - c. Agriculture, Forestry and Waste
      - i. Number and percent of large and medium farms with nutrient management plans
      - ii. Total number of acres in land use stabilization programs (public ownership, easements, current use, etc)
      - iii. Greenhouse gas emission reductions as determined by recycling, composting and disposal tonnages reported annually by Vermont facilities.
    - d. Cross Cutting
      - i. Total estimated annual metric tons of GHGs emitted statewide in Vermont
      - ii. Total estimated annual metric tons of GHGs emitted by State Agencies
      - iii. Total grant dollars awarded to address reductions in GHG.
      - iv. State revenue from sales taxes or other appropriate economic indicator
- 4. **Biofuels Task Force:** Convene a group of individuals representing the various areas of expertise regarding biofuels to discuss, analyze and develop appropriate work plans for the use and / or production of biofuels in Vermont.
- 5. **Establish a Vermont Climate Change Funding Source:** Establish a funding source to support climate change/GHG reduction activities in Vermont. Track potential federal, state and private sources of funds and make applications for available funds. As appropriate, establish a grants program to fund activities within Vermont to address climate change.

## **REFERENCED REPORTS**

- Final Report and Recommendations of the Governor's Commission on Climate Change (2007)
- Vermont 25X'25 Initiative – Preliminary Findings and Goals (Vermont Department of Public Service – January 2008)
- Vermont Comprehensive Energy Plan – Public Review Draft (Vermont Department of Public Service – May 2008)
- VTrans Climate Change Action Plan (Vermont Agency of Transportation - June 2008)
- Life Beyond Garbage: Vermont Waste Reduction and Diversion Strategies (Vermont Agency of Natural Resources - May 2008)

## **APPENDICES**

### **TEMPLATES**

- Energy Supply and Demand (ESD)
- Transportation and Land Use (TLU)
- Agriculture, Forestry and Waste (AFW)
- Cross Cutting Issues (CC)

### **WORK PLANS**

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## TEMPLATES

Recommendation Name	Action Step name	Existing Program(s) related to Action Step?	Why Action needs to be taken	How (including additional research or other needs for implementing the Action)	Timeline for implementation	Cost (Actual \$, or H/M/L)	Who will the Action Step impact fiscally & programmatically (direct)	Potential Impacts (indirect)	Potential co-benefits (indirect)	Lead Agency (and partners)	Measure(s) of success / goals (including GHG reduction)	Current status of Implementation Mechanism	Feasibility (H/M/L ... or describe)	
ESD-1: Evaluation and Continuation/Expansion of Existing DSM for Electricity and Natural Gas	1. Improve electric energy efficiency programs.	Electric efficiency potential study (EEPS) was completed in 2006. Market evaluations conducted by DPS currently underway for both residential and commercial sectors	To ensure adequate funding, sound and appropriately focused program design, and ongoing delivery of electric and gas efficiency programs to capture all reasonably available cost-effective energy efficiency potential.	1) Revisit and challenge key technical assumptions and drivers associated with electric efficiency programs and budgets by conducting thorough energy efficiency potential and market studies (EEPS) on a regular interval 2) Continue to adjust efficiency funding levels to achieve all cost effective electric efficiency.	Every 3-5 years under current structure - potential study required roughly every three years for budget setting process, market evaluation done every three years	EEPS: \$120k Market evaluations cost part of EE Charge	Ratepayers	Informs direction on future Energy Efficiency spending		DPS/PSB, partnering with EEU(s)	Efficiency Utility program verification reveals that all cost effective energy efficiency is being adequately captured. Efficiency Utility program verification ensures that all claimed efficiency savings are actual. Measure of success is meeting and exceeding performance goals set by the PSB informed by negotiations between EEU and PSB	1) In 2006 an EEPS was conducted and lead to a requirement that by 2008, Vermont expenditures on electric sector energy efficiency will increase to \$30.75 million per year. 2) Currently the PSB is exploring program implementation mechanisms alternative to and modification of the efficiency utility. 3) Currently, market evaluations ongoing, required every three years by PSB. These evaluations inform the goals, budgets, and efficiency potential studies into the future.	Managing contractors who conduct EEPS requires substantial state oversight.	
	2. EEU Restructuring -Work to make the EEU contract selection process fair and explore ways to further institutionalize the role of the EEU.	The Public Service Board is currently conducting workshops to explore various mechanisms under which energy efficiency services can be delivered in Vermont.	To ensure the most effective efficiency program delivery.	The PSB workshops are considering a longer term commitment to the EEU in the form of a franchise more similar to a traditional regulated utility.	On-going	Unclear but should be fairly small given the avoided costs of existing process.		Ratepayers - however changes in ratepayer charges and program design can be made independent of structure	Constant re-bidding for the EEU contract may create instability/insecurity and prohibit the Vermont EEU from bidding in the ISO-NE forward capacity market.	Energy efficiency programs become more cost effective over time.	DPS/PSB	A potential new structure could lower the administrative costs of the EEU for rebidding contract as often, allowing funds to be expended to save more kW and kWh. Could be measured by lower per kWh cost for efficiency savings, or more savings acquired	Ongoing.	EEU structure does not necessarily equate perfectly to traditional utility, parties need to work out differences
	3. Geotargeting Monitor and evaluate geotargeted areas.	The PSB has ordered that increased funding for the EEU be directed at specific areas of the state that are in need of substantial electric transmission facility upgrades.	To ensure future investment is aimed at the areas of the state that have the greatest electric transmission constraints.	Increased program funding levels of the Efficiency Utility are being directed toward specific Geographically Targeted ("GT") areas of the state that are forecasted to need costly investments in transmission facilities in the near future. Vermont System Planning Committee ("VSPC") established to monitor and assist progress.	On-going	Varies??		Ratepayers	Efficiency funds may not be distributed to ratepayers equitably.	Reduction in costs for building transmission reduces utility costs and electric bills for all ratepayers.	DPS/PSB	Peak load growth in geotargeted areas is flat or negative. System upgrades are deferred or avoided.	Four areas of the state – St. Albans and vicinity, northern Chittenden County, Newport / Derby, and the southern portion of Vermont from Bennington to Manchester to Brattleboro (known as the "Southern Loop") – have been chosen as pilots for the Geotargeting program. Vermont regulators recently established a central planning and coordinating body known as the Vermont System Planning Committee ("VSPC") that is charged with, among other things, the systematic and strategic use of energy efficiency investments through GT programs to avoid or defer transmission investments.	Availability of EEU to deliver significantly increased services in a short time-frame. Verification of utility savings from GT programs separate from verification of base programs.
	4. Forward Capacity Market (FCM) Continue assisting efficiency programs that participate in the FCM.	Vermont is currently working with other states in the region to establish regional standards for measurement and valuation (M&V) of efficiency programs that participate in the market.	To ensure that there is adequate installed capacity to meet future demands for electricity.	The Public Service Board has initiated a process to determine the appropriate allocation for the market payments that will be received for the capacity benefits of EEU programs	On-going	Returns to ratepayers for participating in the FCM are expected to become net positive in 2008		Ratepayers			DPS/PSB	Meeting the committed savings for the FCM	The FCM currently includes energy efficiency resources as an eligible component of the resource base. The EEU has participated in the first FCM Auction completed 2/6/08 and transition payments have been received by the EEU. To date, payments have been less than costs; however in 2008 net revenues are expected to exceed costs for the first time.	FCM process is in its infancy, still working out the "bugs"
	5. Natural Gas Efficiency Study VGS should be required to periodically complete a natural gas efficiency potential evaluation that is independently reviewed by the DPS or its experts.	Rough calculations of expected efficiency savings are included in the VGS IRP. The next IRP is due in 2008.	Currently the state is not required to do a comprehensive review of the efficiency potential study conducted by VGS.	No specific efforts are currently in place. The requirement would need to be established by the public service board. The DPS would then be directed to conduct a study/evaluation.	By 2010			Natural gas utility and ratepayers.			DPS/PSB	Increase energy efficiency potential estimate and increased spending on natural gas energy efficiency.		Pushback from VGS on additional reporting requirements?
	6. Natural Gas DSM Verification The state should conduct a verification examination of VGS' DSM savings claims.	"Energy Extenders," the DSM efforts of VGS have received awards from the US EPA.	There is no regularly required independent examination of VGS' savings claims.	No efforts are currently in place. The requirement would need to be established by the public service board. The DPS would then be directed to conduct a verification process.	By 2010	\$100k-200k		Ratepayers, natural gas utility.			DPS/PSB	Energy efficiency program budgets are achieved and cost effective energy efficiency potential reached.	Currently, there are no requirements for periodic completion or assessment of VGS' energy efficiency potential studies, nor any independent verification of their savings claims.	
ESD-2 Evaluation and Expansion of DSM to Other Fuels	Expand All Fuel Efficiency Programs	All Fuels Efficiency Study, RAP "Affordable Heat" report.	(1) Acquire "whole building/all fuels" energy efficiency; (3) increase efficiency of home heating fuel use; (4) expand weatherization assistance.	Authorize establishment of a statewide all-fuels efficiency utility. Consider funding from public, private and utility sources, easy-to-use loan programs to assist customers in making upgrades.	Achieve a 12% energy consumption reduction by 2016 and a 29% consumption reduction by 2028.		The PSD All Fuels study concludes that \$14.9 million/year will be needed to run an EU. The RAP study suggests funding levels starting at \$1.7 million/year and increasing to \$24 million/year will be needed between 2009 and 2017.	State of VT, residential, commercial and industrial consumers of heating fuels.	Displaces alternate uses of potential revenue sources	PSD, Certain Utilities, EEU, Weatherization, Community Action Agencies	Fuel consumption reductions and GHG emissions reductions; savings noted above.	The 2008 Energy Efficiency and Affordability Act (Act 92) established a fuel efficiency fund administered by the PSB to support delivery of energy efficiency services to heating and process consumers of oil, kerosene, propane, coal, and wood; and to carry out efficiency measures and greenhouse gas reductions from energy consumption sectors other than natural gas and electric. It also created a heating and process fuel efficiency program similar in function to the existing program for electricity.	Coordinating a thermal energy program across agencies and multiple stakeholders, program development	
ESD-3A Improved (Energy) Building Codes	1. Improve [energy]building codes for the residential and commercial building sectors.	Vermont Residential Building Energy Standards 21 V.S.A. Section 266; Vermont's Commercial Building Energy Standards 21 V.S.A. Section 268; US Environmental Protection Agency (EPA)'s Energy Star Program. City of Burlington multi-family housing time-of-sale energy requirement; Burlington Electric Department and EVT provide statewide energy efficiency services that are funded by an EEC on electric utility bills. Burlington Electric Department and Efficiency Vermont can provide technical assistance and incentives to help the industry meet or exceed building codes. VGS provides technical assistance and incentives to help the industry meet or exceed building codes.	To: 1) Reduce building maintenance costs 2) improve comfort and public health 3) enhance worker productivity 4) decrease local air pollution 5) stimulate economy 6) reduce energy costs 7) reduced GHG emissions 8) increase in-state jobs in the energy efficiency industry.	Support legislation which would require automatic updates of Vermont's Residential Building Energy Standards (RBES) and Commercial Building Energy Standards (CBES), based on updates to national energy codes (IECC or ASHRAE 90.1).	Within three months of a national code update, Vermont's Energy Codes should be updated (with approval by DPS) to reflect any increased efficiency requirements contained in the national update. Then three months after the Vermont update, the new Vermont Energy Code will go into effect. This would, in total, be a six month update cycle from release of the new national energy code.		Low - No funding mechanism needed for code updates. Evaluation studies would likely cost between \$100-500 thousand.	DPS, PSB, Legislature (rule making process), Building Contractors and designers	Increase in construction costs	DPS, PSB, BGS, EEU, VGS, BED, architects, engineers, contractors, builders, mortgage lenders, and legislators.	1) Reduce costs associated with energy efficiency programs and the burden that is placed on ratepayers to support those programs; 2) Internalize efficiency costs into the housing market.	The 2008 Energy Efficiency and Affordability Act (Act 92) states that the DPS shall promptly amend Vermont residential and commercial building energy standards upon issuance of updated standards under the International Energy Conservation Code.	Potential sellers, buyers, and real estate agents currently have no programs to become educated about the new codes which may cause delays.	
	2. Evaluate more advanced building codes than current standards	See ESD-3a (1)	See ESD-3a (1)	Evaluate current building codes, compliance and efficiency potential and develop a plan for creating more ambitious Vermont specific building codes based on a set of targets such as the Architecture 2030 initiative.	Study or evaluation conducted over 4-8 months	Mid	DPS, PSB, Legislature (rule making process), contractors and designers	1) Out of state builders may find it difficult to understand and comply with Vermont codes. 2) Imported pre-fabricated homes may not meet code requirements.	See ESD-3a (1)	See ESD-3a (1)		The 2008 Energy Efficiency and Affordability Act (Act 92) states that the DPS shall promptly amend Vermont residential and commercial building energy standards upon issuance of updated standards under the International Energy Conservation Code. S.339 called for the RBES to be amended to meet entry level requirements under the EnergyStar rating system, and also proposed a study of options to enhance the CBES, but the bill did not make it out of committee (Senate Natural Resources and Energy) in the 2008 session.	See ESD-3a (1); Contractors and Designers need predictability in the codes in order to plan/prepare/design buildings	
	3. Evaluate time-of-sale requirements	See ESD-3a (1)	See ESD-3a (1)	3) Evaluate implementation of a time-of-sale energy disclosure and/or requirement for existing buildings to ensure structure efficiency will be brought up to an improved level before ownership is transferred.	Study or evaluation conducted over 3-5 months	Low	DPS, PSB, Legislature (rule making process)	A time-of-sale energy requirement would impose new burden that is likely to fall on pre-existing homeowners.	See ESD-3a (1)	See ESD-3a (1)		Time-of-sale requirements were proposed in the 2008 legislative session but were not included in the final versions of either the Energy Efficiency and Affordability Act or the Energy Independence and Economic Prosperity Act.	If this requirement was passed without ensuring a sufficient workforce was in place or transition timeframe to complete the work it could greatly impact sale of the homes and rentals by delaying sale.	
ESD-3B Building Commissioning	Building commissioning.	Efficiency Vermont provides statewide energy efficiency services that are funded by an EEC on electric utility bills. Efficiency Vermont can provide funding for building commissioning and building recommissioning.	1) To provide assistance to owners of buildings with more than 5,000 square feet; 2) To help building owners reduce energy usage in their buildings by ensuring that buildings are operating at peak efficiency; 3) To help building owners benchmark their buildings' energy use, identify high-use buildings, and allow prioritization of funds to improve energy efficiency where it is most needed; 4) To develop and implement an inspection for commissioning on a regular yearly basis or multiyear interval.	Create an entity to 1) deliver building design and construction training with other state agencies and groups; 2) investigate ways to supplement or improve existing training programs and 3) institute a building commissioning, building recommissioning, energy tracking and benchmarking program for builders, contractors, building managers, enforcement officials and others.	Into operation in coordination with ESD-3a and ESD-3c	Medium-High ?	DPS, PSB, ??	Funding the entity may defer monies away from efficiency programs.	Provide more concrete data for developing efficiency potential estimates and more accurate EEU budgets.	PSD, engineers and architects.	Building code compliance	The 2008 Energy Efficiency and Affordability Act (Act 92) updates the CBES certification requirements, adding a certification for construction and amending the design certification requirements.	A building commission would require a significant level of funding to be effective.	

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<b>ESD-3C Building Efficiency Codes, Training and Tracking</b>	Building efficiency codes, training, tracking.	Trade groups for builders, architects, engineers, electricians, plumbers, and heating, ventilation, and air conditioning (HVAC) contractors provide training sessions for their members; High schools or vocational centers offer training programs for building trades. The EEU provides statewide energy efficiency services that are funded by an EEC on electric utility bills. Efficiency Vermont has provided training for contractors and builders on energy efficient construction.	To develop and implement energy efficiency training and education programs for public and private sector actors who are involved in promulgation, implementation, and enforcement of building codes.	1) Develop and deliver training with other industry groups to assess ways to supplement or improve the training that already exists in the State. 2) Assist preliminary studies of energy optimization options and providing support for the design team and the owners. 3) Submit a report to the PSD on a yearly basis to outline what has been accomplished and the goals for the following year. 4) The PSD will also perform random inspections to ensure compliance by the entity.	Policies could be implemented in a timely manner to place this option into operation in coordination with ESD-3a and ESD-3b.	Medium-High?	DPS, EEU	Funding the entity may defer monies away from other efficiency programs.	Providing training in-state may help to boost the green job economy and establish in-state building expertise.	Vermont Department of Public Service, Efficiency Vermont, Vermont Gas Service, Burlington Electric Department, architects, engineers, contractors, builders, mortgage lenders, legislators, high schools, vocational schools, and adult education programs.	An increase in the number of contractors available for building efficiency work. Building code enforcement results in a higher level of code compliance.	The 2008 Energy Efficiency and Affordability Act (Act 92) states that the DPS shall promptly amend Vermont residential and commercial building energy standards upon issuance of updated standards under the International Energy Conservation Code.	A building commission would require a significant level of funding to be effective. There are currently not enough contractors in the state to perform enforcement work in a timely fashion.
<b>ESD-4 Evaluate Potential for Contracting Nuclear Power</b>	Recontract Vermont Yankee power	Integrated Resource Planning, NRC relicensing procedures, DPS Studies pursuant to Act 170	Nuclear power plants do not emit carbon dioxide (CO2) during plant operation. A new contract with Vermont Yankee would likely be for significantly less power than the current obligation. Increasing Vermont's reliance on nuclear power is one of the most cost effective ways to procure a low carbon source of energy. Continued operation of Vermont Yankee would provide significant economic/ratepayer benefits tied to revenue sharing agreements embedded in existing sale agreements.	Options for increasing nuclear power reliance would be to diversify the nuclear portfolio through additional contracts trades, or swaps. These options can be developed by the purchasing utilities or by Vermont Yankee as its contract offer to Vermont. Including outage insurance in the contract could also help to mitigate exposure. The Vermont Yankee plant must receive a license extension from the NRC. Per agreement, the Vermont legislature must approve the license extension. The Vermont PSB must issue a certificate of public good for any continued operation of the facility. Vermont utilities must agree on contract terms that are acceptable to all parties and that provide sufficient benefit to justify continued operation of the plant.	Timing: The current Vermont Yankee contract expires in 2012. Vermont Yankee must also renew its operating license well prior to 2012. The Vermont General Assembly is likely to vote before 2010 on whether or not the Vermont PSB should issue an order to approve or deny a new CPG for Vermont Yankee.	Low or net benefit-Nuclear power is likely to be cost competitive. Agreements and other factors suggest net ratepayer value from certification.	Vermont ratepayers, State of Vermont, Vermont utilities, the public.	Increased storage of nuclear waste in Vermont, ongoing accident concerns.	Less expensive, stability priced source of electric energy for Vermonters.	DPS, ANR.	Vermont utilities negotiate a long term contract with VT Yankee or other nuclear supplier for power at or below market price.	Contract negotiations with major VT utilities are ongoing. S 364 - AN ACT RELATING TO A COMPREHENSIVE VERTICAL AUDIT AND RELIABILITY ASSESSMENT OF THE VERMONT YANKEE NUCLEAR FACILITY was passed by the Vermont Legislature in April 2008. The primary purpose of the audit is to address the operational reliability of the plant. Preparations for the audit are currently under-way with a January 30, 2009, deadline for the the public oversight panel to report its findings and evaluation to the general assembly.	(1) Opposition to nuclear power in state; (2) Perceived or real deterioration of VT Yankee; (3) Lack of federal commitment to the storage of nuclear waste in a central location.
<b>ESD-5 Support for Combined Heat and Power</b>	Implement CHP projects in VT.	The EPA CHP Partnership, Vermont Clean Energy Development Fund, related programs also currently exist in CA, CT, NY, NC, TX.	CHP provides reliable distributed and generally efficient electric energy and heating.	1) Identify suitable host facilities; 2) allow energy utilities to sell CHP output to third-party customers; 3) Include consideration of CHP potential in decisions regarding expansion of natural gas in VT; 4) Provide appropriately tailored incentives, such as shared cost studies, that remove barriers for CHP; 5) consider appropriate adjustments to the EEU budget to include appropriate incentive funds for residential and commercial CHP projects; 6) address regulatory barriers to distributed CHP projects	Timing: Increase CHP generation in VT by appropriate MW by 2028. (preliminary target of 60 MW)	Low - Identify CHP projects when cost effective.	State of VT, natural gas companies, suppliers of forestry products, fuel oil companies, consumers.	If funds from the EEU's current budget are used, monies may be diverted away from other efficiency investments for which they were intended.	Lower energy prices, more efficient generation, ability to diversify utility sources	PSD, ANR, AAFM, PSB, EEU (currently under consideration)	MW of CHP generation. Location of CHP in targeted areas.		Finding suitable host locations
<b>ESD-6 Incentives and/or Mandate for Renewable Electricity</b>	1. Expand voluntary green pricing programs.	Both of Vermont's largest investor-owned utilities have programs. The Central Vermont Public Service (CVPS) program "Cow Power" now has more than 2% of its customer base participating in the program (as of mid-2006). The Vermont legislature is now considering requiring that all utilities establish similar programs and make them available to all consumers.	To enable individuals and business to purchase renewable electric power to be distributed by the electric utility.	The serving utility fulfills this obligation through the purchase of RECs in the same manner as the RPS. However, under a voluntary purchase arrangement, only participating customers are charged for the renewable premium.	In progress	No material program costs. The price of REC's purchased is market based.	Electric utilities, participating consumers	Higher rates for participating customers	Voluntary programs may help Vermont achieve SPEED, 25X25 or other RPS goals.	DPS, PSB, Electric Utilities	Emissions impacts of the new portfolio fuels are less than those of purchases of electricity from the ISO New England system. The ISO system emissions factor is 0.63 tCO2/MWh	Legislative proposals to require of all Vermont utilities	Marketing/streamlined program that is uniform across the state.
	2. SPEED (Sustainably Priced Energy Enterprise Development) Program Implementation	Continue to implement the Sustainable Priced Energy Enterprise Development (SPEED) Program, accounting for interactions with other states renewable programs.	To enable Vermonters to reduce all forms of fossil-fueled consumption	Implement the SPEED goals for Vermont utilities to engage in long-term contracts for SPEED-eligible resources??	All load growth by 2012	Low	Ratepayers, Electric Utilities	Some risk that SPEED resources may not be eligible for RECs as defined by other states	RPS programs and goals in other states. Renewable project developers to the extent that it helps encourage local utilities to buy power from their projects.	DPS, PSB, Utilities	More renewable power production within Vermont	SPEED program established on Act 61 of 2005	Risk adverse determination by neighboring states that may impact ability of developers to sell RECs in neighboring states.
	3. Consider establishing a renewable portfolio standard (RPS)	1) Clean Energy Development Fund; 2) transparent and timely interconnection standards for small and renewable generation; 3) various modifications to the net metering programs in Vermont and 4) related tax policies 5) At present, four of Vermont's New England neighbors and New York possess an RPS requiring that a certain percentage of sales be attributable to new renewable resources. Efforts are underway at the regional level to further harmonize the RPS requirements of states with an RPS. The promotion of new contracts with renewable energy resources through the SPEED Program	To enable Vermonters to reduce all forms of fossil-fueled consumption	The Vermont RPS could be met by 1) in-state renewable resources, 2) MWh from contracted out-of-state renewable resources, or 3) certificates purchased from the REC market.	Scenario 1 (If today's current hydro/nuclear commitment continues): By 2012 RPS = 17% by 2028 RPS =25%; Scenario 2 (If today's current hydro/nuclear commitment is halved) : By 2012 RPS =20% by 2028 RPS=45%.			See ESD-6-1	The price of RECs may become prohibitively high. Renewable resources may not be competitively priced or may not be able to fulfill resource reliability objectives. At present, all five of Vermont's New England neighbors and New York possess an RPS requiring that a certain percentage of sales be attributable to new renewable resources. Efforts are underway at the regional level to further harmonize the RPS requirements of states with an RPS.	Efforts are underway to further diversify the regional resource mix, including strengthening transmission inter-tie capabilities between Canada and New England. The decisions that Vermont makes with respect to new resource contracts can, in turn, positively impact the character of decisions within the ISO New England region.	DPS, PSB, Utilities, legislature	RPS is achieved.	Triggered by the failure of SPEED program goals in 2012. RPS has been reviewed by the Public Service Board in early part of this decade.
<b>ESD-8 Incentives for Clean Distributed Technologies for Electricity or Heat</b>	Establish incentives to reduce or displace the use of oil in the RCI sector by encouraging clean consumer technologies for electricity and heat	The Clean Energy Development fund provides monies to a variety of small scale electric facilities.	Reduce dependence on high carbon fuels for electricity and heat generation.	1) Incentives to support clean consumer technologies to displace the use of oil; 2) Incentives to support the conversion to lower carbon fuels (i.e. - natural gas). 3) An analysis of the expansion of natural gas and its rate implications will be needed.	As soon as possible.	High	Residential, commercial and industrial consumers.	????	The GCCC suggests the following benefits: Benefits related to clean consumer technologies: unsure at this point. Benefits from the expansion of natural gas to displace oil usage: Fuel transportation emissions reductions, availability of natural gas efficiency programs, comparatively high efficiency of natural gas equipment, support of economic development in VT, increased property tax base.	PSD, ANR, AAFM.	Reductions in the use of higher carbon fuels (oil). Growth in the use of natural gas and clean consumer technologies such as solar hot water, PV and wind.	Act 92 creates an all fuels efficiency utility which would provide incentives for such technologies.	Future fuel uncertainties, capital infrastructure costs

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<b>ESD-9 Wind-Specific Support Measures</b>	Encourage Wind Generation in Vermont	SPEED, federal tax incentives for investment in wind-generating facilities, ambiguous rate-making proceedings which allow for the recovery of power supply costs	To help meet the goals of the two scenarios described in ESD-6.	1) Consider amendments Act 250 permit and Title 30, Section 248 VSA provisions requiring the generation permit and regulatory approval process to be completed within defined timeframes of submission of the application; 2) encourage Utility investment in or contractual commitment to purchase generation.	The GCCC describes the following options for wind power generation based on events described in ESD-6. Scenario 1: 2012 (19 MW), 2028 (94 MW), Scenario 2: 2012 (54 MW), 2028 (279 MW).	High?	Developers of wind generating facilities, State of VT, utilities, consumers of retail electricity.	Environmental, unstable generation?	ISO NE purchase reductions, clean energy generation, stable resource.	DPS, PSB	MW of wind generation brought online and reductions in power purchases from ISO NE.	Currently 4 MW of wind generation in VT.	Current public opposition to wind project development. Mitigating the potential environmental impacts on birds and bats.
	<b>ESD-10 Hydro-Specific Support Measures</b>	1. Develop a comprehensive guide to small hydropower development in Vermont	VT DEC Hydrology program provides assistance to applicants and has produced some literature that would serve as a foundation for this guide	The guide would provide information to help prospective developers understand the economic and environmental issues associated with small hydropower projects, the regulatory system, and how to make a very preliminary assessment of whether a given site is economically viable	Initiate RFP process	When funding is available.	Estimated at \$35,000	Action will assist applicants considering small hydro projects and assist ANR and DPS in providing advice.		Developed small hydro sites at environmentally and economically appropriate sites	ANR, DPS and PSB	Completed guide	Not started
2. Conduct prefeasibility assessments for public and private projects and resource assessments (i.e., electrofishing) for municipal/public projects.		VT ANR programs provides assistance to applicants	To identify the environmental issues associated with hydropower when a site is first proposed for development.	Use existing ANR staff	Underway	NA	ANR funds this effort which benefits public and private applicants	ANR staff time spent on other environmental programs may be decreased	Rate payer benefitting from increased generation of renewable energy from hydropower	ANR	Developed small hydro sites	Ongoing	High
3. Update the 1980 New England River Basins Commission study to identify the most viable sites for small hydropower development at existing dams		VT DEC Hydrology program	To identify sites most suitable for the development of hydro power	Temporary staff at ANR	When funding is available.	Estimated at \$55,000	Action will assist applicants considering small hydro projects		Developed small hydro sites at environmentally and economically appropriate sites	ANR	Completed study and report	Not started	High - pending available funding
4. Examine possible ways to better integrate the FERC and ANR permit processes for small, low-impact hydroelectric projects.		VT DEC Hydrology program	To better integrate the FERC and ANR permit processes for small, low-impact hydroelectric projects	Use existing ANR staff	Underway	NA	Action will assist applicants considering small hydro projects	ANR staff time spent on other programs may be decreased		ANR	Completed evaluation	Underway	High
5. Determine amount of additional generation that can be produced at existing hydroelectric facilities that currently meet Vermont Water Quality Standards through equipment upgrades and operational changes.			To increase the amount of generation at existing facilities in an environmentally sound and fiscally responsible manner.	DPS work with utilities and other generators	As soon as possible.	NA	Existing hydroelectric facilities owners	DPS staff time spent on other programs may be decreased	Rate payer benefitting from increased generation of renewable energy from hydropower	DPS	Increased capacity at existing facilities	Not started	Medium
6. Convene a public stakeholder process of interested parties to review existing and proposed conservation flow standards and to issue recommendations to the Natural Resources Board regarding the need to amend the conservation flow standards.		VT Natural Resources Board Stakeholder-Hydroelectric Interested Parties Process (SHIPP)	Legislative mandate	Stakeholder process of interested parties		NA	Action may assist applicants considering small hydro projects	ANR, PSB, DPS and NRB staff time spent on other programs may be decreased	Rate payer benefitting from increased generation of renewable energy from hydropower	Natural Resources Board, ANR, DPS, PSB, USEPA, USFWS, Environmental Groups, utilities and hydropower advocates	Completed review process and implemented recommendations	Underway	High
7. Report on the cost of a study of alternative aquatic habitat study methodologies.		VT Dept. of Fish and Wildlife Fisheries Program	Legislative mandate	Use existing ANR staff	Report due to legislative committee by January 15, 2009	NA	ANR	ANR staff time spent on other environmental programs may be decreased		FWD	Completed report	Underway	High

CCTT - Work Plan Template for TLU-1: Compact and Transit-Oriented Bundle	Action Step name	Existing Program(s) related to Action Step?	Why Action needs to be taken	How (including additional research or other needs for implementing the Action)	Timeline for implementation	Cost (Actual \$, or H/M/L)	Who will the Action Step impact fiscally & programmatically (direct)	Potential impacts (indirect)	Potential co-benefits (indirect)	Lead Agency (and partners)	Measure(s) of success / goals (including GHG reduction)	Current status of Implementation Mechanism	Feasibility (H/M/L ... or describe)	
	<b>TLU-1.1 - Provide Resources for Municipalities to Plan</b>													
	TLU-1.1a - Carry out the recommendations of the Growth Center Natural Resource Lands "working group" and staffing.										Need input from ACCD			
	TLU1.1b - Support the Growth Center Planning Coordination Group										Need input from ACCD			
	TLU1.1c - Assist municipalities in identifying and adopting planning principles and programs to reduce GHG emissions such as appropriate growth center densities and growth management techniques.										Need input from ACCD			
	<b>TLU-1.2 - Strengthen state-level planning, decision-making, and relevant programs to support municipalities with the necessary facilities, infrastructure and services (such as transportation, wastewater, and education) to manage growth and reduce GHG emissions</b>													
	TLU-1.2a -Direct wastewater spending, new school construction dollars, and transportation enhancement dollars to downtown areas and growth centers as described in current funding regulations and policies	Yes - Wastewater Rules, Growth Center Program	State infrastructure investment helps guide where development takes place and in the case of wastewater helps determine allowable density	Adhere to relevant state-level policies, practices, rules and statues in place.	Next 5 years	Costs to amend rules as needed and admin. changes in agencies	VTrans, DEC, Dept of Education, municipalities school boards, developers, property owners				VTrans, DEC, Dept of Education, ACCD	Amount of new state investment in downtown areas and growth centers	Uncertain	
	TLU-1.2b - Maintain as possible existing state buildings and schools and locating new state buildings and schools in downtowns and growth centers	Yes	Maintain state building investments in downtowns and growth centers	Amend state-level policies, practices, rules and statues as needed	Next 5 years	Costs to amend rules and admin. changes in agencies	BGS, Dept of Education, municipalities and school boards	Expense (and possible energy efficiency issues) associated with operating, maintaining and upgrading existing buildings	Preservation of historic buildings; increased viability of downtowns/growth centers	BGS, Dept of Education	Number of school and state buildings in downtown areas/growth centers		Uncertain	
	TLU-1.2c - Target downtown areas, growth centers, and commuter routes as transit priority areas	None yet - discussions are underway within VTrans and with transit providers	Transit should be targeted to more dense urban areas where it's most viable	Discussions are underway within VTrans and with transit providers	Next 2 years	None	VTrans, transit providers, transit riders, employers	Directs resources away from rural transit	Enhances viability of housing stock, commercial areas that are served by public transit	VTrans, transit providers, FTA	Transit ridership numbers increase		Feasible	
	TLU-1.2d - Consider carbon-neutral requirements for all development projects receiving state funding	No	Provide incentives to the private sector for carbon neutral development, thus being a catalyst for green development including smart growth	Review requirements that evaluate carbon neutrality for businesses, developers and others receiving various forms of state aid.	Next 5 years	?	All agencies involved in funding infrastructure and other programs	Additional cost may discourage otherwise desirable development		Perhaps ACCD?	Number of carbon-neutral development projects assisted		Uncertain	

	Action Step name	Existing Program(s) related to Action Step?	Why Action needs to be taken	How (including additional research or other needs for implementing the Action)	Timeline for implementation	Cost (Actual \$, or H/M/L)	Who will the Action Step impact fiscally & programmatically (direct)	Potential impacts (indirect)	Potential co-benefits (indirect)	Lead Agency (and partners)	Measure(s) of success / goals (including GHG reduction)	Current status of Implementation Mechanism	Feasibility (H/M/L ... or describe)	
CCTT - Work Plan Template for TLU-1: Compact and Transit-Oriented Bundle	TLU-1.2e - Continue funding for the VHCB at present statutory levels to develop housing in downtown and growth center locations and conserve farmland.	Yes - VHCB is an independent, state-supported funding agency providing grants, loans and technical assistance to nonprofit organizations, municipalities and state agencies for the development of perpetually affordable housing and for the conservation of important agricultural land, recreational land, natural areas and historic properties in Vermont.	VHCB runs successful programs that support smart growth	VHCB continues its work at current levels potential budget issues	?	?	VHCB			VHCB	Number of housing projects in downtown locations; acres of farmland preserved		Uncertain	
	<p><b>TLU-1.3 - Set transportation policy aimed at balancing the rehabilitation and maintenance of existing highway infrastructure and planning for alternative modes in the future to help alleviate present and future capacity needs with practical new capacity projects and planning.</b>                      No specific recommendations in the report for how this will be achieved.</p>													
	<p><b>TLU 1.4 - Break down silos among agencies; creating state-municipal and public-private partnerships; and working together on common goals related to areas such as transportation planning, resource protection, and housing and community development</b></p>													
	TLU-1.4a - Implement the Act 200 planning process requiring coordination among state agencies' and among the state's and regional and municipal plans and the development of accountable strategies in all plans to achieve the Act's planning goals.	None - Act 200 requirements are not being implemented	Coordinated state/regional/municipal plans are needed to implement a vision of small town and urban centers surrounded by farm and forestland	Implement Act 200 as described	1-5 years		?	ACCD and all state agencies required to plan under Act 200, regional planning commissions, municipalities			ACCD	Act 200 approved plans at the state, regional and municipal levels.		Uncertain
	TLU-1.4b - Create transportation plans focused on corridors served by transit to promote growth center development. Planning process includes all stakeholders, especially landowners, developers and local decision makers. One outcome - a program to encourage developers to help pay for transit or the examination of tax policy for land on versus off transit lines.	Yes	Comprehensive corridor planning considers all mode choices and has the potential to serve growth centers well and encourage innovative funding transit solutions	VTrans, the CCMP and the regional planning commissions reconsider how they undertake corridor plans	1-5 years	Some additional federal transportation planning dollars?		VTrans, CCMP, the RPCs, municipalities along planning corridors			VTrans	Number of corridor plans completed as described in the recommendation		Feasible
<p><b>TLU-1.5 - Reform the existing regulatory systems to support the growth of alternative modes, improve the review of energy impacts of new development, and consider the principles of carbon neutrality for development projects in the future</b></p>														
TLU-1.5a - Strengthen Act 250 Crit. 5 (traffic) to support multi-modal options including site design standards that allow for transit and bike/ped circulation.	Yes - S.350 (2008) amends 19 VSA 2310 to make it state policy to maintain or improve existing road surfaces for bicycles and pedestrians	Crit. 5 considers traffic impacts and does not consider how other modes may be affected by development proposals	Act 250 statute changes or rulemaking	1-2 years	None anticipated		Developers			Natural Resources Board, VTrans	Statute/ rulemaking complete		Uncertain	

	Action Step name	Existing Program(s) related to Action Step?	Why Action needs to be taken	How (including additional research or other needs for implementing the Action)	Timeline for implementation	Cost (Actual \$, or H/M/L)	Who will the Action Step impact fiscally & programmatically (direct)	Potential impacts (indirect)	Potential co-benefits (indirect)	Lead Agency (and partners)	Measure(s) of success / goals (including GHG reduction)	Current status of Implementation Mechanism	Feasibility (H/M/L ... or describe)
CCTT - Work Plan Template for TLU-1: Compact and Transit-Oriented Bundle	TLU-1.5b - Establish a task force to examine how the smart growth planning principles identified in Act 183 and carbon neutrality concepts might be incorporated in the Act 250 review process.	None	Make Act 250 a catalyst for supporting smart growth	Natural Resources Board convenes a task force to determine the feasibility of Act 250 statute and rule changes as needed	1-5 years	?	Municipalities, developers, Natural Resources Board and District Commissions, state agencies			Natural Resources Board	Task force completes its work		Uncertain
	TLU-1.5c - Encourage state agencies and other Act 250 statutory parties to establish project review guidelines related to energy efficiency, smart growth and rural lands protection under criteria 9(B) - primary agricultural soils, (C) - productive forest soils, (H) - the cost of scattered development, (J) - public utility services, and (L) - rural growth areas.	None yet, but Act 176 of 2008 (H.863) establishes a multi-sector smart growth study committee to report on this issue. Report is due January 15 2009.	Incorporate smart growth and energy efficiency principles, already allowed under the Act, in the Act 250 review process	Through the current state agency involvement in Act 250	?	?	Developers, Natural Resources Board, ANR, PSD, VTrans, ACCD			Natural Resources Board, ANR, PSD, VTrans, ACCD			

CCTT - Work Plan Template for TLU-2: Alternatives to Single Occupancy Vehicles

Action Step name	Existing Program(s) related to Action Step?	Why Action needs to be taken	How (including additional research or other needs for implementing the Action)	Timeline for implementation	Cost (Actual \$, or H/M/L)	Who will the Action Step impact fiscally & programmatically (direct)	Potential impacts (indirect)	Potential co-benefits (indirect)	Lead Agency (and partners)	Measure(s) of success / goals (including GHG reduction)	Current status of Implementation Mechanism	Feasibility (H/M/L ... or describe)
<b>TLU-2.1 - Transit</b>												
TLU-2.1a - Create a transit system that is easy to use and affordable and serves downtown, growth centers, major employers and major highway corridors with a goal of 15-minute headways throughout these areas and 30-minute headways elsewhere, as appropriate	Yes	Transit system needs to be targeted to certain areas and provide sufficient service to be successful	Find efficiencies in the current system – efforts underway in VTrans to do this. Revenues are not available to make meaningful improvements. Find new funding sources to sustain programs over time.	?	Need input from VTrans Transit Program	VTrans, transit providers, transit users, employers, municipalities			VTrans	Number of routes created as described		Uncertain
TLU-2.1b - Maximize the capacity of existing public transit programs by using performance evaluations of existing transit routes and cost of service data to guide and evaluate public transit services and invest or reinvest in services that have greatest potential to reduce VMT.	Yes	Improve efficiency of the transit delivery system	Find efficiencies in the current system – efforts underway in VTrans	Efforts are underway and expected to continue for the next couple of years	Need input from VTrans Transit Program	VTrans, transit providers, transit users, employers, municipalities			VTrans	Service that meets performance measures		Feasible
TLU-2.1c - Use existing public transit organizations to evaluate, coordinate, and plan services to get more people on to one ride, whether that is a volunteer driver vehicle, a van, or a bus.	Yes	Deliver human service-related transit services more efficiently	Discussions in place with the legislature, providers and advocacy groups	Efforts are underway and expected to continue for the next couple of years	Need input from VTrans Transit Program	VTrans, transit providers, transit users, employers, municipalities			VTrans, transit providers, transit users, employers, municipalities	Increased public transit ridership		Feasible
<b>TLU-2.2 Rideshare</b>												
TLU-2.2a - Continue and expand the state park&ride program and encourage park&ride use and facilities at the regional, municipal, and neighborhood levels.	Yes - Municipal Park&Ride	Park&ride facilities are needed for alternative modes to function	Continue and expand state and municipal park&ride programs. Encourage other park&ride programs through RPCs and local energy conservation initiatives.	Ongoing	Need input from VTrans P&R Program	VTrans, RPCs, municipalities			VTrans, RPCs, towns	Increase in the number of park&ride facilities		State and muni P&R - Feasible Other P&R programs - Uncertain
TLU-2.2b - Configure the state rideshare program to better promote and market both carpooling and vanpooling under a statewide coordinated interregional program.	Yes - Vermont RideShare	Make the VTrans vanpool and rideshare programs more effective	This is occurring under the VTrans Go VT program	Ongoing	Need input from VTrans Transit Program	VTrans, transit providers, employers			VTrans	Increases in the number of rideshare matches and vanpools created		Feasible
<b>TLU-2.3 Biking and Walking</b>												
Incorporate appropriate bicycle and pedestrian accommodations into VTrans projects, programs, and actions.	Yes	Maintain VTrans commitment to serving bikers and pedestrians	Included in current VTrans bike/ped plan	On-going	?	VTrans, municipalities schools, bike/ped interests			VTrans	Bike and pedestrian facilities associated with the state highway system are maintained and increased		Feasible
Sustain current state, regional, and municipal programs to encourage walking and bicycling as a means of transportation.	Yes		Included in current VTrans bike/ped plan Safe Routes to School Program			VTrans, municipalities schools, bike/ped interests			VTrans	Increase in the numbers of people using biking and walking as a means of transportation		Feasible
Promote the incorporation of pedestrian and bicycle considerations into municipal town plans and expand and/or implement regional bicycle and pedestrian plans.	Yes	Land use and local road planning occurs at the local and regional levels	Included in current VTrans bike/ped plan, work with RPCs and municipalities	Ongoing	Need input from VTrans Bike/Ped Program	VTrans, municipalities schools, bike/ped interests			VTrans	Number of plans including bike/ped considerations		Feasible
<b>TLU-2.4 Planning, Marketing and Public Outreach</b>												
Provide incentives and fund Transportation Management Association and guaranteed ride home programs	Yes - Chittenden County Mu	Need input from VTrans Transit Program										
Coordinate rideshare, transit, park-and-ride, bike-pedestrian, and interstate transportation planning and investment at the state, regional, and municipal levels.	Yes	Need input from VTrans Transit & TPI Programs, the MPO and RPCs										
Develop statewide GIS database available to the traveling public that coordinates all transportation options. Include Web-based access to all modes and all inter-connection opportunities.	Yes - GO-VT	Increase information and marketing to public regarding non-SOV travel options	Underway through GO-VT	Ongoing	Need input from VTrans Transit Program	VTrans, Connect VT, travelers, tourists			VTrans, Connect VT?	Website is up, running and used by travelers and non-SOV trips increase		Feasible
Develop & fund marketing strategies promoting alt. modes (e.g., Way to Go Commuter Challenge)	Yes - Way to Go Commuter Challenge	Marketing is critical to increasing ridership and reducing SOV trips	Maintain or increase marketing dollars and strategies Support Way to Go	Ongoing	Need input from VTrans Transit Program	VTrans, MPO, transit providers, Amtrak			VTrans	Marketing campaigns and events with proven results		Feasible
Provide incentives to employers and individuals who encourage or use rideshare, vanpool transit, and other alternative modes. <b>(More options are included in TLU-7.)</b>	Yes - private sector, UVM	Employers and individuals need incentives such as tax credits or other benefit programs to boost use of alternative modes	Many options from tax credits for employers to free bus passes for employees or prizes	Ongoing	?	VTrans, employers, transit providers			VTrans	Number of companies/individual benefiting from incentives programs.		Feasibility dependent on extent of the incentive. More costly = less likely

CCTT - Work Plan Template for TLU-3: Vehicle Emissions Reduction Incentives	Action Step name	Existing Program(s) related to Action Step?	Why Action needs to be taken	How (including additional research or other needs for implementing the Action)	Timeline for implementation	Cost (Actual \$, or H/M/L)	Who will the Action Step impact fiscally & programmatically (direct)	Potential impacts (indirect)	Potential co-benefits (indirect)	Lead Agency (and partners)	Measure(s) of success / goals (including GHG reduction)	Current status of Implementation Mechanism	Feasibility (H/M/L ... or describe)
		A monetary incentive and/or disincentive to encourage the purchase of more efficient vehicles, discourage the purchase of inefficient vehicles, and help encourage a market for more efficient vehicle technology. Could be revenue neutral or raise revenues for alternative modes and efficiency programs.	No programs in place.	To provide purchase incentives and disincentives to increase the efficiency of the VT fleet and help change the market for more efficient vehicles	Disincentive mechanisms are opposed by the administration due to penalties for those who need larger, lower fuel economy vehicles for work or family. Not clear on basis for determining efficiency or where mechanism will be put in place – sales tax or registration fee? Recommendations considered at the regional level through the NEGC/ECP	?	Some analyses by DMV regarding program costs	Any one purchasing a vehicle, automotive industry, car dealers, DMV, VTrans		Improvement in air quality due to reduction in criteria and hazardous air pollutants. Will save consumers money at the gas pump.	VTrans, ANR	?	No programs yet in place, although VT Legislature is investigating.

CCTT - Work Plan Template for TLU-4: Pay-As-You Drive Insurance	Action Step name	Existing Program(s) related to Action Step?	Why Action needs to be taken	How (including additional research or other needs for implementing the Action)	Timeline for implementation	Cost (Actual \$, or H/M/L)	Who will the Action Step impact fiscally & programmatically (direct)	Potential impacts (indirect)	Potential co-benefits (indirect)	Lead Agency (and partners)	Measure(s) of success / goals (including GHG reduction)	Current status of Implementation Mechanism	Feasibility (H/M/L ... or describe)
		Pay-as-you-drive (PAYD) pricing converts a portion of insurance to a variable cost with respect to vehicle travel, so premiums are directly related to mileage	Current state insurance regulations allow PAYD insurance, but it is not currently offered in state.	PAYD makes insurance more actuarially accurate and allows motorists to save money when they reduce their mileage. Changes fixed costs of automobile ownership to incremental costs directly related to mileage driven. Reduces the cost differential between a SOV trip and a public transit trip. Provides a direct financial reward for individuals who reduce VMT.	Implementation of PAYD is dependent upon private sector initiative, driven in part by market forces.	Unknown - BISCHA has been approached by one company regarding this product, but there are no firm plans as of May '08.	?	Consumers, Insurance Industry	Unknown effect on insurance company revenue	Vehicle tracking technology (GPS) records not only mileage but driving behavior, which may lead to safer driving.	BISCHA, insurance companies	?	Under current regulations PAYD is allowed

CCTT - Work Plan Template for TLU-5: Alternative Fuels and Infrastructure	Action Step name	Existing Program(s) related to Action Step?	Why Action needs to be taken	How (including additional research or other needs for implementing the Action)	Timeline for implementation	Cost (Actual \$, or H/M/L)	Who will the Action Step impact fiscally & programmatically (direct)	Potential impacts (indirect)	Potential co-benefits (indirect)	Lead Agency (and partners)	Measure(s) of success / goals (including GHG reduction)	Current status of Implementation Mechanism	Feasibility (H/M/L ... or describe)
		Increase market penetration of low-carbon fuels in VT via a low-carbon fuel standard (LCFS)	None	Increased use of low-carbon fuels will result in reduced net GHG emissions	1) Use information and education outreach to focus on voluntary methods of low-carbon fuels expansion. 2) Provide technical assistance through vehicle dealers, consumer technical support groups, fuels trade and advocacy groups and public demonstrations. 3) Evaluate reduction or elimination of the motor fuels tax on biodiesel and ethanol (E85). 4) Set up pilot and demonstration renewable fueling stations which dispense B20 biodiesel, E85 ethanol. 5) Continue to support R&D projects for renewable fuels.	Reduce GHG intensity of transportation fuels by 2% by 2010, 5% by 2015 and 10% by 2028.	Unknown	Fuel retailers, wholesalers, business owners, municipal and institutional fleet managers, car dealers, biofuels producers, private vehicle owners	Increased demand for biofuels under a LCFS may result in higher costs if supply is limited. Could be addressed by a cost trigger that suspends LCFS at a specified price.	Incentive for continued R&D into low-carbon fuel production technologies (e.g. cellulosic ethanol, algal fuels)	ANR (lead), DPS, federal government, private partners	Decrease the net life-cycle carbon in Vermont's total transportation fuels by 10% by 2028	The Energy Policy Act of 2005 established a RFS for gasoline sold in the U.S. The Energy Independence and Security Act of 2007 sets requirements for the use of renewable transportation fuels. CA has adopted the basic outlines of a LCFS that may serve as a model.

CCTT - Work Plan Template for TLU-6. Regional Intermodal Transportation System – Freight and Passenger	Action Step name	Existing Program(s) related to Action Step?	Why Action needs to be taken	How (including additional research or other needs for implementing the Action)	Timeline for implementation	Cost (Actual \$, or H/M/L)	Who will the Action Step impact fiscally & programmatically (direct)	Potential impacts (indirect)	Potential co-benefits (indirect)	Lead Agency (and partners)	Measure(s) of success / goals (including GHG reduction)	Current status of Implementation Mechanism	Feasibility (H/M/L ... or describe)
	Replace Amtrak engines with more efficient DMUs (Diesel Multiple Units)	Still in planning	Cheaper and more efficient engine technology	Need input from Vtrans Rail Division	?	Need input from Vtrans Rail Division	VTrans, Amtrak			VTrans	DMUs purchased and running	Plan to replace recently faltered due to contract requirements imposed by the legislature	
	Improve the frequency of service and travel time of Vermont's current Amtrak routes	Still in planning	Increase in passengers requires improved service	Need input from Vtrans Rail Division									
	Increase the marketing of the state's current Amtrak routes	Yes - but potential funding challenges	Increase in marketing needed to increase passenger numbers	Identified in Sec. 45 report. Need input from VTrans Rail Division.									
	Expand passenger rail service to Vermont's western corridor	In long-term planning	There is no N-S passenger rail service	Identified in Sec. 45 report. Need input from VTrans Rail Division.									
	Improve intercity bus service throughout the northeast region	In long-term planning		Sec. 45 Study									
	Improve intercity bus service in the Rt. 7 corridor through public-private partnerships	Yes - VT Transit		Sec. 45 Study									
	Improve passenger rail connections to Montreal and Boston	In long-term planning		Sec. 45 Study - 2007 Rail Plan									
	Determine the demand necessary to justify commuter rail service in certain corridors and work to provide the service, including piggybacking commuter and intercity rail services	In long-term planning		Sec. 45 Study									
	Provide adequate intermodal (e.g., transit, bike, pedestrian, and shuttle bus) connections at all railroad stations, airports, and bus stops	In long-term planning		Sec. 45 Study -Connect VT - Go VT									
	Target improved RR station and airport intermodal connections for large institutions, companies, and the VT travel industry	In long-term planning		Sec. 45 Study									
	Provide parking facilities at RR and bus stations and airports	In long-term planning											
	Improve rail infrastructure to serve all freight needs (double-stack on the western corridor)	In long-term planning											
Identify and provide necessary freight modal transfer stations within Vermont and the region	In long-term planning		2007 Rail Plan										
Work w/ municipalities to plan and regulate land use to serve rail and bus infrastructure & service	In long-term planning												

CCTT - Work Plan Template for TLU-7: Commuter Choice/Commuter Benefits	Action Step name	Existing Program(s) related to Action Step?	Why Action needs to be taken	How (including additional research or other needs for implementing the Action)	Timeline for implementation	Cost (Actual \$, or H/M/L)	Who will the Action Step impact fiscally & programmatically (direct)	Potential impacts (indirect)	Potential co-benefits (indirect)	Lead Agency (and partners)	Measure(s) of success / goals (including GHG reduction)	Current status of Implementation Mechanism	Feasibility (H/M/L ... or describe)
	<p>Note this recommendation repeats many of the TLU 2 recommendations and should be merged. State encourages and supports action by others (including large businesses and existing and proposed Transportation Management Associations (TMAs) to put transportation demand management (TDM) strategies and other programs in place to reduce single occupancy vehicle travel. TDM Strategies and other programs may include, but not be limited to the following below:</p>												
	State employee parking management and incentive programs	Way to Go Commuter Challenge	State government can lead by example and can also test particular parking management programs			Low to Med	State government, state employees	The Inter-agency Climate Neutral Working Group has struggled with state government implementing CB. Difficult challenges associated with lack of transit options, HR policies (telecommuting) and negotiated benefits.	Collateral VMT reduction benefits as CB-recipients use transit more outside the commute				Feasible
	Parking priority for low-GHG vehicles (car/vanpools, and low-GHG SOVs)	Van-pool and carpool parking is currently designated on Waterbury state campus	Provide an incentive to commuters for utilizing these preferred commuting modes/vehicles	Designate preferred parking areas for qualifying vehicles				Designated non-SOV parking may exacerbate parking shortages in particular locales if not utilized.	Collateral VMT reduction benefits as CB-recipients use transit more outside the commute	For state property: BGS For non-state property: Facility owners or managers	Reduced SOV commuting	Preferred van-pool and carpool parking is currently designated on Waterbury state campus	Feasible
	Providing employer education and technical assistance, especially for large employers, including the State of Vermont	Yes	Organizations need information regarding various CC/CB programs, and the benefits of offering such programs to the employee, the organization and to air quality			Low?			Collateral VMT reduction benefits as CB-recipients use transit more outside the commute	?	All VT employers over 50 employees offer Commuter Benefits (CB) programs		Feasible
	Improve broadband telecommunication facilities	E- State initiative Vermont Rural Broadband Project	Enhance telecommuting opportunities	DPS "Access for All: Meeting Vermont's Broadband and Wireless Goals" (Feb 2007) recommends 1) creation of a telecommunication authority; 2) facilitation of wireless infrastructure permitting; 3) Broadband provider registration that allows these providers transportation rights-of-way and utility pole access at the same rates as certificated telephone and cable companies; 4) clarifying the role of electric utilities in telecommunications; 5) disclosure of broadband expansion plans by large providers (e.g. Verizon); and 6) closer coordination with federal funding programs.	Universal availability of broadband (as well as cellular) service by 2010	?		Wireless tower siting has historically been a controversial issue	Potential for increased economic activity in all corners of the state	DPS Verizon RCC/Unicel Fairpoint local telephone companies	Universal availability of broadband (as well as cellular) service by 2010		Feasible
	Work to have towns revise parking policies/requirements (See TLU-1)	Yes - in some towns											
	Reducing parking availability and increasing cost	Yes - UVM, City of Burlington	Less parking is an incentive to SOV alternatives	Only feasible in denser urban areas where parking is costly and at a premium and solid transportation alternatives are in place. Not many places in Vermont with the exception of Burlington, the UVM campus, and other core areas such as Montpelier. Controversial and difficult for commercial interests and their customers. Downtown areas become less competitive with commercial suburban areas with free and plentiful parking	Ongoing	?	Employers, Businesses, downtown commercial areas	Visitors and shoppers may avoid downtown areas in favor of suburban shopping centers if parking is too limited or price is prohibitive	Increased use of public transit to access downtown areas	MPO, VTrans, municipalities	Institutions and businesses with parking reductions in place and excellent transportation access		?
	Free or reduced cost transit passes	Yes - UVM, National Life, GMCR	Needed to encourage transit use	Who pays? Makes sense if transit use reduces parking demand -- adequate transit service must be in place	Ongoing	Varies depending on number of users and cost of trips	Employers, transit providers			MPO, VTrans, transit providers	Number of employers providing transit passes		Feasible
	Guaranteed ride home	Yes	Considered necessary to increase participation in rideshare programs	Guaranteed ride home is currently offered in the state rideshare program	In place now	Cost negligible	Transit providers, VTrans			VTrans			Feasible
Telecommuting	Yes - state lead is in developing adequate telecommunication infrastructure to allow other organizations, businesses to implement telecommuting	Working at home is an alternative to driving to work	Ability to put in place varies depending on the function and policies of the employer. Adequate broadband and other internet services are required	Already implemented by select businesses	Potential to save money for businesses, improvements to broadband network may be needed	Employers, employees	More connectivity could result in easier outsourcing of particular kinds of work	Increased telecommuting opportunities may work to retain or attract high-skilled workers	ACCD, Business groups	Number of businesses and other organizations with telecommuting programs in place	Varies by industry, but likely increasing	Feasible	
Marketing commuting alternatives to employers and employees	Yes - VT Way to Go, Rideshare	Way to Go Week, Go Vermont, Rideshare Program outreach is in place and underway	Way to Go Week, Go Vermont, Rideshare Program outreach is in place and underway	Ongoing	?	Employers and employees			VTrans, MPO, transit providers	Increased participation in rideshare, transit, bike/ped as a means of commuting		Feasible	
State of Vermont leads by example in its operations	Climate Neutral Working Group	State is mandated in executive order to do this and it's the right thing to do	To be defined by the CNWG?	?	Depends on type and scope of actions	State of VT, employees			CNWG and all agencies	Number of employees commuting via non-SOV		Feasible	

CCCTT - Work Plan Template for TLU-8: Plug-in Hybrids	Action Step name	Existing Program(s) related to Action Step?	Why Action needs to be taken	How (including additional research or other needs for implementing the Action)	Timeline for implementation	Cost (Actual \$, or H/M/L)	Who will the Action Step impact fiscally & programmatically (direct)	Potential impacts (indirect)	Potential co-benefits (indirect)	Lead Agency (and partners)	Measure(s) of success / goals (including GHG reduction)	Current status of Implementation Mechanism	Feasibility (H/M/L ... or describe)
	<p>Basic research on feasibility and impacts</p>	<p>On December 11, 2007, the UVM Transportation Center hosted a seminar to unveil the results of research on the capacity of Vermont's electric grid to absorb 50,000 100,000 and 200,000 Plug in Hybrid Electric Vehicles. The research was conducted by a team of UTC researchers led by Dr. Richard Watts and sponsored by the UTC and Central Vermont Public Service, Green Mountain Power Corporation and the Burlington Electric Department. Research is ongoing.</p>	<p>PHEVs have significant implications for many aspects of the existing electric system that need to be better understood.</p>	<p>In process</p>	<p>Studies/research are in process, first production line vehicles likely in 2010</p>	<p>Low over time and if done properly/May create significant net benefits</p>	<p>AOT, DPS, Electric Utilities, Participating consumers/Electric Utilities/Electric Utility consumers</p>	<p>Coal use by electric utilities may undercut environmental gains unless there is a national cap and trade system</p>	<p>Electric ratepayers, automotive consumers</p>	<p>DPS Universities Electric Utilities</p>	<p>2015 substantial new car sales share with plug in hybrids</p>	<p>Studies in progress</p>	<p>Feasible</p>
<p>Support and promote the use of <b>plug-in hybrid</b> technology vehicles in VT.</p>	<p>Automakers are designing PHEVs that should be in production in the two year timeframe. PHEV retrofit kits are currently available for HEVs. CVPS has 2 Toyota Prius' which have been converted to PHEVs.</p>	<p>Reduce fossil fuel demand for transportation.</p>	<p>Smart metering and time-of-day electric rate schedules which allow vehicles to be charged during off-peak hours when prices are lowest.</p>	<p>Mass consumer availability of PHEVs is expected by 2010</p>	<p>PHEVs are expected to be initially more expensive than traditional gasoline vehicles.</p>	<p>State of VT, car dealers, private vehicle owners, fleet managers.</p>	<p>Higher demand on electric infrastructure.</p>	<p>Take advantage of time-of-day electricity pricing, lower vehicle emissions, lower transportation fuel prices.</p>	<p>PSD, ANR.</p>	<p>Avoided fossil fuel use, number of plug-in hybrids sold.</p>	<p>Plug-in hybrid prototypes have been developed and should soon be in production.</p>	<p>Feasible</p>	

Recommendation Name	Action Step Name	Status / Existing Programs	Why Action Needs to be Taken	How, including additional research needs	Timeline & over how long a time period	Cost (high, medium and low)*	Who will the Action Step impact fiscally and programmatically	Potential Impacts (Indirect)	Potential Co-Benefits (Indirect)	Who: Lead and partners	Measure(s) of success (including GHG reduction)	Feasibility
<b>AFW-1 Local Foods - VAAFAM has promoted local purchasing for many years; a specific Buy Local program has existed since 2003</b>												
1. Establish & promote a virtual farmers' market to help boost sales	1.) Provide online links to existing food directories & support community groups in developing these directories 2.) Partner with organizations currently developing online ordering models to determine their potential 3.) Work with VT distributors to incorporate online local food ordering into their existing systems	Yes - Virtual market not currently available, but options being worked on.	Difficulty in ordering and / or obtaining information on available local products throughout the year is a barrier to local food use, particularly by large purchasers (e.g. cafeterias).	Expand information available on Agency of Agriculture webpage; meet with distributors to determine current status, and future opportunities, for online ordering; through the Farm-to-Government initiative, work with large scale purchasers to meet their needs for streamlined ordering.	Three years for initial systems to come online.	Medium	Food purchasers, distributors, sellers	May impact distribution system - depends on how orders are handled & delivered or picked up	Pre-order and tracking systems for online sales can help in planning for year-round availability	VAAFAM, organizations currently developing specialized systems (Vermont Fresh Network, New England Grassroots Environment Fund, ACoRN), distributors	Development of online system; Shifts in local food purchasing by individual buyers before & after system; increasing usage rate	High
Explore barriers & obstacles on production side	Expand outreach efforts in communities, with consumer groups, at conferences and working days, etc. Other action steps, for example in meat processing, will address barriers in particular production areas.	Yes - Current, ongoing work	Demand and supply issues for local foods are constantly evolving. This action step recognizes that outreach currently exists, but could increase, particularly in areas outside the Montpelier-Burlington region.	1.) Continue existing programs for outreach. 2.) Visit communities around the state to hear about challenges & opportunities 3.) Partner with New Farmer Network in their new evaluation program for new farmer needs	Ongoing	Low	Producers, Technical Assistance & service providers for farmers	N/A	Information can benefit municipal & regional planners, conservation organizations, and educators	VAAFAM with NOFA, UVM Extension, VFB, New Farmer Network, Sustainable Agriculture Council, and all other interested groups	N/A	High
Expand Meat Production and Self-Sustaining Cold & Warm Weather Products	1.) See processing units recommendation 2.) Support year-round sales venues for local foods, e.g. winter farmers' markets, CSAs, local food in "conventional" outlets (cafeterias, grocery stores, etc.) 3.) See waste heat recommendation	Yes - Current, ongoing work	Significant increases in local food consumption will require more products available outside of the normal growing season. While initial recommendation focuses on production, markets are added here to ensure a profitable connection to consumers.	1.) Provide advertising support for winter-focused local food sales outlets. 2.) Through initiative expanding government-related local buying, develop best practices for bringing local foods into new, year-round venues like cafeterias, institutions, healthcare facilities. 3.) See also online market rec. for example, systems to communicate demand for cold weather products in time for farmers' to plan planting, processing, storage.	Ongoing; initial results in state government initiative within 2 years	High for facility construction; medium for marketing; Medium / Low for marketing	Producers, state purchasers & state-related organizations that purchase local foods (Farm-to-State)	Environmental impacts depend on how meat raised & how / whether it displaces plant-based components of diets. Season extension should not replace goal to increase knowledge of how to eat w/ the seasons.	Business opportunities in meat processing, building season-extending structures (greenhouses, cold frames, etc.). Year-round availability helps customers get into permanent habit of eating locally, boosting summertime sales along with winter.	VAAFAM, see also partners for online ordering & waste heat use	Growth in # of year round farmers' markets & CSAs; growth in institutional and retail buyers signing year-round agreements; see processing & waste heat recommendations	High

CCTT - Work Plan Template for AFW-1 - Buy Local

Recommendation Name	Action Step Name	Status / Existing Programs	Why Action Needs to be Taken	How, including additional research needs	Timeline & over how long a time period	Cost (high, medium and low)*	Who will the Action Step impact fiscally and programmatically	Potential Impacts (Indirect)	Potential Co-Benefits (Indirect)	Who: Lead and partners	Measure(s) of success (including GHG reduction)	Feasibility	
CCTT - Work Plan Template for AFW-1 - Buy Local	Support location of <b>food processing, storage and distribution</b> centers to serve the region's needs	1.) Continue technical assistance for groups proposing projects in processing, storage and distribution. 2.) Provide communities already emerging as local food centers with resources for comprehensive planning that includes infrastructure. 3.) See mobile processing recommendation	Yes - Current, ongoing work	Local food systems needs aren't only in production, but also greater capacity to get food to customers, in the necessary form, and throughout the year. Including support for community planning ensures facilities can respond to local demands / supply / challenges and may open additional grassroots-level projects (for example shared root cellar space)	1.) VAAFM to provide technical assistance to private plans for processing / storage / distribution and plans such as Governor's proposed enterprise kitchens. 2.) Develop pool of funds and a "train the trainer" program for assisting communities in strategic "food center" planning.	Ongoing; mobile units pilot finished in 1 year, town planning pilot in 3 years	Medium / High	VAAFM, municipal government / planning organizations (regional & local), community service organizations dealing with food access	Some systems of processing & storage could demand more energy than transportation from warmer regions (including if transportation systems like rails or alternative fuel vehicles become more popular).	Commercial scale processing can have lower marginal energy demands than home-based processing.	VAAFM	5 towns developed comprehensive plans for local food infrastructure & start implementation by year 3; see mobile processing unit	High
	Engage <b>surrounding states in the region</b> to develop a regional plan to increase regional production, processing, transport and consumption	Continue participation in Harvest New England marketing group	Yes - Current, ongoing work		Harvest New England has marketing plans in place that include a 2009 conference, presentations to retailers, and promotional materials to use at supermarkets. Part of overall New England food branding campaign.	Ongoing	Low	VAAFM, retailers, producers in New England region	Confusion over "local" definition (currently commonly understood as "Vermont").		VAAFM & equivalents in other New England states		High
	Expand technical and financial assistance for <b>mobile livestock processing and fruit and vegetable freezing facilities</b> or other innovative approaches	Construct two pilot processing units - one for poultry and one for produce. Use pilot to explore needs and inform business plan for private, statewide mobile processing.	Yes - Pilots to become available in summer 2008	Mobile processing units reduce farmers' costs in transporting their product to a processing facility and allow processing capacity to expand more quickly by reaching all areas of the state with one piece of equipment.	Use RBEG funding to develop necessary equipment, launch outreach / marketing campaign to find potential producers and processors, study both pre-mobile unit and post-unit attitudes, needs, aggregation potential for farmers.	Pilots begin year 1	High	Producers, value added processors, purchasers including institutions like schools & ski areas with primarily non-summer operations	See above for need to continue education about seasonal eating patterns. Increased use of VT grown ingredients in processed, gourmet foods may lead to more VT raised food sent out of state via tourists, mail order, etc.	Business opportunities in packaging, refrigerated trucks, large freezer storage, and animal-related services (eg vet, feed)	VAAFM, in partnership with Fruit and Vegetable Growers (for produce)	Evaluation / goals for expansion to be completed at end of pilot year.	High
	Expand technical, financial, and economic development assistance to create <b>year-round production facilities which use waste heat</b> from industrial, commercial, utility and farm production.	Develop a matchmaking service between locations with waste heat and producers interested in year-round facilities. Level of initial interest & obstacles that arise will determine next steps.	No projects at this time.	As described in other action steps, year round availability is an important part of increasing local food consumption - but can be energy intensive in some systems.	Initial interviews with relevant agencies, businesses and interested farmers.	Several years out	Exploratory stage = low	VAAFM, producers, electric utilities		Has potential to lower costs for extended season growing of ag products. Additional revenue stream for utilities.	ACCD to identify likely possible host facilities; VAAFM in partnership with trade organizations representing agricultural interests (i.e. Fruit and Vegetable Growers)	Measures would be based on BTU utilized that is, or would be, wasted without the facility.	Needs further study

CCTT - Work Plan Template for AFW-2. Agricultural Soil Carbon Management Programs	Action Step name	Existing Program(s) related to Action Step?	Why Action needs to be taken	How (including additional research or other needs for implementing the Action)	Timeline for implementation	Cost (Actual \$, or H/M/L)	Who will the Action Step impact fiscally & programmatically (direct)	Potential impacts (indirect)	Potential co-benefits (indirect)	Lead Agency (and partners)	Measure(s) of success / goals (including GHG reduction)	Current status of Implementation Mechanism	Feasibility (H/M/L ... or describe)
	Implement Nutrient Management Plans (NMPs)	Existing programs include the Nutrient Management Plan Incentive Grants program and the Farm Agronomic Practices (FAP) program.	NMPs (which meet the USDA-NRCS '590 Standard') are required of all Medium Farm Operations (MFOs) by March 31, 2008 and Large Farm Operations (LFOs) currently. Approximately 125,000 acres of annual and perennial cropland are controlled by MFOs and LFOs and will be managed under a NMP. Development and implementation of NMPs on Small Farm Operations (SFOs) is voluntary. To date, SFOs have enrolled approximately 40,000 acres in the NMP Incentive Grants program. The NMP Incentive Grants program provides financial assistance for the development, and 3-years update, of an NMP which meets the USDA-NRCS '590 Standard.' It can be assumed then that 165,000 acres of annual and perennial cropland will be managed under an NMP. In order to meet the 2028 goal, NMPs need to be implemented on 409,500 acres.* A NMP will need to be developed for an additional 244,500 acres.	Continue NMP development/update through the NMP Incentive Grants program. Research impediments to voluntary NMP implementation on SFOs (as implementation is more costly than initial NMP development). Consider the creation of a program that provides assistance for the development of a farm management plan that incorporates nutrient management practices but does not require an entire '590 Standard' NMP for SFOs.	3.5 years at current NMP Incentive Grant funding of \$695,000 annually (FY2008) if payments were made for NMP development only (no update payments). 13 years at current NMP Incentive Grant funding to develop plans and update them for three years.	If funded through the NMP Incentive Grant's program, NMP development (no updates) will cost \$2,449,701.92. If funded through the NMP Incentive Grant's program, NMP development and 3-years of plan update will cost approximately \$9,229,875.** NMP updates will cost \$819,000 annually (based on current FAP program costs).** The actual NMPIG/FAP program costs (to develop and maintain NMPs) may be lower if farmers choose voluntarily to create and maintain plans out-of-pocket. Economic drivers behind voluntarily implementing NMPs include crop production benefits and reduced fertilizer needs.	Farmers, VAAFM, Conservation Districts, Technical Service Providers	Increased fossil fuel usage. Manure spreaders may need to travel to fields further away (opposed to using fields closer to the farm) in order to achieve better manure nutrient distribution.	Improvement of water quality through reduction in agricultural non-point source pollution. Potential financial benefits to farmers through reduction in fertilizer needs and increased crop production (matching manure nutrients with crop and soil needs).	VAAFM (USDA-NRCS, VT ANR, Conservation Districts, farmer partnerships, UVM Extension, and Technical Service Providers)	Implement NMPs on 75% of farm acreage by 2012 and 90% by 2028.	\$695,000 is available in FY2008 through the NMP Incentive Grants program.	<b>Medium</b> (The feasibility of developing/maintaining NMPs that meet the USDA-NRCS '590 Standard' on 90% of farm acreage is medium as 90% of farm acreage may not need a formal NMP. Much of the land not currently identified as managed under an NMP may be already managed under adequate nutrient management practices. As such, managers may be resistant to going through the formal plan development process when they are already implementing adequate nutrient management practices for their operations).
	Inject Liquid Dairy Manure	Action step implementation requires the development of cost share program to assist in the purchase of manure injection equipment.	Currently a very small amount of manure injection is occurring in Vermont. In order to meet the 2028 goal, manure injection will need to occur on 18,200-27,300 acres (10% of annual and perennial cropland receiving liquid manure***) annually. This necessitates the purchase of manure injection equipment which can exceed \$100,000 per unit.	Provide \$1,000,000 in public/state funding as a 50/50 match (in order to leverage an additional \$1,000,000 in private funding) for the purchase of 20 manure injection units/retrofits. Encourage group/organization purchase of equipment to service as many acres per unit as possible. Each unit would need to be used to inject manure on 910-1,365 acres to meet the 2028 goal.	4 years if \$250,000 were made available annually.	\$1,000,000 if combined with/leveraged with an additional 1,000,000 in private funding** State/public cost may be less as manure injection benefits (better utilization of manure nutrients, especially nitrogen, and reduced fertilizer needs) are demonstrated.	Farmers, VAAFM, equipment dealers	Increased fossil fuel usage by manure injection equipment.	Improvement of water quality through reduction in agricultural non-point source pollution. Potential financial benefits to farmers through reduction in fertilizer needs (less loss of ammonia nitrogen).	VAAFM (USDA-NRCS, VT ANR, Conservation Districts, farmer partnerships, and equipment dealers)	Inject 10% of liquid dairy manure and processed waste water by 2012	There is currently no program to fund the purchase of manure injection equipment. VAAFM proposes \$250,000 be made available to assist in the purchase of manure injection equipment for FY2009.	<b>High</b>
	Increase Acreage Managed Under Cover Crop	The Farm Agronomic Practices (FAP) program provides financial support for cover cropping.	In the fall of 2007, approximate 3,000 acres of annual cropland was cover cropped because of the FAP program. 47,500 acres will need to be cover cropped annually to meet the 2028 goal of having 50% of all annual cropland cover cropped.****	Research potential impediments to increased cover crop implementation including costs to farmers. Investigate seed-need, supplies, and provide for seed availability in Vermont.***** Provide increased FAP funding for cover crop adoption.	1 year if \$950,000 was available to offset the cost of seed at \$20 per acre, if sufficient seed was available (2,375 tons), and if there was sufficient farmer interest.	\$950,000 annually if funded through the FAP program. Yearly FAP program cost (public cost) may be lower as the environmental (water and soil quality) and economic (crop production) benefits of cover cropping are demonstrated.	Farmers, VAAFM, feed and seed dealers	Increased fossil fuel usage by seeding equipment and potentially for additional tillage.	Improvement of water quality through reduction of soil erosion. Potential benefits to farmers through increased crop production (improved soil till and nutrient retention).	VAAFM (USDA-NRCS, VT ANR, Conservation Districts, farmer partnerships, UVM Extension, and feed and seed dealers)	Cover crop 25% of annual cropland by 2012 and 50% by 2028.	\$25,000 was available for soil based conservation practices (including cover cropping) through the FAP program for FY2008. Demand for cover cropping exceeded \$25,000 by early fall 2007. An additional \$45,000 was made available to meet this demand.	<b>High</b>

\*The goal for this action step is to "implement Nutrient Management Plans (NMPs)...on 90% [of farm acreage] by 2028." 455,000 acres of annual and perennial cropland was identified (in Vermont) through the 2002 USDA Census.

\*\*See attached revised cost estimates.

\*\*\*455,000 acres of annual and perennial cropland was identified (in Vermont) through the 2002 USDA Census. It is estimated that 40-60% (182,000-273,000 acres) of annual and perennial cropland in Vermont receive liquid manure application.

\*\*\*\*95,000 acres (of the 455,000 acres of annual and perennial cropland) were annual cropland (2002 USDA Census)

\*\*\*\*\*2,375 tons of rye seed (preferred by most farmers for cover cropping) will be needed annually. Minimum seeding rate is 100 lbs./acre (47,500\*100 lbs.=475,000 lbs. or 2,375 tons).

CCTT Work Plan Template for AFW - 3: Manure Management Methods to Achieve GHG Benefits	Action Step name	Existing Program(s) related to Action Step?	Why Action needs to be taken	How (including additional research or other needs for implementing the Action)	Timeline for implementation	Cost (Actual \$, or H/M/L)	Who will the Action Step impact fiscally & programmatically (direct)	Potential impacts (indirect)	Potential co-benefits (indirect)	Lead Agency (and partners)	Measure(s) of success / goals (including GHG reduction)	Current status of Implementation Mechanism	Feasibility (H/M/L ... or describe)	
	Implement 590 NMP on large and medium livestock farms through agency permitting programs.	Yes - Nutrient Management Plan Incentive Grants Program, NRCS EQIP Program and the Farm Agronomic Practices (FAP) program.	See AFW-2.	-	-	-	-	-	-	-	-	-	-	-
	Implement 590 NMP on small livestock farms when they receive state or federal cost share to construct waste management systems.	Yes - Nutrient Management Plan Incentive Grants Program, NRCS EQIP Program and the Farm Agronomic Practices (FAP) program.	See AFW-2.	-	-	-	-	-	-	-	-	-	-	-
	Provide cost share assistance for farms to develop NMP and provide annual assistance so that existing plans continue to be implemented.	Yes - Nutrient Management Plan Incentive Grants Program and the Farm Agronomic Practices (FAP) program.	See AFW-2.	-	-	-	-	-	-	-	-	-	-	-
	Provide cost share assistance so that farms implement cover crops and other soil erosion and land cover practices.	Yes - Farm Agronomic Practices (FAP) Program, State CREP Program, NRCS EQIP Program and NRCS CRP Program.	See AFW-2.	-	-	Cost is variable for each program. See AFW - 2 regarding the FAP Program.	-	-	-	-	-	-	-	-
	Provide cost share assistance for the construction of waste management systems, including manure storage and composting.	Yes - State BMP Program, NRCS EQIP Program and State & NRCS Alternative Management Program (AMM).	Improvement in water quality through reduction in non-point source pollution.	Continued financial support to implement BMP projects. Over \$56 million is currently needed to address MFO and SFO issues.	Assume total BMP State & NRCS funding at \$7 million/yr (5+2). Approx. 8 years until existing issues can be compensated. Additional time is necessary to implement contracts.	<u>Actual Costs - HIGH</u> SFO - \$47.3 million MFO - \$8.8 million TOTAL - \$56.1 million	Farmer, Ag Agency, NRCS.	Groundwater issues may become pertinent with liquid storage and runoff from solid manure storage.	Positive public perception, Vermont economy.	VT Ag and NRCS	Completion of BMP projects and reduction of NRCS backlog	Ongoing	High	
	Provide feasibility and technical assistance on the pursuit and potential adoption of new technologies on farms.	Yes - State BMP Program, State & NRCS Alternative Manure Management Program (AMM) and State Renewable Energy Agricultural Program Grants (REAP).	Implementing new technologies will add farm diversification and allow new markets to help support the dairy industry.	Continued review of existing projects and research of new systems for applications on Vermont farms is necessary. Support existing Ag Agency role in assessing new technologies.	Ongoing. It is important to assess each new technology and guide farmers to make sound long term investments.	<u>Money Available - LOW</u> State Ag REAP Grants: 10k per project State/NRCS AMM: total dollars vary year to year	Farmers, Ag Agency, AMM.	Some projects may go forward without a good business plan, resulting in failed projects.	Farmer diversification, Vermont staying ahead technologically.	VT Ag and AMM	Completion and results of feasibility studies and AMM projects	Ongoing	High	
	Identify hurdles associated with digesters.	Yes - Methane Work Group and the 25 by 2025 Committee.	Ensure that all avenues have been investigated for digesters to be widespread and supported in Vermont from farmer, power companies and government standpoints. Vermont's energy portfolio is shifting so adequate discussion is necessary to assure we are taking appropriate steps.	Continued review of existing infrastructure and what can and cannot be achieved with it. Look ahead to future energy markets and distribution possibilities.	Ongoing. Energy markets are volatile.	Money Available - LOW Clean Energy Fund is financially supporting this group.	Farmers, power companies, Ag Agency, DPS, NRCS, State of Vermont.	The ease of future project implementation. Greater player understanding of the overall energy and digester subject.	Greater communication between relevant parties involved in these projects.	Farmers, power companies, Ag Agency, DPS, NRCS and other committee members.	The ease of future project implementation. Continued communication between relevant parties. Reaching actual 2025 targets.	Ongoing	High	
	Provide cost share assistance for construction of methane digestion facilities.	Yes - State BMP Program, NRCS EQIP Program, State & NRCS Alternative Management Program (AMM), NRCS EQIP Program, USDA Rural Development Grants/Loans and Clean Energy Development Fund with the Dept. of Public Service.	Reduce GHG methane emissions and odors by the construction of digester facilities. Create additional revenue and consistent bedding stream for farmers.	Continue review of digester projects and research of new systems is instrumental for the medium and small farms.	It is anticipated by 2025 that 50% of our dairy manure will be digested. As energy and project economics shift, these projects will hopefully be self sufficient without cost share assistance.	<u>Money Available - MED.</u> State BMP: up to 75k NRCS: up to 50k 9006 Rural Dev: up to 500k DPS: possible 3-phase upgrades or grant money	Farmers, Ag Agency, NRCS.	Electricity distribution becomes more dispersed ( + and - ).	Farmer diversification, distributed electricity.	VT Ag, NRCS, Rural Development and DPS	Number of manure digesters constructed. Analyze reductions of methane vs. carbon dioxide as a result of the digesters built.	Ongoing	High	
Provide technical assistance to support the development of service industries to maintain new technologies.	Yes - State BMP Program, State & NRCS Alternative Management Program and State Renewable Energy Agricultural Program Grants (REAP).	It is important to have a service industry for new technologies to be serviced and maintained properly.	Support existing Ag Agency role in training new service industries regarding digesters and other new technologies.	Ongoing. It is important to educate people connected to this field about future business opportunities.	Salaries at Ag Agency	Farmers, Ag Agency, Service Industries.	Technology may get ahead of actual service industry, resulting in time loss on projects.	Good Vermont jobs and improved economy.	VT Ag	Identification and training of individuals to service new technologies, such as for digester maintenance. When supply meets or stays even with demand.	Ongoing	High		

GCCC Recommendation	Action Step name	Existing Program(s) related to Action Step?	Why Action needs to be taken	How (including additional research or other needs for implementing the Action)	Timeline for implementation	Cost (Actual \$, or H/M/L)	Who will the Action Step impact fiscally & programmatically (direct)	Potential impacts (indirect)	Potential co-benefits (indirect)	Lead Agency (and partners)	Measure(s) of success / goals (including GHG reduction)	Current status of Implementation Mechanism	Feasibility (H/M/L)
AFW-5 - Forestry Programs to Enhance GHG Benefits	1. Research carbon storage and sequestration effects from different forest management and wood utilization scenarios		GCCC called for more research to reduce uncertainties	Collaborate with UVM & others to model forest management scenarios, biomass utilization scenarios, and determine carbon sequestration results	3 years	Low	Research funding sources		Results showing carbon sequestration benefits from different forest management and biomass utilization scenarios	Current modeling work is being conducted by UVM & in Pennsylvania. Preliminary results have shown the value of this research before policy actions pursued.	Research will also yield ecological benefits (down woody debris for habitat and soil nutrition) from different harvesting methods, and will provide additional information valuable for forest management recommendations that assist carbon sequestration while maintaining ecological integrity of forests.	Some research underway, but additional modeling needed	High
	2. Develop or adopt forest carbon measurement and accounting standards		Quantify changes in carbon sequestration from forest management strategies	Research needed on most efficient, reliable methods, especially for forest soil carbon	5 years	Low	FPR		Recommended methods for forest carbon measurement and accounting at the forest stand level	FPR	Recommended methods for forest carbon measurement and accounting at the forest stand level		High
	3. Develop guidelines for forest management that maximize carbon sequestration while maintaining healthy forests		Maximize carbon sequestration while minimizing ecological harm	Collaborate with forestry partners	5 years	Low	FPR staff; guidelines may affect foresters and loggers depending on outcome	FPR and forest professionals	Recommended by the ANR Sustainable Forestry Task Force-results pending	FPR; USFS, UVM, CFAV, Forest Guild, NE SAF, VWA, VWOA, FSC, VMC, forest industry	Forest ecosystem sustainability		Low
	4. Maintain existing state programs that support sustainable forestry practices, monitor and manage forest stress agents	FPR programs: County Foresters, State Lands, Forest Resource Protection, Urban & Community Forests, Markets & Utilization	Healthy forests will enhance carbon sequestration	UVA program support; FPR program support	ongoing	\$1 million over next 3 years	Forest landowners, FPR	FPR	Acres of forest land in UVA maintained and increased; acres of forest land with disturbances below normal	FPR; USFS, UVM, CFAV, Forest Guild, NE SAF, VWA, VWOA, FSC, VMC, forest industry, Town Fire Wqrden, AOA, APHIS, landscapers, architects, local & regional planners	UVA program provides landowner incentive to keep forest land forested; forest resources to support economy & quality of life	Ongoing	High
AFW-6 - Increased Forest Biomass Energy Use	1. Research carbon storage and sequestration effects from different forest management and wood utilization scenarios		GCCC called for more research to reduce uncertainties	Collaborate with researchers to model forest management scenarios, biomass utilization scenarios, and determine carbon sequestration results	3 years	\$75,000	Research funding sources		Results showing carbon sequestration benefits from different forest management and biomass utilization scenarios	Current modeling work is being conducted by UVM & in Pennsylvania. Preliminary results have shown the value of this research before policy actions pursued.	Research will also yield ecological benefits (down woody debris for habitat and soil nutrition) from different harvesting methods, and will provide additional information valuable for forest management recommendations that assist carbon sequestration while maintaining ecological integrity of forests.	Some research underway, but additional modeling needed	High
	2. Model wood available for biomass energy incorporating forest growth into existing regional model		Recent BERC study determining biomass availability, but without growth estimates	Work with researchers to use an existing forest growth model developed by NEFA	3 years	\$60,000	Research funding sources	FPR and researchers	Improved estimates of future biomass supply for energy use		No direct benefit, but results will reduce uncertainty in carbon inventory and supply for fossil fuel offsets using forest biomass		Moderate
	3. Develop regional geospatial data layers on biomass supply and markets		Reduce uncertainty of biomass availability models	In conjunction with the forest growth modeling work, the spatial information will be needed to support regional biomass demands	3 years	Low	Research funding sources	NEFA, VT FPR and other state partners	Improved estimates of future biomass supply for energy use in specific areas of Vermont	Northern New England and New York state forestry organizations are working together to obtain funding for this work	No direct benefit, but results will reduce uncertainty in carbon inventory and supply for fossil fuel offsets using forest biomass		Moderate
	4. Provide outreach and technical advice about forest biomass use in distributed energy generation, combined heat and power systems, and biomass power plants, especially small-scale biomass power generation close to forest resource sources.		Fossil fuel offsets	Outreach through existing FPR sources	ongoing	\$215,000	FPR, PS, APCD; utilities	FPR and partners	Vermont Energy Plan calls for an expansion in the use of renewable energy sources; economic advantages in lower heating or energy prices.	FPR Utilization and Markets		Ongoing within FPR	High
	5. Promote wood pellet industrial development in Vermont		A local supply of wood pellets for home heating would support the wood industry and allow homeowners to support a local product	Research	5 years	Medium	Out of state markets for wood pellets	FPR, Commerce, research organization	New pellet manufacturing industry in Vermont				Moderate
	6. Increase wood energy production from the current 4.71% of Vermont energy needs, to 8.54% by 2025 (Vermont 25 X 25)	Vermont 25 X 25: Preliminary findings	Reduce GHG emissions	Outlined in 25 X 25 plan	2025	High		Potential for increased particulate emissions from wood burning stoves and furnaces	Reduce dependence on fossil fuels, increase markets for forest biomass	FPR, DPS	Wood energy production 8.54% of Vermont energy needs	Ongoing	High

GCCC Recommendation	Action Step name	Existing Program(s) related to Action Step?	Why Action needs to be taken	How (including additional research or other needs for implementing the Action)	Timeline for implementation	Cost (Actual \$, or H/M/L)	Who will the Action Step impact fiscally & programmatically (direct)	Potential impacts (indirect)	Potential co-benefits (indirect)	Lead Agency (and partners)	Measure(s) of success / goals (including GHG reduction)	Current status of Implementation Mechanism	Feasibility (H/M/L)
AFW-7 - Forest Protection: Reduced clearing and conversion to non-forest cover	1. Establish a geospatial forest carbon accounting system to improve current estimates, track progress towards goals, and identify areas for future protection	Partially exists. Geospatial conservation lands database exists for public and some private lands but not UVA parcels. A carbon accounting system exists within APCD, but needs updated forestry models and data.	Provide accounting system to demonstrate progress towards land conservation goals and carbon sequestration.	Database structure developed through ANR IT; existing UVA parcels digitized and attribute tables entered; update and maintain public conservation lands database; create and maintain a carbon accounting module and a conservation lands accounting system.	3 years	\$255,000	ANR IT and FPR		Creation of geospatial database benefits State Stewardship programs, conservation easement accounting and planning, planning for climate change impacts	ANR-FPR, Air Pollution Control Division, UVM Spatial Analysis Lab, ANR IT, ANR-F&W, The Nature Conservancy, Vermont Land Trust, US Forest Service Global Climate Change Research Program, NRCS, Northern Forest Alliance	Accurate baseline inventory of forest land conserved & associated carbon offsets	USFS has models for forest carbon to be added to VT database. Forest soil carbon model nearly completed through UVM Plant & Soil Science. Geospatial conservation lands database exists for public and some private lands but not UVA parcels. A carbon accounting system exists within APCD, but needs updated forestry models and data.	High
	2. Increase acres of forest land conserved using various conservation mechanism	Legacy, State Land Acquisition fund, Housing and Conservation Board, Green Mountain National Forest	Prevent conversion of forest land to non-forest land	Increase funding for existing programs: State land purchase & State Land operations funds, federal Legacy program, Vermont Land Trust, The Nature Conservancy	Greatest increase needed over next 5-10 years	Low	FPR-program implementation and accounting; private landowners gain financially		Accomplishes "permanence" legalities needed for carbon trading; additional ecosystem benefits accomplished	State and Federal legislators. FPR is a partner	GHG potential reduction= 22 MMtCO <sub>2</sub> e, 2008-2028	US Farm Bill includes Legacy funding	Moderate
	3. Increase enrollment in the Use Value Appraisal Program	UVA Program currently includes 33% of eligible forest lands; run by Property & Valuation and County Foresters	Provides economic incentive for forest land owners to keep lands forested.	Increase funding for existing program thru Tax Dept. and FPR.	5-10 years	\$17.36/acre	If no new staff, FPR County Forester program and Property & Valuation programs.		Improved forest stewardship on additional lands	State legislators; FPR and Tax Dept. to implement	Increase acres in UVA	Vermont legislature is considering this action item	Moderate
	4. Develop a new forest management support program to compensate landowners for ecosystem services	No	Some forest land is not eligible for UVA yet provides carbon sequestration, a public benefit from private land. May successfully prevent the loss of additional forest land.	Partner with the UVM Gund Institute to study feasible options for Vermont	3 years to research	Low	FPR & GUND to seek external funding source			UVM GUND & FPR	Proposal for ecosystem services program	Funds needed	Low
	5. Incentive program to maintain forest cover in developed areas through land use planning, technical assistance and other methods (e.g. storm water crediting)	A new pilot study for the City of Burlington is under way that demonstrates existing forest cover and allows planning and incentive program development	Developed areas are increasing; cobenefits and educational opportunities are large	Study existing forest cover using new Lidar photography; may start with storm water incentives for companies					Storm water mitigation; energy conservation through appropriate tree planting locations; property value increase	FPR, towns, ANR	Urban tree canopy goals established	Pilot spatial analysis of city of Burlington canopy cover completed by UVM SAL & USDA FS.	Moderate
	6. Reduce parcelization of forest land (the first step towards forest land conversion)	Forest Stewardship Program exists, but funding drying up; UVM Extension has started estate planning consultations; Dept. F&W has ongoing outreach on forest conservation to local and regional planning commissions, and town conservation commissions	Forest land division is a first step towards conversion to non-forest use	Pursue funding, collaborate with UVM Extension on estate planning, collaborate with F&W to provide land conservation outreach to towns and regional planners	3 years	\$400,000	FPR		Improved forest stewardship on additional lands	FPR, UVM Extension & F&W	Increase acres in forest conservation	UVM Exention Forester working with FPR to develop estate planning outreach plan	High
	7. Maintain programs that educate about and encourage forest stewardship and best management practices	FPR programs: County Foresters, State Lands, Forest Resource Protection, Urban & Community Forests, Markets & Utilization	Maintaining healthy forests is key to future carbon sequestration and storage	Maintain FPR outreach programs	ongoing	\$ 6 million annually				FPR			Moderate
	8. Expand education for foresters, landowners and the public on GHG benefits provided by forests	Infrastructure exists, content needed	Educate landowners, resource managers and the public about the relationship between forests and carbon offsets, and the value of healthy forests to climate change	Develop a marketing plan for outreach on the benefits of forests; continue development of "web of connection" outreach tool	2-5 years	Low	FPR/ANR		Education about many ecosystem services, economic values, and connection to other environmental issues	FPR, ANR	Marketing plan developed, funding for outreach tools secured, "web of connection" outreach tool on the web		High
	9. Apply existing risk assessment studies to manage potential forest transitions	No	New forest pests, shifts in tree species distribution, potential for increased fire danger can all adversely affect protection of forest land for carbon sequestration.	Geospatial risk assessment study	5 years		FPR, ANR IT		Maintain economic viability of forest industry and forest ecosystem services	FPR, US FS	Risk assessment map for planning		Moderate
	10. Detect and manage infestations of existing or new exotic invasive organisms to maintain forest health	FPR- Forest Resource Protection	Maintaining healthy forests is key to future carbon sequestration and storage	Ongoing work	continuous	low	FPR, Agency of Agriculture, APHIS		Maintain economic viability of forest industry and forest ecosystem services	FPR, Agency of Agriculture, USDA APHIS	Acres of forest decline at or below normal	Ongoing program	Moderate

GCCC Recommendation	Action Step name	Existing Program(s) related to Action Step?	Why Action needs to be taken	How (including additional research or other needs for implementing the Action)	Timeline for implementation	Cost (Actual \$, or H/M/L)	Who will the Action Step impact fiscally & programmatically (direct)	Potential impacts (indirect)	Potential co-benefits (indirect)	Lead Agency (and partners)	Measure(s) of success / goals (including GHG reduction)	Current status of implementation Mechanism	Feasibility (H/M/L)
AFW-8 - Expanded Production and Use of Durable Wood Products (Especially from Vermont Sources)	1. Research carbon storage and sequestration effects from different forest management and wood utilization scenarios		GCCC called for more research to reduce uncertainties	Collaborate with researchers to model forest management scenarios, biomass utilization scenarios, and determine carbon sequestration results	3 years	\$75,000	Research funding sources		Results showing carbon sequestration benefits from different forest management and biomass utilization scenarios	Current modeling work is being conducted by UVM & in Pennsylvania. Preliminary results have shown the value of this research before policy actions pursued.	Research will also yield ecological benefits (down woody debris for habitat and soil nutrition) from different harvesting methods, and will provide additional information valuable for forest management recommendations that assist carbon sequestration while maintaining ecological integrity of forests.	Some research underway, but additional modeling needed	High
	2. Promote branding and marketing of locally manufactured wood products	Forest Branding exists, some work done by Department of Economic Development	Increase local wood product markets to maintain forest land and store carbon long-term	Work with partners to expand marketing	1 year	low	Out of state wood product manufacturers	FPR and Ag.	Increase in local product purchases	FPR, Dept. Econ. Dev., AOG, VSJF, Chamber of Commerce, VWMA, Dept Marketing & Tourism, WoodNet, Guild of Vermont Furniture Makers, VWA, other landowner groups, National Historic Park, Cornerstone Project, environmental groups, academic institutions	Expand local wood industry		High
	3. Research carbon benefits of a buy local program		Determine actual carbon benefits	Collaborate with researchers	3 years	\$81,000				FPR	No direct benefits, but results will improve our carbon accounting for forest product marketing		High
	4. Implement a "Buy Local" program for forest products	Agency of Agriculture has a Buy Local effort through Department of Economic Development	Collaborate with existing Agency of Agriculture "Buy Local" program	Work with partners	3 years	\$250,000				FPR, Dept. Econ. Dev., AOG, WOA, VWMA, VWA, Dept Marketing & Tourism, architects, designers, forest certification providers			High

CCTT - Work Plan Template for AFW-9 Advanced/Expanded Recycling and Composting	Action Step name	Existing Program(s) related to Action Step?	Why Action needs to be taken	How (including additional research or other needs for implementing the Action)	Timeline for implementation	Cost (Actual \$, or H/M/L)	Who will the Action Step impact fiscally & programmatically (direct)	Potential impacts (indirect)	Potential co-benefits (indirect)	Lead Agency (and partners)	Measure(s) of success / goals (including GHG reduction)	Current status of Implementation Mechanism	Feasibility (H/M/L ... or describe)
	Develop <b>Advanced Recycling</b> so entire state is able to participate in single stream** recycling	Some of the SWDs, such as CSWD, already have such programs in place. Of the 14 SWDs, 6 are participating in single stream recycling	Not all programs are convenient and comprehensive for Vermonters (e.g. Saturday morning collection only)	Research gaps in infrastructure, determine costs and funding sources and build up infrastructure	Mandatory recycling in two years	High for additional MRF (\$1-2M)	State, Local municipalities, waste industry	Increased fees for capital cost to build single-stream MRF	Potential opportunities for local business startups to use recycled materials	ANR, Solid waste planning entities (districts, alliances, towns), private sector waste industry, economic developers	Achieve state's 50% diversion goal by 2011. While SW program tracks GHG reductions through its recycling efforts, it doesn't currently have a GHG reduction goal	Solid waste planning entities currently plan and implement their own recycling programs to achieve the goals set in the state's Solid Waste plan. No statewide implementation mechanisms (such as funding) is currently in place.	Med to high
	Develop an incentive/rewards based recycling infrastructure	Pay-as-you-Throw (PAYT or unit based pricing) for trash with free recycling exists but extent is unknown	Diversion rate over the past 10 years has plateaued at 30%; state goal is 50% by 2011	Research the extent of PAYT and types of rate structures currently available. Develop minimum standards for PAYT programs and require all programs to meet them.	1 to 3 year implementation	Low, technical assistance and staff resources will be needed	Municipalities and haulers (especially smaller haulers)	Smaller haulers may not be able to implement incentive programs due to cost of managing separate recyclables stream	PAYT helps lead to waste prevention, the highest priority of the State Solid Waste Plan	ANR, SWDs, towns, haulers	Reduction in waste generation and GHG emissions, increased recycling	Proposed in draft state Waste Prevention plan. Requires review and approval.	High
	Develop additional processing capacity across the state for processing organic wastes (e.g., composting facilities) and expand the collection of commercially-generated organic waste materials.	Private sector composting operations, residential composting, and farms provide current infrastructure	Compostable organics comprise an estimated 30% of state's wastestream. There is only a fraction of this material diverted from disposal. Vermont has only a few composting facilities. Service needs to be expanded to the majority of the state with denser populations or convenient co-facilities (such as farms or digesters for household waste) to make it economically feasible.	Improve on-site management of existing and future composting sites relating to stormwater management, leachate management and on-site operations. Streamline and clarify the permitting process for composting facilities. Provide financial support (loans, grants, etc.) for composting equipment and facilities. Provide alternative waste disposal options for compostable materials: i.e., drop-off opportunities at solid waste districts for organic waste or frequent collection of organics waste from residents. Promote backyard composting. Provide subsidies/incentives for large scale hauling of composting materials. Research other options for recycling organics. Planning needs to be done for banning organics from landfills. Studies required to determine how much organic material is needed in landfills for energy generation and which does greater public good, returning the nutrients to the soil or creating energy. Increase residential organics recycling, e.g. backyard or vermicomposting.	Some of the process has been underway for more than 10 years. Current need is for regulatory clarification, more start-up funds, and greater understanding of alternatives to composting. With adequate staff and funding, could increase initiative in year one. Depending on funding, estimate 15 year until full operation for the whole state.	High for facility infrastructure: range from \$50K for on farm small scale composting site to \$1.5M for a large scale facility	Solid waste planning entities, haulers, municipalities, waste generators, and composting facilities. There is a potential, if a statewide mandate was created for organics recycling that all residences and businesses would be impacted. Some local ordinances already exist.	NIMBY issues for expanded or new facilities. Unhealthy competition for organic residues if development not directed and planned holistically. Slight possibility of supply outpacing demand, though it hasn't been seen so far. Potential for pollution if regulations are not strict enough or not enforced.	Additional locally produced soil amendments available to market for consumers or for farmers to use on their farms. Increased organic matter in currently depleted soil lessens loss of topsoil, decreases need for fertilizer and pesticides, improves water holding capacity of soils, and filters many pollutants from stormwater. All beneficial to the environment and farming. Local business opportunities in areas of hauling, compost production, and compost use (i.e. hydromulching).	ANR, Department of Economic Development, and Agriculture are lead agencies. Partners are Haulers, Composters, Composting Association of Vermont, Agency of Transportation, Private sector disposal companies, solid waste planning entities, The Highfields Institute and other interested non-profits, Natural Resource Conservation Service, Natural Resource Conservation Districts, Local Conservation Committees, Master Composter Program, anaerobic digester groups, Lake Champlain Basin Committee, Food Industry (producers, wholesalers, and retailers) Trade Groups, Farmers, and for backyard promotion Garden Clubs and Farmers Markets	Amount diverted, number of new facilities, number of new programs, number of haulers licensed, increased number of collection routes, increased participation rates, accessibility to services statewide, decrease in Biological Oxegen Demand (from organic materials) coming into waste water treatment plants.	Recommendations of the draft Waste Prevention Plan. Most operating compost facilities were funded with start-up grants from the state. This money is no longer available, going into a block grant program that is primarily used by the recipients to pay for unregulated hazardous materials disposal in specialized landfills. The Composting Association of Vermont has a project to look at regulation issues in Vermont that begins this spring. Master Composter classes offered (scheduled for Fall)	Medium
	Develop a used clothing recycling program (curb-side and rural drop off model) for used clothing.	Local solid waste planning entity programs, private sector, charity and community action programs	Textiles represent 5% by weight of residential waste	Expand on existing organizations and infrastructure for clothing and textile reuse and recycling. Provide better information about opportunities for clothing reuse/recycling.	Starting year 1	Low	Textile recycling providers (reuse stores, non-profits)	If a curbside textile program was started, it could reduce the amount of clothes and textiles coming into reuse businesses and social service agencies (such as the Salvation Army). Could be a rise in dirtier, contaminated clothes coming to collection centers	Increased business opportunities from increased supply of used clothing and scrap textiles	Used clothing stores, social service agencies, solid waste districts, ANR	Reduce amount of textiles in waste stream	Numerous drop off programs currently exist for textiles at transfer, recycling centers, and in public places. ANR is not aware of any curbside collection programs in Vermont. Many private sector reuse businesses exist around the state and provide the infrastructure. ANR's role should be to promote these opportunities.	High
	Develop an incentive/rewards based recycling infrastructure specifically for construction and demolition (C&D) materials	Market forces provide incentives for certain materials (high value materials such as metals. Construction waste is heavy and expensive to dispose of). US Green Building Council LEED certification provides "branding" incentive for construction projects that achieve either 50% or 75% waste diversion.	C&D waste comprises over 25% of state's waste stream. Few options currently exist to both reuse and recycle these wastes.	Institutionalize waste prevention, deconstruction, and recycling in project design; specify waste diversion in construction bid documents. Develop regional markets. Use economic incentives to build infrastructure. Institute a phased landfill ban of select C&D waste. Educate the public about C&D waste reduction. Collaborate with national and regional organizations.	Starting year 1	High for infrastructure development. Low for waste reduction in project design and contract bids, and education.	Builders, contractors, green building organizations, building owners	More time/higher cost for building deconstruction and waste separation	New business opportunities for reuse/recycling (used building stores), cost savings once diversion programs are established and institutionalized	ANR for education; building industry groups; construction contractors; waste management companies	Reduction in C&D waste generation and increase in diversion	Development of methods and infrastructure is in its infancy	Medium-Low (resource intensive)
	Where the incentive-based methods mentioned above do not achieve progress toward the 2012 and 2028 goals, develop and implement appropriate mandates to achieve the goals	Local solid waste entity mandatory recycling programs	To insure Vermont meets its waste diversion goal, conserve natural resources, reduce GHG emissions	Require mandatory recycling statewide for materials with established recycling markets and infrastructure, phase in a ban for materials with established markets and work to develop markets and infrastructure for materials without established markets. Develop and implement comprehensive education program for regulated community.	Years 1 through 5	Low for developing mandates; high for infrastructure development.	Everyone generating wastes	Dumping, burning or other illegal disposal, smaller haulers might not be geared to implement larger scale recycling programs	Business opportunities for reuse/recycling, job creation	ANR and SWDs for regulation	Reduction in waste generation and increase in diversion	No mandates currently in place or under development. Waste Prevention plan recommends phased-in landfill ban	Unknown - Function of political will

\*\* Single stream: All recyclables are collected together in one container and separated at a central facility

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CCTT - Work Plan Template for AFW-10 - Programs to Reduce Waste Generation	Develop prototype residential and commercial waste prevention programs that will validate costs savings realized by the waste prevention.	This action step is an overarching program for all the waste prevention strategies listed below											
	Develop a communication portal that will keep all constituents apprised of waste reduction/minimization initiatives and actively promote waste minimization efforts, including the results of prototype programs and specific case studies.	Existing ANR Waste Prevention web site		Staff time to update, maintain, link to other sites, and promote the site	Year 1	Low	If promoting statewide, could educate all waste generators in VT		Would educate Vermonters on other benefits to reducing waste	ANR, SWDs, and other environmental organizations		Web site exists but there are limited resources to maximize its effectiveness. Ideally, an ongoing, coordinated communications strategy needs to be developed simultaneously with waste reduction initiatives	M
	Develop sector-specific waste minimization strategies (schools, hotels, hospitals, restaurants, retail, banks, etc.). Develop these strategies in collaboration with other organizations and the local community.	VT Business Environmental Partnership	Waste prevention strategies vary by sector. There is no one size fits all for all sectors	Additional staffing for the Small Business Development Center (SBDC) for hands-on technical assistance, meet with sector-specific organizations	Year 1 and ongoing	Medium - staff time				SBDC/ANR	Measurable waste prevention for the sectors targeted	Specific programs exist for vehicle service, auto body repair technicians, print shops and hotels.	M - but requires additional staff
	Develop an assistance program to provide engineering support to businesses to: 1) reduce product packaging and shipping materials; and 2) select product packaging and shipping materials that are highly recyclable.	The Manufacturing Extension Center provides assistance to VT manufacturers, which could include packaging design	1) Reduce product packaging and shipping materials 2) select product packaging and shipping materials that are highly recyclable.	1) Technical assistance providers, such as the Business Environmental Partnership could provide such businesses with EPP (environmentally preferable purchasing) specifications for packaging (e.g. source reduced packaging, percent recycled content) 2) Manufacturers can be encouraged to request packaging for their products that meets the specifications for their product and is source-reduced.	Year 1	Low			Reduced packaging may reduce costs to businesses	SBDC/ANR		Already underway, but could be more effective with better outreach to recruit more program partners.	H
	Encourage manufacturers to provide end-of-life management solutions that reduce the environmental impact of waste (e.g., "cradle-to-cradle" responsibility of waste).	Support and promote the Product Stewardship Institute (PSI) initiatives (current focus of this group is on toxics). Bring VT issues to the attention of this group.	Principal of product stewardship is to share responsibility for end of life management to all those involved in a product from design, manufacture, retail, end use and disposal	1) Identify Vermont product stewardship priorities to the PSI and to specific industry groups 2) Promote purchasing specifications that encourage product stewardship	Year 1 and ongoing	Low	It would impact those businesses required to manage end of life for the products they make and sell	Purchase prices could increase to cover life-cycle costs	Solid waste districts and municipalities can reduce the high cost of managing toxic wastes		Reduces amount of toxics and MSW generated	VT is a current member of the Product Stewardship Institute	L - product stewardship is a longer-term goal for how resources are managed in the future
	Develop and implement a green purchasing program for all state operations, and use that program as a model and encourage adoption of that model by all municipalities and businesses.	Clean State Council was a statewide program that helped to promote environmentally preferable purchasing (EPP). It is no longer operating. BGS Purchasing Division highlights its EPP contracts on its contracts page at <a href="http://www.bgs.state.vt.us/PCAEpp/index.htm">http://www.bgs.state.vt.us/PCAEpp/index.htm</a> . Climate Neutral Working Group is a state program to reduce GHG emissions in state government	Government needs to lead by example	Through development and maintenance of green purchasing standards for all state government procurements	Year 1 and ongoing	Low	All government sectors; likely largest impact on VTrans and BGS	It would help create economies of scale for EPP products and services	Use of green (and presumably less toxic) products may result in a healthier workplace	BGS and ANR		Governor's Executive Order 10-31 (2004) called for development of a Materials Management Plan to enhance continued wise purchase, use and reuse of products, whenever feasible, that promote resource conservation and pollution prevention. BGS had developed an Environmental Purchasing Policy.	H

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AFW-11 - Water and Wastewater Treatment – Energy Efficiency Improvements	1. <b>Assessment</b> - Quantify the energy consumed in Vermont's municipal and private/investor-owned water and wastewater treatment sector annually, to establish a baseline for these sectors.	No, may be undertaken by Efficiency Vermont	Determine baseline values for energy use for all water supply and wastewater treatment plants	Database mining of existing records of energy use, and ANR records of treatment	1-2 months if dedicated person	Low	Efficiency Vermont and ANR		Improved working relationship with Efficiency Vermont	Efficiency Vermont (ANR)	Completed Assessment	Efficiency Vermont may be able to conduct the assessment with the help of a summer intern in 2008	High
	2. <b>Assessment</b> - Assess the potential for energy savings for these sectors.	No, may be undertaken by Efficiency Vermont	To determine the priority for further evaluations, education and investments	Compare baseline results against preferred alternative	1-2 months if dedicated person	Low	Programs conducting the assessment		Educational value to treatment plant operators and owners	Efficiency Vermont (ANR)	Completed Assessment	Efficiency Vermont may be able to conduct the assessment with the help of a summer intern in 2008	High
	3. <b>Assessment</b> - Assess the potential for energy production using digester gas (in anaerobic plants).	No	To better use anaerobic digester gases	Review of ANR files on individual plant facilities	1-2 months if dedicated person	Low	Programs conducting the assessment		Educational value to treatment plant operators and owners	ANR (Contractor and Wastewater Treatment Plants)	Completed Assessment	Not funded	High
	4. (Fluorescent) Lighting retrofits from T12 systems to T8;	Yes - Efficiency Vermont	Reduce demands for electricity	Education and Rebate Program	Ongoing voluntary program	Low	Treatment plant owners	Increased heating costs	Municipalities may make changes in other buildings	Efficiency Vermont (Wastewater Treatment Plants)	Percent of T12 systems replaced (goal of 100%)	Ongoing voluntary program	High
	5. Heating retrofits from electric heat	No, yet may be part of other programs	Potentially reduce costs for energy	Education and potential incentive program	Ongoing voluntary program	Low	Treatment plant owners	Price sensitivity of fuels may not result in savings	Municipalities may make changes in other buildings	Efficiency Vermont (Wastewater Treatment Plants)	Completed Assessment	Ongoing voluntary program	Medium
	6. Installation of high-efficiency influent and effluent pumps, high-efficiency motors and variable frequency drives	Yes - Efficiency Vermont	Reduce demands for electricity	Education and voluntary participation	Voluntary program could take 30 years as part of plant upgrades	Medium	Treatment plant owners	Up front investment costs		Efficiency Vermont (ANR and Wastewater Treatment Plants)	Percent of motors retrofitted (goal of 100%)	Efficiency Vermont does "add ons" for VFDs and works through ANR on plant upgrades	Medium
	7. Evaluate the costs and benefits to second-stage activated sludge mixing and aeration	No	Reduce demands for electricity	Contract for evaluation of wastewater treatment plants	One year for completion of contract	Medium	Treatment plant owners		Improved wastewater treatment	Efficiency Vermont (ANR and Wastewater Treatment Plants)	Percent of facilities evaluated (goal of 100%)	Not funded	Medium
	8. Identify opportunities for peak demand reduction and optimizing load profiles	Yes - Efficiency Vermont	Reduce demands for electricity and rates	Education and voluntary participation	Voluntary program could take 20 years	Medium	Treatment plant owners		Municipalities may make changes in other buildings	Efficiency Vermont (Wastewater Treatment Plants)	Percent of facilities evaluated/ goal 100%	Efficiency Vermont	Medium
	9. Co-generating electricity and thermal energy on-site; capturing and using anaerobic digester gas.	No	To better use anaerobic digester gases	Contract for assistance to be provided to individual wastewater treatment plants	48 Months	High	Treatment plant owners			ANR (Contractor and Wastewater Treatment Plants)	Percent of feasible projects constructed	Routine plant upgrades, note Efficiency Vermont not currently allowed to work in this area	Medium
	10. New - Efficiency Vermont collaboration on projects applying for loans and grants from ANR	Yes	To reduce the energy demands for new facilities	ANR notifies Efficiency Vermont of applicants for loans and grants	Voluntary program could take 20 years as part of plant upgrades	Low	Treatment plant owners		Municipalities may make changes in other buildings	Efficiency Vermont (ANR and Wastewater Treatment Plants)	Percent of facilities evaluated/ goal 100%	Efficiency Vermont	High

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<p><b>CCTT - Work Plan Template for CC-1 (GHG Inventories &amp; Forecasts)</b></p>	<p>Develop a periodic, consistent, &amp; complete inventory of emission sources &amp; sinks, and an accompanying forecast of future GHG emissions in at least 5 &amp; 10 year increments, out to 2030 and 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.</p>	<p>Yes - GCCC Inventory and Forecast Document provides inventory of sources and sinks from 1990-2005, with projected emissions out to 2030; DEC Air Division - Planning Section periodic emission inventory efforts should be augmented to continually improve and update the inventory.</p>	<p>Comprehensive and accurate emissions inventories are the only effective way to measure total annual GHG emissions, and track progress towards meeting the GHG reduction goals established by the Governor and the Legislature. It is important that this effort is periodic and utilizes standardized, widely-accepted methodologies such as those provided by EPA, IPCC, and WRI.</p>	<p>DEC staff already have some of the necessary expertise to undertake this approach. However, ongoing &amp; timely assistance from other state agencies in collecting appropriate data, and reviewing inventory / projection assumptions will be critical. In addition, CCS must provide DEC with all of the raw data, and methodologies used in the GCCC inventory and forecast effort. This will enable DEC to maintain consistency in future inventory and forecast efforts, and improve methodologies where feasible.</p>	<p>Transfer of knowledge from CCS to DEC should happen ASAP during 2008. The next comprehensive GHG inventory should be conducted as soon as a robust set of new data exists for all (or at least the majority of) inventoried sectors. (2008?, 2010?)</p>	<p>Low</p>	<p>Primarily DEC</p>	<p>NA</p>	<p>NA</p>	<p>DEC, with assistance from other Agencies and Departments</p>	<p>No actual GHG reductions achieved, but critical to track success with periodic inventories</p>	<p>DEC has the capability to construct a GHG emissions inventory using the EPA State Greenhouse Gas Inventory Tool (SGIT). However, to assure compatibility with the GCCC effort, DEC must obtain data and methodologies from CCS. Recent effort completed through the GCCC Inventory &amp; Forecast documents.</p>
	<p>Inventory all natural &amp; 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).</p>											

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<b>CCTT - Work Plan Template for CC-2 (State GHG Reporting) &amp; CC-3 (State GHG Registry)</b>	<b>Development of Reporting protocols, opportunities and, in the case of mandatory reporting, underlying regulatory requirements</b>	Yes - THE CLIMATE REGISTRY (ongoing development)	The registry will foster collaboration between states, provinces and tribes aimed at developing and managing a common greenhouse gas emissions reporting system with high integrity that is capable of supporting various greenhouse gas emission reporting and reduction policies for its member states and reporting entities. It will provide an accurate, complete, consistent, transparent and verified set of greenhouse gas emissions data from reporting entities, supported by a robust accounting and verification infrastructure	DEC is currently working with other governmental agencies and NGOs to establish the basic framework of an international GHG emissions registry. Continued participation in this large scale effort will enable Vermont organizations to participate in a robust registry system. Moving forward, Vermont will need to discuss the merits of voluntary vs. mandatory reporting requirements.	THE CLIMATE REGISTRY is expected to be operational by September 2008. Enhancing participation from Vermont-based organizations will require a targeted recruiting if the effort is to be voluntary. A mandatory reporting requirement (similar to Maine's) would require additional time to institute appropriate regulation / rule / legislation and infrastructure.	L? - Initial funding has come from private foundations and the participating states. On an on-going basis, it is expected that The Climate Registry will be primarily funded through fees from reporting organizations. Mandatory annual GHG reporting similar to Maine's would require that minor changes be made to existing state air pollutant registration program.	DEC will be impacted through increased administrative cost / time demands. Reporting organizations will also be impacted financially through preparing emissions reports and paying fees to participate. Tiered fee structure for participants ranges from \$450 to \$10,000 annually.		Adding GHGs to the list of reported air pollutants would allow ANR, academic institutions, municipalities, businesses, manufacturers, etc. to gain a more holistic understanding of the overall environmental effects of various onsite infrastructure changes or policy decisions.	DEC will need to collaborate with counterpart agencies in other states, provinces and countries in finalizing the various reporting & registry components. Once the registry is operational, further collaboration will take place with reporting organizations and 3rd party verifiers.	Measures of success for a voluntary registry might be expressed as an increase in participation by x% per year, or to have y% of Vermont's eligible organizations participating by 2012. The measure of success for a mandatory registry would be to have all necessary rules / regulations / legislation in place.	THE CLIMATE REGISTRY is in the 'late' developmental stages, with an expected operational date of September 2008.	H

Action Step name	Existing Program(s) related to Action Step?	Why action needs to be taken	How (including additional research or other needs for implementing the Action)	Timeline for implementation	Cost (Actual \$ or H/M/L)	Who will the Action Step impact fiscally & programmatically (direct)	Potential impacts (indirect)	Potential co-benefits (indirect)	Lead Agency (and partners)	Measure(s) of success /goals (including GHG reductions)	Current status of Implementation Mechanism	Feasibility (H/M/L ... or describe)
Establishment of Advisory Group	None	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.	Advisory Group would be responsible for guidance and oversight of the public education and engagement programs of climate change. The Advisory Group could be a subcommittee of the VCC, and could include members from organizations outside of the VCC.	GCCC report recommends "early establishment" of this group.	Low	Unknown, depends upon makeup and organization of advisory group		Efficiency gained through coordination of social marketing efforts	Unknown. Potential leads are VCC, VTANR		It is unknown who will appoint the proposed Advisory Committee, and who the Advisory Committee will report to. One possible approach is to have the Advisory Group be a subcommittee of the VCC.	H
Establish a state funding mechanism to help subsidize coordinated education, engagement, marketing, and technical assistance programs	None	Other activities identified under this recommendation cannot proceed without funding and other resources	Under current state budget conditions the allotment of state funds to this activity is uncertain. Other possible funding sources include grants or partnerships with other entities.	Concurrent with or shortly after establishment of Advisory Group	Unknown	Unknown	Assuming no funding increase for state agencies, funding may need to be diverted from another (as yet unidentified) program		Lead: Advisory Group Partner: VTANR		Not Started	Unknown
Develop priorities and a social marketing plan to encourage behavior change to meet reduction goals, including the following elements: •Through surveys and other methods, establish behavior benchmarks. •Define and carry out social marketing strategies with broad ethical goals. •Develop and maintain a strong Web-based presence to provide critical support to the many broad educational activities already underway. •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 a unified and multilayered marketing brand is coordinated, implemented and maintained.	Numerous related programs are underway: • Vermont Energy Education Program (www.veep.org) • Vermont Campus Energy Group (www.vcegroup.net) • Vermont Energy and Climate Action Network • 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.cleantoolkit.org/for_communities/toolkit_home.php) • Vermont Green Building Network (www.vgbn.org) • Vermont Earth Institute (www.vtearthinstitute.org) • Vermont Energy Investment Corporation and Efficiency Vermont (www.veic.org) and (www.veic.org) • Vermont Interfaith Power & Light (www.vtimpl.org)	Awareness leading to behavior change is the key to the reduction of energy use and waste	Development of a social marketing plan is a significant task in both time and effort. Will likely require the assistance of an external expert.	To be decided by Advisory Group	Marketing Plan Development: L to M (\$50-100K) Marketing Plan Implementation: Depends on scope, M to H (\$100K-\$500K)	Unknown	• Assuming no new funding source, funding may need to be diverted from another program or programs to finance this activity • Some businesses or business sectors could be negatively affected by changed behaviors	• Increased environmental literacy and awareness on all related issues • Encourages new business models • Potential for synergistic effects from a coordinated campaign	Lead: Advisory Group Partner: VTANR	Many possible measures. IBNLT: Slowing growth and eventual decline in VMT; increase in mass-transit ridership; slowing growth and eventual reduction in per-capita electricity use;	Not Started	Contingent on funding/resources
Identify and establish climate change "best practices" for public and private use in all sectors of the economy	Green Hotel and VT Business Environmental Partnership	Sector-specific practices will be more relevant and potentially more effective than generic practices	Options include adoption of BP from others (particularly EU); ANR develops BPs; convene stakeholder or industry groups or panels of experts in particular fields to develop BPs		Low	VTANR	BPs may have higher costs than existing standard practices	Reduced energy use and waste generation	Lead: VTANR	Number of companies committing to implement BPs in each sector	Green Hotel Program already exists and can serve as a model for development of other sector best practices.	H
Encourage, foster, and promote the research and academic excellence necessary to advance statewide solutions to climate change	A number of state educational organizations have programs in support of this step; however, there is no coordinated effort on the statewide level. The Vermont Climate Change Collaborative (VT CCC) is intended to perform much of this function		Examples from GCCC report 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	Underway	Low				Lead: VT CCC			H
Development of a standards-based curriculum regarding climate change for grades K-12	Statewide Environmental Education Programs (SWEEP)	Teachers and students need to discuss climate change and carbon footprinting to be empowered to address the issue. Sustained behavior change will occur with next generation of adults.	Enlist SWEEP to lead development of curriculum	If possible by 2009	L-M (<\$20K)	Low impact on SWEEP for development; broader potential impact on all VT K-12 educators if adopted	CC/GHG curriculum could compete for time with other environmental education lesson plans	Improved overall environmental literacy at the K-12 level	Lead: SWEEP Partners: VTDoE, VTANR, VTDP	Achievement of learning outcomes	N/A	H

CCTT - Work Plan Template for CC-4 (State Climate Public Education and Engagement)

	Action Step name	Existing program(s) related to Action Steps?	Why action needs to be taken	How (including additional research or other needs for implementing the Action)	Timeline for implementation	Cost (Actual \$ or H/M/L)	Who will the Action Step impact fiscally & programmatically (direct)	Potential impacts (indirect)	Potential co-benefits (indirect)	Lead Agency (and partners)	Measure(s) of success / goals (including GHG reductions)	Current status of Implementation Mechanism	Feasibility (H/M/L ... or describe)	
CCTT - Work Plan Template for CC-5 (Adaptation)	State Climate Change Adaptation Strategy. Subgroups should be formed under the <u>Commission on Adaptation to Climate Change</u> to address specific issues and sectors, such as societal infrastructure, agricultural and forest resources, and recreational and ecological sectors.	No	Actions to reduce greenhouse gas (GHG) emissions are critical to slow the arrival of and mitigate the severity of climate change. Despite our best actions to reduce GHG emissions; however, scientists indicate that we have already committed ourselves to some degree of climate change. Our success in reducing GHG emissions will help determine how much we have to adapt; while our success in adapting will determine our survival and prosperity.	Vermont must begin to: 1) Identify expected short term and long-term impacts from climate change, 2) Identify sectors most at risk from such changes, 3) Educate all sectors regarding the risks of inaction, 4) Collaborate with all sectors to develop viable strategies, policies and systems to avoid or reduce impacts to the natural environment, 'built environment' / infrastructure, human health, and various sectors of the economy. This information would be compiled in the form of a <i>Climate Change Adaptation Plan</i> , which would be reviewed and updated every 5 years, or as new information becomes available.	Multi-sector working group(s) should be established during summer / fall 2008, with a <i>Climate Change Adaptation Plan</i> report to the Governor due by winter 2009 outlining adaptation needs, opportunities for education, and draft potential policy recommendations.	L	State Agencies including ANR, VTrans, Agency of Ag. Food & Markets, ACCD, Public Safety, state and local emergency management response, etc.		Will enhance public safety and improve infrastructure.	ANR would be lead. Partners would include key state agencies such as: VTrans, Public Safety, Dept. of Health, ACCD, Agriculture Food & Markets, BISHCA. Private sector partners would include universities, businesses, environmental groups, engineers, architects, insurance companies, banks, etc.	Success measured by completion of a comprehensive report which identifies: 1) Sectors where adaptation to climate change is necessary and possible, 2) Opportunities / strategies for education and outreach, 3) Policy recommendations intended to reduce risks to various sectors associated with climate change.	NA	H	
	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.	Yes, there are some ongoing efforts to track the symptoms of climate change in VT. However, these need to be expanded. Also, more emphasis needs to be given to using the findings for educational purposes and policy guidance.					L/M	State Agencies (largely ANR), universities and other schools		Will raise public general awareness and concern for sensitive Vermont ecosystems	ANR could serve as lead. Key partners would include: VT Dept. of Education, universities, businesses, environmental groups, public schools, citizen groups	Success measured by completion of a comprehensive report which identifies: 1) Sectors where adaptation to climate change is necessary and possible, 2) Opportunities / strategies for education and outreach, 3) Policy recommendations intended to reduce risk	NA	H
	Development of policy recommendations as necessary.	No				Details would be developed following 2009 Commission report (see above)	?	State Agencies including ANR, VTrans, Agency of Ag. Food & Markets, ACCD, Public Safety, state and local emergency management response, etc.			All state agencies with input from those involved with the <i>Commission on Adaptation to Climate Change</i>	Success measured by successful implementation of policy recommendations	NA	M/H
	Establishment of financial structures and creation of markets that are likely to thrive under anticipated climate impacts.	No					?	Potentially all sectors of the economy	While new financial structures / markets may initially hamper Vermont's economy; over time these efforts can stimulate job growth, as well as place Vermont at a competitive advantage in a global market 'constrained' by climate change.			Success measured by various economic indicators	NA	?

	Action Step name	Existing program(s) related to Action Step?	Why action needs to be taken	How (including additional research or other needs for implementing the Action)	Timeline for implementation	Cost (Actual \$ or H/M/L)	Who will the Action Step impact fiscally & programmatically (direct)	Potential impacts (indirect)	Potential co-benefits (indirect)	Lead Agency (and partners)	Measure(s) of success / goals (including GHG reductions)	Current status of Implementation Mechanism	Feasibility (H/M/L ... or describe)
<p><b>CCTT - Work Plan Template for CC-6 (Options for State GHG Goals or Targets)</b></p>	<p>The PG 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 &amp; coordinate implementation strategies for GHG reduction policies, including regulatory and non-regulatory initiatives.</p>	<p>Yes - program being proposed in the form of the Governor's Vermont Climate Collaborative, which will promote the following: • Education Commissioner will work with UVM to establish an ecological literacy standard that can help prepare students for future career opportunities in the green economy • \$350,000 in state matching grants for local communities to move forward with their own initiatives to save energy and stimulate green jobs. • Allowing maple sugar operators expanded access to state forest lands • Expanding timber harvest in the state forests as a source of local renewable energy, high-quality wood products and habitat management. • Creation of the Center for Climate Change and Waste Reduction within the Agency of Natural Resources to act as a clearinghouse and coordination arm for state government in helping Vermonters reduce their energy needs, both in the public and private sectors</p>	<p>There are numerous interrelated programs ongoing inside and outside of state government related to climate change. Coordination of these efforts will facilitate enhanced GHG reduction strategies and avoid redundancies in effort.</p>		<p>The CCTT will present work plans by September 2008. Implementation will depend on when The Center for Climate Change &amp; Waste Reduction is initiated. Efforts to meet the 2012 and 2028 GHG reduction goals (adopted through Executive Order and Legislation) will be ongoing.</p>	<p>Uncertain - depends upon scope and magnitude of action</p>	<p>Primarily ANR, but other state agencies may be impacted</p>	<p>Focus on addressing climate change issues could eclipse other important environmental and health issues, unless a holistic approach is used.</p>	<p>More coordination should translate into enhanced operating efficiency of state government, better working relationships with the private sector and non-profits, etc.</p>	<p>ANR would be the lead agency. Partners would include all agencies involved with the CCTT (at minimum), along with universities, the private sector, and non-profits</p>	<p>As stated by the Plenary Group in the CC-6 "Policy Design" section: <i>"The PG 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 to compensate for any shortfall in 2012."</i></p>	<p>The Climate Change Transition Team (CCTT) is developing work plans for the 38 recommendations (and action items contained therein).</p>	<p>H / M</p>

Action Step name	Existing program(s) related to Action Steps?	Why action needs to be taken	How (including additional research or other needs for implementing the Action)	Timeline for implementation	Cost (Actual \$ or H/M/L)	Who will the Action Step impact fiscally & programmatically (direct)	Potential impacts (indirect)	Potential co-benefits (indirect)	Lead Agency (and partners)	Measure(s) of success / goals (including GHG reductions)	Current status of Implementation Mechanism	Feasibility (H/M/L ... or describe)
Implementation may be assisted by current, parallel efforts to implement the 2005 Vermont State Agency Energy Plan (SAEP)	Yes - CNWG / SAEP	Linkage between the Climate Neutral Working Group (CNWG) and the SAEP is critical in allowing the state to comprehensively and effectively address both reductions in energy use and GHG emissions from state gov't buildings and operations	CNWG / SAEP technical staff should continue to identify overlaps that will further the goals of both efforts, as well as provide analysis of expected GHG and energy reduction, costs, etc.. Given that implementation of both efforts is largely within the purview of BGS (and that ANR, Public Service, VTrans, Agency of Ag. and others will be focusing on activities to address climate change statewide - beyond the boundaries of state government) the administration might consider re-drafting the existing executive order #14-03: (1) So that the CNWG and SAEP efforts line up more closely regarding personnel, reporting requirements, etc. & (2) So that the Commissioner of BGS becomes the Chair of the CNWG / SAEP combined effort, and that other agencies (ANR, DPS, VTrans) serve as a Technical & Advisory Committee. The administration should review the recommendations put forth in the CNWG 1st and 2nd Biennial Reports along with additional analyses to be provided by technical staff. The recommendations should be prioritized based on relative cost-benefit, and implemented such that the goals of the CNWG and SAEP are met.	This is already ongoing, but should be enhanced / formalized as we move forward		Primarily BGS since they are the agency responsible for the SAEP, and are the primary owner / operator of most state government infrastructure. This will impact all agencies to some degree (depending on their energy consumption and responsibility / ownership of various state resources)			BGS will be the lead. Primary partners will include DEC, DPS, VTrans, Efficiency VT and others as interested	Reduce GHG emissions from 1990 baseline by 25% by 2012, 50% by 2028, and if practicable using reasonable efforts, 75% by 2050	The CNWG has been ongoing since 2002. The SAEP was updated in 2005 and begins to integrate the recommendations put forth in the 1st Biennial Report of the CNWG	H
The State should lead by example by adopting best practices across the board to serve as a model for other emitters	Yes - CNWG	This is consistent with the agreement Vermont entered with other government entities participating in the New England Governors & Eastern Canadian Premiers Climate Change Action Plan adopted in 2001. Leading by example provides an educational platform to share successes with the private sector and Vermonters in general. GHG reduction potential is sizeable given that Vermont State Government is one of the largest employers in the state.	BGS with cooperation from other agencies must continue to implement the various recommendations of the CNWG in such a way that the goals of Executive Order #14-03 are met in 2012 and 2028. Emphasis needs to be threefold - 1) enhance tracking of progress achieved through existing programs; 2) determine cost-benefit of remaining (and new) recommendations; 3) Implement remaining recommendations (note that this will require appropriate allocation of funding and personnel)	Ongoing with specific goals to be met in 2012, 2028 and 2050		Primarily BGS since they are the primary owner / operator of most state government infrastructure. This will impact all agencies to some degree (depending on their GHG emissions / energy consumption and responsibility / ownership of various state resources)						H
The State should frame & target the emission reductions called for as continuous annual improvement efforts (e.g., reducing emissions ~3% per year over the long term)	Yes - CNWG (however incremental annual goals have not been explored adequately)	Concrete GHG emissions reduction steps should be helpful in enabling state government to meet the goals of E.O. #14-03. An annual reduction goal would likely be given a higher priority than a goal that is several years away.	Enhance 'monitoring' of actual GHG reductions associated with specific actions, policies, projects, etc. Currently BGS tracks total annual energy use by state agency (which is converted to CO2 emissions). This should be enhanced so that individual project GHG savings are quantified. This information could be used to evaluate successful projects & initiatives which could be replicated elsewhere within state government.	Given that the first reduction goal is only 4-5 years away, incorporation of this approach should be evaluated ASAP.	Cost to implement various CNWG recommendations contained in the 2 Biennial Reports will vary and should be analyzed by technical staff. Some fiscal and additional staff resources should be dedicated to the CNWG efforts to make it possible to reach the emissions reduction targets facing the CNWG.					Looking at 2007 emissions estimates from BGS and the CNWG - state government CO2 emissions would need to be reduced by roughly 10,000 tons (space heat, electricity, business travel, employee commuting) per year (starting in 2008) to meet the 2012 goal	BGS (with help from the CNWG) is beginning to evaluate incremental strategies to reach the 2012 goal for building space heating, electricity consumption, and vehicle fleet/ business travel. The CNWG could further this effort by focusing efforts on employee commuting strategies to reduce CO2 emissions.	M
State procurement processes should contribute substantially in assisting agency emission reduction efforts.	Yes - BGS EPP (Environmentally Preferable Purchasing)	A large portion of this action is already in place, but should be enhanced as discussed below.	Through the Environmentally Preferable Purchasing (EPP) Program, BGS - Purchasing department already has requirements regarding purchase of 'right-sized', fuel efficient vehicles, energy star appliances, and various recycled/recyclable office materials. An enhanced effort should be made to quantify GHG emissions savings that are achieved through purchasing choices. This could be used as an educational piece for state employees as well.	Program is ongoing, but enhancements could be made over the next couple of years.		BGS (in regards to Purchasing & Contract Admin. changes), All state agencies (in regards to products available for purchase)			BGS with assistance from other agencies	Ensure that all purchasing choices have been screened so that the purchased product 'meets the intended needs', but results in the least GHG emissions possible	ongoing	H
Education, outreach, and marketing efforts should apply to and engage the State as well as nongovernmental 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.	No relevant program / policy exists or is being planned	Education, outreach, and marketing efforts would provide a consistent level of understanding for all involved. Public recognition would provide an incentive to do the right thing. Enhanced coordination within and among all state agencies would help remove redundancy in effort and promote a synergistic approach to solving the problem		Some efforts are ongoing, but enhancements should be made ASAP		All State Agencies			CNWG / SAEP would be lead entities. Coordination with universities, schools, businesses, non-governmental organizations and others would be essential.	Measures of success would need to be developed	NA	H
Agency progress in meeting the State's reduction targets should be one of the yardsticks by which agency performance is measured.		This would place responsibility on each agency in reducing GHG emissions. However, it should be recognized that some agencies would be better able to meet their portion of the reduction goal than others.				All State Agencies			BGS / CNWG	Each state agency would reduce GHG emissions to some degree, with state government (as a whole) realizing reductions that meet the 2012 & 2028 goals.		M

CCTT - Work Plan Template for CC-7 (The State's Own GHG Emissions)

## WORK PLANS

**CCTT Work Plan for ESD-1  
(Evaluation and Continuation/ Expansion of Existing DSM for Electricity and Natural Gas)**

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*Action Step 1 - Improve electric energy efficiency programs*

1. **Lead Agency:** PSD/PSB.
2. **Other Partners:** EEU(s).
3. **Authority:** PSD/PSB.
4. **Budget/Funding:** VT spending on electric energy efficiency increased to \$30.75 million per year in 2008. Market evaluations funded by ratepayers through EE charge.
5. **Resources:** Electric energy potential study completed in 2006. Residential and commercial market evaluations by PSD currently underway.
6. **Schedule of Tasks:**
  - i Electric energy potential study and market evaluations should be completed every three years.
  - ii EEU budgets should be adjusted to accurately capture all cost effective energy efficiency as new efficiency potential studies are completed.

*Action Step 2 – Energy Efficiency Utility (EEU) restructuring*

1. **Identify Lead Agency:** PSD/PSB.
2. **Other Partners:** Vermont utilities
3. **Authority:** PSB. Workshops are currently ongoing to explore ways in which EE services can be delivered in VT.
4. **Budget/Funding:** The EEU is funded through a surcharge on electric ratepayer bills via and energy efficiency charge (EEC). The EEU is also funded through participation in VT electric markets. The budgets are reviewed at least every three years, and we anticipate this cycle will continue under any new EEU structure.
5. **Resources:** PSB workshops.
6. **Schedule of Tasks:**
  - i Work to make the EEU contract selection process fair.

- ii Explore ways to further institutionalize the role of the EEU.

***Action Step 3 - Geotargeting***

1. **Lead Agency:** PSD/PSB.
2. **Other Partners:** Utilities
3. **Authority:** PSB and VT System Planning Committee. PSB has directed that increased EEU funding be directed to specific areas of the state that need substantial transmission facility upgrades. VSPC was created to monitor and assist GT program.
4. **Budget/Funding:** EEC, Vermont utility rates
5. **Resources:**
6. **Schedule of Tasks:**
  - i Identify areas within Vermont which will potentially require costly transmission and distribution improvements.
  - ii Monitor and re-evaluate areas currently identified as “geotargeted.”
  - iii Direct funding for energy efficiency programs towards DSM in geotargeted areas.

***Action Step 4 - EEU Participation in the Forward Capacity Market***

Continue assisting efficiency programs that participate in the FCM.

1. **Lead Agency:** PSD/PSB.
2. **Other Partners:** EEU.
3. **Authority:** PSB. PSB has initiated a process to determine the appropriate allocation for the market payments that will be received for the capacity benefits of EEU programs.
4. **Budget/Funding:** FCM payments. Returns to ratepayers for participating in the FCM are expected to become net positive in 2008.
5. **Resources:** Vermont is currently working with other states in the region to establish regional standards for measurement and verification (M&V) of efficiency programs that participate in the market.
6. **Schedule of Tasks:**
  - i The EEU participated in the first FCM auction on 2/6/2008 and should continue to participate in future auctions.

- ii. Revenues are expected to exceed costs sometime in 2008.

***Action Step 5 - Natural Gas Efficiency Study***

VGS should be required to periodically complete a natural gas efficiency potential evaluation that is independently reviewed by the PSD or its experts.

- 1. Lead Agency:** PSD/PSB.
- 2. Other Partners:** Vermont Gas (VGS).
- 3. Authority:** PSB and PSD. The requirement would be established by the PSB and the PSD would then conduct a study/evaluation of VGS' efficiency potential.
- 4. Budget/Funding:** Natural gas utility rates
- 5. Resources:** Rough calculations of expected efficiency savings are included in the VGS IRP. The next IRP is due in 2008.
- 6. Schedule of Tasks:** 1) VGS should complete its study by 2010. 2) Study should be independently reviewed.

***Action Step 6 - Natural Gas DSM Verification.***

The state should conduct a verification examination of VGS' DSM savings claims.

- 1. Identify Lead Agency:** PSD/PSB.
- 2. Other Partners:** VGS.
- 3. Authority:** PSB would require VGS to report DSM savings and the PSD would verify the reported savings.
- 4. Budget/Funding:** VGS, PSD.
- 5. Resources:** VGS DSM programs ("Energy Extenders").
- 6. Schedule of Tasks:** Develop a program to verify VGS' DSM savings claims.

**CCTT Work Plan for ESD-2  
(Evaluation and Expansion of DSM to Other Fuels)**

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*Action Step - Expand all fuels efficiency programs*

- 1. Identify Lead Agency:** PSD.
- 2. Other Partners:** EEU, certain utilities, community action agencies, VT Weatherization Program.
- 3. Authority:** All fuels EEU established by order of General Assembly; oversight resting with PSD/PSB.
- 4. Budget:** Act 92 (S.209) directs the PSB to establish a non-electric energy efficiency fund to be funded by appropriations, by FCM payments resulting from the bidding of efficiency resources, and from revenues obtained through Vermont's participation in the Regional Greenhouse Gs Initiative (RGGI). Oversight of the fund rests with PSB.
- 5. Resources:** All Fuels Efficiency Study, RAP "Affordable Heat" report.
- 6. Schedule of Tasks:**
  1. Establish and secure funding for all fuels EU.
  2. Achieve energy consumption reductions.
    - i. 12% by 2016
    - ii. 29% by 2028

**CCTT Work Plan for ESD-3a  
(Improved Building Codes)**

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***Action Step 1 - Improve (energy) building codes for the residential and commercial building sectors.***

- 1. Lead Agency:** PSD, PSB.
- 2. Other Partners:** BGS, EEU, VGS, BED, architects, engineers, contactors, builders, mortgage lenders, and legislators.
- 3. Authority:** Act 92 of 2008 requires prompt updates to the Residential Building Energy Standards (RBES) and Commercial Building Energy Standards (CBES). PSB and PSD would have responsibility beyond that.
- 4. Budget/Funding:** Not identified. Source and funding levels need to be identified.
- 5. Resources:** Vermont Residential Building Energy Standards 21 V.S.A. Section 266; Vermont's Commercial Building Energy Standards 21 V.S.A. Section 268; US Environmental Protection Agency (EPA's) Energy Star Program; City of Burlington multi-family housing time-of-sale energy requirement; Burlington Electric Department and EVT provide statewide energy efficiency services that are funded by an EEC on electric utility bills. Burlington Electric Department and Efficiency Vermont can provide technical assistance and incentives to help the industry meet or exceed building codes. VGS provides technical assistance and incentives to help the industry meet or exceed building codes.
- 6. Schedule of Tasks:** 1) DPS to lead update of RBES to the International Energy Conservation Code (IECC) in 2008-2009.

***Action Step 2 - Evaluate the use of building codes that are more advanced than current standards.***

- 1. Lead Agency:** PSD, PSB.
- 2. Other Partners:** BGS, EEU, VGS, BED, architects, engineers, contactors, builders, mortgage lenders, and legislators.
- 3. Authority:** PSD, PSB.
- 4. Budget/Funding:** **Not identified – funding will be necessary**
- 5. Resources:** Vermont Residential Building Energy Standards 21 V.S.A. Section 266; Vermont's Commercial Building Energy Standards 21 V.S.A. Section 268; US Environmental Protection Agency (EPA's) Energy Star Program; City of Burlington multi-

family housing time-of-sale energy requirement; Burlington Electric Department and EVT provide statewide energy efficiency services that are funded by an EEC on electric utility bills. Burlington Electric Department and Efficiency Vermont can provide technical assistance and incentives to help the industry meet or exceed building codes. VGS provides technical assistance and incentives to help the industry meet or exceed building codes.

**6. Schedule of Tasks:**

Evaluate current building codes, compliance and efficiency potential and develop a plan for creating more ambitious Vermont specific building codes based on a set of targets such as the Architecture 2030 initiative or the Vermont edition of the Core Performance Guide in 2009.

***Action Step 3 - Evaluate time-of-sale energy consumption***

**1. Lead Agency:** PSD, PSB.

**2. Other Partners:** BGS, EEU, VGS, BED, architects, engineers, contactors, builders, mortgage lenders, and legislators.

**3. Authority:** PSD, PSB.

**4. Budget/Funding: Not yet identified.** Source and funding levels need to be identified.

**5. Resources:** Vermont Residential Building Energy Standards 21 V.S.A. Section 266; Vermont's Commercial Building Energy Standards 21 V.S.A. Section 268; US Environmental Protection Agency (EPA's) Energy Star Program; City of Burlington multi-family housing time-of-sale energy requirement; Burlington Electric Department and EVT provide statewide energy efficiency services that are funded by an EEC on electric utility bills. Burlington Electric Department and Efficiency Vermont can provide technical assistance and incentives to help the industry meet or exceed building codes. VGS provides technical assistance and incentives to help the industry meet or exceed building codes.

**6. Schedule of Tasks:**

Evaluate implementation of a "time-of-sale" energy disclosure.

**CCTT Work Plan for ESD-3b  
(Building Commissioning)**

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*Action Step - Building commissioning.*

**1. Lead Agency:** PSD.

**2. Other Partners:** Architects, engineers.

**3. Authority:**

**4. Budget/Funding:**

**5. Resources:** Efficiency Vermont provides statewide energy efficiency services that are funded by an EEC on electric utility bills. Efficiency Vermont can provide funding for building commissioning and building recommissioning.

**6. Schedule of Tasks:**

1) Create an entity to a) deliver building design and construction training with other state agencies and groups; b) investigate ways to supplement or improve existing training programs and c) institute a building commissioning, building recommissioning, energy tracking and benchmarking program for builders, contractors, building managers, enforcement officials and others.

2) Implement building commissioning programs in coordination with ESD-3a and ESD-3c.

3) Act 92 of 2008 establishes a process for certification of buildings.

**CCTT Work Plan for ESD-3c  
(Building Efficiency Codes, Training, Tracking)**

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*Action Step: Building efficiency codes, training and tracking.*

1. **Lead Agency/Department/Entity:** PSD.
2. **Other Partners:** Efficiency Vermont, Vermont Gas Service, Burlington Electric Department, architects, engineers, contractors, builders, mortgage lenders, legislators, high schools, vocational schools, and adult education programs.
3. **Authority:**
4. **Budget/Funding:** PSD, EEU.
5. **Resources:** Trade groups for builders, architects, engineers, electricians, plumbers, and heating, ventilation, and air conditioning (HVAC) contractors provide training sessions for their members; high schools or vocational centers offer training programs for building trades. The EEU provides statewide energy efficiency services that are funded by an EEC on electric utility bills. Efficiency Vermont has provided training for contractors and builders on energy efficient construction.
6. **Schedule of Tasks:**
  - 1) a. Develop and deliver training with other industry groups to assess ways to supplement or improve the training that already exists in the State.  
b) Assist preliminary studies of energy optimization options and providing support for the design team and the owners.  
c) Submit a report to the PSD on a yearly basis to outline what has been accomplished and the goals for the following year.  
d) The PSD will also perform random inspections to ensure compliance by the entity.
  - 2) Policies should be implemented in a timely manner to place this option into operation in coordination with ESD-3A and ESD-3B.
  - 3) Current legislation: Act 92 (S.209) requires prompt initiation of upgrades of the state's residential and commercial building codes.

**CCTT Work Plan for ESD-4  
(Evaluate Potential for Contracting Nuclear Power)**

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*Action Step - Negotiate and evaluate proposal for contract with VT Yankee owners for nuclear power.*

1. **Lead Agency/Department/Entity:** PSD, ANR.
2. **Other Partners:** Vermont utilities
3. **Authority:** PSD, PSB and potentially the General Assembly.
4. **Budget/Funding:** Ratepayer savings are expected to be significant. Costs of resource are expected to be below market and to generate ratepayer benefits..
5. **Resources:** Integrated Resource Planning, NRC relicensing procedures, DPS Studies pursuant to Act 170. Act 189 of 2008 requires a thorough, independent, and public assessment of the reliability of the systems, structures, and components of the Entergy Nuclear Vermont Yankee facility.
6. **Schedule of Tasks:**
  - 1) Options for increasing nuclear power reliance would be to diversify the nuclear portfolio through additional contracts, trades, or swaps. These options can be developed by the purchasing utilities or by Vermont Yankee as its contract offer to the State of Vermont. Including outage insurance in the contract could also help mitigate exposure. The Vermont Yankee plant must receive a license extension from the NRC. Per agreement, the Vermont legislature must approve the license extension. The Vermont PSB must issue a certificate of public good for any continued operation of the facility. Vermont utilities must agree on contract terms that are acceptable to all parties and that provide sufficient benefit to justify continued operation of the plant.
  - 2) Complete Vermont Yankee review of recertification by 2010.

**CCTT Work Plan for ESD-5  
(Support for Combined Heat and Power [CHP])**

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***Action Step 1 - Identify suitable host facilities***

Identify locations where there is a year round demand for heat, cooling, and electrical power such as large manufacturing facilities (e.g. IBM), hospitals (e.g. Fletcher Allen, CVMC, RPMC), colleges and universities (e.g. UVM, state colleges), state office complexes (e.g. Waterbury), municipal district heating systems (e.g., Brattleboro), greenhouse facilities, and others to be identified).

- 1. Lead Agency/Department/Entity:** PSD
- 2. Other Partners:** VAAFM, VTC, Efficiency Vermont, Northeast Combined Heat & Power Applications Center. Installation contractors could be partners later in the process once sites/projects are identified.
- 3. Authority:** No additional authority necessary; this is a research project.
- 4. Budget & Resources:** Approximately 0.5 FTE for DPS coordination of this effort. Time commitment also required from other partners.
- 5. Schedule of tasks (1-12 months; 13-48 months)**  
Six month task duration:
  - Two (2) months of planning
  - Two (2) months data gathering
  - Two (2) months report preparation
- 6. Assumptions:** Assumes commitment by the Department of 0.5 FTE during a period of many competing demands and downsizing by state government. Also assumes effective cooperation and by other partners and a relatively high level assessment based on profiles of certain businesses using publicly available information resources.

***Action Step 2 - Encourage energy utilities to sell CHP output to third-party customers***

(Note: This is already authorized)

- 1. Lead Agency/Department/Entity:** PSD
- 2. Other Partners:** Public Service Board
- 3. Authority:** No additional authority needed for heat and electricity sale. A utility would need PSB approval for any particular project through the existing permitting/approval process

4. **Budget & Resources:** N/A
5. **Schedule of tasks (1-12 months; 13-48 months):** N/A
6. **Assumptions:** Assumes that there is a host thermal load near the project. The electric utility may require either Board authority to sell or distribute the thermal energy. A gas utility would require Board authority to sell or distribute the electric energy. The electric utility involved could also just receive the power and rely on it as part of the generation mix used for servicing its retail customers.

***Action Step 3 - Include consideration of CHP potential in decisions regarding expansion of natural gas in VT.***

1. **Lead Agency/Department/Entity:** PSD
2. **Other Partners:** Public Service Board, ACCD, Vermont Gas
3. **Authority:** None required.
4. **Budget & Resources:** Can likely be accomplished by PSD within existing budget and resources.
5. **Schedule of tasks (1-12 months; 13-48 months):**  
Ongoing. Low level of activity until Vermont Gas makes an application for expansion of service. Triggering event would be identification of an entity that would make expansion cost effective. Once an application is received, consideration of CHP potential is already an evaluation criterion.
6. **Assumptions:** Suitable project in reasonably close proximity to the existing footprint of Vermont Gas. The cooperation of electric utilities and understanding of the electric interconnection costs of the project would also need to be well understood before moving forward.

***Action Step 4 - Provide appropriately tailored incentives, such as shared cost studies, that remove barriers for CHP***

1. **Lead Agency/Department/Entity:** PSD (Clean Energy Development Fund)
2. **Other Partners:** ACCD, EEU, VAAFM
3. **Authority:** Legislative authority already exists. EEU requires Board authorization for use of Energy Efficiency Fund for these purposes. However, discussions are already underway.

4. **Budget & Resources:** Clean Energy Development Fund (CEDF) and Energy Efficiency Utility (EEU) budgets already exist. Other economic incentives would likely be required.
5. **Schedule of tasks (1-12 months; 13-48 months):** Development of incentives is existing and ongoing. PSD, VAAFFM, USDA already have existing incentive programs targeted to their areas of responsibility. Current incentive programs range from \$25,000 grants from the CEDF for performing project feasibility studies to grant, tax and other incentives potentially available to large projects. PSD and EEU are currently negotiating scope of incentive programs which will be funded through the EEU by a charge on energy.
6. **Assumptions:** Available funds from the CEDF and/or Public Service Board authority granted to the EEU for use of Energy Efficiency Fund for either technical assistance or financial incentives.

***Action Step 5 - Consider appropriate adjustments to the EEU budget to include appropriate incentive funds for residential and commercial CHP projects.***

1. **Lead Agency/Department/Entity:** PSD
2. **Other partners:** EEU
3. **Authority:** None required. Public Service Board approves budgets and modifications.
4. **Budget:** Under development for FY 2009 (see below)
5. **Resources:** Being accomplished by existing resources
6. **Schedule of tasks (1-12 months; 13-48 months)**  
As mentioned above, the PSD and the EEU are currently negotiating the scope of incentive programs to be funded through EEU. Based on the outcome of these negotiations the budget for incentives and the revenue mechanism will be set.
7. **Assumptions:** General agreement on the precise scope and nature of the services to be provided by the EEU and willingness to commit ratepayer funds to support these projects in competition for other cost-effective energy efficiency fund programs and activities.

***Action Step 6 - Address regulatory barriers to distributed CHP projects.***

- Interconnection Standards (Institute of Electricians Engineers technical interconnection standard IEEE 1547, covers criteria and requirements for interconnection, including protection requirements at the interface) (PSB Rule 5.500)
- Interconnection Standards (business processes, such as timelines, fees, contractual requirements) (PSB Rule 5.500)
- Regulatory barriers, including form of regulation (GMP Alternative Regulation Plan in place, CVPS plan proposed) - Decoupling

- Nondiscriminatory rates for backup and interconnection (to be addressed in future rate design proceedings)
- Utility awareness of benefits (voltage support, reactive power)
- Financial incentives - Clean Energy Development Fund exists. Others needed.
- Air Quality Standards

**1. Lead Agency/Department/Entity – DPS**

**2. Other Partners - ANR, AOA, VGS, Vermont Electric Utilities**

**3. Authority - Primarily through PSB regulation**

**4. Budget**

DPS – 2/3rds FTE

Utilities in rates

**5. Resources - Utility rate proceedings; utility and regulatory staff resources for rates;.**

**6. Schedule of Tasks**

Year 1 - Reliance on interconnection rule, alternative regulation, and clean energy development fund elements are matters of ongoing implementation.

Year 2 - Work with one or two distribution utilities to establish approach to setting guidelines for backup and interconnection charges.

Years 3-4 - Establish backup and interconnection tariffs for other utilities.

**7. Assumptions:** Much of the work has already been completed as part of the development of PSB Rule 5.500 and the alternative regulation plans proposed or under development. Additional work on tariff and interconnection rates is still ahead. DPS commitment of staff or resources to support consulting assistance. Cooperation of Vermont's distribution utilities.

**CCTT Work Plan for ESD-6  
(Incentives and/or Mandate for Renewable Electricity)**

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*Action Step 1 - Expand voluntary green pricing programs.*

- 1. Lead Agency:** PSD & PSB.
- 2. Other Partners:** Electric utilities.
- 3. Authority:** PSB
- 4. Budget/Funding:** Utilities (participating ratepayers).
- 5. Resources:** Both of Vermont's largest investor-owned utilities have programs. The Central Vermont Public Service (CVPS) program "Cow Power" now has more than 3% of its customer base participating in the program (as of mid-2008). Act 92 (S. 209) requires that all utilities establish similar programs and make them available to all consumers.
- 6. Schedule of Tasks:**
  - 1) The PSB shall develop guidelines for green pricing programs;
  - 2) Vermont utilities shall propose green pricing programs;
  - 3) The DPS and PSB should review programs;
  - 4) Utilities shall effectively market and implement green pricing programs.

*Action Step 2 – Sustainably Priced Energy Enterprise Development (SPEED) program implementation.*

- 1. Lead Agency:** PSD & PSB.
- 2. Other Partners:** Vermont utilities
- 3. Authority:** PSB.
- 4. Budget/Funding:** Utilities (ratepayers), Cost of SPEED Facilitator: \$40K, DPS and PSB review over and above existing responsibilities.
- 5. Resources:** None expected
- 6. Schedule of Tasks:**
  - 1) Continue to implement the SPEED Program through board rule and SPEED Facilitator
  - 2) Vermont utilities should meet all new load growth plus 5% with SPEED resources by 2012
  - 3) PSD and DPS should monitor success of SPEED program.

***Action Step 3 - Consider establishing a Renewable Portfolio Standard (RPS).***

**1. Lead Agency:** PSD, PSB.

**2. Other Partners:** VT General Assembly, electric utilities.

**3. Authority:** PSD, PSB and potentially the General Assembly.

**4. Budget/Funding:** \$15 million per year estimated for early years in additional ratepayer costs if SPEED goals are not met.

**5. Resources:**

1) Clean Energy Development Fund

2) At present, five of Vermont's New England neighbors and New York possess an RPS requiring that a certain percentage of sales be attributable to new renewable resources. Efforts are underway at the regional level to further harmonize the RPS requirements of states with an RPS.

**6. Schedule of Tasks:** If adverse determination on SPEED is made by the PSB, then an automatic RPS goes into effect.

***Action Step 4 - Investigate avenues for encouraging the development of additional sources of commercial scale renewable electricity in Vermont.***

**1. Lead Agency:** PSD, PSB.

**2. Other Partners:** ANR, SPEED facilitator and electric utilities.

**3. Authority:** PSD and PSB

**4. Budget/Funding:** potentially

**5. Resources:** n/a

**6. Schedule of Tasks:**

1) Initiate PSB workshops to determine opportunities

2) If warranted, commission a study.

**CCTT Work Plan for ESD-8**  
**(Incentives for Clean Distributed Technologies for Electricity or Heat)**

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*Action Step - Provide incentives to support clean consumer technologies to displace oil usage, such as rebates, direct subsidies, and tax credits.*

**1. Lead Agency:** PSD

**2. Other Partners:** Contractor(s) & PSB

**3. Authority:** PSD and entities or entity chosen to develop efficiency programs.

**4. Budget/Funding:** Not identified. Source and funding levels need to be identified..

**5. Resources:** 1) The Clean Energy Development Fund 2) The Small Wind and Solar Incentive Program 3) NEIL funds 3) Act 92 (S.209) allows for the creation of an entity or entities that may provide incentives for clean distributed technologies.

**6. Schedule of Tasks:**

- 1) Provide technical assistance to electric customers who wish to install Combined Heat and Power (CHP). Investigate providing incentives.
- 2) The entity or entities chosen by the PSD to deliver efficiency services in the unregulated fuels sector should develop incentive programs.

**CCTT Work Plan for ESD-9  
(Wind Specific Support Measures)**

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*Action Step 1 - Allow targeted incentives for utility investment in new utility owned wind generation. Premiums to allow return on equity on such investments was suggested as an example. The DPS does not support such premiums at this time.*

*Action Step 2 - Amendment to Act 250 permit and Title 30, § 248 V.S.A. provisions to accelerate the wind generation permit and regulatory approval process once a complete application is received.*

- 1. Lead Agency:** NRB, PSD, PSB.
- 2. Other Partners:** VT General Assembly, electric utilities
- 3. Authority:** NRB & PSB.
- 4. Budget/Funding:** Docket / Rulemaking
- 5. Resources:** N/A
- 6. Schedule of Tasks:** 1) ANR & DPS files with the PSB to change Title 30, § 248 V.S.A. provisions; and 2) Legislation / NRB rule making to amend Act 250?

*Action Step 3 - Utility investment in or contractual commitment to purchase wind generation, once approved by the Vermont PSB, is deemed prudent and is useful for rate-making so far as the facts that were known to regulators at the time the project was permitted.*

- 1. Lead Agency:** PSD, PSB.
- 2. Other Partners:** Electric utilities
- 3. Authority:** Title 30
- 4. Budget/Funding:** No additional funding necessary
- 5. Resources:** N/A
- 6. Schedule of Tasks:**  
Applications will be reviewed as they are received

**CCTT Work Plan for ESD-10  
(Hydro-Specific Support Measures)**

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***ESD 10 – Hydro-Specific Support Measures***

Based on conversations with DPS, ANR recommends that the four implementation mechanisms identified by the Governor’s Commission on Climate Change should be replaced by those below:

***Action Step 1 - Develop a comprehensive guide to small hydropower development in Vermont.***

The target audience would be the developers of prospective projects, with the focus on those projects that do not exceed 100 kW of installed capacity. The guide would provide information to help prospective developers understand the economic and environmental issues associated with small hydropower projects, the regulatory system, and how to make a very preliminary assessment of whether a given site is economically viable. It could be a print publication, website or both.

- 1. Lead Agency:** ANR, DPS, PSB.
- 2. Other Partners:** n/a
- 3. Authority:** n/a
- 4. Budget/Funding:** \$35,000 for contract writer, funding from appropriation
- 5. Resources:** n/a
- 6. Schedule of Tasks:**
  - i. Initiate RFP process and project schedule when funding is secured

***Action Step 2 - Conduct prefeasibility assessments for public and private projects and resource assessments (i.e., electrofishing) for municipal/public projects.***

- 1. Lead Agency:** ANR
- 2. Other Partners:** hydroelectric developers, municipalities
- 3. Authority:** ANR
- 4. Budget/Funding:** n/a
- 5. Resources:** n/a

**6. Schedule of Tasks:** n/a

***Action Step 3 - Update the 1980 New England River Basins Commission study to identify the most viable sites for small hydropower development at existing dams.***

1. **Identify Lead Agency:** ANR

2. **Other Partners:** DPS, PSB

3. **Authority:** n/a

4. **Budget/Funding:** \$55,000

5. **Resources:** temporary staff

6. **Schedule of Tasks:**

- i. Develop project plan when funds are appropriated

***Action Step 4 - Examine possible ways to better integrate the FERC and ANR permit processes for small, low-impact hydroelectric projects.***

1. **Identify Lead Agency:** ANR, PSB, DPS

2. **Other Partners:** FERC

3. **Authority:** Clean Water Act, Federal Power Act

4. **Budget/Funding:** n/a

5. **Resources:** existing resources

6. **Schedule of Tasks:**

- i. Initiate process in June 2008

***Action Step 5 - Determine amount of additional generation that can be produced at existing hydroelectric facilities that currently meet Vermont Water Quality Standards through equipment upgrades and operational changes.***

1. **Identify Lead Agency:** DPS

2. **Other Partners:** ANR, electrical utilities and generating companies

3. **Authority:** N/A

4. **Budget/Funding:** N/A
5. **Resources:** Clean Energy Development Fund and current project operations.
6. **Schedule of Tasks:** Identify project and funding for studies.

***Action Step 6 - Convene a public stakeholder process of interested parties to review existing and proposed conservation flow standards and to issue recommendations to the Natural Resources Board regarding the need to amend the conservation flow standards.***

1. **Identify Lead Agency:** Natural Resources Board
2. **Other Partners:** ANR, DPS, PSB, USEPA, USFWS, environmental groups, utilities and hydropower advocates
3. **Authority:** Act 92, § 37
4. **Budget/Funding:** n/a
5. **Resources:** n/a
6. **Schedule of Tasks:**
  - i. June 1, 2008 – convene stakeholder process (note: process underway)
  - ii. Encourage Vermont utilities to continue their review of projects

***Action Step 7 - Report on the cost of a study of alternative aquatic habitat study methodologies.***

1. **Identify Lead Agency:** ANR
2. **Other Partners:** Vermont legislature
3. **Authority:** Act 92, § 38
4. **Budget/Funding:** n/a
5. **Resources:** n/a
6. **Schedule of Tasks:**
  - i. January 15, 2009 – submit report to appropriate legislative committees

**CCTT Work Plan for TLU-1  
(Compact and Transit-Oriented Development Bundle)**

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The Agency of Commerce and Community Development will continue to implement the downtown and Growth Centers Programs

In addition, the VTrans Climate Change Action Plan (June 2008) identifies transit-oriented development (TOD) as a planning concept that supports transit, walking, biking and other alternative transportation modes. Successful TODs require numerous partners, including VTrans, ACCD, municipalities and private sector developers. See the VTrans Climate Change Action Plan for additional information.

**CCTT Work Plan for TLU-2**  
**(Alternatives to Single-Occupancy Vehicles)**

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The VTrans Climate Change Action Plan (June 2008) includes as a strategy “Expand[ing] access to and the quality of alternative transportation modes: transit, rail (passenger and freight), bike/pedestrian, inter-city bus, and including inter-modal connections. Also, increase vehicle occupancy rates through rideshare and vanpool programs and encourage related mechanisms such as park and ride facilities.” See the VTrans Climate Change Action Plan for additional information.

**CCTT Work Plan for TLU-3  
(Vehicle Emission Reduction Incentives)**

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The Vermont Comprehensive Energy Plan (2008) includes as a strategy “Other efforts to improve operational efficiency of new and existing vehicles.” The report discusses monetary and other incentives to encourage vehicle emission reductions. See the Comprehensive Energy Plan for additional information.

**CCTT Work Plan for TLU-4  
(Pay-as-You-Drive Insurance)**

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*Action Item: Develop strategies for implementing pay-as-you-drive insurance.*

**1. Lead Agency:** BISHCA

**2. Other Partners:** ANR, private insurance companies

**3. Authority:** According to BISCHA, current insurance regulations do not prohibit insurers from offering this product.

**4. Budget/Funding:** None required

**5. Resources:**

**6. Schedule of Tasks:** Monitor status of the availability of PAYD insurance. BISHCA has been contacted by one company regarding this product, although there is no commitment or schedule for introduction.

**CCTT Work Plan for TLU-5  
(Alternative Fuels and Infrastructure)**

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**Action Item: Increase market penetration of low-carbon fuels in VT via a low-carbon fuel standard (LCFS).**

LCFS should not set goals for individual fuel types; rather it should establish a full life-cycle GHG rating system and set goals for the whole state.

**1. Lead Agency:** ANR.

**2. Other Partners:** DPS, federal government, private partners

**3. Authority:**

**4. Budget/Funding:** Not yet identified.

**5. Resources:** The Energy Policy Act of 2005 established a RFS for gasoline sold in the U.S. The Energy Independence and Security Act of 2007 sets requirements for the use of renewable transportation fuels.

**6. Schedule of Tasks:**

- 1) Use information and education outreach to focus on voluntary methods of low-carbon fuels expansion.
- 2) Provide technical assistance through vehicle dealers, consumer technical support groups, fuels trade and advocacy groups and public demonstrations.
- 3) Evaluate reduction or elimination of the motor fuels tax on biodiesel and ethanol (E85).
- 4) Set up pilot and demonstration renewable fueling stations which dispense B20 biodiesel, E85 ethanol.
- 5) Continue to support R&D projects for renewable fuels.
- 6) Reduce GHG intensity of transportation fuels by 2% by 2010, 5% by 2015 and 10% by 2028.

**CCTT Work Plan for TLU-6**  
**(Regional Intermodal Transportation System – Freight and Passenger)**

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The VTrans Climate Change Action Plan (June 2008) includes as a goal “Expand[ing] access to and the quality of alternative transportation modes: transit, rail (passenger and freight), bike/pedestrian, inter-city bus, and including inter-modal connections.” See the VTrans Climate Change Action Plan for additional information.

**CCTT Work Plan for TLU-7**  
**(Commuter Choice – Commuter Benefits)**

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**Employee commuter programs and other programs aimed at reducing trips from certain sectors, such as tourism or higher education**

The VTrans Climate Change Action Plan (June 2008) includes as strategies “Expand[ing] access to and the quality of alternative transportation modes: transit, rail (passenger and freight), bike/pedestrian, inter-city bus, and including inter-modal connections” and “[Expanding] Employee commuter programs and other programs aimed at reducing trips from certain sectors, such as tourism or higher education.” See the VTrans Climate Change Action Plan for additional information.

**CCTT Work Plan for TLU-8  
(Plug-In Hybrids)**

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***Action Item 1: Conduct research on the feasibility and impacts of plug-in hybrid vehicles (PHEVs) in VT.***

- 1. Lead Agency:** PSD, universities, electric utilities.
- 2. Other Partners:** ANR, VTrans.
- 3. Authority:**
- 4. Budget/Funding:** PSD, universities, electric utilities.
- 5. Resources:** UVM Transportation Center research on the capacity of Vermont's electric grid to absorb 50,000, 100,000 and 200,000 Plug in Hybrid Electric Vehicles.
- 6. Schedule of Tasks:** Support ongoing and promote new research into the feasibility of large numbers of PHEVs in VT.

***Action Item 2: Support and promote the use of plug-in hybrid technology vehicles in VT.***

- 1. Lead Agency:** PSD, ANR.
- 2. Other Partners:** VTrans, electric utilities.
- 3. Authority:** VTrans, PSD.
- 4. Budget/Funding:** PSD, VTrans.
- 5. Resources:** Automakers are designing PHEVs that should be in production in a two year timeframe. PHEV retrofit kits are currently available for HEVs. CVPS has 2 Toyota Prius' that have been converted to PHEVs.
- 6. Schedule of Tasks:**
  - 1) Work with electric utilities to create smart metering and time-of-day electric rate schedules to support the use of PHEVs.
  - 2) Work with auto dealers to promote PHEVs once they become available to the public on a large scale.

## CCTT Work Plan for AFW-1 (Programs to Support Local Farming / Buy Local)

### *Action Step 1 - Establish & promote a virtual farmers' market to help boost sales*

1. **Lead Agency/Department/Entity:** VAAFMM
2. **Other Partners:** VAAFMM, organizations currently developing specialized systems (Vermont Fresh Network, New England Grassroots Environment Fund, ACoRN), distributors
3. **Authority (Y/N additional authority needed? [legislation, rule]):** No additional authority needed.
4. **Budget & Resources:** Pilot projects can be completed within existing budget, utilizing available web platforms for non-profits along with distributors' online system investments. However, a comprehensive system that would facilitate larger scale buying, beyond single customers (e.g. institutions), would require investment in web design and 0.5 FTE for maintaining the system, training users, collecting feedback on operations and connecting the virtual world to what is happening in other marketplaces.
5. **Schedule of tasks (1-12 months; 13-48 months):** Preliminary research into the platform can be completed in 6 months (if begun after the growing season). Timeline for creating a new virtual market would depend on funds available.
6. **Assumptions:** That current experiments with virtual markets show an interest / need in expanding the model. Full completion of the project assumes funding and technical expertise not currently available.

### *Action Step 2 - Explore barriers & obstacles on production side*

1. **Lead Agency/Department/Entity:** VAAFMM
2. **Other Partners:** Agricultural non-profit organizations, producer trade groups.
3. **Authority (Y/N additional authority needed? [legislation, rule]):** No additional authority needed.
4. **Budget & Resources:** Can be accomplished in existing resources & budget.

5. **Schedule of tasks (1-12 months; 13-48 months):** VAAFAM continually performs reviews of producer needs. Ongoing.
6. **Assumptions** N/A

***Action Step 3 - Expand Meat Production and Self-Sustaining Cold & Warm Weather Products***

1. **Lead Agency/Department/Entity:** VAAFAM
2. **Other Partners:** ACCD, Producer Associations
3. **Authority (Y/N additional authority needed? [legislation, rule]):** No additional authority needed.
4. **Budget & Resources:** This goal should be addressed via both market development and infrastructure development. Budget requirements would depend on the facilities being built and whether they are constructed entirely via private enterprise or state loans / grants. This project could *not* be accomplished with existing resources.
5. **Schedule of tasks (1-12 months; 13-48 months)** Mobile processing unit for poultry expected to come online by Fall, 2008. Mobile freezing unit for produce online by Summer 2008. Study of processing needs to be completed by Fall, 2008. Marketing efforts ongoing.
6. **Assumptions:** Availability of resources to invest in infrastructure change.

***Action Step 4 - Support location of food processing, storage and distribution centers to serve the region's needs***

1. **Lead Agency/Department/Entity:** VAAFAM
2. **Other Partners:** ACCD, municipal government / planning organizations (regional & local), community service organizations dealing with food access
3. **Authority (Y/N additional authority needed? [legislation, rule]):** No additional authority needed.
4. **Budget & Resources:** Budget currently exists for supporting two processing facilities through ACCD as the Vermont Innovation Kitchens program. Study of needs and locations underway with no additional resources needed. VAAFAM currently partnering with the VT Foodbank to develop a program for helping communities plan for food system development, including processing, storage & distribution. Resources do not currently exist for this project; private grants are being sought through the Foodbank.

5. **Schedule of tasks (1-12 months; 13-48 months):** Processing needs survey to be finished by Fall, 2008. Innovation Kitchen Grants to be awarded in Fall, 2008. Community planning project to be underway by winter, 2008/2009. Technical assistance & information provision ongoing.
6. **Assumptions:** Grants awarded for community planning assistance.

***Action Step 5 - Engage surrounding states in the region to develop a regional plan to increase regional production, processing, transport and consumption***

1. **Lead Agency/Department/Entity:** VAAFMM
2. **Other Partners:** Harvest New England
3. **Authority (Y/N additional authority needed? [legislation, rule]):** No additional authority needed.
4. **Budget & Resources:** Current projects are done in conjunction with Harvest New England and supported by existing VAAFMM staff time.
5. **Schedule of tasks (1-12 months; 13-48 months):** Plans set by Harvest New England.
6. **Assumptions:** N/A

***Action Step 6 - Expand technical and financial assistance for mobile livestock processing and fruit and vegetable freezing facilities or other innovative approaches. See earlier notes on meat production (3) and processing facilities (4)***

***Action Step 7 - Expand technical, financial, and economic development assistance to create year-round production facilities which use waste heat from industrial, commercial, utility and farm production.***

1. **Lead Agency/Department/Entity:** ACCD
2. **Other Partners:** VAAFMM
3. **Authority (Y/N additional authority needed? [legislation, rule]):**
4. **Budget & Resources:**
5. **Schedule of tasks (1-12 months; 13-48 months):** None currently.
6. **Assumptions:**

**CCTT Work Plan for AFW-2  
(Agricultural Soil Carbon Management Programs)**

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***Action Step 1 - Implement Nutrient Management Plans (NMPs)***

**1. Lead Agency/Department/Entity:** VAAFAM

**2. Other Partners:** USDA-NRCS, VT ANR, Conservation Districts, farmer partnerships, UVM Extension, and Technical Service Providers

**3. Authority (Y/N additional authority needed? [legislation, rule]):** No additional authority needed. However, continued funding of the NMP Incentive Grant program is crucial to meeting the goals of this action step. The NMP Incentive Grant program provides a payment for plan development (per acre plus soil and manure testing) and three years of plan update. NMPs funded through this program must meet the USDA-NRCS '590 Standard' which is a set of technical specifications for nutrient management.

**4. Budget & Resources:** \$675,000 is available through the NMP Incentive Grant program for FY2009. Total NMP Incentive Grant program cost, to develop (and update) NMPs on 90% of farm acreage by 2028, is estimated at approximately \$9,200,000. The NMP Incentive Grant program cost to develop (only) the plan is estimated at approximately \$2,400,000. Considerable outreach and education (at least one additional full time position) will be needed to encourage voluntary NMP development and implementation on Small Farm Operations (SFOs). An additional full time position may be needed to develop and assist in the implementation of NMPs.

**5. Schedule of tasks (1-12 months; 13-48 months):** Continue enrollment in the NMP Incentive Grant program. Consider providing payment for NMP development only (no plan update payment). Research impediments to voluntary NMP implementation on SFOs. Reevaluate grant payments (rate and maximum) to order to meet increased development costs. Consider the creation of a program that provides assistance for the development of a farm management plan that incorporates nutrient management practices but does not require an entire '590 Standard' NMP for SFOs. Research the true cost of NMP implementation and develop an additional program to provide financial incentives.

**6. Assumptions:** Estimated program costs assume payments do not increase (per acre payment, soil test payment, manure test payment, and plan update payment). Total funding for the NMP Incentive Grant program is increased or remains level yearly. Farmers maintain and implement NMPs beyond grant obligations.

***Action Step 2 - Inject Liquid Dairy Manure***

**1. Lead Agency/Department/Entity:** VAAFAM

**2. Other Partners:** USDA-NRCS, VT ANR, Conservation Districts, farmer partnerships, and equipment dealers

**3. Authority (Y/N additional authority needed? [legislation, rule]):** No additional authority needed. Continued funding of the Capital Equipment Assistance Program (new for FY2009) is vital to making manure injection a financially feasible management option. The Capital Equipment Assistance (CEA) Program provides 50% cost share, up to \$50,000, for the purchase of manure injection equipment. Priority will be giving to applicants in the Lake Champlain watershed.

**4. Budget & Resources:** \$250,000 is available through the CEA program for FY2009. A minimum of 20 manure injection units will be needed statewide to meet the 2012 goal of injecting 10% of liquid dairy manure and process wastewater (assessed as 10% of annual and perennial cropland receiving liquid manure application). A minimum of \$1,000,000 in financial assistance is needed to assist in the purchase of this equipment at FY2009 cost share rates. Considerable technical assistance and financial management (at least one half-time position) will be needed to coordinate this program.

**5. Schedule of tasks (1-12 months; 13-48 months):** Promote, and encourage enrollment in, the CEA program. Provide technical assistance on manure injection equipment and use. Research impediments to manure injection equipment purchase and use. Reevaluate cost share funding (percentage and maximum payment). Coordinate group purchase and shared usage of equipment. Extend program statewide beyond the Lake Champlain watershed.

**6. Assumptions:** The CEA program is continued and funding remains at (or above) \$250,000 annually for at least four years. 50% cost share, up to \$50,000, is sufficient to incentivize the purchase/retrofit of manure injection equipment. Technical assistance (one half-time position) is available to facilitate manure injection usage.

***Action Step 3 - Increase Acreage Managed Under Cover Crop***

**1. Lead Agency/Department/Entity:** VAAFAM

**2. Other Partners:** USDA-NRCS, VT ARN, Conservation Districts, farmer partnerships, UVM Extension, and feed and seed dealers

**3. Authority (Y/N additional authority needed? [legislation, rule]):** No additional authority needed. Continuation of Farm Agronomic Practices (FAP) program is essential to meeting the 2028 goal of cover cropping 50% of all annual cropland. The

FAP program currently provides a \$20/acre incentive for cover cropping up to a maximum of \$5,000.

**4. Budget & Resources:** \$75,000 is available through the FAP program for FY2009. However, this program also provides incentives for NMP maintenance/update, strip cropping, conservation crop rotation, and cross-slope tillage. Therefore, not all \$75,000 is available for cover cropping. To meet the 2028 goal for this action step, approximately 48,000 acres will need to be cover cropped. At \$20/acre, \$950,000, a considerable increase from current funding, will be needed annually to incentivize cover cropping. At least one full time position will be needed to coordinate the expansion of the FAP program (technically and administratively).

**5. Schedule of tasks (1-12 months; 13-48 months):** Continue to promote, and enroll cover cropping in, the FAP program. Research impediments to cover cropping. Demonstrate the benefits of cover cropping through education and outreach. Coordinate with feed and seed dealers to evaluate winter rye (the cover crop preferred by most farmers) availability and find new sources of seed if possible. Reevaluate funding rates, and maximum payment, if insufficient to incentivize cover cropping.

**6. Assumptions:** Funding available through the FAP program increases annually. Farmers recognize benefits and voluntarily adopt cover cropping. Adequate seed (winter rye) is available annually. Approximately 2,400 tons of winter rye seed is needed annually (at a minimum seed rate of 100 lbs./acre) to meet this action step's 2028 goal.

## CCTT Work Plan for AFW-5 (Forestry Programs to Enhance GHG Benefits)

### *Action Step 1 - Research carbon storage and sequestration effects from different forest management and wood utilization scenarios.*

- 1. Lead:** Department of Forests, Parks & Recreation
- 2. Partners and stakeholders:** UVM, other forest carbon researchers, Society of American Foresters-Green Mountain Chapter, Forest Guild, BEREC, US Forest Service, Northern Forest Center, traditional and other economic stakeholders.
- 3. Authority Needed (Y/N) [legislation, rule]:** None required
- 4. Budget = \$75,000**
  - Contract funds needed**
    - Research funds for modeling carbon sequestration = \$35,000
    - Data on utilization of Vermont wood = \$40,000
- 5. Resources**
  - No additional resources necessary
- 6. Schedule of tasks (1-12 months; 13-48 months)**
  - Identify needs for carbon sequestration from different forest management and wood utilization scenarios to address concerns about costs and benefits as expressed in the Governor's Climate Change Commission Report.
  - Coordinate work others involve in the Northern Forest Biomass Energy Action Plan.
  - Collaborate with researchers to solicit funds and obtain data needed, especially focused on wood procurement and utilization for various wood products.
  - Results will provide an analysis of strategies that maximize carbon sequestration during harvesting and wood processing.
  - Forestry partners and stakeholders will be involved in reviewing results and developing recommendations.

### *Action Step 2 - Develop forest carbon measurement and accounting standards for evaluating individual forest stands in Vermont*

- 1. Lead:** Department of Forests, Parks & Recreation

**2. Partners:** UVM, US Forest Service Research Station, Society of American Foresters-Green Mountain Chapter, Forest Guild, Northern Forest Center, Consulting Forests of Vermont Association.

**3. Authority Needed (Y/N) [legislation, rule]:** None required

**4. Budget = \$120,000**

**FTE for ANR**

- Staff time = \$40,000/year

**5. Resources**

0.5 FTE for four years

**6. Schedule of tasks (1-12 months; 13-48 months)**

**Year 1**

Compile and review existing carbon measurement and accounting standards for feasible options

**Year 2**

Collaborate with research community to evaluate measurement and accounting standards for: feasibility, cost, reliability, and areas where additional information or research is needed.

**Year 3**

Draft standards for Vermont and allow review period for forest-related groups

**Year 4**

Develop final document on recommended carbon measurements and accounting standards for use in Vermont

***Action Step 3 - Develop guidelines for forest management that maximize carbon sequestration while maintaining forest health.***

**1. Lead:** Department of Forests, Parks & Recreation

**2. Partners and stakeholders:** US Forest Service, UVM Rubenstein School of Environmental Resources, Consulting Foresters Association of Vermont, Forest Guild, NE Society of American Foresters, Vermont Woodland Association, Southern Vermont Woodland Owners Association, FSC, VMC, forest industry representatives

**3. Authority Needed (Y/N) [legislation, rule]:** None required

**4. Budget = \$35,000**

**FTE for ANR**

- Staff time = \$15,000

**Other funds needed**

- Publication of guidelines = \$20,000

**5. Resources**

0.2 FTE; can be performed with existing staff resources

**6. Schedule of tasks (1-12 months; 13-48 months)**

**Year 3**

- Results from research on forest carbon sequestration effects from forest management scenarios, and forest carbon measurement and accounting actions listed above will be needed before developing guidelines for forest management to maximize carbon sequestration.
- Guidelines will be developed by a subset of the Vermont Forestry Division staff, with input from partners.
- Draft guidelines will be reviewed by partners before publishing.
- Hardcopy guidelines will be published for distribution and will be available via the internet.

**7. Assumptions:** Assumes completion of action Step 4

*Action Step 4 - Maintain existing state programs that support sustainable forestry practices, and monitor and manage forest stress agents.*

**1. Lead:** Department of Forests, Parks & Recreation

**2. Partners:** : US Forest Service, UVM Rubenstein School of Environmental Resources, Consulting Foresters Association of Vermont, Forest Guild, NE Society of American Foresters, Vermont Woodland Association, Southern Vermont Woodland Owners Association, FSC, VMC, forest industry representatives, Town Fire Wardens, Agency of Agriculture, APHIS, landscapers, architects, local and regional planners.

**3. Authority Needed (Y/N) [legislation, rule]:** None required

**4. Budget = \$1,000,000**

**FTE for ANR**

\$ 1,000,000 Sustainable Forestry Programs – this is the amount of federal funding that is anticipated to be lost over the next three years and will need to be replaced in order to maintain these programs at their current level

**5. Resources**

See above

**6. Schedule of tasks (1-12 months; 13-48 months)**

Ongoing activities include:

- County Forester involvement with landowners: 33% of private forest lands enrolled in UVA, municipal forests, backyard forests
- Forest Resource Protection staff monitoring and management insect, disease, weather and forest fire issues
- State Land forest management on 6% of Vermont forest land.
- Utilization and marketing
- Urban and Community Forestry: green infrastructure expansion, forest cover targets, and energy efficiency through landscape design
- Conservation Education

## CCTT Work Plan for AFW-6 (Increased Forest Biomass Energy Use)

*Action Step 4 - Provide outreach and technical advice about forest biomass use in distributed energy generation, combined heat and power systems, and biomass power plants, especially small-scale biomass power generation close to forest resource sources.*

**1. Lead:** Department of Forests, Parks & Recreation

**2. Partners:** Biomass Energy Research Center (BERC), Northeast Forestry Association (NEFA), Dept. Public Service, BGS, US Forest Service, Vermont Sustainable Jobs Fund, Department of Economic Development, DEC Air Pollution Control Division

**3. Authority Needed (Y/N) [legislation, rule]:** None required

**4. Budget = \$215,000**

ANR FTE = \$15,000/year

Other funds needed (contracts for market analysis) = \$170,000

**5. Resources**

0.2 FTE for contract administration – may be able to be performed with current staff

**6. Schedule of tasks (1-12 months; 13-48 months)**

- Plan for sustainable biomass harvesting by continuing to produce reports on sawmill/logger inventories, results from the Forest Inventory and Assessment (FIA), and publicly owned wood resource inventory and harvesting.
- Analyze existing and future local and regional wood markets.
- Staff develop outreach materials on distributed energy, combined heat and power, and biomass power plants.
- Ongoing work by staff to provide advice and technical information.

*Action Step 6 - Increase wood energy production from the current 4.71% of Vermont energy needs, to 8.54% by 2025 (Vermont 25 X '25 Initiative).*

**1. Lead:** Department of Public Service

**2. Partners:** Dept. of Forests, Parks & Recreation, AIV, VTrans, BGS, DEC, BEREC, VSJF, US Forest Service, US Rural Development, Department of Economic Development

**3. Authority Needed (Y/N) [legislation, rule]:** Yes

**4. Budget = \$26,400,000**

**Funds needed**

- \$8.8 million/year [\$50-150 million over the entire time period (2008-2025)]

**5. Resources**

**6. Schedule of tasks (1-12 months; 13-48 months) – Vermont 25 X '25 Initiative:**

**Financing:**

Develop a portfolio of commercial lending, small grant, and loan guarantee programs that will make capital available to the forest products industry and help develop wood supply businesses.

**Permitting:**

Develop streamlined permitting processes for wood energy systems.

**Technical:**

- Develop state government/forest industry partnerships that enable young workers to get into the business while utilizing programs such as the Economic Development's Vermont Training Program and regional vocational technical programs.
- Local and state policies should encourage adequate highway and bridge maintenance, as well as uniform truck weight limits between towns.
- Support increasing Vermont's interstate truck weight limit from 80,000 lbs to 99,000 lbs to conform to limits of neighboring states. Advocate the need for this adjustment to our Congressional delegation and for increased funding for bridge and highway maintenance.
- Revisit efforts to develop a district energy system and increase the combustion efficiency of the McNeil Generating Station in Burlington.
- Support research and development of cellulosic ethanol technologies.

**Marketing:**

- Develop tax laws that support the private ownership of forestland for producing forest crops. Programs such as the Use Value Appraisal Program should be maintained. Estate and land transfer taxes should be crafted to support intergenerational transfer of land while discouraging fragmentation.

**GCCC Recommendation:** AFW-6 – Increased Forest Biomass Energy Use (cont.)

- Educate local governments on the value and importance of maintaining working forestland in their towns. Planning and zoning boards should be encouraged to support “Right to Harvest” ordinances.
- Support efforts to make Workers Compensation Insurance more affordable. Look at New York as a model for million-dollar premium strategies and explore efforts of the Associated Industries of Vermont.
- Work with insurance regulators to develop classifications that recognize differences between different types of producers and create mechanisms that reflect these differences in premiums.
- Work cooperatively with public and private partners and the forest industry to increase public outreach and education on the benefits of managed forests while highlighting examples of well-managed forests.
- Promote positive messages about the forest products industry that reflect upon the role and the long history of the industry. The “buy local” campaign for agriculture can be used as a model.
- Create and fund a mechanism/organization charged with identifying and promoting strategies for:
  1. Retaining the local economic benefits of energy production within project host communities.
  2. Creating incentives for communities considering local projects.
  3. Building capacity at the local level to develop and implement projects.
- Create and fund a Vermont task force focused on the development of biomass wood-fired combined heat and power with district energy components.

## **CCTT Work Plan for AFW-7 (Forest Protection: Reduced Clearing and Conversion to Non-Forest Cover)**

*Action Step 1 - Establish a geospatial forest carbon accounting system to improve current estimates, track progress towards goals, and identify areas for future protection.*

**1. Lead:** Department of Forests, Parks & Recreation

**2. Partners:** ANR-Air Pollution Control Division, UVM Spatial Analysis Lab, ANR IT, ANR-F&W, The Nature Conservancy, Vermont Land Trust, US Forest Service Global Climate Change Research Program, NRCS, Northern Forest Alliance

**3. Authority Needed (Y/N) [legislation, rule]:** None required

**4. Budget** – Total for 3 year period = \$255,000

**FTE for ANR = \$95,000**

- Develop an accounting system for all ANR forest lands, Legacy and other conserved lands = \$15,000
- Maintain accounting system for conserved lands = \$5,000 /year
- Develop carbon accounting database to improve forest calculations in EPA carbon accounting system used by the State = \$15,000
- Maintain carbon accounting system for forest land = \$5,000/year
- Update State Lands database = \$15,000
- Assist with municipal lands database = \$20,000

**Other contract funds needed= \$165,000**

- Maintain and update existing Conservation Lands Database (State Lands, GMNF, TNC, VLT, Municipal lands) through UVM SAL = \$5,000 annually
- Develop spatial layer and database for UVA parcels through UVM SAL = \$150,000

**5. Resources**

One full-time permanent geospatial specialist required to establish and maintain the accounting system

**6. Schedule of tasks (1-12 months; 13-48 months)**

**Year 1**

1. Seek funding for activities
2. Contact partners and plan for activities
  - USFS to obtain most accurate forest carbon models and data
  - ANR-APCD to incorporate FS models into current EPA carbon model for VT
  - VLT, TNC, State Lands and GMNF to obtain updated spatial data on conserved lands and lands with conservation easements
  - ANR IT, to develop a geospatial system for State Lands
  - ANR-F&W, to obtain WMA data layers
  - UVM SAL on procedure for updating, maintaining, and providing access to Conservation Lands Database
  - County Foresters for UVA data acquisition
  - USDA NRCS to develop geospatial model of forest soil carbon stock
  - Northern Forest Alliance to assist with mapping of Town Forests

## **Year 2**

### **Forest Land Actions on Climate Change and Carbon Sequestration**

3. Building on an existing FPR GIS database, “Assessment of Need” for forest land, expand it to include an accounting system to keep track of existing and planned conservation lands (or lands with conservation easements). This comprehensive database will include ANR forest lands, Legacy forest land, and other existing or planned conservation lands and lands with conservation easements, and will be done in collaboration with public and private land conservation groups.
4. Digitize UVA parcels to include in Conservation Lands Database.
5. Document attributes of UVA parcels (forest type, age class, MSD, etc) in a statewide database to complement the UVA parcel spatial layer.
6. Update existing Conservation Lands Database in collaboration with conservation organizations (State, GMNF, VLT, TNC, UVM, Lyndon, Middlebury and others).

### **Forest Carbon Inventory and Monitoring**

7. Adopt a forest carbon accounting database from existing models, and acquire available data.
  - a. Work with USFS FIA to acquire the most recent inventory data.
  - b. Work with NRCS to acquire soil carbon estimates.
  - c. Work with USFS GCCRP to identify and acquire most relevant forest carbon models
  - d. Work with APCD to modify EPA Carbon Database to include current forest carbon models.
8. Plan for maintaining and updating databases.

## **Year 3**

9. Finish spatial data layer and parcel attributes database for UVA parcels.
10. Finish updates on Conservation Lands Database, including UVA parcels.
11. Finish accounting system for Legacy and other conservation lands.
12. Finish carbon accounting database and calculate new estimates of forest carbon using the updated FIA data and updated Conservation Lands Database.

***Action Step 6 - Reduce parcelization of forest land (the first step towards forest land conversion)***

**1. Lead:** Department of Forests, Parks & Recreation and UVM Extension

**2. Partners:** UVM Extension, Forestry Roundtable, Vermont Woodland Association, Vermont Forest Consultants, Vermont Land Trust, The Nature Conservancy, Consulting Forester Association of Vermont, Vermont Forestry Foundation, Coverts, regional and municipal planners and conservation commissions.

**3. Authority Needed (Y/N) [legislation, rule]:** Yes

**4. Budget = \$342,000**

**FTE for ANR**

- Workshops and publications = \$12,000
- Outreach to regional and local planners & conservation commissions = \$80,000/year

**Other contract funds needed:**

- Estate planning for forest landowners through UVM Extension Forester = \$30,000/year

**5. Resources**

One full-time permanent Forester III

**6. Schedule of tasks (1-12 months; 13-48 months)**

**Year 1**

Develop program plan between FPR and UVM Extension to assist forest land owners with estate planning. This will include: workshops, webcasts, personal consultations with forest landowners and professional foresters that are in contact with landowners. Materials will be developed on: the costs of no action, how to initiate conversations about planning within families, alternatives that can keep lands intact and in the family, state statutes and policy options that can reward families that do intergenerational planning.

Collaborate with Department of Fish & Wildlife to establish ongoing outreach on forest conservation to local and regional planning commissions and town conservation commissions.

**Year 2**

Develop options to revise estate tax law to reward families that do intergenerational planning for keeping forests intact and present to the Forestry Roundtable.

Begin implementation of estate planning programs to include outreach to community and municipal groups, nonprofits, forestry organizations, wildlife groups, financial planners and senior citizen advocates, in conjunction with partners.

**Year 3**

Work to revise estate tax laws to favor keeping forests intact, in collaboration with the Vermont Forestry Roundtable. Continue estate planning programs to educate Vermont landowners.

***Action Step 8 - Expand education for foresters, landowners and the public on GHG benefits provided by forests.***

**1. Lead:** Department of Forests, Parks & Recreation

**2. Partners:.** US Forest Service, Consulting Foresters Association of Vermont, Forest Guild, NE Society of American Foresters, Vermont Woodland Association, Southern Vermont Woodland Owners Association, FSC

**3. Authority Needed (Y/N) [legislation, rule]** No

**4. Budget = \$135,000**

**FTE for ANR = \$80,000**

**Other funds needed = \$55,000**

Outreach materials = \$35,000

Contracted = \$20,000

**5. Resources**

**6. Schedule of tasks (1-12 months; 13-48 months)**

**Year 1-3**

Develop a marketing plan to better educate the public on the benefits of forests to society.

**GCCC Recommendation:** AFW-7 – Reduced Forest Clearing and Conversion to Non-Forest Cover (cont.)

Compile and summarize literature on carbon sequestration and storage, biomass supply, and climate change impacts, and summarize findings for staff and forestry professionals.

Hold workshops for staff, professional foresters, municipalities, conservation commissions, etc.

Create demonstration areas on public land to inform landowners, forest professionals and the public about carbon measurement, management and benefits of forests to GHG reductions and climate change.

Develop outreach tools demonstrating the benefits of forests in energy efficiency, carbon sequestration, and other ecosystem services for use as an interactive internet site connecting humans to forests and forest values (e.g. ACORN, Healthy Forests First Web of Connection).

Provide outreach of climate change information to the public using existing methods or through new methods suggested from the marketing plan.

## **CCTT Work Plan for AFW-8 (Expanded Production and Use of Durable Wood Products)**

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### *Action Step 2 - Promote branding and marketing of locally manufactured wood products*

- 1. Lead:** Department of Forests, Parks & Recreation
  
- 2. Partners:** Department of Economic Development, Agency of Agriculture, VSJF, Department of Marketing & Tourism, Chamber of Commerce, Vermont Wood Manufacturing Association, WoodNet, Guild of Vermont Furniture Makers, Vermont Woodland Association, other landowner groups, National Historic Park, Cornerstone Project, environmental groups, academic institutions
  
- 3. Authority Needed (Y/N) [legislation, rule]:** None required
  
- 4. Budget = \$345,000**
  - FTE for ANR**
  - Coordinate with partners = \$15,000/year
  - Other funds needed**
  - Marketing =\$100,000/year
  
- 5. Resources**
  
- 6. Schedule of tasks (1-12 months; 13-48 months)**
  - Year 1**
  - Develop a strategy to include Vermont branding of wood products in existing marketing programs.
  
  - Year 2 & 3**
  - Support marketing efforts, over a 2 year period, by existing partners to include wood products with brand.
  
- 7. Assumptions:** A brand for local wood already exists but needs development

***Action Step 3 - Research carbon benefits of a buy local program.***

- 1. Lead:** Department of Forests, Parks & Recreation
- 2. Partners:** Department of Economic Development, Agency of Agriculture, Vermont Wood Manufacturers Association, VSFJ, Research community
- 3. Authority Needed (Y/N) [legislation, rule]:** None required
- 4. Budget = \$81,000**
  - FTE for ANR**
  - Grant oversight = \$6,000
  - Other funds needed**
  - Grant to conduct research = \$75,000
- 5. Resources**
- 6. Schedule of tasks (1-12 months; 13-48 months)**

**Year 1**

Seek funding. Write request for proposals to study the carbon benefits from a forest-based buy local program.

**Year 2**

Conduct research.

**Year 3**

Report on carbon benefits of a variety of buy local type programs for forest material and wood products.

***Action Step 4 - Implement a “Buy Local” program for forest products.***

- 1. Lead:** Department of Forests, Parks & Recreation
- 2. Partners:** Department of Economic Development, Agency of Agriculture, WOA, VWMA, VWA, Department of Marketing & Tourism, architects and designers, forest certification providers.
- 3. Authority Needed (Y/N) [legislation, rule]:** None required
- 4. Budget = \$250,000**
  - FTE for ANR**
  - Develop the infrastructure for a buy local program for forestry = \$75,000
  - Other funds needed**
  - Marketing and materials = \$175,000

**5. Resources**

**6. Schedule of tasks (1-12 months; 13-48 months)**

**Year 1-3**

- Implement buy local programs based on results from the previously mentioned research on the carbon benefits of buy local programs for forest materials and wood products.

## CCTT Work Plan for AFW-9 (Advanced/Expanded Recycling and Composting)

### *Action Step 1 - Develop Advanced Recycling so entire state is able to participate in “single stream” recycling*

- 1. Lead Agency/Department/Entity:** ANR
- 2. Other Partners:** Solid waste planning entities (districts, alliances, towns), private sector waste industry, economic developers
- 3. Authority (Y/N additional authority needed? [legislation, rule]):** None required
- 4. Budget & Resources:**  
No additional resources required at ANR to oversee this activity. Solid Waste Districts may need additional staff and resources to develop the infrastructure model. Implementation of the approved plan will require a large (> \$500,000) investment or economic incentives to the private sector to build an infrastructure.
- 5. Schedule of tasks (1-12 months; 13-48 months)**  
Year 1 - Research gaps in infrastructure, determine costs and funding sources  
Year 2-4 - Build up infrastructure
- 6. Assumptions**  
ANR Secretary has tasked the Solid Waste District managers with recommending an infrastructure model for statewide convenient recycling.

### *Action Step 2 - Develop an incentive/rewards based recycling infrastructure* *Note: The Waste Prevention Plan identifies PAYT as the top priority for waste reduction for traditional recyclable materials.*

- 1. Lead Agency/Department/Entity:** ANR
- 2. Other Partners:** Solid waste planning entities (districts, alliances, towns), haulers
- 3. Authority:** None required unless PAYT was required statewide
- 4. Budget & Resources:**  
Low, technical assistance and staff resources will be needed

**5. Schedule of tasks (1-12 months; 13-48 months)**

Year 1 - Research extent and type of PAYT (unit-based pricing systems in place.)

Research other incentive programs, such as Recycle Bank

(<http://www.recyclebank.com>) to increase recycling

Year 2-4 – Develop tool kits and requirements, if minimum standards for PAYT are mandated, to set up PAYT programs. Establish or promote other effective incentive programs identified.

**6. Assumptions -**

***Action Step 3 - Develop additional processing capacity across the state for processing organic wastes (e.g., composting facilities) and expand the collection of commercially-generated organic waste materials.***

1. **Lead Agency/Department/Entity:** Solid waste planning entities, ANR, Department of Economic Development, and Agency of Agriculture
2. **Other Partners:** Haulers, Composters, Composting Association of Vermont, Agency of Transportation, Private sector disposal companies, solid waste planning entities, The Highfields Institute and other interested non-profits, Natural Resource Conservation Service, Natural Resource Conservation Districts, Local Conservation Committees, Master Composter Program, anaerobic digester groups, Lake Champlain Basin Committee, Food Industry (producers, wholesalers, and retailers) Trade Groups, Farmers, and for backyard promotion Garden Clubs and Farmers Markets
3. **Authority:** None required
4. **Budget & Resources:**  
High for facility infrastructure: range from \$50K for on farm small scale composting site to \$1.5M for a large scale facility
5. **Schedule of tasks:** Note: *Some of the process has already been underway for more than 10 years.*  
Year 1 – Clarify regulations, secure start-up funds, and provide composting education.  
Year 2-4 –Build infrastructure.
6. **Assumptions -** It is estimated that it will take about 15 years until full operation of composting infrastructure statewide.

***Action Step 4 - Develop a used clothing recycling program (curbside and rural drop off model) for used clothing.***

1. **Lead Agency/Department/Entity:** ANR
2. **Other Partners:** Infrastructure is fairly well established by used clothing stores, social service agencies, solid waste districts.
3. **Authority:** None required
4. **Budget & Resources:**  
Low - Outreach and Education materials need to be developed and distributed to recycle clothing and textiles from the waste stream.
5. **Schedule of tasks (1-12 months; 13-48 months)**  
Year 1 – Develop promotional and outreach information and distribute  
Year 2-4 – Continue to disseminate information
6. **Assumptions**

***Action Step 5 - Develop an incentive/rewards based recycling infrastructure specifically for construction and demolition (C&D) materials***

1. **Lead Agency/Department/Entity:** ANR, Buildings and General Services, Agency of Commerce and Community Affairs
2. **Other Partners:** Building industry groups; construction contractors; waste management companies.
3. **Authority:** None required
4. **Budget & Resources:**  
High for developing infrastructure and offering incentives. Low for education and for development of waste reduction contract specifications.
5. **Schedule of tasks (1-12 months; 13-48 months)**  
Year 1 - Research contract specification language and institutionalize waste prevention, deconstruction, and recycling in project design for state buildings. Though education, encourage private and public sector to specify waste diversion in construction bid documents.  
Year 2 and on – Begin to develop regional markets.
6. **Assumptions:** Funding for economic incentives to support and encourage new markets for reusable and recyclable C&D materials will be available. Convenient and comprehensive reuse and recycling programs will be supported and established

**Action Step 6 - Where the incentive-based methods mentioned above do not achieve progress toward the 2012 and 2028 goals, develop and implement appropriate mandates to achieve the goals.**

- 1. Lead Agency/Department/Entity:** ANR
- 2. Other Partners:** Solid Waste Planning Entities (solid waste districts, alliances, towns, etc...)
- 3. Authority:** Legislation would be required
- 4. Budget & Resources:**  
Mandates would need to be supported by infrastructure development and education.
- 5. Schedule of tasks (1-12 months; 13-48 months)**

*C&D*

*Phase-in a C&D landfill ban*

1. Starting year 3 (2011) for clean wood, cardboard, asphalt, brick and concrete.
2. Starting year 6 (2014) for drywall and asphalt shingles.

*Recyclables*

1. Require mandatory recycling statewide starting in year 1 through year 3.
2. Enact a landfill ban for materials with established markets and collection programs.

*Organics*

1. Mandate Composting/Diversion for all Generators with Specific Timeframes.

**6. Assumptions**

The current State Solid Waste Plan's diversion goal of 50% by 2011 is a much more vigorous goal than Action Step #6. It is a goal specifically for Municipal Solid Waste (MSW – trash from households, businesses, and institutions). (Note: 32% of Vermont's MSW was diverted in 2006) The Governor's Climate Change report does not specify which wastes, in addition to MSW, are included in the report's goal of 50% by 2028. Such "other" wastes could include construction wastes, highway pavement and other aggregate wastes, special wastes (such as asbestos, petroleum contaminated soils, mining wastes, paper sludge) etc...

The state would need to improve its data tracking of such waste to accurately measure total diversion beyond MSW.

## CCTT Work Plan for AFW-10 (Programs to Reduce Waste Generation)

***Action Step 1 - Develop prototype residential and commercial waste prevention programs that will validate costs savings realized by the waste prevention.***

Note: this action Step is an umbrella for all of the other action Steps. Therefore, it does not need to be described as a separate Action Step. In addition, specific strategies to prevent waste targeted at: traditional recyclable materials, organics, construction waste and demolition debris, electronics, and household hazardous waste, are identified in the stakeholder planning process report, *Life Beyond Garbage: Waste Prevention and Diversion Strategies*.

***Action Step 2 - Develop a communication portal that will keep all constituents apprised of waste reduction/minimization initiatives and actively promote waste minimization efforts, including the results of prototype programs and specific case studies.***

- 1. Lead Agency/Department/Entity:** ANR/Solid Waste Districts
- 2. Other Partners:** Environmental organizations
- 3. Authority (Y/N additional authority needed? [legislation, rule]):** No
- 4. Budget & Resources:** Low - staff resources needed to build, maintain, and manage an internet site
- 5. Schedule of tasks (1-12 months; 13-48 months)**  
Year 1 – update and populate current internet site with all waste prevention initiatives and link to SWD and other relevant organizations’ sites (either <http://www.anr.state.vt.us/dec/wastediv/R3/DECwpPLAN.htm> or <http://www.anr.state.vt.us/dec/wastediv/R3/WReduct.htm> )  
Year 2 and forward – maintain and keep updated
- 6. Assumptions** – staff resources are available to manage site and keep it current

**Action Step 3 - Develop sector-specific waste minimization strategies (schools, hotels, hospitals, restaurants, retail, banks, etc.). Develop these strategies in collaboration with other organizations and the local community.**

ANR, along with the Small Business Development Center, established the Vermont Business Environmental Partner (VBEP) program to provide non-regulatory assistance to Vermont businesses representing a range of sectors, such as printers and auto body shops. <http://www.vbep.org/>. The Vermont Green Hotels in the Green Mountain State program is a subset of this program. <http://www.vtgreenhotels.org/>

- 1. Lead Agency/Department/Entity:** ANR/DEC/Small Business Development
- 2. Other Partners:** Participating businesses, schools, municipalities, etc
- 3. Authority (Y/N additional authority needed? [legislation, rule]):** None required
- 4. Budget & Resources:**  
VBEP staffing is currently part-time (for both VT-ANR & SBDC). An additional staff person to provide technical assistance is needed to expand this program.
- 5. Schedule of tasks (1-12 months; 13-48 months)**  
Year 1: Add additional staff person to the VBEP program.  
Year 2 and on: Provide technical assistance and measure waste prevention efforts of participating businesses.
- 6. Assumptions:**

**Action Step 4 - Develop an assistance program to provide engineering support to businesses to: 1) reduce product packaging and shipping materials 2) select product packaging and shipping materials that are highly recyclable.**

Vermont Manufacturing Extension Center (VMEC - <http://www.vmec.org>) provides assistance to Vermont manufacturers, including technical support in selecting packaging materials.

- 1. Lead Agency/Department/Entity:** Vermont Manufacturing Extension Center for supplier development and technical assistance. A useful resource for this Action Step is also the existing ANR/SBDC Business Environmental Partner program for environmentally preferable purchasing (EPP) (<http://www.vbep.org/purchasing.html>)
- 2. Other Partners:** Participating businesses and manufacturers, third party packaging experts

3. **Authority (Y/N additional authority needed? [legislation, rule]):** None required
4. **Budget & Resources:** Unknown
5. **Schedule of tasks (1-12 months; 13-48 months)**
6. **Assumptions** – VT Technical College will need to approve any project that VMEC undertakes, thus assumption is this approval is granted.

*Action Step 5 - Encourage manufacturers to provide end-of-life management solutions that reduce the environmental impact of waste (e.g., “cradle-to-cradle” responsibility of waste).*

1. **Lead Agency/Department/Entity:** ANR\Solid Waste Districts\Vermont Manufacturing Extension Center
2. **Other Partners:** BGS Purchasing Division
3. **Authority (Y/N additional authority needed? [legislation, rule]):** None required
4. **Budget & Resources:**
5. **Schedule of tasks (1-12 months; 13-48 months)**  
Year 1: Start with electronics end-of-life management as described in the Waste Prevention report. Encourage consumers to create demand for take back of their products. Develop purchasing contracts for state government that require take-back for items such as carpets, computers.  
Promote EPEAT (<http://www.epeat.net>) to state agencies, municipalities, and private sector for end-of-life management of computers
6. **Assumptions**

*Action Step 6 - Develop and implement a green purchasing program for all state operations, and use that program as a model and encourage adoption of that model by all municipalities and businesses.*

Buildings and General Services, Purchasing and Contract Administration administers the Vermont Environmentally Preferable Purchasing (EPP) Program. Its “green contracts” are also available to Vermont schools and municipalities.  
(<http://www.bgs.state.vt.us/PCA/epp/index.htm>)

The Clean State Council (<http://www.bgs.state.vt.us/csc/homepage.htm>) was started to help “green” state government. Its work included developing and promoting Environmentally Preferable Purchasing (EPP). This group, which represented all agencies in state government is no longer active, but was a good model for this proposed Action Step and could be reactivated with staff resources.

- 1. Lead Agency/Department/Entity:** ANR/Buildings and General Services
- 2. Other Partners:** All state agencies, business, schools, non-profits, and municipal groups
- 3. Authority (Y/N additional authority needed? [legislation, rule]):** None required
- 4. Budget & Resources:**  
Low, staff person needed to administer a program
- 5. Schedule of tasks (1-12 months; 13-48 months)**  
Year 1 – hire staff person to research, select, and begin to expand and promote EPP programs and specifications  
Year 2 – continue to develop, promote, and institutionalize EPP programs
- 6. Assumptions**

## CCTT Work Plan for AFW-11 (Water and Wastewater Treatment – Energy Efficiency Improvements)

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*Action Step 1 - Assessment - Quantify the energy consumed in Vermont's municipal and private/investor-owned water supply and wastewater treatment sectors annually, to establish a baseline for the sector.*

1. **Lead Agency/Department/Entity:** Efficiency Vermont (George Lawrence)
2. **Other Partners:** ANR Wastewater Management Division and Water Supply Division
3. **Authority (Y/N additional authority needed? [legislation, rule]):** Not needed as this is an assessment.
4. **Budget & Resources:** Efficiency Vermont has indicated they may be able to attract a summer intern to conduct this assessment in 2008. Efficiency Vermont and ANR would provide information from existing data files to support this using existing resources.
5. **Schedule of tasks (1-12 months; 13-48 months)** The assessment would be completed in the first 12 months.
6. **Assumptions**
  - ❖ Efficiency Vermont can both find an intern and agrees to oversee the intern's work
  - ❖ ANR can provide reports from existing databases

*Action Step 2 - Assessment - Assess the potential for energy savings for the sector.*

1. **Lead Agency/Department/Entity:** Efficiency Vermont (George Lawrence)
2. **Other Partners:** ANR Wastewater Management Division
3. **Authority (Y/N additional authority needed? [legislation, rule]):** Not needed as this is an assessment.
4. **Budget & Resources:** Efficiency Vermont has indicated they may be able to attract a summer intern to conduct this assessment in 2008.

5. **Schedule of tasks (1-12 months; 13-48 months)** The assessment would be completed in the first 12 months.
6. **Assumptions**
  - a. Efficiency Vermont can both find an intern and agrees to oversee the intern's work
  - b. Efficiency levels can be determined from available information on energy use and gallons treated
  - c. ANR can provide reports from existing databases and comment on assessment reports

*Action Step 3 - Assessment - Assess the potential for energy production using digester gas (in anaerobic plants). Note many plants currently use digester gas and this assessment would identify areas for improvement.*

1. **Lead Agency/Department/Entity:** ANR Facilities Engineering Division
2. **Other Partners:** Contractor conducting assessment, individual wastewater facilities representatives and ANR Waste Water Management Division
3. **Authority (Y/N additional authority needed? [legislation, rule]):** Not needed as this is an assessment.
4. **Budget & Resources:**
  - a. \$30,000 for contractor
  - b. Assistance and information provided by ANR
5. **Schedule of tasks (1-12 months; 13-48 months)** Contract could be completed within 12 months.

**6. Assumptions**

- 18 wastewater plants
- 2 days per plant, one site visit, one report writing
- \$100/ hour

*Action Step 4 - (Fluorescent) Lighting retrofits from T12 systems to T8*

1. **Lead Agency/Department/Entity:** Efficiency Vermont (George Lawrence)
2. **Other Partners:** Wastewater treatment plant representatives

3. **Authority (Y/N additional authority needed? [legislation, rule]):** None needed as this is a voluntary program.
4. **Budget & Resources:** Varies depending on the number of bulbs per facility. Some rebates are currently available; see [http://www.encyvermont.com/stella/filelib/2008\\_HPT8FactSheet\\_FINAL1207.pdf](http://www.encyvermont.com/stella/filelib/2008_HPT8FactSheet_FINAL1207.pdf)
5. **Schedule of tasks (1-12 months; 13-48 months)** This is an ongoing program that will likely extend beyond 48 months.
6. **Assumptions**
  - a. Efficiency Vermont continues to provide this service to wastewater treatment plants.

*Action Step 5 - Heating retrofits from electric heat*

1. **Lead Agency/Department/Entity:** Efficiency Vermont (George Lawrence)
2. **Other Partners:** Wastewater treatment plant operators.
3. **Authority (Y/N additional authority needed? [legislation, rule]):** None needed as this is a voluntary program.
4. **Budget & Resources:** Not able to quantify because the economic attractiveness of each installation are dependant on the price difference between various fuel costs.
5. **Schedule of tasks (1-12 months; 13-48 months)** This is an ongoing program that will likely extend beyond 48 months.
6. **Assumptions**

In some cases, electricity may be the most appropriate source of energy.

*Action Step 6 - Installation of high-efficiency influent and effluent pumps, high-efficiency motors and variable frequency drives*

1. **Lead Agency/Department/Entity:** Efficiency Vermont (George Lawrence)
2. **Other Partners:** Wastewater treatment plant representatives and ANR Facilities Engineering Division (in cases where funding is requested)

3. **Authority (Y/N additional authority needed? [legislation, rule]):** None needed as this is a voluntary program.
4. **Budget & Resources:** Varies depending on the number and type of changes made at a given facility.
5. **Schedule of tasks (1-12 months; 13-48 months)**
  - a. 1-12 months for assessment
  - b. 12-48 implementation to be determined based on outcome of assessment
6. **Assumptions**
  - a. Efficiency Vermont continues to provide this service to wastewater treatment plants.
  - b. A better estimate to the costs and schedule should be available upon completion of the assessments described above.

*Action Step 7 - Evaluate the costs and benefits to second-stage activated sludge mixing and aeration*

1. **Lead Agency/Department/Entity:** ANR Center for Climate Change and Waste Reduction
2. **Other Partners:** Wastewater treatment plant representatives, Efficiency Vermont and ANR Facilities Engineering Division
3. **Authority (Y/N additional authority needed? [legislation, rule]):** None needed as this is a voluntary program.
4. **Budget & Resources:**
  - a. \$ 160,000 for consultant
  - b. Technical assistance and data from ANR
5. **Schedule of tasks (1-12 months; 13-48 months)** Evaluation to begin within one year of obtaining funding.
6. **Assumptions**
  - a. 100 wastewater plants
  - b. 2 days per plant, one site visit, one report writing
  - c. \$100/ hour
  - d. Cost could be reduced base on competitive bids and/ or combining with contracts mentioned above.

***Action Step 8 - Identify opportunities for peak demand reduction and optimizing load profiles***

- 1. Lead Agency/Department/Entity:** Efficiency Vermont (George Lawrence)
- 2. Other Partners:** Wastewater treatment plant representatives
- 3. Authority (Y/N additional authority needed? [legislation, rule]):** None needed as this is a voluntary program.
- 4. Budget & Resources:** Varies depending on the characteristics at a given facility.
- 5. Schedule of tasks (1-12 months; 13-48 months)** This is an ongoing program that may take more than 20 years to complete routine upgrades at existing facilities.
- 6. Assumptions**
  - a. Efficiency Vermont continues to provide this service to wastewater treatment plants.
  - b. A better estimate to the costs and schedule should be available upon completion of the assessments described above.

***Action Step 9 - Co-generating electricity and thermal energy on-site; capturing and using anaerobic digester gas.***

- 1. Lead Agency/Department/Entity:** ANR Facilities Engineering Division
- 2. Other Partners:** Wastewater treatment plant representatives
- 3. Authority (Y/N additional authority needed? [legislation, rule]):** None needed as this is an existing program.
- 4. Budget & Resources:** To be determined pending outcome of assessment of need. A contract will likely be needed to provide assistance to wastewater treatment plants.
- 5. Schedule of tasks (1-12 months; 13-48 months)**
  - a. 1-12 months complete assessment as outlined in “C” above
  - b. 12-14 months develop revised workplan.
  - c. 15-48 months plus implement revised workplan
- 6. Assumptions**
  - a. Assessment of existing plants will identify opportunities for improving the use of digester gas.

*Action Step 10 - Efficiency Vermont collaboration on projects applying for loans and grants from ANR*

1. **Lead Agency/Department/Entity:** Efficiency Vermont (George Lawrence)
2. **Other Partners:** ANR Facilities Engineering Division
3. **Authority (Y/N additional authority needed? [legislation, rule]):** Not needed as this is technical assistance
4. **Budget & Resources:** None needed at this time as efficiency Vermont has agreed to provide this service.
5. **Schedule of tasks (1-12 months; 13-48 months)** Ongoing program for the next 48 months.
6. **Assumptions**
  - a. Efficiency Vermont will be funded to continue providing this service
  - b. ANR continues to provide loans to wastewater treatment facilities.

**CCTT Work Plan for CC-1  
(GHG Inventories & Forecasts)**

- ❖ **Develop a periodic, consistent & complete inventory of emission sources & sinks, and an accompanying forecast of future GHG emissions in at least 5 & 10 year increments, out to 2030 and 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 & 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).**
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- 1. Lead Agency/Department/Entity:** ANR
- 2. Other Partners:** Agency of Ag., Food & Markets, VTrans, Public Service, BGS, and other state agencies that can provide data relevant to calculation of GHG emissions from Vermont's various sources, & sequestration from forest and farm land. Non-governmental partners such as UVM and other academic institutions would also provide important guidance.
- 3. Authority (Y/N additional authority needed? [legislation, rule]):**  
No additional authority needed.
- 4. Budget & Resources:** Some details still need to be developed. However an ongoing GHG inventory and forecast effort for VT (similar to the GCCC inventory & forecast document) would require the following:
  - ❖ Approximately 1 to 2 FTEs to:
    - Collect source category-specific data for Vermont
    - Collect regional or national data as needed where VT-specific data are lacking.
    - Ensure that inventory computer software tools [EPA – State Greenhouse Gas Inventory Tool (SGIT), and others] are updated to include most recent modules and updates.
    - Process raw data into a GHG inventory using EPA SGIT and post-processing tools.
    - Create graphical and text summaries of the processed data that will become the periodic inventory.
    - Determine likely future trends to be used in the 'GHG forecast'. (This will require statistical analyses of the raw inventory data, as well as a thorough literature review to gain a comprehensive understanding of pending state / federal / international policy direction.

**5. Schedule of tasks (1-12 months; 13-48 months)**

Year 1: (2008-09)

- FTE's would do a thorough review of the inventory and forecast document prepared by the Center for Climate Strategies (CCS) for the GCCC effort. This review would facilitate a QA/QC of the existing work, as well as enable ANR to determine what additional software or data may be needed.
- Ensure that data collection protocols and GHG emissions estimation methods are fully operational.

Year 2: (2010)

- Collect suite of data and produce a comprehensive inventory of GHG sources and sinks for CY 2008. This would synchronize the Vermont GHG inventory effort with existing inventory efforts for the EPA National Emissions Inventory (NEI) regarding criteria pollutant and hazardous air pollutant emissions within the state.
- Produce summary graphs and text for GHG inventory report.

Year 3: (2011)

- Do a complete review of relevant state / regional / national / international data & policies.
- Complete a statistical analysis of 1990-2008 GHG emissions data
- Perform GHG forecast analysis based on results of previous steps.

Year 4: (2012)

- Finalize CY 2008 Inventory and begin collecting CY 2011 data as available.

**CCTT Work Plan for CC-2 (State GHG Reporting)  
& CC-3 (State GHG Registry)**

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

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**1. Lead Agency/Department/Entity:** ANR

**2. Other Partners:**

*Development partners:* other member states, provinces, tribes, and countries involved with The Climate Registry (TCR), The Northeast States for Coordinated Air Use Management (NESCAUM)

*Stakeholders / Potential reporters:* Vermont academic institutions, municipalities, businesses, manufacturers, etc

**3. Authority (Y/N additional authority needed? [legislation, rule])**

CC-3: Vermont ANR is already participating in The Climate Registry development process, so at this time no additional authority is needed regarding a registry. However, see CC-2 below.

CC-2: Yes - Possible legislative authority may be required if a mandatory GHG reporting requirement (like Maine's) is considered.

**4. Budget & Resources:** DEC will be impacted somewhat through increased administrative cost / time demands. Reporting organizations will also be impacted programmatically & financially through preparing emissions reports and paying fees to participate. Tiered fee structure for participants ranges from \$450 to \$10,000 annually. Initial funding has come from private foundations and the participating states. On an on-going basis, it is expected that The Climate Registry will be primarily funded through fees from reporting organizations. Mandatory annual GHG reporting similar to Maine's would require that minor changes be made to existing state air pollutant registration (and possibly permits and compliance) program.

**5. Schedule of tasks (1-12 months; 13-48 months)**

Year 1: (2008)

- a. February 2008 - Sent invitations to relevant Vermont manufacturers, businesses, academic institutions, municipalities, etc. announcing a TCR recruiting meeting
- b. March 2008 – Convened TCR recruiting meeting to inform potentially interested emission-reporting entities about TCR process and requirements.
- c. June 2008 is the expected 'launch-date' for enabling reporters to begin submitting historical and current GHG emissions to TCR.

- d. Continue to participate in TCR Advisory Committee, Board of Directors, and related work groups to ensure that the registry addresses and is compatible with Vermont's specific needs.

Year 2 & beyond:

- e. Convene additional TCR recruiting meetings as necessary to enhance reporter participation for VT.
- f. Consider feasibility of incorporating a mandatory GHG reporting program (similar to Maine's) into the existing registration program that catalogs criteria pollutants and hazardous air contaminants.

**CCTT Work Plan for CC-4  
(State Climate Public Education and Engagement)**

**Goal:** Build an informed and involved public to help reverse the growth in GHG emissions via a coordinated collaborative of education and outreach partners

***Action Step 1. Establishment of the State Climate Change Advisory Group (CCAG)***

*(see Work Plan for CC-6)*

***Action Step 2. Establish a state funding mechanism to help subsidize coordinated education, engagement, marketing, and technical assistance programs***

- 1. Lead Agency/Department/Entity:** VTANR
- 2. Other Partners:** Businesses, 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.
- 3. Authority (Y/N additional authority needed? [legislation, rule]):** No additional authority required
- 4. Budget & Resources:** Work to establish a mechanism can likely be performed with existing resources.
- 5. Schedule of tasks (1-12 months; 13-48 months)**  
Year 1: Develop outline budgets for each of the proposed outreach activities. Identify possible sources of funding or in-kind contributions, including grants and partnerships.  
Year 2 – 4 : Repeat as necessary as initial activities are completed and new projects are identified, and as funding sources change.

***Action Step 3. Develop priorities and a social marketing plan to encourage behavior change to meet reduction goals.***

- 1. Lead Agency/Department/Entity:** Vermont Climate Collaborative (VCC) & Vermont Climate Working Groups (see Work Plan for CC-6 for details).
- 2. Other Partners:** Businesses, including industry and trade groups; government, including local, regional and state agencies; colleges and universities; and nonprofit

organizations, including citizen advocacy groups on health, the environment, land use, and transportation.

3. **Authority (Y/N additional authority needed? [legislation, rule]):** No additional authority required
  
4. **Budget & Resources:** Development of a comprehensive social marketing plan will likely take some time and will be expensive. For comparison, in 2007 the DPS undertook the first phase (data gathering) of development of a social marketing plan regarding Vermont's energy future. The effort included several complementary elements, including on-line meetings/forums, regional workshops, and a two-day deliberative polling event. The cost of this effort was over \$500,000.
  
5. **Schedule of tasks (1-12 months; 13-48 months)**  
  
Year 1 - Use the Vermont's Energy Future as a model for development of a list of data-gathering activities and a schedule. An effort should be made to make the process more cost-effective.  
Year 2-4: Use the social data along with data regarding the potential for GHG reductions to develop a series of campaigns designed to raise awareness and promote behavior change.

*Action Step 4. Develop and maintain a strong Web-based presence to provide critical support to the many broad educational activities already underway.*

1. **Lead Agency/Department/Entity:** VTANR
  
2. **Other Partners:** VCC, businesses 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.
  
3. **Authority (Y/N additional authority needed? [legislation, rule]):** No additional authority required
  
4. **Budget & Resources:** 0.25 to 0.5 FTE to design and maintain web page, plus \$10K-\$15K for associated software, web-hosting service.
  
5. **Schedule of tasks (1-12 months; 13-48 months)**

Year 1: Review existing state climate change web pages ([www.vermontclimatechange.us](http://www.vermontclimatechange.us), [www.anr.state.vt.us/air/Planning/htm/ClimateChange.htm](http://www.anr.state.vt.us/air/Planning/htm/ClimateChange.htm))

Develop content and determine what each site will be used for and where content is best located. Redesign pages, refine and consolidate content.

Year 2-4: Monitor traffic on site(s). Keep content and links current. Update site as necessary

## 6. Assumptions

This assumes that the revised web presence is developed and maintained in the context of a broader and sustained statewide education and outreach effort.

### *Action Step 5. Identify and establish climate change “best practices” for public and private use in all sectors of the economy*

1. **Lead Agency/Department/Entity:** Vermont Climate Collaborative (VCC) & Vermont Climate Working Groups (see Work Plan for CC-6 for details).
2. **Other Partners:** Businesses, 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.
3. **Authority (Y/N additional authority needed? [legislation, rule]):** No additional authority required
4. **Budget & Resources:** 0.25 to 0.5 FTE to research existing best practices and develop a mechanism or mechanisms (internet, mailings, fact sheets, trainings, etc.) for disseminating them to the target audiences
5. **Schedule of tasks (1-12 months; 13-48 months)**

Year 1: Identify target sectors in Vermont (criteria could be industry size, largest GHG emitters, estimated potential for GHG emission reduction. Research existing best practices for those sectors. Develop an education plan for each sector. Establish baseline emissions if possible.

Year 2-4: Execute education plan, including feedback mechanism. Use feedback on outreach plus measures of GHG emissions reduction as an indicator of the efficacy of the effort. Continue research and updating of best practices to ensure they are current with the latest technology and techniques.
6. **Assumptions**

Assumes that many best practices have already been identified and defined by others (e.g., EPA, academia, efficiency utility, etc.).

***Action Step 6. Encourage, foster, and promote the research and academic excellence necessary to advance statewide solutions to climate change***

- 1. Lead Agency/Department/Entity:** Vermont Climate Collaborative (VCC) & Vermont Climate Working Groups (see Work Plan for CC-6 for details).
- 2. Other Partners:** Businesses, 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.
- 3. Authority (Y/N additional authority needed? [legislation, rule]):** No additional authority required
- 4. Budget & Resources:** TBD
- 5. Schedule of tasks (1-12 months; 13-48 months):** TBD

**CCTT Work Plan for CC-5  
(Adaptation)**

- A 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, and recreational and ecological sectors.
  - B 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.
  - C Development of policy recommendations as necessary.**
- 

- 1. Lead Agency/Department/Entity:** ANR
- 2. Other Partners:** VTrans, Dept. of Public Safety, Dept. of Health, Agency of Commerce & Community Development, Agency of Agriculture Food & Markets, Dept. of Education, BISHCA. Private sector partners would include universities, businesses, environmental groups, engineers, architects, insurance companies, banks, etc
- 3. Authority (Y/N additional authority needed? [legislation, rule]):** No additional authority needed.
- 4. Budget & Resources:** Contingent on whether the *Commission on Adaptation to Climate Change* process would be conducted similarly to the *Governor's Commission on Climate Change* process where services of a consultant / contractor would be needed. Hiring a consultant to support, coordinate and facilitate the effort is likely to require a commitment of approximately \$100,000. In the absence of a consultant, ANR would need to dedicate 2 FTE to support the process.
- 5. Schedule of tasks (1-12 months; 13-48 months)**
  - Year 1:  
(Fall / Winter 2008)
    - Establish *Commission on Adaptation to Climate Change* multi-sector working group(s) to:
      - 1) Work with scientists / data experts in compiling and reviewing all Vermont or Northeast-specific environmental monitoring data relevant to the effects of climate change
      - 2) Identify and interpret data trends, and outline additional future research needs.
      - 3) Identify expected short-term, mid-term, and long-term impacts from climate change.
  - Year 2:  
(Spring / Summer / Fall 2009)

- 1) Identify Vermont sectors most at risk from expected changes
- 2) Develop potential policy recommendations based on:
  - i. Review of scientific data trends
  - ii. Evaluation of risks / costs of inaction; cost / benefit analysis if implemented; likely co-benefits; resources required; expected timeline, etc.

(Fall / Winter 2009)

- Compile all information collected by the *Commission on Adaptation to Climate Change* into a comprehensive “*Climate Change Adaptation Plan*” for delivery to the Governor.

Year 3 and beyond: (2010 - )

- Conduct extensive education and outreach regarding anticipated adaptation measures.
  - 1) Work with universities, schools and the general public to expand monitoring and documentation of trends related to the effects of climate change in Vermont.
  - 2) Develop sector-specific outreach material outlining the risks, and explaining best practices for reducing climate-related risks. (This may include materials / training for engineers and construction contractors, farmers, foresters, homeowners, insurance companies, etc.)
- Update the “*Climate Change Adaptation Plan*” as necessary (roughly every 5 years unless key information becomes available sooner).

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**D Establishment of financial structures and creation of markets that are likely to thrive under anticipated climate impacts.**

Details would be developed following 2009 “*Climate Change Adaptation Plan*” (*see above*)

**CCTT Work Plan for CC-6  
(Options for State GHG Goals or Targets)**

**The PG 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 & coordinate implementation strategies for GHG reduction policies, including regulatory and non-regulatory initiatives.**

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- 1. Lead Agency/Department/Entity:** All Vermont State Government Agencies and UVM as part of the *Vermont Climate Collaborative (VCC)*
- 2. Other Partners:** Stakeholders from a wide range of disciplines, businesses, non-governmental organizations, various state agencies, and others will collaborate with the VCC through various *Vermont Climate Working Groups*
- 3. Authority (Y/N additional authority needed? [legislation, rule]):** No, although this group will assist and coordinate with the proposed “Vermont Climate Change Oversight Committee,” a panel to be created by the Vermont Legislature.

**4. Budget & Resources:** TBD

**5. Schedule of tasks (1-12 months; 13-48 months)**

Year 1&2: (2008-10)

The Vermont Climate Collaborative is in the process of finalizing its Charter. To meet the goals of its charter, the VCC shall develop a set of criteria and indicators and a plan for monitoring and feedback that will help to determine success. The Collaborative shall also develop guidelines for responding to proposals and recommendations that are submitted to it for evaluation and endorsement. In addition, the VCC will begin to identify key topic areas and form *Vermont Climate Working Groups* with relevant expert stakeholders to begin to address these issues. Some of these groups are already formed and actively working toward defined outcomes and will be encouraged to partner with the VCC. Other working groups will be initiated for priority activities for which no organized group or implementation team currently exists.

**CCTT Work Plan for CC-7  
(The State's Own GHG Emissions)**

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***Action Step 1 - Implementation may be assisted by current, parallel efforts to implement the 2005 Vermont State Agency Energy Plan (SAEP)***

- 1. Lead Agency/Department/Entity:** BGS
- 2. Other Partners:** All state agencies are required to prepare Agency Implementation Plans (AIPs) that fulfill the requirements laid out by the State Agency Energy Plan (SAEP). Also, the Climate Neutral Working Group (CNWG) is a parallel interagency group tasked with reducing state government greenhouse gas emissions, which are largely associated with energy consumption.
- 3. Authority (Y/N additional authority needed? [legislation, rule]):** No additional authority needed as the SAEP is already legislatively required, and the CNWG is authorized by Executive Order.
- 4. Budget & Resources:** Uncertain at this time
- 5. Schedule of tasks (1-12 months; 13-48 months)**  
Year 1: (2008-09)
  - CNWG and BGS technical participants need to review and coordinate ongoing efforts that apply to both the SAEP and CNWG reduction goals. Technical staff should prepare a 'cross-walk' that will allow the energy reduction goals of the SAEP to be directly reconciled with the GHG reduction goals of the CNWG. This effort will take advantage of synergistic overlaps, and greatly simplify tracking of progress towards the goals of both the CNWG and SAEP.
  - Consider drafting a new executive order that would better coordinate, and combine more formally these 2 complementary efforts to reduce energy consumption and GHG emissions.

***Action Step 2 -The State should lead by example by adopting best practices across the board to serve as a model for other emitters***

- 1. Lead Agency/Department/Entity:** Currently DEC, BGS, Public Service Department are co-chairs of the Climate Neutral Working Group (CNWG)
- 2. Other Partners:** VTrans & Efficiency Vermont have been extensively involved. In addition, Chittenden County Transit Authority (CCTA) and Green Mountain Transit Agency (GMTA) have been involved regarding employee commuting issues. Other

state agencies are encouraged to participate, as they will be affected by policies / initiatives promoted by the CNWG effort. Cooperation from all state agencies will help state government meet its GHG reduction goals.

3. **Authority (Y/N additional authority needed? [legislation, rule]):** No additional authority needed, the CNWG is already authorized under Executive Order #14-03
4. **Budget & Resources:** Uncertain at this time, although allocation of a budget and resources to the CNWG (which is currently un-funded and staffed on a part-time basis) would greatly enhance Vermont state government's ability to attain the goals of Executive Order #14-03, and continue to lead by example.
5. **Schedule of tasks (1-12 months; 13-48 months)**

Year 1 and beyond: (2008 - )

- Continue the ongoing work of the CNWG and various BGS initiatives, but augment with additional resources / funding.
- Develop policy to ensure that environmentally-preferred products and technologies are identified, supported & incorporated during all phases (design, new construction, renovation) of the building process.

*Action Step 3 -The State should frame & target the emission reductions called for as continuous annual improvement efforts (e.g., reducing emissions ~3% per year over the long term)*

1. **Lead Agency/Department/Entity:** Climate Neutral Working Group (CNWG)
2. **Other Partners:** All state agencies, Efficiency Vermont, transit providers.
3. **Authority (Y/N additional authority needed? [legislation, rule]):** No additional authority needed.
4. **Budget & Resources:** Uncertain at this time
5. **Schedule of tasks (1-12 months; 13-48 months)**

Year 1: (2008 - 2009)

- BGS / CNWG have already begun review of historical, current and target GHG emissions from state government. Focus has been largely on meeting the short-term reduction goals for 2012, rather than mid-term (2028) or long-term (2050) targets. CNWG technical participants should perform analyses of several annual emissions reduction strategies that would allow us to meet our short, mid and long term goals.

***Action Step 4 - State procurement processes should contribute substantially in assisting agency emission reduction efforts.***

- 1. Lead Agency/Department/Entity:** BGS – through the Environmentally Preferable Purchasing (EPP) Program, the BGS - Purchasing department already has requirements regarding purchase of 'right-sized', fuel efficient vehicles, energy star appliances, and various recycled/recyclable office materials. An enhanced effort should be made to quantify GHG emissions savings that are achieved through purchasing choices. This could be used as an educational tool for state employees as well.
- 2. Other Partners:** All state agencies & relevant vendors.
- 3. Authority (Y/N additional authority needed? [legislation, rule]):** No additional authority needed.
- 4. Budget & Resources:** Uncertain at this time, but funding will be necessary for the production of educational materials and other support resources
- 5. Schedule of tasks (1-12 months; 13-48 months)**  
Year 1 & 2: (2008-2010)
  - Review the existing EnviroCalc software used by BGS and confirm the appropriateness of the methodology and emission factors used by the software. If the EnviroCalc calculations are deemed acceptable, the data should be considered as part of the periodic energy consumption / GHG inventory conducted by BGS and the CNWG.
  - Work with BGS Purchasing to compile annual purchase data in such a way that will enable BGS and the CNWG to determine GHG / energy savings from the actual products purchased vs. corresponding products considered less environmentally-friendly.
  - Work with BGS to develop educational presentations / materials to target staff within each agency who are responsible for making & approving purchasing requests, and submitting them to BGS. Educational materials should outline the basic science of climate change, identify and quantify (where feasible) the multiple co- benefits of purchasing 'environmentally-friendly' or 'green' products, and outline the existing requirements of the BGS EPP Program.

***Action Step 5 - Education, outreach, and marketing efforts should apply to and engage the State as well as nongovernmental 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.***

1. **Lead Agency/Department/Entity:** CNWG / SAEP
2. **Other Partners:** All state agencies. Coordination with universities, schools, businesses, non-governmental organizations and others would be essential.
3. **Authority (Y/N additional authority needed? [legislation, rule]):** No additional authority needed.
4. **Budget & Resources:** Uncertain at this time (also see CC-4), but funding will be necessary for the production of educational materials and other support resources
5. **Schedule of tasks (1-12 months; 13-48 months)**

Years 1 & 2: (2008-2010)

- Utilize the existing frameworks of the Climate Neutral Working Group and the State Agency Energy Plan to develop a comprehensive climate change & energy education / outreach / marketing campaign for state employees. For example:
  - Create concise educational materials that promote the why, the what, and the how of the CNWG efforts, SAEP, and Agency Implementation Plans (AIP's).
    1. The 'Why' – State government is a contributor to global warming and as a good steward, must re-think the way it does the business of the State and demonstrate leadership by example.
    2. The 'What' – Review pertinent State policies, laws, and agreements with regard to the CNWG, SAEP/AIP duty charge.
    3. The 'How' – Present implementation plans and strategies for achieving the CNWG, SAEP and AIP's goals. Most importantly, in order for the plan to be successful, the educational material must obtain 'buy in' from the individual state employees.
  - Promotion - Get the word out on the requirements for the CNWG, SAEP and AIP's to all state employees by use of:
    - Direct emails to employees who utilize computers in their job functions.
    - Agency/Department newsletters (for example: <http://www.bgs.state.vt.us/facilities/engineering/pdf/bgs-energy-news.pdf>)
    - Conduct 'in Person' Town Meeting style presentations of the CNWG, SAEP and AIP's by a selected team of trained energy plan educators & GHG emissions experts. The presenters would need to blanket the state. Attendance would be mandatory not unlike 'diversity training'.
  - Communication - The developed educational materials should be communicated in several formats such as:
    - Providing written brochures.

- Creating PowerPoint presentations by 'Presenter Teams' to the agency work sites.
  - Developing coordinated climate & energy informational web sites.
  - Energy Usage Monitors - It is also suggested that each Agency put out a call for employee volunteers to act as 'energy usage monitors' – last person out checks for power consuming devices left on and windows left open, etc. As 'energy waste' items are discovered, strategies can be developed to establish 'best-practices' that can be implemented state-wide.
  - Issuing periodic direct email notifications to state employees & posting informational displays in building lobbies – 'how is my building / Agency / Department doing regarding GHG emissions & energy consumption?' Provide statistics on past electrical and heating fuel usage, present current usage and compare to the targeted energy usage goals.
- Coordinate education, outreach and marketing efforts to target effectively both state government and all other sectors of Vermont, including the general public. (see CC-4)

***Action Step 6 - Agency progress in meeting the State's reduction targets should be one of the yardsticks by which agency performance is measured.***

- 1. Lead Agency/Department/Entity:** CNWG / SAEP
- 2. Other Partners:** All state agencies
- 3. Authority (Y/N additional authority needed? [legislation, rule]):** No additional authority needed.
- 4. Budget & Resources:** Uncertain at this time
- 5. Schedule of tasks (1-12 months; 13-48 months)**

Year 1: (2008)

- Improve and coordinate energy consumption data collection (which can be used to estimate GHG emissions) with BGS so that energy use (electricity, space heat, fleet use, etc.) from individual Agencies or Departments can be tracked
- Develop a 'recognition & reward' system for employees that do an exceptional job reducing workplace GHG emissions & energy consumption needed to effectively implement the CNWG, SAEP/AIP strategies..

Year 2 and beyond: (2009- )

- Have all state government agencies join The Climate Registry (TCR) and report annual GHG emissions data. The Agency of Natural Resources (ANR) joined in April 2008 and will begin reporting agency-wide GHG emissions to TCR soon. For details regarding TCR, see <http://www.theclimateregistry.org/>