



Vermont

Governor's Commission on Climate Change

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Memo

To: Vermont Plenary Group Members
From: The Center for Climate Strategies
CC: Governor's Climate Change Commission (GCCC), Vermont Department of Environmental Conservation (DEC)
Subject: Overview for the Final Meeting of the Vermont Plenary Group (PG)
Date: July 26, 2007

Final Plenary Group Meeting

At the 7th and final meeting of the Vermont GCCC Plenary Group on Thursday, July 26, 2007, the PG will finalize and approve all remaining climate change policy options. The PG will review, discuss, and modify these options as needed to reach final approval. As you know, options will receive from the PG either Unanimous Consent, a Supermajority; a simple Majority, or not be approved (in the even that they lack a simple majority).

The time available to us for this meeting is constrained by the State House closing time. Accordingly, we hope to launch directly into discussion and approval of the remaining policy options that have not yet been approved. Options that were approved without objection by the Plenary Group at its June 21st meeting (or earlier, in the case of the early consensus options), are noted as such in the tables below. For the remaining options, please come prepared to consider final approval and to offer alternative language that you believe could achieve greater consensus if you believe it is needed.

A summary of the 38 draft policy options is included below in tables by TWG, and a detailed description of each along with related background material is posted to the GCCC-PG website at www.vtclimatechange.us. Please review these documents prior to the meeting to the extent that you can. Several documents have had late-breaking adjustments made so there may be differences between the tables below and those posted with the policy options themselves; if so, the values below should reflect the latest information. Copies will be provided at the meeting, and any changes can be highlighted by TWG facilitators. In addition, we received a request to break out the present value costs and present value benefits that make up the net present value (NPV) figure shown for options whose costs have been quantified. Where possible, this information is provided in a second table for each TWG following the TWG's policy options table.

In addition, at its June 21st meeting, the PG requested a better sense of relative reductions by sector, and a table with this information is included below. In short, it shows that reductions from

both ESD and TLU reflect ~58-60%. AFW options far exceed this sector's emissions due to the effects of policies which incrementally increase sequestered carbon. A chart reflecting all reductions associated with the policy options considered by the PG is included at the end of this memo.

Finally, please remember two important contexts underlying the PG's work. First, just as the inventory and forecast prepared for this effort is a *planning-level* document rather than an exhaustive, site-specific, compliance level inventory, the PG's recommendations provide a similar *planning-level* approach to identifying, framing, and initially quantifying policies that Vermont could pursue to reduce its GHG emissions. Additional and supplemental analytical work may be necessary in many cases before policies can move directly into implementation. Second, the PG was created by the GCCC to provide broader stakeholder input in identifying and characterizing policy options that the GCCC may decide to recommend to the Governor in keeping with its charge from him. The GCCC will of course determine the nature and content of the recommendations that it ultimately forwards to the Governor.

Tentative Schedule for the Conclusion of the GCCC-PG Process

Plenary Group

- July 26, 2007 (Thursday) – Final Plenary Group meeting; final voting on options to forward to the GCCC.
- August 10, 2007 (Friday) – CCS complete quantification revisions, eliminate double-counting among final options, prepare draft report for Plenary Group review.
- August 14, 2007 (Tuesday) – Plenary Group conference call to review and comment on draft report.
- August 17, 2007 (Friday) – CCS prepare final report based on feedback received on conference call.

Governor's Commission on Climate Change

- August 27, 2007 (Monday) – Draft final recommendations from GCCC to Governor based on Plenary Group report and public input received.
- August 30, 2007 (Thursday) – Final revisions and decisions by GCCC regarding recommendations to Governor.
- September 4, 2007 (Tuesday) – Deliver recommendations to Governor (first business day after September 1, 2007).

Agriculture, Forestry, and Waste Management Technical Work Group Summary List of Policy Options

| | Policy Option | GHG Reductions (MMtCO ₂ e) | | | Net Present Value 2007–2028 (Million \$) | Cost-Effective-ness (\$/tCO ₂ e) | Level of Support |
|--------|---|---|------------|-----------------|--|---|-------------------|
| | | 2012 | 2028 | Total 2007-2028 | | | |
| AFW-1 | Programs to Support Local Farming/Buy Local | 0.00 | 0.02 | 0.20 | Not Quantified | Not Quantified | TBD |
| AFW-2 | Agricultural Nutrient Management Programs | 0.08 | 0.10 | 1.60 | \$4 | \$3 | Unanimous Consent |
| AFW-3 | Manure Management Methods to Achieve GHG Benefits | 0.01 | 0.02 | 0.30 | \$34 | \$136 | Unanimous Consent |
| AFW-4 | Protect Open Space/Agricultural land | 0.06 | 0.11 | 1.80 | \$56 | \$31 | TBD |
| AFW-5 | Forestry Programs to Enhance GHG Benefits* | 0.03 | 0.12 | 1.30 | \$4 | \$3 | TBD |
| AFW-6 | Increased Forest Biomass Energy Use | <i>Quantified under AFW-5 & ESD options</i> | | | | | TBD |
| AFW-7 | Forest Protection – Reduced Clearing and Conversion to Non-Forest Cover | 0.40 | 2.00 | 22.00 | \$34 | \$2 | TBD |
| AFW-8 | Expanded Use of Durable Wood Products (especially from VT sources) | 0.09 | 0.05 | 1.40 | Not Quantified | Not Quantified | TBD |
| AFW-9 | Advanced/Expanded Recycling and Composting | 0.16 | 0.88 | 9.10 | \$37 | \$4 | TBD |
| AFW-10 | Programs to Reduce Waste Generation | 0.34 | 0.73 | 10.00 | Not Quantified | Not Quantified | Unanimous Consent |
| AFW-11 | Waste Water Treatment – Energy Efficiency Improvements | 0.00 | 0.01 | 0.14 | -\$19 | -\$133 | Unanimous Consent |
| AFW-12 | In-State Liquid Biofuels Production | | | | | | |
| | Ethanol Production | 0.03 | 0.42 | 3.7 | \$5 | \$1 | Unanimous Consent |
| | Biodiesel Production | 0.004 | 0.24 | 2.2 | \$40 | \$18 | Unanimous Consent |
| | Sector Total After Adjusting For Overlaps | 1.2 | 4.7 | 54.0 | \$190 | \$4 | |
| | Reductions From Recent Actions (table to be added below) | 0 | 0 | 0 | 0 | 0 | |
| | Sector Total Plus Recent Actions | 1.2 | 4.7 | 54.0 | \$190 | \$4 | |

* These estimates are based on the mid-point of results achieved using two different methods.

AFW TWG – Present Values of Costs, Benefits, and Net (NPV) (Millions)

| Policy Option | | Costs 2008-2028 (A) | Benefits 2008-2028 (B) | NPV 2008-2028 (=A-B) |
|---------------|---|---|------------------------------|----------------------------|
| AFW-1 | Programs to Support Local Farming / Buy Local | Not Quantified | Not Quantified | Not Quantified |
| AFW-2 | Agricultural Soil Carbon Management Programs | \$7 | \$3 | \$4 |
| AFW-3 | Manure Management Methods to Achieve GHG Benefits | \$34 | \$0 | \$34 |
| AFW-4 | Protect Open Space / Agricultural Land | \$56 | \$0 | \$56 |
| AFW-5 | Forestry Programs to Enhance GHG Benefits | \$4 | \$0 | \$4 |
| AFW-6 | Increased Forest Biomass Energy Use | <i>Subsumed into other forestry practices</i> | | |
| AFW-7 | Forest Protection - Reduced Clearing and Conversion to Non-forest Cover | \$34 | \$0 | \$34 |
| AFW-8 | Expanded Use of Durable Wood Products (especially from VT sources) | Not Quantified | Not Quantified | Not Quantified |
| AFW-9 | Advanced / Expanded Recycling and Composting | | | \$37 |
| AFW-10 | Programs to Reduce Waste Generation | Not Quantified | Not Quantified | Not Quantified |
| AFW-11 | Waste Water Treatment - Energy Efficiency Improvements | | | -\$19 |
| AFW-12 | In-State Liquid Biofuels Production | | | |
| | (Ethanol Production) | \$5 | \$0 | \$5 |
| | (Biodiesel Production) | \$40 | \$0 | \$40 |

Energy Supply and Demand Technical Work Group Summary List of Policy Options

| | Policy Option | GHG Reductions (MMtCO ₂ e) | | | Net Present Value 2008–2030 (Million \$) | Cost-Effectiveness (\$/tCO ₂ e) | Level of Support |
|--------|--|---------------------------------------|-------------|-----------------|--|--|-------------------|
| | | 2012 | 2028 | Total 2008–2030 | | | |
| ESD-1 | Evaluation and Continuation/ Expansion of Existing DSM for Electricity and Natural Gas | 0.7 | 1.7 | 21.5 | -\$1,041 | -\$48 | Unanimous Consent |
| ESD-2 | Evaluation and Expansion of DSM to Other Fuels | 0.1 | 0.5 | 5.3 | -\$304 | -\$58 | Unanimous Consent |
| ESD-3 | Building Efficiency Codes, Training, Tracking | 0.0 | 0.2 | 2.0 | -\$107 | -\$55 | Unanimous Consent |
| ESD-4 | Evaluate Potential for Contracting Nuclear Power | | | | | | |
| | (Scenario 1) | 0.5 | 1.1 | 16.7 | -\$140 | -\$8 | Pending |
| | (Scenario 2) | 0.3 | 0.7 | 10.2 | -\$70 | -\$7 | Pending |
| ESD-5 | Support for Combined Heat and Power | 0.1 | 0.2 | 2.6 | -\$105 | -\$41 | Unanimous Consent |
| ESD-6 | Incentives and/or Mandate for Renewable Electricity | | | | | | |
| | (Scenario 1) | 0.1 | 0.4 | 5.4 | -\$37 | -\$7 | Pending |
| | (Scenario 2) | 0.2 | 1.2 | 15.7 | -\$79 | -\$5 | Pending |
| ESD-7 | GHG Cap & Trade and/or GHG tax | <i>Pending</i> | | | | | Pending |
| ESD-8 | Incentives for Clean Distributed Technologies for Electricity or Heat | | | | | | |
| | Natural Gas Fuel Switching | 0.1 | 0.1 | 2.2 | \$15 | \$7 | Pending |
| | Solar Thermal Water Heating | 0.0 | 0.2 | 2.7 | \$67 | \$25 | Pending |
| ESD-9 | Wind-Specific Support Measures | | | | | | |
| | (New Wind, Scenario 1) | 0.0 | 0.2 | 2.1 | -\$6 | -\$3 | Pending |
| | (New Wind, Scenario 2) | 0.1 | 0.5 | 6.3 | \$10 | \$2 | Pending |
| ESD-10 | Hydro-Specific Support Measures | | | | | | |
| | (Continued Large Hydro, Scenario 1) | 0.0 | 1.1 | 14.9 | \$0 | \$0 | Pending |
| | (Continued Large Hydro, Scenario 2) | 0.0 | 0.6 | 8.7 | \$0 | \$0 | Pending |
| | (New Hydro, Scenario 1) | 0.0 | 0.1 | 0.8 | -\$22 | -\$27 | Pending |
| | (New Hydro, Scenario 2) | 0.0 | 0.2 | 2.4 | -\$64 | -\$27 | Pending |
| | Total | | | | | | |
| | Scenario 1 (Generation of Nuclear and Hydro at Historic Levels) | 1.56 | 5.53 | 73.27 | -\$1,651 | -\$23 | |
| | Scenario 2 (Generation of Nuclear & Hydro at 50% of Historic Levels) | 1.58 | 5.43 | 70.87 | -\$1,624 | -\$23 | |

Note: Positive numbers for Net Present Value (NPV) and cost-effectiveness reflect net costs. Negative numbers reflect net cost savings.

ESD TWG – Present Values of Costs, Benefits, and Net (NPV) (Millions)

| Policy Option | | Costs 2008-2028 (A) | Benefits 2008-2028 (B) | NPV 2008-2028 (=A-B) |
|---------------|---|---------------------------|------------------------------|----------------------------|
| ESD-1 | Evaluation and continuation / expansion of existing DSM for electricity and natural gas | \$562 | \$1,602 | -\$1,041 |
| ESD-2 | Evaluation and expansion of DSM to Other Fuels | \$200 | \$504 | -\$304 |
| ESD-3 | Building Efficiency Codes, Training, Tracking | \$70 | \$177 | -\$107 |
| ESD-4 | Evaluate Potential for Contracting Nuclear Power | | | |
| | (scenario 1) | \$1,504 | \$1,644 | -\$140 |
| | (scenario 2) | \$752 | \$822 | -\$70 |
| ESD-5 | Support for Combined Heat and Power | \$205 | \$310 | -\$105 |
| ESD-6 | Incentives and/or Mandate for Renewable Electricity | | | |
| | (scenario 1) | \$353 | \$390 | -\$37 |
| | (scenario 2) | \$1,053 | \$1,132 | -\$79 |
| ESD-7 | GHG Cap & Trade and/or GHG tax | <i>Pending</i> | | |
| ESD-8 | Incentives for Clean Distributed Technologies for Electricity or Heat | | | |
| | Natural Gas fuel switching | \$1,037 | \$1,022 | \$15 |
| | Solar thermal water heating | \$219 | \$151 | \$67 |
| ESD-9 | Wind-specific support measures | | | |
| | (New wind, scenario 1) | \$150 | \$156 | -\$6 |
| | (New wind, scenario 2) | \$463 | \$453 | \$10 |
| ESD-10 | Hydro-specific support measures | | | |
| | (Continued large hydro, scenario 1) | \$0 | \$0 | \$0 |
| | (Continued large hydro, scenario 2) | \$0 | \$0 | \$0 |
| | (New hydro, scenario 1) | \$36 | \$58 | -\$22 |
| | (New hydro, scenario 2) | \$106 | \$170 | -\$64 |

**Transportation and Land Use Technical Work Group
 Summary List of Policy Options**

| | Policy Option | GHG Reductions (MMtCO ₂ e) | | | Net Present Value 2008–2028 (Million \$) | Cost-Effectiveness (\$/tCO ₂ e) | Level of Support |
|-------|---|---------------------------------------|-------------|-----------------|--|--|-------------------|
| | | 2012 | 2028 | Total 2008–2028 | | | |
| TLU-1 | Compact and Transit-Oriented Development Bundle | .26 | .99 | 10.88 | Net savings | | Pending |
| TLU-2 | Alternatives to Single Occupancy Vehicles (SOVs) | .28 | .32 | 6.57 | Net savings | | Pending |
| TLU-3 | Vehicle Emissions Reductions Incentives | .11 | .63 | 7.73 | -\$38 | -\$5 | Pending |
| TLU-4 | Pay as You Drive Insurance | .20 | .32 | 5.30 | Net savings | | Pending |
| TLU-5 | Alternative Fuels and Infrastructure (LCFS) | .12 | .42 | 5.75 | NA | | Unanimous Consent |
| TLU-6 | Regional Intermodal Transportation System – Freight and Passenger | .05 | .20 | 2.22 | NA | | Pending |
| TLU-7 | Commuter Choice/Parking Cash-out | .06 | .19 | 1.86 | -\$69 | -\$37 | Unanimous Consent |
| TLU-8 | Plug-in Hybrids [part of TLU-5] | - | - | - | - | | Unanimous Consent |
| TLU-9 | Fuel Tax Funding Mechanism [TWG recommends examining as part of a funding package after reductions policies are chosen] | - | - | - | - | | Unanimous Consent |
| | SECTOR TOTAL BEFORE ADJUSTING FOR OVERLAPS | 1.09 | 3.07 | 40.31 | NA | NA | |
| | REDUCTIONS FROM RECENT POLICY ACTIONS | | | | | | |
| | SECTOR TOTAL PLUS RECENT POLICY ACTIONS | 1.09 | 3.07 | 40.31 | NA | NA | |

TLU TWG – Present Values of Costs, Benefits, and Net (NPV) (Millions)

| Policy Option | | Costs 2008-2028 (A) | Benefits 2008-2028 (B) | NPV 2008-2028 (=A-B) |
|---------------|---|---------------------|------------------------|----------------------|
| TLU-3 | Vehicle Emissions Reductions Incentives | \$6 | \$77 | -\$38 |
| TLU-7 | Commuter Choice/Parking Cash-out | \$540 | \$647 | -\$69 |

**Cross Cutting Technical Work Group
 Summary List of Policy Options**

| | Policy Option | GHG Reductions (MMtCO ₂ e) | | | Net Present Value 2008–2028 (Million \$) | Cost-Effectiveness (\$/tCO ₂ e) | Level of Support |
|------|--|---------------------------------------|------|-----------------|--|--|-------------------|
| | | 2012 | 2028 | Total 2008–2028 | | | |
| CC-1 | GHG Inventories and Forecasts | <i>Not Quantified</i> | | | | | Unanimous Consent |
| CC-2 | GHG Reporting | <i>Not Quantified</i> | | | | | Unanimous Consent |
| CC-3 | GHG Registry | <i>Not Quantified</i> | | | | | Unanimous Consent |
| CC-4 | Public Education and Outreach | <i>Not Quantified</i> | | | | | Unanimous Consent |
| CC-5 | Adaptation | <i>Not Quantified</i> | | | | | Unanimous Consent |
| CC-6 | Options for Goals or Targets | <i>Not Quantified</i> | | | | | Pending |
| CC-7 | The State’s Own GHG Emissions | <i>Not Quantified</i> | | | | | Pending |
| | SECTOR TOTAL AFTER ADJUSTING FOR OVERLAPS | | | | | | |
| | REDUCTIONS FROM RECENT POLICY ACTIONS | | | | | | |
| | SECTOR TOTAL PLUS RECENT POLICY ACTIONS | | | | | | |

VT GCCC-PG Relative Reductions by Sector

| Sector (All values in MMTCO _{2e}) 2030 Data from I&F 5/28/07, Table ES-1 | 2030 | Estimated 2028 | PG Reductions | Sector GHG Remaining | GHG Reduction in Sector |
|---|-------------|-------------------|------------------|-------------------------|-------------------------------|
| Electricity Consumption - (Low Emissions, no new DSM) | 1.91 | 1.86 | | | |
| Residential, Commercial, Industrial | 2.72 | 2.64 | | | |
| Fossil Fuel Industry | 0.03 | 0.03 | | | |
| Industrial Process | 1.24 | 1.21 | | | |
| <i>Sector Total</i> | <i>5.90</i> | <i>5.73</i> | <i>3.37</i> | <i>2.36</i> | <i>58.8%</i> |
| Transportation | 3.64 | 3.54 | | | |
| <i>Sector Total</i> | <i>3.64</i> | <i>3.54</i> | <i>2.10</i> | <i>1.44</i> | <i>59.4%</i> |
| Waste | 0.23 | 0.22 | | | |
| Agriculture | 0.90 | 0.87 | | | |
| <i>Sector Total</i> | <i>1.13</i> | <i>1.10</i> | <i>4.70*</i> | <i>-3.60</i> | <i>428%</i> |
| Overall Totals | 10.67 | 10.37 | 10.17 | 0.20 | 98.1% |

* AFW carbon reductions greater than emissions are accomplished through sequestration.

