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Catalog of State-Level GHG Reduction Policy Options

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Prepared by the Center for Climate Strategies (CCS) for the Governor's Commission on Climate Change (GCCC), its Plenary Group (PG), and Technical Work Groups (TWGs) based on actions undertaken or considered by US states.

Tables of Policy Options

Table	Sectors Covered
1	Residential, Commercial, Industrial (RCI)
2	Energy Supply (ES)
3	Transportation and Land Use (TLU)
4	Agriculture, Forestry and Waste Management (AFW)
5	Cross Cutting Issues - Reporting, Registries, Education (CC)

Key To Future Rankings of Options in the Tables that Follow:

Potential Emission Reductions <u>1/</u>	Potential Cost or Cost Savings <u>1/ 2/</u>
High (H): At least 100,000 Metric Tons (MT) carbon dioxide equivalent (CO ₂ e) per year by 2020 (~1% of emissions)	High (H): \$50 per Metric Ton CO ₂ e (MTCO ₂ e) or above
Medium (M): From 10,000 to 100,000 MT CO ₂ e per year by 2020	Medium (M): \$5-50/MTCO ₂ e
Low (L): Less than 10,000 MT CO ₂ e per year by 2020, or 100,000 MT CO ₂ e by 2050	Low (L): Less than \$5/MTCO ₂ e
Uncertain (U): Not able to estimate at this time	Uncertain (U): Not able to estimate at this time
<p><u>1/</u> Several measures may overlap in terms of emissions reductions and/or cost impacts. Estimates assume measures would be implemented independently from other measures.</p> <p><u>2/</u> Costs are denoted by a positive number. Cost savings (i.e., “negative costs”) are denoted by a negative number.</p>	

Definition of “Priorities for Analysis”:

- **High:** High priority options will be analyzed first.
- **Medium:** Medium priority options will be analyzed next, time and resources permitting.
- **Low:** Low priority options will be analyzed last, time and resources permitting.

Notation of Options:

Options marked with an asterisk (*) indicate options that are at least partially “base case” policies, i.e., that have been considered or undertaken at some level in Vermont.

Table 1 - Residential, Commercial, Industrial (RCI)

Option No.	GHG Reduction Policy Option	Priority for Analysis	Potential GHG Emissions Reduction	Potential Cost or Cost Savings	Additional Impacts, Feasibility Considerations	Notes
RCI-1	ENERGY EFFICIENCY PROGRAMS, FUNDS, AND GOALS					
1.1.	Utility Demand Side Management (DSM) Programs for electricity, natural gas, propane, fuel oil *					<i>E.g., Efficiency VT for electricity, analogous entity for fuels</i>
1.2.	Energy Efficiency Funds (e.g. Public Benefit Funds) administered by State agency, utility, or 3rd party (e.g. Energy Trust) *					A portion of VT Yankee's uprate created a fund for electricity efficiency projects. <i>E.g., energy efficient mortgages (Check with James)</i>
1.3.	Energy Efficiency Requirements (e.g. Utility Savings Goals or Energy Portfolio Standards) *					Has been debated by legislature, but not acted upon yet.
1.4.	Market transformation and technology development programs					
RCI-2	APPLIANCE STANDARDS					
2.1.	Expansion of State-level Appliance Efficiency Standards *					Done by legislature
2.2.	Support for Federal-level Appliance Efficiency Standards					

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RCI-3	BUILDINGS					
3.1.	Improved Building Codes *					Initiatives at the Department of Public Service (DPS)
3.2.	Promotion and Incentives for Improved Design and Construction (e.g. LEED ¹ , green buildings)					E.g., through Vermont's 5-Star rating
3.3.	Training and Education for Builders and Contractors (e.g. HVAC ² sizing, duct sealing)					
3.4.	Training of Building Code and other Officials in Energy Code Enforcement					At both local and state level.
3.5.	Building Commissioning and Recommissioning, including Energy Tracking and Benchmarking					
3.6.	Energy Management Training/Training of Building Operators					
3.7.	Reduction of Emissions from Diesel Engines Used in New Construction Developments *					Have initiated limited pilot work with VTrans
3.8.	Periodic building energy efficiency assessments					E.g., at time of tax reassessments. (Check with Alan)

¹ LEED = Leadership in Energy Efficiency Design, a national building certification program.

² HVAC = Heating, Ventilation, and Air Conditioning

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3.9.	Building energy usage disclosure policy (at time of sale)					(Check with James/Alan)
RCI-4	EDUCATION AND OUTREACH					
4.1.	Consumer education programs *					<i>Efficiency Vermont / DPS</i>
4.2.	Introduce in School Curriculum					Check with DPS Service and the Department of Education
RCI-5	PRICING AND PURCHASING					
5.1.	Green Power Purchasing *					Available from Green Mountain Power (GMP) and Connecticut Valley Public Service (CVPS)
5.2.	Bulk Purchasing Programs for Energy Efficiency or other Equipment (Public or Private sector)					
5.3.	Net Metering Policies *					Adopted by legislature
5.4.	Time of Use Rates					
RCI-6	TECHNOLOGY-SPECIFIC POLICIES					
6.1.	Incentives for Renewable Energy Applications (Solar roofs, water heaters, etc.) *					Limited availability from DPS
6.2.	Clean Combined Heat and Power					
6.3.	Waste Energy Recycling (via waste heat, pressure drops, or tail gases)					

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6.4.	Promotion and Tax or Other Incentives (e.g. EnergyStar, credits for solar hot water)					
6.5.	Appliance Recycling/Pick-Up Programs *					Services through Solid Waste Districts
6.6.	White Roofs, Rooftop Gardens, and Landscaping (including Shade Tree Programs)					
6.7.	Focus on specific end-uses/technologies: window AC units, lighting, water heating, plug loads, networked PC management, power supplies, motors, pumps, boilers, etc. Consumer products programs, may include incentives, retailer training, marketing and promotion, education, etc ,					
RCI-7 NON-ENERGY EMISSIONS (HFCS, PFCS, SF6, CO2 PROCESS EMISSIONS)						
7.1.	Participation in Voluntary Industry-Government Partnerships *					CVPS participates in EPA’s voluntary SF6 program
7.2.	Process Changes/ Optimization					
7.3.	Leak Reduction /Capture, Recovery and Recycling of Process Gases					

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7.4.	Use of Alternative Gases (other HFCs, hydrocarbon coolants/refrigerants, etc.) *					Done by the legislature in the 1990s
RCI-8	GHG EMISSIONS-SPECIFIC GOALS AND POLICIES					
8.1.	Support for switching to less carbon-intensive fuels (coal and oil to natural gas or biomass)					
8.2.	Industry-Specific Emissions Cap and Trade Programs *					Regional Greenhouse Gas Initiative (RGGI)
8.3.	Voluntary emissions targets					
8.4.	Small-source Aggregation					
8.5.	Negotiated Emissions or Energy Savings Agreements					
RCI-9	OTHER					
9.1.	Government Agency Requirements and Goals (including procurement) *					Climate Neutral Working Group (CNWG) established by Executive Order #14-03
9.2.	Focus on specific market segments: existing homes (weatherization), new construction, apartments, low income, etc. *					State weatherization program for existing homes / Act 250 for new homes
9.3.	Reinvestment Fund					
9.4.	Municipal Energy Management *					New initiative from <i>Efficiency Vermont</i>
9.5.	Focus on Small and Medium Enterprises (SMEs)					

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9.6.	Industrial ecology/ by-product synergy					
9.7.	Industrial and Commercial Audits					

Table 2 - Energy Supply (ES)

Option No.	GHG Reduction Policy Option	Priority for Analysis	Potential GHG Emissions Reduction	Potential Cost or Cost Savings	Additional Impacts, Feasibility Considerations	Notes
ES-1	RENEWABLE ENERGY					
1.1.	Environmental Portfolio Standard (renewables and energy efficiency) with renewable energy credit trading					Proposed by Legislature / Opposed by Governor. (Must be designed to provide incentive for maintaining existing renewables and off-grid renewables.)
1.2.	Feed-in tariff for renewable energy					
1.3.	Green power renewable resources programs *					GMP & CVPS
1.4.	State purchase of electricity through green power renewable resources programs					Including green power procurement standard for public sector entities
1.5.	Public Benefit Charge Funds					
1.6.	Financial incentives for renewable energy (e.g., payback buydown, production tax credits, etc.)					
1.7.	Renewable energy development issues (zoning, siting, etc.)					
1.8.	Energy Storage Technologies					

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1.9.	Renewable energy research and development (R&D)					
1.10.	Landfill gas recovery (see also Waste) *					2 or 3 existing generation sites
1.11.	Waste to energy (see also Waste)					
1.12.	Support for community scale power					Incentives, facilitation, regulatory reform, etc. (Check with James)
ES-2	DISTRIBUTED GENERATION (DG)					
2.1.	Incentives for combined heat and power (CHP) and clean DG					Note, consider reduced T&D losses
2.2.	Removing barriers to CHP and clean DG (including utility contracting barriers, financing, information, private wires, etc.)					
2.3.	Incentives to recycle waste energy (e.g., waste heat and/or pressure recovery)					
2.4.	Interconnection rules for clean, distributed generation					
2.5.	Net Metering *					Statute in place
2.6.	Support for district energy					Incentive, regulatory reform

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ES-3	ADVANCED FOSSIL FUEL MEASURES					
3.1.	Incentives for advanced coal, including IGCC and carbon capture and storage (CCS)					
3.2.	Fuel Cell Development Incentives					
3.3.	Combined H2/electricity production from fossil fuels with sequestration					
3.4.	Research and Development (R&D)					
ES-4	NUCLEAR					
4.1.	New Nuclear Capacity and Licensing					
4.2.	Nuclear Plant Relicensing					
4.3.	Nuclear Plant Upgrading *					Done at VT Yankee
ES-5	EMISSIONS POLICIES					
5.1.	Generation Performance Standards					
5.2.	GHG Cap and Trade *					RGGI Consider in context of whole-economy Cap and Trade
5.3.	CO2 Tax					Consider in context of whole-economy CO2 tax See Colorado's REM

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5.4.	GHG offset/mitigation requirements for new power plants					
5.5.	Voluntary utility CO2 targets					
ES-6	OTHER ELECTRICITY MEASURES					
6.1.	Establish an “energy efficiency utility” to maximize efficiency resources through market dynamics *					• Efficiency Vermont
6.2.	Pricing strategies (e.g., increasing block rates, real time pricing, etc.)					
6.3.	Advanced metering					
6.4.	Integrated Resource Planning (IRP)					
ES-7	TRANSMISSION AND DISTRIBUTION (T&D)					
7.1.	Renewable and distributed Energy Transmission Authority					
7.2.	Upgrade transmission system *					Ongoing
7.3.	Reduce transmission and distribution line losses					
ES-8	OIL & GAS PRODUCTION					
8.1.	Reducing methane emissions from distribution (e.g., green completions, leak reduction, etc.)					

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ES-9	EDUCATION/AWARENESS					
9.1.	Environmental (emissions) disclosure					
9.2.	Public education					