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**Meeting #6 Summary**  
Minnesota Climate Change Advisory Group (MCCAG)  
St. Paul, Minnesota  
December 5, 2007

**Attendees:**

**MCCAG:** Jon Anderson, Leith Anderson, Willis Anthony, Jan Callison, Rick Carter, Staci Bohlen (for Mitch Davis), Chuck Dayton, Barbara Freese, Ann Glumac by phone, Bill Grant, J. Drake Hamilton, Andy Hart by phone, Bill Heaney, Jonathan Holmes, Robert Jagusch, Greg Jason, Boise Jones, John Kelly, Julie Ketchum, Scott Lambert, Shalini Guta (for William Lee), Chuck MacFarlane by phone, Jim Marchessault, Tim McGraw, Margaret Hodnik by phone (for Dave McMillan), Jeff Muffat, Eric Olsen, Pat Perry, Doug Peterson, Mike Robertson, Rick Evans (for David Sparby), Will Steger, Peter Sullivan, Barb Thoman, Clarence Lehman (for David Tilman), Bev Turner (for Nim Traeger), Jay Reinhardt (for Jeff Wilkes), Bruno Zagar

**Department of Commerce (DOC):** Edward Garvey, Linda Limback, Bill Sierks, and Marya White.

**Pollution Control Agency (PCA):** Todd Biewen, Jim Chiles, Peter Ciborowski, Anne Claflin, Lisa Herschberger, John Seltz, David Thornton, and Rebecca Walter.

**Center for Climate Strategies (CCS):** Bill Dougherty, Tom Peterson, Linda Schade, Will Schroeer, Jeff Wennberg, and Tom Looby, Steve Roe, Adam Rose, Randy Strait, and Dan Wei by telephone.

**Others:** See Attachment for Technical Work Group (TWG) Members and Members of the Public that Attended MCCAG Meeting #5.

**Background Documents** (all posted at [www.mnclimatechange.us](http://www.mnclimatechange.us))

1. Notice and Agenda
2. Draft Summary for MCCAG Meeting #5
3. PowerPoint Presentation
4. Memo to MCCAG on Preparation for 6<sup>th</sup> Meeting
5. Policy Option Descriptions for Analysis for each TWG
  - Agriculture, Forestry, and Waste Management
  - Energy Supply
  - Residential, Commercial, Institutional, and Industrial
  - Transportation and Land Use
  - Cross-Cutting Issues
  - Cap-and-Trade

## Discussion and Conclusions

### 1. Welcome and Introductions

Edward Garvey welcomed attendees, and went around the room with introductions by members of the MCCAG, Technical Work Group (TWGs), the public, MN agencies, and CCS. Mr. Garvey reviewed the day's agenda.

### 2. Approval of Summary of Prior Meeting; Other Logistics

The MCCAG did not consider approval of the summary for Meeting #5. MCCAG members were asked to submit any comments they have on the summary to David Thornton or Edward Garvey.

A MCCAG member commented that on page 5, second paragraph of the summary of meeting #4, that his recollection is that the MCCAG did not exclude consideration of new nuclear plants under ES-6 (Nuclear Power Support and Incentives).

Mr. Garvey confirmed that the next two meetings are scheduled for January 10, 2008, and January 24, 2008. The meeting location will be announced later.

### 3. Review of the MCCAG Process Status and Next Steps

Jeff Wennberg from CCS updated the MCCAG members on the status of various items. Jeff explained that at this meeting, the MCCAG members will review the initial quantification of the individual policy options as well as integrated results completed to eliminate 'double counting' of emission reductions and costs / cost savings resulting from the overlap of different policy options. He also noted that existing barriers to agreement on policy options can be identified at this meeting and returned to the TWG for further work. Today the MCCAG will begin review and final approval of the draft pending policy options, with the goal of approving as many as possible in order to finish work by the end of January. He suggested that the MCCAG focus on the options for which the quantification is complete and are ready for consideration as final by the MCCAG.

### 4. Public Input and Announcements

#### Public Input:

Tim Burnell (Eureka Inc.) is concerned with AFW-7 (Front-End Waste Management Technologies) and AFW-8 (End of Life Waste Management Practices) noting that Eureka does not feel that these options are ready for approval by the MCCAG. Eureka supports the AFW-7 goals for recovery rate, but once this goal is met, the waste goes to the AFW-8—municipal waste—and infrastructure is needed before this can be attained. He asks that the analysis of these options needs to be refined to address these points.

Jerry Hinderman is concerned that new nuclear power is not being considered, especially in the context of how the state will meet its long-range GHG reduction goal to reduce GHG emissions by 80% from 2005 emission levels by 2050. For this to be realistic, nuclear energy is essential. The MCCAG should take a leadership role, even though legislature is reconsidering nuclear. He recommends three things:

1. Change legislation that doesn't permit new nuclear plants,
2. Urge the MN congressional delegation to approve the waste depository site, and
3. Make nuclear a consideration whenever a new power plant is to be built.

**Announcements:**

The MN Legislative Energy Task force has announced that it will have a meeting on Cap-and-Trade on January 15. Three speakers are scheduled: Steve Polasky, Rich Cowart from the Public Utility Commission of Vermont, and Terry Tamminen who was an adviser to California Governor Schwarzenegger.

David Thornton noted that the U.S. Senate Environment Committee is considering a Lieberman–Warner bill, which is relevant to our proceedings today.

**5. Overview of Preliminary Results**

Tom Peterson provided an overview of the preliminary quantification results. Tom Peterson and Randy Strait also explained the initial quantification of GHG emission reductions associated with existing actions provided in Slide 10 of the PowerPoint. Existing actions are actions that MN has already taken to reduce GHG emissions but are not included in the business-as-usual (BAU) forecast. The emissions reductions shown in slide 10 for each of the existing actions reflect incremental reductions associated with each action relative to the BAU forecast.

For the meeting today, the emission reductions associated with the renewable energy standard (RES) and the energy conservation improvement program (CIP) in the Next Generation Energy Act (NGEA) of 2007 are not shown in slide 10 because these are accounted for under ES-5 and RCI-1, respectively. Reductions associated with ES-5 and RCI-1 are shown as reductions associated with 'planned actions' under ES-5 and RCI-1 to keep the reductions with the costs / cost savings estimated for ES-5 and RCI-1, respectively. Bill Dougherty of CCS confirmed that for the RCI and ES TWGs, options that would be implemented after 2005 have been considered as planned actions and not included in the reference case.

A MCCAG member noted that it is important to isolate the costs of the RES and CIP. It matters to know what we accomplished in 2007 and what the costs were. It was noted that the reason the RES and CIP got defined as ES and RCI options, respectively, is that we wanted to quantify these programs. The discussion was whether to strengthen the requirements of the RES and CIP or not, and it was decided to stay with the requirements specified in the NGEA. It was also noted that it is important to quantify the emission reductions and costs / cost savings associated with the RES and CIP in order to integrate the results for these programs with other 'planned actions' to eliminate any potential double-counting of emission reductions and costs / cost savings.

After a lengthy discussion the MCCAG agreed that the reductions associated with the RES and CIP should be added to the chart in slide 10 reflecting the RES and CIP reductions as existing actions. Tom Peterson noted that one of the decisions before the MCCAG is how to define the reference case—whether it includes just existing, planned, or likely actions or not—and a judgment call has to be made.

In response to other questions, clarification was provided that the forecast (the blue line in slide 10) includes emissions associated with two new coal plants (planned additions) with replacement of existing coal plant capacity. A member noted that this is a key assumption and should be clearly documented. Agreed; there is a need to clarify the assumptions which are written but perhaps buried in technical background text.

The discussion then turned to slides 11 and 12 that show the initial integrated cumulative emission reductions associated with the pending policy options (planned actions) relative to the BAU forecast, reductions from existing actions, and the statewide GHG reduction targets for 2015 and 2025. These results are shown on a consumption and production basis (for electricity) for both gross and net emissions (which are the same in MN). It was noted that the reductions associated with planned actions (the green line in slide 10) did not include any emission reductions associated with TLU options because the integrated analysis for the TLU options has not yet been completed. However, if the green line is extended forward, one concern is to avoid lock-ins that may create barriers for 2025. Roads and power plants, for example, create long-term GHG outcomes.

A discussion ensued about whether the focus should be on ‘getting 2025 right,’ or ‘looking at 2050.’ Mr. Garvey noted that the report that DOC needs to file with the State Legislature needs to address 2050. It was agreed that the analysis needs to get 2025 correct but that a forecast to 2050 should be prepared, recognizing the many limitations and uncertainties associate with this.

A member noted that the consumption versus production emissions for the electricity supply sector is important, we should evaluate both, but keep in mind that imports are significant in MN. The current approach is simplified because we have an idea of what the power mix is coming into the state, and we assume that mix continues to 2025.

Are costs to the economy and consumers being considered in this analysis? Yes. That is forthcoming and will be based on the results of the option analysis which is typically limited to direct impacts. We will have a full roundup of costs, with some limits on the breakout of detail, limited by data availability. Documentation of the quantification methods should be included in the policy option description files. The final report will also contain an appendix that provides documentation of the quantification methods and assumptions for the stand-alone and integrated analyses. In general, the methods follow US EPA standards for impact analyses but the methods are adjusted as needed to address specific needs for quantifying individual policy options. [In responding to this question at Meeting #8, Tom Peterson clarified that it's not possible to conduct a detailed analysis of costs for consumers for each option. He said that CCS will clarify in the Final Report the primary and secondary costs.](#)

On the broader economic question, should we look at job creation impacts and state domestic products? The general response is that that would be good to do, but we haven't decided yet to proceed with those analyses.

A member noted that when the results of the MCCAG's work is presented to the public, it will be important to make the charts more real world and in the narrative to effectively communicate understanding of the recommendations and results.

It was noted that the black (state GHG targets) and green (cumulative reductions from MCCAG policy options) lines shown in the slides are nearly identical, and that this is a coincidence. The green line will drop somewhat after including cumulative reductions from the TLU options.

## **6. Review and Approval of the Draft Priorities for Analysis**

The CCS facilitator for each TWG provided a brief summary of each pending policy option and the initial quantification results. TWG members were then invited to provide additional points on their work on each option. The CCS facilitator and TWG members then responded to questions and comments from the MCCAG. Then the MCCAG decided if the option was ready for final approval or needed additional work.

Due to time constraints, the MCCAG was unable to consider draft pending policy options for the TLU, CC, and Cap & Trade TWGs during its meeting today.

## **Residential, Commercial, and Industrial**

### **Summary of Comments and Responses to Questions:**

Bill Dougherty of CCS noted that the RCI numbers presented today represent a substantial refinement since the last meeting. Many assumptions have been clarified.

**RCI-1 (Maximize Savings from the Utility Conservation Improvement Program (CIP))** – As previously discussed, RCI-1 is already an existing action and being considered as a policy option. RCI-1 (reflecting the requirements of the NGEA) includes an energy policy goal for MN to achieve annual savings equal to 1.5% of annual retail energy sales of electricity and natural gas. At least 1% of these sales should come directly through energy CIP and rate design. The additional 0.5% of savings can come indirectly through energy codes and appliance efficiency standards, programs designed to transform the market or change consumer behavior, energy savings resulting from efficiency improvements to the utility infrastructure and system, and other activities to promote energy efficiency and energy conservation.

Several members commented that the cost savings estimated for this option should be included in the baseline (reference case) rather than included as a planned action since it is a requirement of the NGEA. A TWG member noted that more work is underway, including further decoupling, which is helping utilities to achieve the goals. Also, TWG members thought it should be in the reference case. A member suggested that the title for RCI-1 could be clarified to something like ‘achieving CIP goals from 2005.’ It was noted that RCI-1 goal is now part of the Midwestern Governors Association process.

A suggestion was made to create RCI-1b, to analyze the incremental impacts associated with increasing the CIP goal from 1.5% to 2%. A member noted that the 1.5% goal was a tripling of the gas industry’s existing goal, and that increasing the goal to 2% might be a bit too aggressive for now. A second member agreed and thought that a higher number should be considered in the future. The suggesting member requested data and analysis for 2.0.

Tom Peterson emphasized that there is a class of actions that are underway but gains will not be achieved without specific additional actions. The group needs to review whether it is comfortable with how RCI-1 was quantified.

**RCI-2 (Improved Uniform Statewide Building Codes)** – Why are savings so negligible for RCI-2? A TWG member responded that MN building codes are already pretty good, but we still think more savings are possible. The percentage of counties that already use the statewide building code is 85%, then the number of counties where the option would apply is low.

**RCI-3 (Green Building Guidelines and Standards Based on Architecture 2030)** – This option is based on Architecture 2030 challenge. A request was made that language be added to reflect the sentiment that this policy is ‘only if funding is available.’

**RCI-4 (Incentives and Resources to Promote Combined Heat and Power (CHP))** – The TWG asks for the MCCAG’s guidance on assumptions to use on the effectiveness of this option (i.e., 100% or some level below 100%) for the purpose of developing the quantification analysis (a recommendation was not provided during the meeting).

Member comments/guidance:

- Implementation mechanisms and the costs to the implementing entities or agencies (utility, government, and consumer) need to be identified and presented separately in the policy option.
- Need to balance what can be achieved with what it costs.
- 50% effectiveness seems very aggressive.
- Consider a personal property tax exemption for co-generation facilities.

**RCI-5 (Program To Reduce Emissions of Non-Fuel, High-Global-Warming-Potential GHGs)** – The initial quantification of this option was completed after the files for this meeting were posted to the project website. Initial results indicate a cumulative GHG reduction of 0.5 MMtCO<sub>2</sub>e at a cost savings of about -\$4.7/tCO<sub>2</sub>e reduced. The quantification is being reviewed by the TWG but the initial quantification results are not likely to change significantly. It was noted that this option recommends that the MPCA undertake a rulemaking process to identify uses and emission sources of high global warming potential gases, and to eliminate the use of such gases where that can be done at a reasonable cost.

**RCI-6 (Non-Utility Strategies and Incentives To Encourage Energy Efficiency and Reduce GHG Emissions)** – Bill Dougherty noted a correction to the cumulative emission reductions; the value should be 8.3 rather than 0.83 MMtCO<sub>2</sub>e. A TWG member noted that RCI-6 is incremental to RCI-1.

Member: The whole premise of this option is through voluntary, nonregulatory assistance including tax incentives. More information is needed in order to estimate state government costs associated with providing incentives. Also, how was the 13% reduction number determined? The RCI TWG needs guidance – now the assumption is that the

technical assistance needed to make this happen is equal to what the tax incentives will be.

Member: Another consideration is that renewables could decrease efficiency. One way is to consider increased use of renewables in place of fossil fuels for industrial facilities. The TWG is encouraged to look at where the increase in use of renewables fits into this option. Bill Dougherty noted that demand-side renewables is not picked up in RCI, except in RCI-12, but we could capture that here.

Responding to cost questions, Bill Dougherty said: Whatever the costs are of bringing those technologies and equipment online, could be considered to be the MN investment. There is a very clear number for implementation costs, but it is not shown on this bottom line chart. We can make it explicit.

Member: It is important that we specify what is included in the cost to all consumers. TWG member: CIP program costs are included in RCI-1 but they do not include what those incentives might be, for example, they could be structured in a way to encourage a business to make upgrades.

Member: I am skeptical about our ability to quantify what the costs to state government are because of a lack of data. TWG member: If there is an explicit implementation mechanism that has costs, we should flag it.

Member: State agencies have to estimate the costs for any programs they implement for budgeting purposes. We'll have to consider those as we move forward. But we may not have time to do that now.

**RCI-7 (Conservation Improvement-Type Program for Propane and Fuel Oil Efficiency)** – Discussion postponed since the quantification is not yet ready.

**RCI-8 (Energy Performance Disclosure)** – The intent of this option is for consumers to understand the implications of their energy choices. No comments.

**RCI-9 (Promote Technology-Specific Applications To Reduce GHG Emissions)** – This option was not quantified because of overlap with RCI-3, so the gains are quantified and captured by RCI-3. Difference between RCI-3 and -9: Ground source heat pumps are not a part of RCI-3. RCI-9 talks about on-site generation. TWG members noted that reductions are reflected in RCI-3. TWG Member: There are two plants coming online. How do we reconcile that with our effort to increase renewables?

**RCI-10 (Support Strong Federal Appliance Standards and Require High State Standards in the Absence of Federal Standards)** – This option is undergoing additional quantification which was decided last week.

### **RCI Voting**

Members proceeded with voting on the options but some noted that they would like to revisit the numbers later since they have not had enough time to evaluate them.

**RCI-1** – Approved without any objections, with modifications as noted. The MCCAG also requested the TWG to quantify impacts associated with a new RCI-1b based on increasing the goal from 1.5% to 2%. Two members stated their desire to reserve the

right to object later as the numbers are more refined and until we are more comfortable. A third agreed that greater citation such as on laws referred to, for example, costs and benefits is needed. CCS agreed to include the breakout of numbers on the fiscal note and to do text cleanup.

**RCI-2** – Approved without any objections. Move forward as a final recommendation with reservation on the numbers.

**RCI-3** – Approved without any objections, with modifications to text as noted. Rewrite to make clear that it is not an unfunded mandate. A member noted their interest in revisiting the numbers after they had time to review them in detail.

**RCI-4** – Return to TWG for further development. The analysis should reflect full implementation of the option and incorporate the comments provided by the MCCAG.

**RCI-5** – Approved without any objections.

**RCI-6** – Return to TWG for further development. A member asked that renewables be considered in this option. A member also noted that the fixed, 10% target is very high and prefers a graduated approach.

**RCI-7** – Return to TWG for further development.

**RCI-8** – Approved without any objections, with modifications to text as noted above.

**RCI-9** – Approved without any objections, with modifications to text as noted above.

## **Energy Supply**

### **Summary of Comments and Responses to Questions:**

Bill Dougherty of CCS noted that the ES numbers presented today represent a substantial refinement since the last meeting. Many assumptions have been clarified. It was noted that ES-2 was transferred to the TLU TWG for analysis.

**ES-1 (Generation Performance Standard)** – The TWG has prepared for analysis the following three scenarios:

- Scenario 1 - includes new coal plants but not RES.
- Scenario 2 - includes new coal plants and RES.
- Scenario 3 - includes RES but not new coal plants.

Several members commented on the assumption that the scenarios that include new coal plants assume that old coal plants are backed-down. No utility has said they would do that. It was noted that in-state utilities that operate coal plants could export the electricity to other states if not allowed to sell the electricity in MN.

A member noted that with the RES and CIP (energy efficiency), MN's demand for electricity generated from fossil fuel goes down. So if it goes down are new coal plants really needed? The cost analysis should reflect that any plant that isn't needed should result in high negative costs. Thus, the back-down assumption is a big question.

The MCCAG requested that the TWG develop a reference case that assumes that old coal plants are not backed-down and consider if the new coal plants are really needed. The MCCAG also asked the TWG to consider a range of costs reflecting assumptions on technologies that may be used for new coal plants (e.g., Integrated Gasification Combined Cycle (IGCC)).

Substantial concerns to be addressed:

- Do we ‘back-down coal’ as we look at new coal plants?
- Which of these mitigation numbers are mutually exclusive?
- Total at bottom of page looks like double counting.

### **ES-3 (Efficiency Improvements, Repowering and other Upgrades to Existing Plants)**

This policy would promote the identification and pursuit of cost-effective emissions reductions from existing generating units through improving their operating efficiency, adding biomass or other fuel changes, or adding carbon capture technology. This option would compliment ES-1. The initial quantification of the option assumes that 8% of the coal used by existing power stations is replaced with biomass. The TWG initially considered evaluating improvements that would make plants more efficient but, as we talked about it, we looked at biomass. We could look at efficiency upgrades too – but the emissions impact would be the same both ways. The net out would be that the coal fleet would be affected by this option.

Members asked if we can think of this as efficiency upgrades rather than as biomass? Is 8% a high or a low number? The coal fleet as a whole could be affected by this option. It was noted that this is a stand-alone option that does not depend on the others.

### **ES-4 (Transmission System Upgrading, Including Reducing Transmission Line and Distribution System Loss) – Quantification is underway by the TWG.**

**ES-5 (Renewable and/or Environmental Portfolio Standard) –** Clarification was provided that the quantification of this option is based on the RES requirement in the NGEA (current statute) even though the narrative talks about projecting the effects of the RES to 2050. To extend the RES beyond current statute (25% by 2025) would require figuring out how to go beyond it, or to other renewables. So we’re not sure how to get beyond the current statute. If the bulk of the renewable facilities come on line near 2025, they will continue to last for a long time so we’ll see the carbon reduction beyond. The narrative needs to be rewritten.

Member: Someone needs to evaluate the impact beyond 2025 given the 2050 statewide GHG reduction target in the NGEA. We need to know the implications.

No objections moving forward.

**ES-6 (Nuclear Power Support and Incentives) –** The TWG is uncertain about how to evaluate costs for new nuclear power because of a lack of quality data on new nuclear plant technology.

Member: Last time we said we were not going to look at new nuclear—and I think we need to. TWG response: We're just not through it yet. Major firms have developed new reactor designs but quality cost data are not available; so data uncertainty high.

Member: Did the TWG decide to not quantify? Right. We'd assumed that megawatts came on line at 2020. Afterwards, we took a closer look at the meeting summary of Sept. and realized that we were only to look at re-licensing. But the MCCAG could decide to go back.

Other member: It would be good to see that analysis of what Germany is doing.

Third member: When I look at the cost of ES-6, I would recommend taking it off the table. TWG response: Technology still 15 to 20 years out. This group could still go on and do R&D.

CCS: There is an assumption that the current nukes will be operational through the planning period, and getting that right is very important.

Member: This is a good place to build in biomass.

**ES-7 (Advanced Fossil Fuel Technology Incentives, Support or Requirements) and ES-8 (Carbon Capture and Storage and/or Reuse Policies)** – ES-7 and ES-8 were discussed together. The idea is for one power plant to be brought into the system.

Member: ES-7 includes advanced fossil fuel technology only. This talks about two plants by 2020. Seems unrealistic. TWG: We used gas and wind, and carbon capture and sequestration still has potential.

Other member: ES-7 and ES-8 seem like federal issues. Is it our option not to move these two forward? You could put 'pursue federal funds.'

Third member: Are the two power plants coming online in the next 5 years? Are they plants that create no emissions? The answer is no. There is one project (Masada) that is attempting that.

Member: Let's not take it off the table. This may be expensive now but if the earth cannot recover on its own, this carbon capture is all we'll have to reverse the 20th century policies. If they are including biomass, in an IGCC system in the future, that is a way to remove emissions from the biosphere and return emissions to the geosphere.

Member: Where does this number come from? We assumed that it would displace existing coal generation in the system. ES-8 now includes carbon capture and storage capacity.

**ES-10 (Voluntary GHG Targets)** –

Member: Does this just address electricity or is there overlap with CC-2? Just electricity—on demand side—that would reduce the demand from centralized energy sources. The TWG has not had the benefit from seeing the numbers so far. It's likely that the reductions would be small from this option in comparison to other options.

Member: I'd ask that the CC TWG, TLU, and ES all look at these related issues.

**ES-12 (Distributed Renewable Energy Incentives and/or Barrier Removal)** –

Not ready for consideration by the MCCAG.

**ES-13 (Technology-Based Approaches, Including Research and Development, Fuel Cells, Energy Storage, Distributed Renewable Energy Technologies, etc.) –**

Member: The concept of R&D is important here, difficult to quantify but it has huge potential. Other member: When we talk to USC guy, he continues to reference that when you get through the low hanging fruit; the cost curves change, becoming more attractive. Third member: Yes there is a vast energy storage system. If we're using 100% electric cars in 2050 we'll have a huge energy storage capacity.

Member: In GHG inventory, we're looking at emissions produced out-of-state, but how are the GHGs produced out-of-state incorporated here? Difficult but critical to get this right in the ES forecast (15% to 20% of total demand). Whatever is generated in-state is consumed in-state, and what is left to meet MN demand comes from the region at an average carbon intensity.

Member: But don't we then have a problem of double counting? We're OK with internal consistency on those assumptions.

**ES Voting**

The MCCAG agreed that none of the ES options were ready to be considered final approval. The MCCAG requested that the TWG move forward with its analysis of all of the options incorporating the MCCAG's comments provided today.

**Agriculture, Forestry and Waste**

**Summary of Comments and Responses to Questions:**

Steve Roe of CCS provided a summary of the AFW draft pending policy options with clarification provided by the TWG members as needed to address questions and comments from the MCCAG.

A MCCAG member provided an overall comment requesting that the TWG provide an estimate of the public costs associated with the options that have public costs. The TWG responded that it will attempt to do this where data are available, or at least note that a public cost may exist if data are not available to quantify the costs.

**AFW-1 (Agricultural Crop Management)** – This option addresses both agricultural soil carbon management as well as nutrient management to achieve GHG reduction benefits. The initial quantification results show a significant savings for this option.

Member: Does AFW-1 include funding for research? Also, note that it does not include yield loss in the cost savings and does not include incentives (risk aversion cost) to farmers to get them to adopt.

TWG members: There is a question about whether we should focus on 'practices' or just goals. For nutrient management, there are significant qualifications involved in the numbers which are affected by natural variables such as climate, precipitation, weather, etc. These result need to be significantly qualified.

Question: Are the assumptions for no till just from fuel? Yes. So it was assumed it was a zero cost for no till? There are Iowa and North Carolina studies that cite a cost subsidy. Why don't we assume that cost rather than assuming zero. We did include carbon sequestration; OK, we'll look for input from the MN Farm Bureau TWG member and include costs as appropriate. Agreement that assumptions must be included in straw proposals for clarity.

Question: Does the full TWG agree with AFW-1? TWG answer: There is quite a broad consensus among industry folks and others on the direction this is going but there are a few issues on methods and sampling to be resolved.

TWG comment: Peatland protections, wildfire reduction, and others are extremely important factors though they are difficult to quantify.

Member: Our members are concerned about yield reductions. In addition there is a need to increase pesticide use with no till, and apparently nitrous oxide emissions increase.

TWG comment: There is a lot of controversy about carbon in a no till practice but this policy doesn't dictate no till. It's a whole range of options.

Steve Roe: AFW-1 could be called 'Soil-Carbon Practices;' no till is just an example (note that element A is referred to as 'Soil Carbon Management').

**AFW-2 (Land Use Management Approaches for Protection and Enrichment of Soil Carbon)** – Comment: Peatlands are MN's largest carbon sink and we have more than any other state except Alaska so our peatlands are important nationally as carbon sinks. Climate projections increase dryness. The TWG recognized this point but we didn't have data to quantify.

**AFW-3 (In-State Liquid Biofuels Production)** –

- A. Ethanol Carbon Content
- B. Fossil Diesel Displacement
- C. Gasoline Displacement

A. Roe: questions remain on Element A about the capital costs vs. conventional arrangement of MN ethanol plants (costs for conversion to renewable fuels, such as biomass). The TWG needs to refine the quantification of this element.

B. Bio-diesel production using superior GHG feedstocks (Roe — quantification ready but need more work on implementation mechanisms).

C. Assumption is starch-based or cellulosic. (Quantification ready but need more work on implementation mechanism).

Roe: B and C overlap with TLU low-carbon fuel option so we've taken reductions out having scrubbed for overlaps (CCS assumes 100% overlap of benefits).

Member: What is the volume basis of gas displacement? The US EPA only allows 10% ethanol additions. This consumption-side issue should be addressed in the TLU LCFS.

Other member: Even though this is a BAU analysis, it has to be linked with strong demand-side reduction policies.

**AFW-4 (Expanded Use of Biomass Feedstocks for Electricity, Heat, or Steam Production)** – This option looks at developing a biomass industry in the state from agricultural or forestry residues. Costs and emission reductions presented have been adjusted to remove double-counting of costs and emission reductions for the RCI and ES options that overlap with AFW-4.

TWG comment: Agricultural residues could remove nutrients and they may need to be replaced. There are costs. Transportation of biomass is also expensive. Therefore, biomass for feedstock has to be balanced against the cost of transporting the biomass. It's a difficult balance. Also, the numbers are based on theoretical amounts of biomass available – but the level of removal assumed may not be sustainable so we have to be careful.

**AFW-5 (Forestry Management Programs To Enhance GHG Benefits)** –

- A. Forestation
- B. Urban Forestry
- C. Wildfire Reduction
- D. Restocking
- E. Forest Health and Enhanced Sequestration

TWG Comments: Stocking numbers are being revised down.

Member: Timeframe too short to count total benefits which will exist beyond 2025.

Second member: We would not go into plains areas of the state, though we would be replanting acres which haven't been forested in decades. Noted huge benefits of urban forestry. Also emphasized strength of durable wood products.

Comment: Regarding planting additional trees, there was a huge and rapid acreage loss so we're talking about restocking five million acres. Answer: Those five million acres will not come from agricultural lands but from public lands not in forested use. Although the narrative says 'agricultural' lands, this should not be taken to mean private ag lands would be targeted with this policy. There was a program for planting on agricultural land that provided cost estimates for this option. This option does not restock on private agricultural land – but there are a few agricultural acres of county lands that could be restocked.

Member: Is the assumption that we are going to be planting that many trees is overly ambitious? Is there really that much land available to plant that many trees every year? The stocking numbers are very 'high-carbon.' You need to take a good look at these numbers.

Member: I think the policies are going to be implemented in 2008. The analysts have been assuming 2008.

Member: It would be hard to spend that amount of money in the first year when you'd just be ramping up. Doesn't make sense.

Tom Peterson affirmed that 'ramp-up' assumptions need to be clarified.

**AFW-6 (Forest Protection—Reduced Clearing and Conversion to Non-Forest Cover)** – The state has lost 1/2 million acres of forest land in recent decades. That’s a lot. If we can do something so that the loss doesn’t continue, it would be a positive. Not huge totals in the carbon column but avoiding losses are very important.

**AFW-7 (Integrated Waste Management) and AFW-8 (End of Use Waste Management Practices)** – The MCCAG agreed that these options were not ready for consideration as final. A member expressed concern about the landfill capture rates assumed for AFW-7 and AFW-8.

### **AFW Voting**

TWG comment – The TWG agrees on options but we know there’s uncertainty in the numbers and we won’t know until further research is done. We don’t want these unquantifiable ones to drop away. They have potential but they need research and verification for their carbon sequestration ability.

A member asked whether farmers are represented and yes, several of the TWG members represent farmers. As a farm representative, a member noted that they do not oppose moving forward — uncertainties are inherent in many of these policies.

Other member: What are the emissions from biofuels that affect human health? Are there institutional measures to evaluate human health impacts? David Thornton responded: We can work with CCS and the TWGs over the next couple weeks to have it in for next meeting.

A member noted that the AFW options all start with verbs and requested that clarification be provided in the options on who will be doing what? Should the State of MN be the actor?

The MCCAG voted to approve AFW-1, 2, 4, 5, and 6 as final, subject to the text and analytical revisions noted during the discussion of the options. There were no objections to approving AFW-1, 2, 5, and 6. One MCCAG member objected to final approval of AFW-4 on the basis of a lack of clarity on the technology (it looks like it is based on dry tons) and that they think there is double counting with the ES biomass option. Tom Peterson noted that we would provide this clarification.

On AFW-3, more time is needed on cost estimates. AFW-7 and -8 need more work and are not ready for consideration today.

## **7. Public Comment**

The public was invited to provide comments at the end of the meeting. There were no public comments offered.

## **8. Agenda, Time, and Date for Next Meetings**

The next MCCAG meeting will be held on January 10, 2008 at the Saint Paul Hotel.

## Attachment

### Members of the Public Attending MCCAG Meeting #6 St. Paul, Minnesota December 5, 2007

<b>Name</b>	<b>Company</b>
Allen Dotson	<a href="#">Minnesota Pollution Control Agency</a> MPCA
Andrew Chilseth Leonard	Street and Deinard
Andy Pomroy	Minnesota House
Annette Henkel	Minnesota Utility Investors
Bill McAuliffe	Star Tribune
Christine Pierson	Minnesota Rural Electric Association
Cindy Schulte	MECLI
Darlene Sliwag	Minnesota Senate Counsel & Research
Diane Schmidt	Flint Hills
Don Parmeter	Am Property Coalition
Doug Carnival	McGrann Shea Anderson Carnival Straughn & Lamb
Duane Arens	Connexis Energy
Edward Werner	Minnesota Senate Republican Caucus
Jenna Divenhogger	Minnesota House
Jenny Engh-Gargill	<a href="#">Cargill</a>
Jenny Myers	Minnesota Senate
Jerry Hinderman	
Jim Turnure	Xcel Energy
Joan Gilbertson	WCCO TV
John Bailey	<a href="#">Greater Minnesota Housing Fund</a> GMHF
Kevin Reuther	Minnesota Center for Environmental Advocacy
Kirk Kowdelka	Minnesota House
Loren Laughtug	OtterTail Power Company
Mary Ann Hecht	Minnesota Senate
Mary Jo Roth	Great River Energy
Mary Sandok	Xcel Energy
Michael Noble	Fresh Energy
Mike Kuhczyk	
Patrick Colburn	Best & Flanagan
Princesa VanBuren	<a href="#">Minnesota Environmental Quality Board</a> EQB
Rebecca Kenow	Flint Hills
Richard Newmark	Minnesota Audubon
Robert Ambrose	Great River Energy
Stacey Fujii	Great River Energy
Stephanie Hemphill	<a href="#">MPR</a> Minnesota Public Radio
Tim Bronwell	Eureka Recycling
William Black	<a href="#">MMUA</a> Minnesota Municipal Utilities Association
Brett Smith (by phone)	Sierra Club