



Iowa Climate Change Advisory Council

Clean and Renewable Energy (CRE)
Subcommittee Meeting #7

April 3, 2008

Iowa Department of Natural Resources
The Center for Climate Strategies

Agenda

1. Introductions and Roll Call
2. Review and Approval of Prior Call Summary [Decision Item]
3. Review and Discuss Draft Straw Proposals
4. Next Steps for Development of Straw Proposal Options
5. Agenda, Date and Time for Next Meetings [Decision Item]
6. Public Comments
7. Announcements

Welcome and Introductions

- Iowa DNR
- Iowa Subcommittee (SC) Members
- Members of the Public
- Center for Climate Strategies

Review and Approval of Call Summary 6

- Review draft meeting summary for CRE SC call #6
- Consider any corrections or additions to meeting summary
- Move to approve meeting summary with agreed upon changes

Goals for ICCAC Meeting #4

(April 11, 2008)

- Review and Approve Straw Proposals from Subcommittees [Policy Descriptions and Policy Designs]
- Review Subcommittee Recommendations on Draft Iowa Emissions Inventory and Forecast

Stepwise Planning Process

- Develop inventory and forecast of emissions
- Identify a full range of possible actions
- Identify initial priorities for analysis
- ***Develop straw proposals***
- Quantify GHG reductions and costs/savings
- Evaluate externalities, feasibility issues
- Develop alternatives to address barriers
- Aggregate results
- Iterate to final agreements
- Finalize and report recommendations

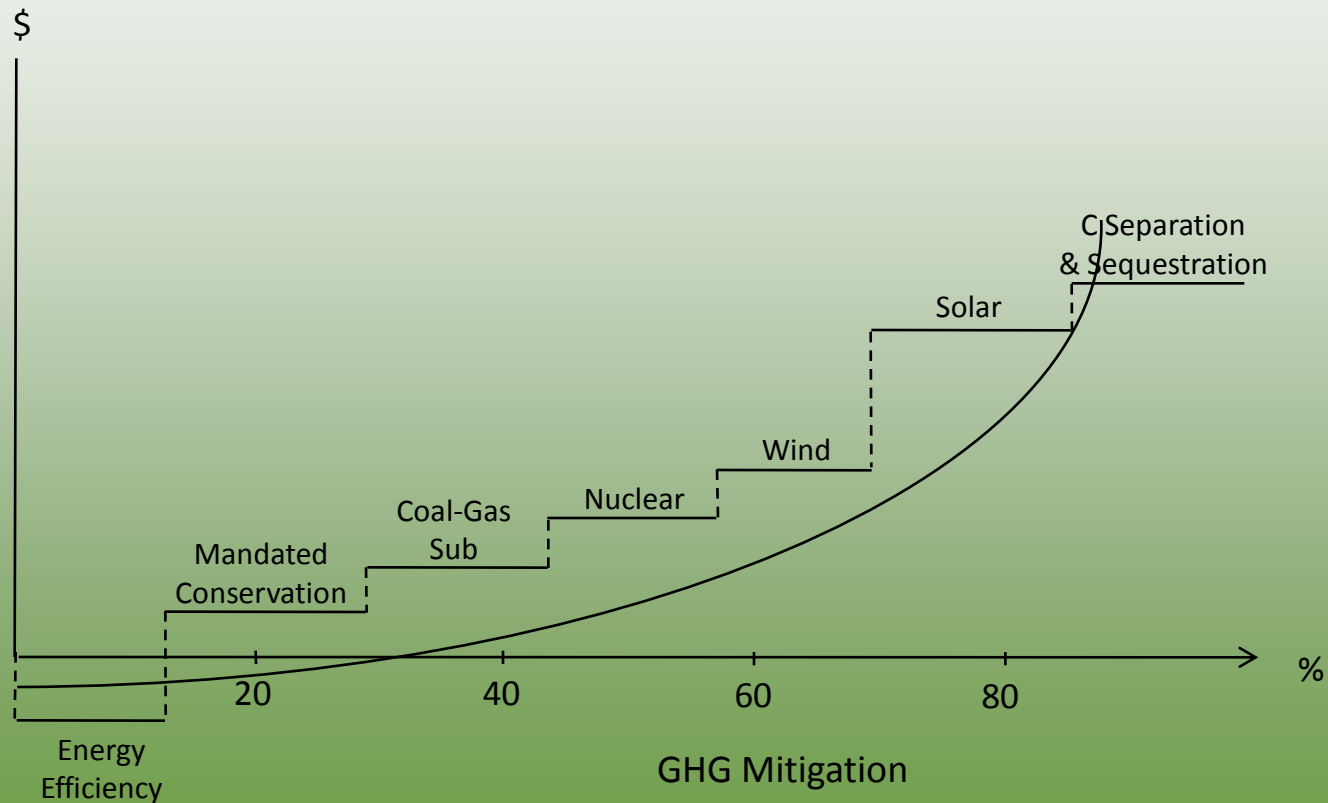
Policy Option Template

(See Sample Policy Option Template)

- ***Policy Description (Concept)***
- ***Policy Design (Goals, Timing, Parties Involved)***
- **Implementation Methods**
- **Related Programs and Policies (BAU)**
- **Estimated GHG Savings and Costs Per MMTCO_{2e}**
 - Data Sources, Methods and Assumptions
 - Key Uncertainties
- **Additional (non-GHG) Benefits and Costs, as Needed**
- **Feasibility Issues, if Needed**
- **Status Of Group Approval**
- **Level of Group Support**
- **Barriers to Consensus, if any**

Cap and Trade: Sample Cost Curve

Marginal Costs of GHG Mitigation (Curve)



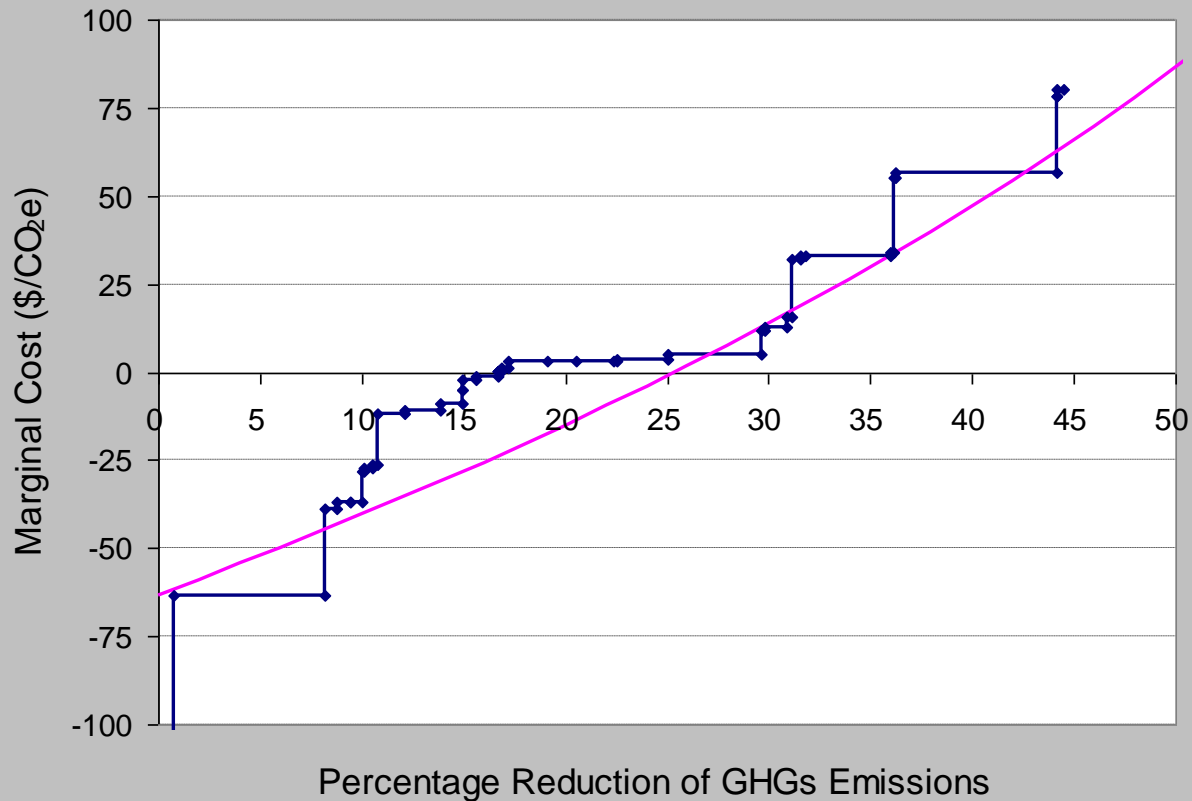
Minnesota as an Example

GHG Mitigation Options List of Minnesota, 2025

Sector	Climate Mitigation Actions	Estimated 2025 Annual GHG Reduction (MMtCO ₂ e)	Estimated Cost or Cost Savings per ton GHG Removed	GHG Reduction Potential as Percentage of 2025 Baseline Emissions	Cumulative GHG Reduction Potential	Weights (add-up to 100)
RCI	MN: Improved Uniform Statewide Building Codes	0.005	-\$576.00	0.00%	0.00%	0.01
RCI	MN: Support Strong Federal Appliance Standards and Require High State Standards in the Absence of Federal Standards	1.4	-\$124.00	0.71%	0.71%	1.59
RCI	MN: Maximize Savings From the Utility Conservation Improvement Program (CIP)	14.7	-\$63.20	7.44%	8.15%	16.72
TLU	MN: Adopt California Clean Car Standards	1.16	-\$39.00	0.59%	8.74%	1.32
AFW	MN: Agricultural Crop Management_B. Nutrient Management	1.3	-\$37.00	0.66%	9.39%	1.48
RCI	MN: Non-Utility Strategies and Incentives To Encourage Energy Efficiency and Reduce GHG Emissions	1.3	-\$37.00	0.66%	10.05%	1.48
RCI	MN: Conservation Improvement-Type Program for Propane and Fuel Oil Efficiency	0.05	-\$28.00	0.03%	10.08%	0.06
RCI	MN: Green Building Guidelines and Standards Based on Architecture 2030	0.94	-\$27.00	0.48%	10.55%	1.07
ES	MN: Transmission System Upgrading, Including Reducing Transmission Line and Distribution System Loss--Natural gas transmission and distribution upgrades	0.4	-\$26.10	0.20%	10.75%	4.32
AFW	MN: Forestry Management Programs to Enhance GHG Benefits_B. Urban forestry	2.7	-\$12.00	1.37%	12.12%	3.07
AFW	MN: Front-End Waste Management Techs._B. Recycling	3.4	-\$11.00	1.72%	13.84%	4.10
AFW	MN: In-State Liquid Biofuels Production_A. Ethanol carbon content	2.2	-\$9.00	1.11%	14.95%	0.47
RCI	MN: Program To Reduce Emissions of Non-Fuel, High-Global-Warming-Potential GHGs	0.05	-\$5.00	0.03%	14.98%	5.63
AFW	MN: Agricultural Crop Management_A. Soil Carbon Management	1.3	-\$2.00	0.66%	15.64%	10.24
TLU	MN: Climate-Friendly Transportation Pricing / Pay as You Drive	2.1	-\$1.00	1.06%	16.70%	0.46
ES	MN: Generation Performance Standard	0	\$0.00	0.00%	16.70%	2.50
ES	MN: Nuclear Power Support and Incentives--Installation of a nuclear power station in 2020	0	\$0.00	0.00%	16.70%	0.46
ES	MN: Advanced Fossil Fuel Technology Incentives, Support or Requirements	0	\$0.00	0.00%	16.70%	0.96
TLU	MN: Expand Transit, Bicycle, and Pedestrian Infrastructure	0.3	\$0.00	0.15%	16.85%	0.50
AFW	MN: End of Life Waste Management Practices_A. Landfilled Waste Methane	0.73	\$1.00	0.37%	17.22%	9.56
AFW	MN: Expanded Use of Biomass Feedstocks for Electricity, Heat, or Steam Production	3.8	\$3.00	1.92%	19.14%	0.22
AFW	MN: Forest Protection--Reduced Clearing and Conversion to Non-Forest Cover	2.7	\$3.00	1.37%	20.51%	0.22
AFW	MN: Front-End Waste Management Techs._A. Source Reduction	3.6	\$3.00	1.82%	22.33%	17.86
AFW	MN: Front-End Waste Management Techs._C. Composting	0.41	\$3.00	0.21%	22.54%	0.03
RCI	MN: Incentives & Resources To Promote Combined Heat and Power (CHP)	4.95	\$3.80	2.50%	25.04%	0.72
AFW	MN: In-State Liquid Biofuels Production_C. Gasoline Displacement	9	\$5.00	4.55%	29.60%	0.00
ES	MN: Efficiency Improvements, Repowering and other Upgrades to Existing Plants--Biomass co-	0.4	\$12.00	0.20%	29.80%	100.00
AFW	MN: Forestry Management Programs to Enhance GHG Benefits_A. Forestation	2.2	\$13.00	1.11%	30.91%	0.00
TLU	MN: Reduce Maximum Speed Limits	0.4	\$15.50	0.20%	31.11%	0.00
AFW	MN: End of Life Waste Management Practices_C. WTE Preprocessing	0.84	\$32.00	0.43%	31.54%	0.00
AFW	MN: Land Use Management Approaches for Protection and Enrichment of Soil Carbon_A. Preserve Land	0.44	\$33.00	0.22%	31.76%	0.00
AFW	MN: Forestry Management Programs to Enhance GHG Benefits_D. Restocking	8.4	\$33.00	4.25%	36.01%	0.00
AFW	MN: Land Use Management Approaches for Protection and Enrichment of Soil Carbon_B. Reinvest in Minnesota--Clean Energy (RIM-CE)	0.19	\$34.00	0.10%	36.11%	0.00
AFW	MN: In-State Liquid Biofuels Production_B. Fossil diesel displacement	0.19	\$55.00	0.10%	36.20%	0.00
ES	MN: Renewable and/or Environmental Portfolio Standard	15.7	\$56.40	7.94%	44.15%	0.00
ES	MN: Distributed renewable energy	0.023	\$78.10	0.01%	44.16%	0.00
AFW	MN: End of Life Waste Management Practices_B. Residuals Management	0.63	\$80.00	0.32%	44.48%	0.00

¹ 2025 projected consumption-based gross CO₂ emission level is 197.65 Million Metric Tons CO₂e.

Economy-wide Stepwise and Fitted Marginal Cost Curves of MN, 2025



Sample Outputs

(multi-state cap and trade)

TABLE IM1-2025. ECONOMY-WIDE EMISSION TRADING SIMULATION AMONG SIX MIDWESTERN STATES PLUS MANITOBA IN YEAR 2025

(million dollars or otherwise specified)

State	Before Trading	After Trading			Cost Saving	Permits Traded	Emission Reduction w/ Trading		Emission Reduction Goal
	Mitigation Cost	Mitigation Cost	Trading Cost	Net Cost		(million tCO ₂)	(million tCO ₂)	(percent from BAU)	(percent from BAU)
IA	-478	-910	344	-565	87	7.10	47.91	38.01	43.65
IL	-1,581	-941	-756	-1,697	116	-15.61	138.64	43.02	38.18
KS	-621	-1,392	510	-882	261	10.53	42.27	34.94	43.65
MI	-1,663	-1,445	-234	-1,679	16	-4.83	109.06	39.95	38.18
MN	-439	-972	451	-521	81	9.31	79.82	40.38	45.09
WI	-915	-706	-233	-939	24	-4.81	67.32	41.11	38.18
MB	-178	-122	-83	-204	26	-1.70	8.10	39.29	31.02
Total	-5,876	-6,487	0	-6,487	611	26.94 ^b	493.11	40.28	40.28

^a Permit Price = \$48.45/tonCO₂e. This is the price of the last permit sold, which is also equal to the price of the last ton of CO₂e mitigated (its *marginal* mitigation cost). It is the same for each state for a given case. The *average* mitigation cost per unit of CO₂ equivalent in this simulation differs for each state. For MN, for example, it is -\$12.17/tonCO₂e. Please note that the average mitigation cost is related to mitigation level of a state, which for this case is 40.38% below the baseline level in 2025 for MN. Multiplying the average mitigation cost by the number of tons of CO₂ mitigated will equal the *total* mitigation cost for each state.

^b Represents number of permits bought or sold.

Sample Outputs

(Minnesota only cap and trade)

Emission Trading Simulation Among Four Sectors in Minnesota
(million dollars or otherwise specified)

State	Before Trading	After Trading ^a			Cost Saving	Permits Traded	Emission Reduction After Trading		Emission Reduction Cap
	Mitigation Cost	Mitigation Cost	Trading Cost	Net Cost		(million tCO ₂ e)	(million tCO ₂ e)	(percent from BAU)	(percent from BAU)
Power Sector	2,653	-692	1,141	449	2,203	17.42	24.14	30.38	52.31
Transportation Sector	-68	216	-457	-241	173	-6.98	20.71	52.06	34.51
Other	928	-9	584	575	352	8.92	24.97	31.80	43.16
Sequestration	0	272	-1,268	-996	996	-19.36	19.36	n.a.	n.a.
Total	3,512	-213	0	-213	3,725	26.35 ^b	89.18	45.10	45.10

^a Permit Price = \$65.48/tonCO₂e.

^b Represents number of permits bought or sold.

CRE Draft Straw Proposals

- Review of draft policy option language
- Discuss and revise draft straw proposals for recommendation to ICCAC as needed

Next Steps

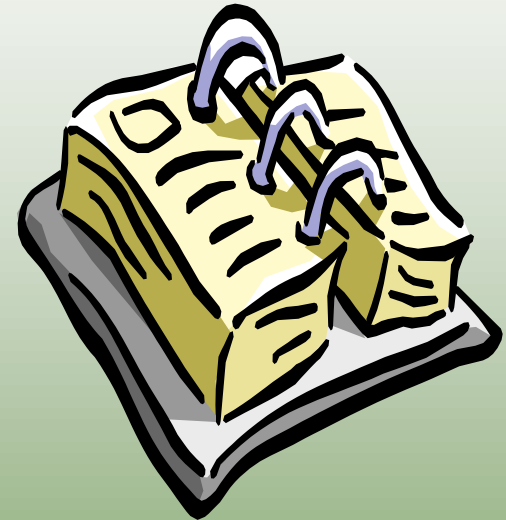
- Review of ICCAC # 4 Meeting Results
- Review and Discuss Development of Iowa Inventory and Forecast
- Next Steps in Development of Policy Options

Timing

Date	Action
October 18, 2007	1st ICCAC meeting
December 17, 2007	2nd ICCAC meeting
February 8, 2008	3rd ICCAC meeting
April 11, 2008	4th ICCAC meeting
June 12, 2008	5th ICCAC meeting
September 3, 2008	6th ICCAC meeting
November 10, 2008	7th ICCAC meeting
December 15, 2008	ICCAC Final Report completed
Between ICCAC meetings	SC conference calls and meetings

Next Sub-Committee Meeting

- Agenda:
 - Review and discuss policy design straw proposals provided by CRE volunteers
 - Review Iowa Inventory and Forecast
- Next Call
 - TBD



Public Input, Announcements