

**APPENDIX L**  
**COMPILATION OF PUBLIC COMMENTS ON**  
**MINNESOTA CLIMATE CHANGE ADVISORY GROUP FINAL REPORT**  
MAY 1, 2008

**I. GENERAL COMMENTS ON MCCAG REPORT**

The Minnesota Climate Change Final Draft Report is an excellent document that lists a variety of critically important steps for the State of Minnesota to take to reduce greenhouse gas emissions and thereby address global climate change. This is perhaps the most important environmental issue of this century. It is appropriate and commendable that Minnesota is being proactive and working to address this issue. The costs of not acting to address global climate change will certainly be higher than the costs of action, on this complex and challenging issue.

*Thomas Pearson, St Paul, MN*

The Minnesota Farm Bureau Federation (MFBF) appreciates the opportunity to offer comments on the final report of the Minnesota Climate Change Advisory Group (MCCAG). Farmers play a vital role and are committed to respecting and protecting our natural resources, both for ourselves and for future generations while remaining a leader in providing food, fiber and fuel.

Addressing greenhouse gas (GHG) emission reduction mitigation options is a complex and cumbersome task. We would like to commend the Governor for bringing together a diverse group of representatives from various sectors to disseminate recommendations on how Minnesota can reduce GHG emissions. We appreciated the opportunity to participate in the Agriculture, Forestry and Waste (AFW) Technical Working Group (TWG) and believe that the recommendations included in the report provide a number of opportunities for agriculture and forestry.

The Minnesota Farm Bureau supports the use of common sense and peer reviewed science in climate change legislation. While we appreciate the Governor's swift response to the goals set forth by Minnesota legislature through the 2007 Next Generation Energy Act, we believe that the aggressive timeline imposed on the MCCAG did not allow for sufficient Minnesota specific, economic and scientific analysis. In addition, we are concerned with the rapid pace in which recommendations were made and the manner in which quantifications were presented.

The MCCAG report states that in order to complete this monumental effort, the MCCAG and TWG members and CCS were required to make numerous estimates and assumptions. We recommend that before the State of Minnesota moves forward with the MCCAG recommendations, the aggressive goals, estimates and assumptions undergo further scientific and economic analysis.

MFBF policy also supports a full evaluation of the economic impact climate change legislation will have on consumers. We believe that the full economic impact to consumers is lacking in the MCCAG final report. Of the 48 MCCAG recommendations included in the report, only 31 were analyzed quantitatively to estimate their effects on emission and 25 were analyzed quantitatively to estimate their costs/cost savings, this leaves a large gap and high level of uncertainty as to what the true overall economic impact of the recommendations will be. Additionally, societal costs have not been specifically fully addressed. In fact, the report states that most of the AFW options incur net societal costs because they are targeting changes in current practices. Yet, the MCCAG fails to include those costs in their quantifications. Therefore, any economic net savings or cost is not accurately being represented. The report is also lacking a complete representation of what governmental costs are incurred by adoption of the recommendations. Before the State moves forward with the aggressive measures proposed in the report, specifically those in the AFW section, a full societal and governmental economic analysis should be performed.

As noted above, GHG emission reduction mitigation options provide a number of opportunities for Minnesota agriculture. Minnesota Farm Bureau will continue to be an active participant in the GHG emission reduction process. Any climate change legislation developed from these and other recommendations should appropriately recognize the positive role agriculture and forestry plays in

mitigating GHG emissions. Climate change legislation should not adversely impact a farmer's ability to provide safe and abundant food and should not regulate or mandate production methods or practices.

*Kevin Paap, President, Minnesota Farm Bureau Federation, Eagan, MN*

I want to know what I must do to lower my Carbon Footprint.

*Sandra Shanley, Anoka, MN*

Please do not go forward with this initiative. The climate has been changing and will continue to change for all of time whether we want it to or not. The proposed policy will not have a measurable effect on the environment, but it will have a measurable effect on the hard working, tax paying citizens trust and faith in its elected officials. This scheme will boost government revenue, which is an obvious benefit to the plan for you, our government. It will also add further costs and taxes to the hard working citizens of MN, which is not a benefit to us. Please continue to be protectors of our freedom as Americans and as citizens of the great State of Minnesota. Please do not place social policy above the well being of the people. This great nation was formed in the mold of freedom, and policies such as these threaten that freedom to the very core.

*David Beck, Otsego, MN*

It looks to me like those of you on the advisory group have done a fine job with your task and I thank you. In these final stages of your work please ensure that the recommendations for policy change be as solid and far reaching as possible (practice water conservation). Please also write in clear plans for implementation with shorter timelines.

*Jill Curran, St Paul, MN*

While there is general agreement that CO<sub>2</sub> is a greenhouse gas, that it has been increasing at a rate of about 10 percent every 20 years, and that this increase will cause the atmosphere to absorb more heat, there is not agreement or any evidence on how much this or future increases will increase global temperature. Many estimates for temperature rises from doubling CO<sub>2</sub> are from one tenth to one third of the higher values published as possible by the IPCC. Over 60% of the IPCC temperature increase estimates are from unverified positive climate feedbacks, not basic CO<sub>2</sub> physics. Additionally, there has been no measured rise in global temperatures in the last 10 years. Therefore quantifying benefits is not a reliable exercise, so any costs should not be unduly burdensome. Because of this the reduction targets can be greatly reduced and the time scales moved out substantially.

*Richard J. Petschauer, Edina, MN*

Exempting Mesaba from CO<sub>2</sub> emission standards conflicts with the goal of reducing Minnesota's GHG emissions. I hope the Climate Change Advisory Group will kindly not agree to allow Mesaba Energy to release any more pollutants into our Northern Minnesota air. We, the citizens of the northland, appreciate our relatively less pollutant laden air and water. Thank you for the opportunity to comment.

*Cynthia B. Driscoll, Grand Rapids, MN*

It is now known that wetlands sequester carbon and the destruction of wetlands releases carbon, which impacts global warming. St. Louis County (along with Koochiching and Lake Counties) will lose much of their remaining wetlands if a new metallic sulfide mining industry is allowed within the state. Polymet, whose draft EIS is scheduled for this summer, would mine less than 1% ores and create 99% waste, using declining supplies of oil, and using large amounts of electricity, while emitting over 160,000 tons of carbon dioxide per year. In addition, this one operation would destroy 900 acres of wetlands. (Sulfide mining also creates acid mine drainage, which requires perpetual treatment and contaminates ground water.) A huge way to keep a lid on carbon emissions in order to help Minnesota reach its reduction goals would simply be

to put a hold on the permitting of this brand new mining industry of less than 1% ores (copper, nickel, precious metals) within the state.

*Elanne Palcich, Chisholm, MN*

I am a land and home owner in a very close proximity to the planned site of the Mesabi site for a coal plant. The exemption for emissions is not acceptable!!

*David Hudek, North Branch, MN*

I cannot believe the waste of time, effort, and money for the purpose of promoting AGW. There is so much SCIENTIFIC evidence opposing this nonsense, as opposed to this computer generated JUNK SCIENCE, that it has become evident that this is not about science but about imposition and control of people. My recommendation: DO NOTHING and DO NOT spend one penny more in this regard! To wit: snowing in Iraq and other Middle Eastern countries this year (first time in centuries;) extreme cold temperatures in China this year; etc. etc. The earth has cooled 0.7C in the last year as reported by all four of the agencies that track the earth's temperatures, putting us back to where we were in 1930. You had better hope this is not the coming of the end of the Holocene period we are in now, because if it is this AGW/cap and trade nonsense will be finally exposed for what it is: the greatest man made HOAX ever perpetuated!

*Jerald Valento, St Paul, MN*

These general comments on the MCCAG process are submitted on behalf of Barbara Freese (Union of Concerned Scientists), Charles Dayton (Minnesota Center for Environmental Advocacy), Bill Grant (Izaak Walton League of America Midwest Office) J. Drake Hamilton (Fresh Energy), and Duke Bascom (Global Green Energy LLC) all of whom were members of the MCCAG, and also on behalf of the Institute for Agriculture and Trade Policy and Clean Water Action. The MCCAG final report represents an important first step in helping the state find a set of ways to meet its statutory emission reduction targets. The MCCAG was given an enormously ambitious assignment, involving complex analysis, difficult consensus-building, and all the uncertainties inherent in making multi-decadal predictions. The process demonstrated something important -- that there are many promising and broadly-supported ways we can reduce emissions, but it will take immediate, aggressive and sustained action on many policy fronts to reach our statutory goals.

As the first and only plan in existence for getting Minnesota to its reduction goals, it would be a shame if this final report were shelved and allowed to gather dust. It would also be a mistake if it were treated as the final and authoritative statement on the policies it recommends or on those it rejects. There is one policy that was rejected by the MCCAG that deserves particular mention here because it represents such a major lost opportunity and because the MCCAG was so deeply split on the issue. By a close vote, the MCCAG decided not to recommend a version of the Generation Performance Standard (ES-1) that would have, in effect, prevented the construction of the two coal plants currently under regulatory consideration the Big Stone II unit and the Mesaba coal plant. A Center for Climate Change (CCS) analysis of ES-1 (which was disputed but is presented for informational purposes at page G-2) estimates that preventing these coal units would prevent millions of tons of new CO<sub>2</sub> emissions annually while saving the state \$7.4 billion, making it the single most cost-effective emission-reduction option considered. The question of whether it makes sense for Minnesota to invest billions in high-emitting coal plants while it simultaneously struggles to reduce emissions throughout its economy is clearly a critical one. Unfortunately, the MCCAG as a whole had only an hour or two to consider this question, and not until the last day it met. Even so, close to half the group was ready to recommend a policy that would prevent those plants from being built. The MCCAG's narrow rejection of such a promising option should by no means foreclose its further consideration by Minnesota's citizens and policymakers. (Additional discussion of this option is presented in the comments to ES-1.)

As for the MCCAG report as a whole, it offers a useful road map and many appropriate vehicles for reaching our destination. An important role the MCCAG report can play in the future is as a starting point and framework within which to conduct further planning and discussion. For example, to the extent the state does not implement some of the MCCAG's recommendations, or falls behind schedule, the state should identify other emission reductions that could take the place of those being relied on by the MCCAG.

Moreover, as we learn things that run counter to assumptions relied on by the MCCAG, the state should determine what impact corrected assumptions would have on our overall reduction efforts, and change course as necessary.

These comments are offered as background to help with the ongoing process of checking the MCCAG's assumptions against emerging realities. Some of the assumptions underlying certain recommendations were quite controversial when made; others have already been called into question by information not available to the MCCAG in time. The reason to highlight these assumptions here is not to undermine the value of the MCCAG report but rather to increase its long-term value by giving policymakers, citizens and analysts the ability to view this plan in context and adjust it as the context changes and new information becomes available.

There are six important assumptions (mostly related to Energy Supply and Cap and Trade) that readers should keep in mind when reading the report, the first three of which are elaborated upon in more detail in the section-by-section comments:

1. **Coal Plant Back-Down Assumption.** The report assumes that if any new coal units are built, old coal units will be simultaneously backed down. This assumption was made because the MCCAG projects that the state's demand for coal power will steadily decline in the years ahead, but the MCCAG did not want to assume the state would generate more coal power than it actually needed. This back-down assumption (which is unfounded because the regional electric market means excess power would likely be sold to other states) has the effect of obscuring the enormous impact that the proposed Big Stone II unit and the proposed Mesaba plant would have on state greenhouse gas emissions. If Minnesota allows the construction of new coal units without requiring old coal units to reduce their output, the state is at risk of falling millions of tons short of reaching its reduction targets. This issue is discussed more in comments attached to ES-1.

2. **Overestimating Costs of Renewables.** The MCCAG report greatly overstates the cost of building wind, which has the effect of artificially inflating the cost of the state's Renewable Energy Standard and the recommended Cap and Trade program. This issue is discussed more in comments attached to ES-5 and CT-1.

3. **Assuming Unrealistic Reductions from Agriculture and Forestry.** The report places a heavy reliance on large reductions associated with agricultural and forestry practices—a reliance that now appears to be highly unrealistic. Presenting findings not available to the MCCAG at the time it voted on its recommendations, Regents Professor Peter Reich and his associates at the University of Minnesota state that the MCCAG Recommendations promise four times more emissions reductions than can realistically be expected from [the agriculture and forestry] sectors. These comments, which we understand are being formally filed in response to this report, represent the collective expertise of many of the state's top academic experts, and must be factored in as policymakers develop the package of policy measures needed to reach the state's statutory reduction goals. Policymakers must also keep close track of the emerging science regarding the indirect land use impacts of replacing food crops with biofuels production, which may lead to potentially large increases in greenhouse gases. These developments mean that the state will need to more aggressively pursue emissions reductions from other sectors by adopting policies beyond those recommended by the MCCAG. This issue is discussed more in comments attached to AFW-5.

4. **Assuming No Federal Regulation.** The report assumes that the federal government is not going to regulate greenhouse gases in the years ahead, even though it is widely expected that it will. In other words, the report compares state emission reduction policies to a scenario under which greenhouse gas (GHG) sources could simply continue emitting greenhouse gases unfettered by new federal standards, caps or taxes and at no cost for decades. This assumption makes the cost analysis far simpler (which is why it was made), but it is certainly unrealistic and has the effect of greatly exaggerating the costs of state action.

5. **Ignoring Environmental Co-Benefits.** The report's cost estimates do not count the very substantial but hard to quantify public health, conservation and environmental benefits associated with many of the policies considered. For example, less fossil fuel combustion will reduce the health and environmental impacts caused by air particulates, smog, and mercury contamination. Better soil management will result in less fertilizer runoff, with health and habitat benefits. Moreover, the primary benefit of these policies—reducing GHGs and the costs and impacts of global warming—is uncounted.

6. **Ignoring Economic Co-Benefits.** Finally, the report's cost analyses do not reflect the economic benefits associated with emission reduction policies. As a state that does not produce any of its own fossil fuels, Minnesota will surely benefit by reducing the dollars that leave the state to buy coal, oil and gas. The analyses do not reflect the job growth and other benefits associated with a growing renewable power sector

or other green technologies and businesses. And they do not reflect the benefits of being ahead of the curve in reducing our greenhouse gas emissions, which positions the state to thrive in the carbon-constrained national and global economies that lie ahead.

*Barbara Freese, Union of Concerned Scientists, Minnesota Center for Environmental Advocacy, Izaak Walton League of America -- Midwest Office, Fresh Energy, Global Green Energy LLC, Institute for Agriculture and Trade Policy, Clean Water Action, St Paul, MN*

It seems that a very vital aspect of renewable energy has been left out of the public discussion. The amount of corn or other biomass needed for bio-fuels must be replaced with other food demand grains. Near as I can tell from the pricing of groceries, this has not happened. What is happening is citizens are paying more for everything including E-85. One of the great selling points for E-85 is that it would displace petroleum demand and therefore drive down the price of gasoline. The exact opposite is occurring. Ethanol has caused food prices to rise, has had no effect on gasoline prices and according to many independent studies has been proven to consume more energy in production than it provides in use. Not to mention that in the entire process it creates as much or more carbon-dioxide than fossil fuel production and the water use is going to cause water rights issues and shallow private well (or wetlands) to dry up. And aside from all this, the premise for creating bio-fuels (global warming) is being proved, almost daily, to be based on erroneous data propagated by politics and greed for science foundation grant money. If these carbon policies are put into place it will almost certainly result in a poorer standard of living for generations to come. This statement is also supported by analysis of these prospective programs by several independent economists. Additionally, I believe it is ill advised and a conflict in interest having energy companies or light bulb manufacturers help right the legislation pertaining to light bulb mandates. If I sold standard light bulbs for 25 cents and was approached by a government agency that said We are going to implement a light bulb mandate that all people will have to by X-type of bulbs and I know that I can make X-bulb for 40 cents but since there is limited competition I know I can sell them for \$3, how do you think I would act? Please realize that these good intentions are going to result in very adverse effects. Government programs are not the answer to progress but rather are the roadblocks.

*Tony Becker, Shoreview, MN*

To all, WE all know we really know very little. Data shows we are now starting a cooling trend, How could that be if man is causing warming. Ha, the truth is the sun has more control than man. It has been proven that if man did everything he could cost be damed we could have perhaps 1 degree affect of the grobal temp. We send the Govenor to the watch ice melt in July. How about sending him in January? We have proven that ethenol is a disaster, food shortages, water shortages and worst of all it takes more energy to make a gallon of ethenol and it produces. Leave things to Goverment and they will find a way to screw it up. We have prof the the earth has been through and recovered from several ice age's with mans help. We have prof that areas now covered with snow were once tropical. You are lost in politics and what is good for the country is being tossed aside so some can feel good. As always follow the money. What a joke you poeple are.

*Bryan Noble, Woodbury, MN*

I refer to this as the Governor's Greenhouse Gasbags, or the Climate Change Inaction Plan, because it recommends further study of advanced technologies meaning IGCC-coal gasification, despite a record full of evidence that it's a bad idea any way you look at it; because exemption of Mesaba and Big Stone is not reducing greenhouse gas, but allowing significant increases; it recommends increase of use of biomass, which even Xcel recognizes is a bad idea and in its most recent IRP is decreasing biomass generation. This report is full of bad ideas that do nothing to reduce CO2 and instead increase CO2 production.

**IMPORTANT LEGAL ISSUE:** Exemption of Big Stone II and Mesaba violates Minnesota law, Minn. Stat. §216H.02, and as environmental law the report is fair game under the Minnesota Environmental Rights Act and Minnesota Environmental Policy Act. This exemption is beyond the scope of the charge of the group, and contrary to the charge to devise a plan to REDUCE CO2 emissions. The report assumes exemption of two large CO2 emitters, Big Stone II and Excelsior Energy's Mesaba project. This exemption is stated, but the statute provides only for the group to: (7) evaluate the option of exempting a

project from the prohibitions contained in section [216H.03, subdivision 3](#), if the project contributes a specified fee per ton of carbon dioxide emissions emitted annually by the project, the proceeds of which would be used to fund permanent, quantifiable, verifiable, and enforceable reductions in greenhouse gas emissions that would not otherwise have occurred. Minn. Stat. §216H.02, Subd. 4(7). The exemptions were ASSUMED, not evaluated, and there is no specified fee per ton of carbon dioxide emissions emitted annually by the project, the proceeds of which would be used to fund permanent, quantifiable, verifiable, and enforceable reductions in greenhouse gas emissions that would not otherwise have occurred. This violates the legislative charge to the committee.

*Carol R. Overland, Red Wing*

Respectfully. Shortly after announcing its recommendations, two members from the committee appeared on public radio. In his opening remarks, the gentleman stated, The debate is over! Most rationale people would state that at its core, a debate is two individuals, or groups, presenting their perspectives on an issue. The falacy in these findings are that there was never a scientific debate on the issues at hand. Excuse my frankness but having a politician mandate that recommendations be brought forward is not the same as debating an issue. It is sad that a debate was never conducted; no peer review or dissenting opinion was provided. Minnesota jumped into ethanol and now reports show more pollution, less power and negative impacts the price of corn. This thrust carries a similar fate. Not having a debate diminishes credibility to the recommendations and subsequent actions. Regards,

*L. A. Ellis, Shoreview, MN*

Sierra Club Comments. Sector: General. Primary Author: Brett Smith.

Makeup of MNCCAG: The membership of MNCCAG was heavily weighted toward corporate and utility members. The 55 members of the commission included at least 8 utility representatives and even more numerous representatives of major corporations such as Cargill, Waste Management, Northwest Airlines, Target, 3M, Travelers, etc. The representation of communities of color, Indigenous People, and low income Minnesotans was minimal, as was the representation of organized labor and local government. While environmental non-profits were well-represented, the group as a whole had a corporate and utility based bias which resulted in the neglect of certain aspects of the global warming problem and potential solutions as will be discussed further below. In some instances, many of the private sector representatives appeared to be following the lead of the Minnesota Chamber representative Mike Robertson. While the Executive summary states that members made judgments with the best intentions, it must be realized that there were many at the table with strong economic interests in the outcome which undoubtedly affected their viewpoint on the issues. The lack, particularly, of low income and minority voices as well as labor voices meant that issues related to climate justice (who benefits and who pays) and job impacts were neglected. It is extremely difficult for one or two representatives of a different point of view to balance or counteract a massive set of opinions with a different perspective. An effort like this in the future should have a much broader set of decision makers and not be so heavily weighted to corporate and utility representation. In addition, consideration should be given to providing financial support for representatives of low-income, Indigenous, or minority groups who are not paid by their organization to participate in these intensive processes.

Environmental Justice Issues: The MNCCAG Report as summarized in the Executive Summary contains not a single consideration of the distribution of costs and benefits across demographic groups or economic classes. While the report makes a large point of calculating costs and benefits, there is no discussion of who will bear the costs and who will enjoy the benefits of the climate change which is already occurring or of the measures taken to address the reduction in climate change pollution. It is widely acknowledged that climate change has important implications for social and environmental justice and that solutions chosen will impact different groups differently. Given the skewed representation on MNCCAG, it is not surprising that these impacts were not considered. As the process of further development and implementation moves forward it will be imperative that greater voice be given to those who are likely to be heavily impacted, which, consequently, are often the populations contributing the least to the challenge of climate change. The voice of low income Minnesotans and of marginalized communities, primarily communities of color and Indigenous People, must be heard and their concerns must be addressed if we are

to successfully move to an economic system which deals effectively with the problems of excess greenhouse gas releases.

**Jobs and the New Green Economy:** The report completely misses or ignores the tremendous potential for economic growth and job development which could result from aggressive development of greenhouse gas reduction strategies such as the development of renewable energy sources and greater energy efficiency. While the report does attempt to measure economic costs and benefits, these appear to be totally static calculations which do not include the potential for economic advantage and development that stems from taking the lead on new technology implementation and on energy efficiency actions such as new building construction standards and aggressive building energy retrofits. This neglect of the job creating potential of climate change reduction actions is perhaps a result of the lack of fair labor representation on the panel. As a founding member of the Blue Green Alliance, the Sierra Club is committed to solving environmental problems in ways which create family-supporting jobs in manufacturing and related industries. A report recently done for the Alliance by the Renewable Energy Policy Project identifies thousands of jobs that could be created through greater commitment to renewable energy in such areas as wind, solar, geothermal, and biomass based energy. A more recent report produced by CDC Associates and released by the Mayors of Minneapolis and Saint Paul and the Blue Green Alliance, entitled *Making it Green* identified approximately 30 green product opportunities for expansion in the Twin Cities, including such things as insulation, batteries, fuel cells, geothermal pumps, etc. We are inevitably moving into a new greener economy. The MNCCAG report is silent on the economic benefits which will flow to those states, cities, and regions which take a lead in addressing climate change in an aggressive and creative way. The linking of greenhouse gas reduction with economic development strategy is crucial for the economic and environmental future of the state. Strategies for accomplishing this linkage will include steps like increased workforce training and a green job corps for providing workers for the new economy, incentives for solar and wind manufacturing, increased investment in public transit and efficient vehicle fleets, state loans to schools, local government units, and individuals to fund renewable energy installations and energy saving retrofits. The Sierra Club, as part of the Blue Green Alliance, is eager to work with state and local decision makers to make such a program of green job development a reality.

**Prioritization and Implementation:** While the Executive Summary states that the work of MNCCAG included prioritization of actions to reduce greenhouse gas pollution, the document does not appear to prioritize any of the 46 policy actions recommended by the panel. Thus, the reader or member of the public is left with an almost overwhelming list of possible actions without clear indications of which ones should be pursued most aggressively and/or first. It is this lack of prioritization which, in part, produces a report heavy on numbers and possible actions but woefully weak on implementation steps and timelines. To some extent, this reflects the short timeframe under which the report was prepared, but also reflects the extent of the disputes over numbers and approaches which characterized even this relatively homogeneous group of representatives. The preparation of the numbers and assumptions took up so much time that the report was behind schedule, it seemed, much of the time and was finished up in a flurry of activity at the deadline. This made implementation and prioritization discussions very difficult. It also meant that public discussion of the document was not really encouraged until after the report was completed. The Sierra Club laments this lack of implementation energy, but looks forward to working with the Legislature and Administration in moving good recommendations forward.

*Cesia Kearns, Sierra Club, Minneapolis, MN*

Today is April 26, 2008. I woke to snow falling in my little urban neighborhood. Please take this completely unsupported theory that man-made greenhouse gases are going to cause massive global warming and stick it where the sun doesn't shine. I realize that you are a policy advisory board, and not scientists, but there were a couple of people listed on your roster that looked like they had a scientific background. One of the basic tenets of science is that when the observable facts don't fit your theory you modify your theory and test again. You've thrown that all away for this cult-like adherence to the idea that we're dooming the planet. Hogwash! The planet was here before us and will be here after us. To think otherwise is hubris, plain and simple. The last thing I'd like to comment on is the fact that this seems like an all the other states are doing it type of undertaking. To which I refer to my mother's common sense statement, If all the other kids jumped off a bridge, would you jump off, too? This is the first step off the bridge, and as you know, it's all downhill from there. Please shelve this initiative. It's going to kill our

economy and do absolutely nothing to the climate. Until you can control sunspot activity, volcanic eruptions and the El Nino/La Nina cycle, we're pretty insignificant.

*Josh Warneke, Saint Paul, MN*

On behalf of the Climate Justice Working Group, which is supported by Environmental Justice Advocates of Minnesota (EJAM) and the Women's Environmental Institute (WEI), we commend and support efforts to address the critical problem of climate change. While we have serious concerns on the process and type of policies being developed (as outlined below), we are in full support of the state moving forward aggressively in reducing its emissions and adhering to the goals set by Next Generation Energy Act 2007 legislation to reduce the state's emissions by 80% by 2050. Effecting climate change is an economic, social and moral responsibility that we must assume as citizens in a global economy. It is imperative that Minnesota policies and programs be designed in a manner that results in verifiable CO2 reductions.

1. Inadequate Representation of Minnesota Demographics on the MCCAG panel. As we have made known in previous letters and through public comments at the final MCCAG meeting, there were serious issues regarding citizen representation and involvement in the MCCAG decision-making process. MCCAG was not representative of the diverse citizen base of Minnesota including low-income groups and communities of color.

In response to a letter sent with concerns regarding fair and inclusionary participation, Commissioner Ed Garvey responded, that MCCAG and its Technical Work Groups represent a diverse and broad range of interests, perspectives and communities. In fact, the MCCAG and its Technical Work Groups was not representative of Minnesota communities as there were nominal groups/individuals present whose sole purpose was to represent the interests of low-income and communities of color. Given the substantial economic and social impacts that global warming emission reduction policies will have across the state, it is imperative that a more inclusive citizen participation forum for policy development be established.

2. The MCCAG process was inadequate in incorporating the criteria of equity into its analyses of policy options. Any policies implemented by the State of Minnesota must address environmental justice and rigorously effect reductions in the state's GHG emissions. We are going on the record to express our concern that explicit equity criteria or considerations were not a functional part of the MCCAG process. Commissioner Garvey, in a response letter to Climate Justice Working Group stated: After countless hours, the MCCAG is in the process of finalizing a set of options designed to reduce greenhouse gas emissions. Your interest in equity in MCCAG decision criteria is an important issue that has come up at meetings. The MCCAG is looking at cost and effectiveness issues but, as a result of the tight timeframe under which it is operating, it is not possible (sic) to conduct a detailed economic and social analysis of each option. However, we believe such analysis is important and should be done before irrevocably proceeding. In addition, you will have an opportunity to comment on the merits on the MCCAG's report as well as have a hand in implementing the approved options in fair and **equitable** ways (italics added). Given that the MCCAG report is forwarded without detailed economic and social analyses of each option, we are extremely concerned that any MCCAG policy recommendations will be considered seriously without such an analysis.

Therefore we request: 1. Formation of a Social Equity Task Force to review and comment on any proposal forwarded by MCCAG and being considered by the Governor; 2. Analysis and explanations of why policies will be forwarded without detailed economic and social analyses; 3. Detailed plans on how communities concerned with climate change and equity will have a hand in implementing approved options in fair and equitable ways.

3. We propose that Minnesota mitigation policies moving forward explicitly include the following equity criteria. Income Equity: Minnesota ranks third in the nation in number of households who have incomes at or below 50% of the poverty line. In addition, over 41,000 households have incomes between 50% and 74%, and nearly 50,000 more households have incomes between 75% and 99% of the poverty level (Fisher, Sheehan and Colton). Rising energy costs are a substantial burden for moderate and low-income houses. In the winter heating season of 2005-2006, natural gas prices rose 20.9%, fuel oil prices rose 26.1% and propane prices rose 16.9%, and electric prices rose 11.8%. In the same period, the total energy bills of Minnesota low-income households exceeded the affordable level by \$388 million (Fisher, Sheehan and Colton). Moreover, the Brookings Institution estimated that at \$3.00 per gallon, which doubled in price between 2004 and 2006, the average household increased its total transportation

expenditures by 14 percent, or \$1,200 per year. The substantial gasoline price hikes since 2006 significantly exacerbates this problem. Average expenditures on transportation range up to 25% of total household budgets. Rising energy costs are increasingly affecting low and moderate income households. Policy options must include equity analyses of the costs of implementation across income.

**Distributive Justice and Hot Spots:** The Climate Justice Working Group endorses and recommends the following principles and criteria for policy approval, as developed by Professor Alice Kaswan (University of San Francisco School of Law ) in addressing California's cap and trade legislation:

**Distributive Justice:** Climate change policies shall not increase the existing disproportionate burden of environmental harms on poor and of-color communities. Policies should also improve air quality in communities already experiencing unacceptable levels of pollution.

**Distributive Justice and Co-Pollutants.** Climate change policies, including any carbon trading system also implicates the distribution of harmful co-pollutants, including toxics and criteria pollutants such as particulates, nitrogen oxides, sulfur oxides, and carbon monoxide. Policies to control greenhouse gases must not increase harmful co-pollutants or fail to achieve co-pollutant reductions. Regulators must address not only greenhouse gas reductions, but the regulations impacts on co-pollutants.

**Distributive Justice and Hot Spots:** Climate change policies, including any market mechanisms, must prevent the creation of hot spots. Policies must be designed to prevent increases in toxic air contaminants or criteria air pollutants, and consider the potential for direct, indirect, and cumulative emission impacts from these mechanisms, including localized impacts in communities that are already adversely impacted by air pollution.

**Cultural Equity:** State and federal policies must abide by the U.N. Declaration of Indigenous Rights and recommendations in the Permanent Forum of Indigenous Peoples report, Impact of Climate Change Mitigation Measures on Indigenous Peoples and on their Territories and Lands (Victoria Tauli-Corpuz and Appaluk Lyngé) which offer the following: Indigenous peoples are among the first to face the direct consequences of climate change, owing to their dependence upon, and close relationship with the environment and its resources. Climate change exacerbates the difficulties already faced by vulnerable indigenous communities, including political and economic marginalization, loss of land and resources, human rights violations, discrimination and unemployment. Climate change poses threats and dangers to the survival of indigenous communities worldwide, even though indigenous peoples contribute little to greenhouse emissions. In fact, indigenous peoples are vital to, and active in, the many ecosystems that inhabit their lands and territories, and may therefore help enhance the resilience of these ecosystems. In addition, indigenous peoples interpret and react to the impacts of climate change in creative ways, drawing on traditional knowledge and other technologies to find solutions which may help society at large to cope with impending changes. The perpetuation of highly centralized, fossil-fuel-based energy supplies should be challenged. Old centralized electricity grids, which are not suitable for the challenges of diverse and decentralized renewable energy sources, and which are the basis of the dominance of large energy companies, need to be challenged. The principles of common but differentiated responsibilities, equity, social justice and sustainable development should be key principles of any climate change policy. The human-rights based approach to development and the ecosystem approach should guide the design and implementation of national, regional and global climate policies and projects. The crucial role of indigenous women and indigenous youth in developing mitigation and adaptation measures should also be ensured.

The United Nations Declaration on the Rights of Indigenous Peoples should serve as a key framework in the formulation of plans for development and should be considered in all processes related to climate change at national, regional and global levels. This is of specific importance in Minnesota because of the eleven American Indian tribal sovereigns located in Minnesota. **Economic Equity:** Minnesota Climate Change policy must integrate environmental policy with economic development initiatives.

Narrowly focusing on technological options without analyses and goals on social and economic impacts is shortsighted. The Minnesota economy includes workers, investors, businesses, land, natural resources, infrastructure, and energy. Climate change policies must address the future viability of all sectors, if they are to be effective and equitable. We recommend commitment of public sector investment in creating meaningful living wage jobs for all Minnesotans, specifically targeting those left out of the fossil-fuel economy and those affected by a transition to a sustainable economy. These include funding for green jobs training which targets green jobs training for low-income youth, adults, and low income communities; green planning and community development funds for low-income and transitional neighborhoods and communities.

4. Nuclear power cannot and must not be included as an option for climate change. Substituting CO<sub>2</sub> for the political and environmental risks of nuclear is unacceptable and is not a prudent course of action for Minnesota. Preliminary analysis shows that countries which have developed nuclear power as a significant part of their electrical generation are still increasing their CO<sub>2</sub> emissions (Center for Energy and Environmental Policy, forthcoming). This evidence indicates nuclear power is not a solution to the problem of CO<sub>2</sub>, and any policy action toward that end commits future Minnesotans to significant technological, economic and environmental problems.

5. Shift the Ineffective Supply Side Oriented Policy Framework for Mitigating Climate Change to Reducing Demand. Fundamentally, cap and trade and other supply oriented policies promote inequality and even greater transference of resources from the most needy to the most wealthy. Because the key factor in a cap and trade policy scheme is price, and (price increases are essential to the success of a cap and trade program), in an economy where the energy cost burden is already highly unequal, the very function of cap and trade adds to this inequality by increasing the price of carbon-based energy. If the household energy affordability gap of the most vulnerable Minnesotans was \$388 million in 2006, the cap and trade solution only exacerbates this problem. We also function in a political setting where Low Income Energy Assistance Programs are consistently under-funded. Thus, we do not support cap and trade as the sole or primary policy mechanism for dealing with climate change. At minimum, if a cap and trade policy is implemented it must be 100% auction, and auction revenues must be directly targeted to the lowest incomes and for transforming energy infrastructure in an equitable way. Criteria of equity outlined in point (3) above must be adhered to.

As much analytical resources that are going to such Supply-Side solutions, should be re-oriented to Demand Side oriented policies to reduce our need for energy in the first place. Demand side reduction policies are more cost effective, direct solutions to the problem of high fossil-fuel consumption and preclude large public subsidy and windfall profits to energy suppliers. Sophisticated policies and programs promoting household and economy energy demand reduction, such as efficiency, strategic planning, and on-site energy production should be the core focus of mitigation policies being promoted. Citations: Fisher, Sheehan and Colton. On the Brink: 2006. The Home energy Affordability Gap. Minnesota; Alice Kaswan. 2008. Draft Framework for Achieving Environmental Justice in a California Market-based Mechanism for Reducing Greenhouse Gas Emissions. University of San Francisco School of Law; Congressional Budget Office. Trade-Offs in Allocating Allowances for CO<sub>2</sub> Emissions. Economic and Budget Issue Brief, April 25, 2007; Victoria Tauli-Corpuz and Aqqaluk Lynge. Impact of Climate Change Mitigation Measures on Indigenous Peoples and on their Territories and Lands. Permanent Forum on Indigenous Issues, Seventh Session, April/May 2008; Climate Change and Indigenous Peoples: Background. Permanent Forum on Indigenous Issues, Seventh Session, April/May 2008.

*Cecilia Martinez (consultant), Climate Justice Working Group, Environmental Justice Advocates of Minnesota and Women's Environmental Institute, Minneapolis, MN*

I respectfully disagree with the analysis and conclusions of the Minnesota Draft Climate Change Report. Having studied this issue for over 15 years - and analyzed it from climate, energy, economic and civil rights perspectives - I strongly believe the approaches being considered will have serious adverse effects on Minnesota residents, especially poor and minority families, and will do nothing to stabilize a planetary climate that has not been stable for any appreciable time in Earth's history. \*\*\* Our Earth warmed a degree over the last quarter century, as it emerged further from the Little Ice Age, and humans likely played a role. However, hundreds of scientists say there is no evidence of a looming climate catastrophe driven by human greenhouse gas emissions.

Our planet has experienced numerous climate shifts, they point out, including prolonged ice ages, a 400-year Medieval Warm Period and a 500-year Little Ice Age. Climate scientists still don't understand what caused these events - or the temperature swings of the last century. As carbon dioxide levels rose steadily, temperatures climbed from 1910 to 1945, fell between 1945 and 1975, and increased again from 1975 to 1998, notes International Arctic Research Center founding director Syun-Ichi Akasofu. \*\*\* Four of the ten hottest years in US history were in the 1930s, the era of the infamous Dust Bowl. Average global temperatures stabilized in 1998, and then fell 1.1 degrees F the past twelve months, satellite measurements show. Ice core data demonstrate that higher atmospheric carbon dioxide levels followed rising temperatures, by hundreds of years - the exact opposite of climate chaos hypotheses.

That is why climate activists have had to rely on computer models that generate scary-sounding worst-case scenarios of a coming climate cataclysm. Climate models do help scientists evaluate possible consequences of changing economic growth, emission, cloud cover and other variables. However, they

cannot reproduce the actual climate of the past century, or make accurate predictions even one year in the future, much less fifty.

Models reflect the assumptions and hypotheses that go into them - and our still limited understanding of complex, turbulent climate processes that involve the sun, oceans, land masses, water vapor, precipitation, high cirrus clouds and other factors, notes MIT meteorology professor Richard Lindzen.

They place too much emphasis on carbon dioxide, and insufficient attention to extraterrestrial factors like changes in the Earth's irregular orbit around the sun, solar energy levels, and solar winds that appear to influence the level of cosmic rays reaching Earth, and thus the formation of cloud cover and penetration of infrared solar radiation. They fail to incorporate the effects that periodic shifts in Pacific Ocean currents have on Arctic temperatures and sea ice.

Different models often generate opposite climate scenarios for the same regions, University of Alabama at Huntsville climatologist John Christy points out. One says the Dakotas and Rio Grande valley would become complete deserts; another says huge swamps.

They are no more reliable than computer predictions of August 2009 vacation weather or 2050 stock markets. They do not represent reality and shouldn't be used to determine economic and energy policy.

85 percent of the energy Americans use comes from fossil fuels. Less than 0.5% is wind power, which is expensive and generates electricity only eight hours a day, on average. Nuclear provides 20% of US electricity. Over half is produced by coal, because it is plentiful and affordable, and modern power plants emit few pollutants, but do generate abundant plant food (the same carbon dioxide we exhale).

Any climate change regime would impose new restrictions and sharply higher prices for coal and gas-generated electricity, transportation, heating and manufacturing. Any facility that generates significant CO2 would be subject to strict regulation: bakeries, breweries, soft drink makers, factories, apartment and office buildings, dairy farms and countless others. Low income families and small businesses would be hurt worst of all.

A number of bills and proposals seek to slash US carbon dioxide emissions 80% below 1990 levels by 2050, even as China, India and other developing countries continue their economic and emissions boom. The last time the United States emitted such low amounts of CO2 was 1905! Just imagine what life would be like with energy and emissions of a century ago.

If we head down this path, poor, minority and blue-collar families will get hammered; millions of jobs will head overseas; and millions of people will need energy welfare, as government revenues shrivel. Worst, in the end, the sacrifices won't make a difference, because our climate is not driven by carbon dioxide - but by the same natural forces that caused major and minor climate changes since the dawn of time - say numerous experts, including those who signed the Manhattan Declaration on Climate Change ([www.ClimateScienceInternational.org](http://www.ClimateScienceInternational.org)).

Having studied and written about these issues for years, I can only conclude that climate change is now primarily power to control - and limit - the power we rely on to build, heat and cool our homes, produce raw materials, food and consumer products, transport people and products, and support modern living standards. It is about access to real energy, versus mandates to use futuristic, mostly illusory, and certainly costly, unreliable, insufficient alternative energy, like wind and solar power.

And its conclusions and recommendations are based, not on climate history or observed data and trends, but on simulations, scenarios and worst-case projections generated by computer models that should never be used to determine government policy - especially on matters that profoundly affect livelihoods, living standards, life spans. and economic civil rights that include life, liberty and the pursuit of happiness in the form of jobs, homes, healthcare and achieving the American Dream.

Enacting the kinds of legislation and regulations suggested by the Draft Report, state legislature, activist groups and governor will have a serious, regressive, disproportionate, adverse effect on poor and minority families, and numerous small businesses. I urge you to study this matter much more carefully, and focus on adjusting to whatever climate changes Nature (or humans) might cause - rather than on trying to control or stabilize a complex, chaotic and turbulent climate system that is far beyond our poor power to regulate.

*Paul Driessen, Congress of Racial Equality, New York, NY*

Science is not static; rather it is dynamic, that is, constantly changing. These new scientific facts have recently come out. Fact: according to NASA satellite data, the earth's average temperature has remained flat for the last ten years. Fact: ocean temperature probes are showing that the oceans have been cooling for the last six years. Fact: NASA's Aqua satellite has shown that when there is warming in the atmosphere, weather processes compensate and limit the warming. In other words, there is a negative, not positive, feedback that keeps the earth's temperature from climbing out of control. The planet no longer has a fever. The planetary emergency has ceased to exist. These data show that the climate models are wrong. There is no run-away warming, only natural fluctuations. Therefore the moral imperative here is to immediately suspend ethanol mandates and subsidies (biofuels are falling far below expectations and are causing hunger, starvation, environmental degradation, and in Minnesota run-away food inflation), as well as suspending mandates in alternate energy sources. Cost/benefit analysis shows that continuing on the present mandate path will cost Minnesota's households about \$3,500 per year in increased energy costs by the year 2020. This means that low income and lower-middle income families face economic ruin if present policies are continued. This will result in incalculable human suffering, huge new outlays in welfare spending, lower tax base and tax collections, and flight of human capital from Minnesota. In short, it will put Minnesota's economy and quality of life in a death spiral. This is morally wrong and unacceptable. Research and development should continue, of course. Oil is still the best fuel around and continues to get cleaner. Nuclear for electricity is the only sensible alternative to coal. If our economy is to continue to grow, cheap energy is a must. The alternative of sky-high prices means human suffering and regression rather than progress. This is unacceptable. Only a wealthy society cares about the environment. The poor are only interested in survival. Do the morally right and sensible thing: step back, take a timeout from the present policy direction of expensive energy, and rethink the whole thing. All Minnesotans will thank you for that.

*Robert Hellmann, Montrose, MN*

The effort is to be commended, and the report contains much that is interesting and potentially useful. However, it seems to me that in many ways the report is not internally consistent and the conclusions and recommendations are inconsistent with the stated purpose. This might reflect the tug-of-war between various special interests.

Fundamentally, the report is too favorable to coal, "biomass" and garbage incineration, and not forward-looking with regard to the true potential of solar, conservation, and transportation alternatives such as plug-in hybrid cars. For example it is correctly stated that:

*"The key challenge in addressing GHG emissions from Minnesota's energy supply sector is the state's continued reliance on coal-fired generation from both inside and outside Minnesota."* [4-1]

But, the report apparently supports the construction of new coal capacity by Excelsior Energy ("Mesaba Project") and the Big Stone II project in South Dakota. ("*... after a close vote, the MCCAG decided to exempt these new power stations, because they are currently undergoing regulatory review.*" [4-4])

The units, if built, would emit over 10 mt/yr of CO<sub>2</sub> and swamp other reduction efforts. (The estimate of "5.1 million tons of CO<sub>2</sub>e per year" [4-2] appears to be an error and it is not clear if the authors are assuming construction of both phases of Mesaba.)

Building these coal units would clear be an error. Rather, Minnesota should immediately enact a moratorium on the construction of any new in-state coal capacity and on the import of power into Minnesota from any new coal capacity. More information on the need for this is provided in a recent letter from Dr. James Hansen to Governor Pawlenty. The recommendations in this letter should be incorporated into the report. The report states [4-2] that: "*... the carbon intensity of existing coal-fired electricity generation could be decreased through biomass co-firing and carbon capture and storage technologies for new and existing (through retrofits) coal-fired stations in the state.*" Neither of these seems practicable. "Biomass" costs two or more times as much as coal on a btu/basis, and is unlikely to be available in ways that don't cause carbon release greater than or equal to that of burning fossil carbon. Carbon capture and storage, while perhaps technically possible, is not available on a commercial scale within the 2025 horizon of this report, and is unlikely ever to be available on an economically reasonable basis. The economic, regulatory, and technical obstacles are well-described in an extensive literature.

The report notes correctly [4-2] that "*Significant opportunities to reduce GHG emissions through options to further reduce electricity consumption also exist, and can often provide net cost savings to Minnesota consumers and the state.*" However, it does not appear that these opportunities have been taken

very seriously. Rather than propose measures to "reduce electricity consumption," the discussion seems to have focused on minimal measures to reduce the rate of increase. Footnote 1 on page 4-2:

*"An accurate estimate of the electricity sales growth rate was a subject of much discussion, with some members of the Minnesota Climate Change Advisory Group (MCCAG) advocating a higher rate (i.e., 1.0%–1.5% per year), and others advocating a lower rate (i.e., about 0.5% per year). The final value used in the analysis of options represents a central estimate, though it may be still objectionable to some MCCAG members."*

The report should be amended to propose hard goals for absolute annual reductions in electricity consumption and to redirect investment towards the "demand side."

*Alan Muller, Red Wing*

## **II. COMMENTS ON INVENTORY AND PROJECTIONS OF GHG EMISSIONS CHAPTER**

When developing standards, there is generally a margin of safety built into any projections to insure that any error in assessment will not result in exceeding the standard. Our future reductions should be conservative, so that a 10% exceedance in our projections does not result in our not meeting our goals for future CO2 emissions.

*Brian Nerbonne, Minneapolis, MN*

Another example of the ineffectiveness and improper focus and assumptions of the Greenhouse Gasbag group is found on p. 2 (EX-5) Consumption-based approach v. production-based. It seems to me that, while as an electrical net import state, if there is electricity being produced here that is being exported, we should also take that into account in our projections and estimates, essentially a consumption+ method, including generation in Minnesota for export, but being careful not to double-dip. Table 1 While the Electricity Production Coal figure rises from 28.1 to 39.2, a significant increase, the Net Imported Electricity number increases from 5.03 to 35.9. Imported generation with high CO2 emissions could be nothing but coal. Increasing reliance on coal and importing coal generation is not a reduction in greenhouse gas. Although I presume coal generation would increase, that is the purpose of CapX 2020 transmission, a 600% increase in imported electricity should raise questions. What is basis for this, as I don't see that increase reflected in utility IRPs (other than Big Stone, and Mesaba is not part of any utility IRP -- it's not needed, otherwise there'd be no mandate!). The approach chosen and the presumptions are tilting the focus and then the results. The policy impact of such a large shift to imported power should be addressed, and is worthy of a PUC docket. What does this mean for Minnesota energy policy? What is impact of reliance on transmission for electricity? What is regulatory impact of increased imports, given Xcel is largest utility in state, and Xcel doesn't generate in states we'd be importing from, doesn't this add another layer to delivery and another layer of profits for that middleman and increased charges to ratepayers?

p. EX-5, para. 1; 4-2. I refer to this plan as the Governor's Greenhouse Gasbags, or the Climate Change Inaction Plan, because exemption of Mesaba and Big Stone is not reducing greenhouse gas, but allowing significant increases. The use of metric tons is misleading and lends the perception that things are not so bad, that there's not all that much CO2 being generated. This is a flawed approach. Talk in US tons. Mesaba I alone would emit 5.4 million tons, and Mesaba I & II would emit 10.6 million tons annually. Big Stone II would emit 4.6 tons annually. The plan should clearly state the impact, meaning that looking at the chart of tons of emissions saved by various actions, the exemption of Big Stone II and Mesaba means that many of the specific actions listed are catch up from that exemption. Using the summary chart on p. ES-7, the exemption of BSII and Mesaba is more than the impacts of all of the transportation sector actions 9.3 million metric tons in the plan through 2025. On that same chart, that is essentially the same as, and so eliminates the benefits of, all of the actions planned for Residential, Commercial and Industrial. Let's be clear about the impacts of exemption.

*Carol A. Overland, Red Wing, MN*

### III. COMMENTS ON THE RESIDENTIAL, COMMERCIAL AND INDUSTRIAL SECTORS (RCI)

#### RCI 1: Maximize Savings from MN's Utility Conservation Improvement Program

Residential, Commercial and Industrial Sectors there is Table 3-1. This table shows the costs and benefits of the CIP. It shows a very large negative cost, that is, a cost savings. This was calculated assuming the savings to the consumer who invested in more energy efficient appliances to achieve the 1.5% annual reduction in power usage. These cost savings were calculated to be achieved during the period from 2008 – 2025. There were two problems with this calculation. Firstly, there were no costs assumed as incentives to encourage these purchases. Secondly, the effect of replacement appliance lifetime wasn't adequately included. There were many skeptical members outside the environmental community that believed this analysis was wholly inadequate. In other words costs to utilities and governments must be included because they are ultimately passed on to consumers and taxpayers.

There should be a mention in the Additional Costs and Benefits section that the costs of incentivizing the CIP program were not included in the cost estimate. It is unclear that the cost to the consumer based on appliance mean time to failure was properly calculated.

*Jerry Hinderman, North Oaks, MN*

I am an amateur and do not have time to study the report completely, but it appears that the approach to heating our houses is to stay the course and maximize savings in CIP. I believe that this is an incorrect course. It appears that RCI use of natural gas is about 15% of Minnesota's GHG emissions. The bulk of this I am sure is home heating. I heat my house with a geothermal heat pump and buy all of my electricity from Xcel's WindSource program, thus I emit no net GHG to heat my home. I analyzed my home's heating requirements for two different winters. For one winter my home required 85 million btu of heat. If I used a 80% efficient natural gas furnace, I would have to purchase  $85/0.8=106$  million btu of natural gas. If I used a 95% efficient furnace, I would have to purchase 89.5 million btu of natural gas. That is basically the best we can do if we continue on our current course.

There is no method to drive this segment of our GHG to zero or near zero using natural gas furnaces. Geothermal heat pumps are expensive to install. However, I am of the belief that many heating contractors install geothermal systems that are too large, and thus too expensive. The expense can be lowered by analyzing heating needs more closely. I found a Canadian website that recommended that heat pumps be sized to 60%-70% of maximum load. I do not think that I can find that site again. One heat pump manufacturer, WaterFurnace, comments on their web page that it does not make economic sense in northern climates to use a heat pump for a homes entire heating load. I agree with this due to an analysis I did for another winter four or five years ago.

My house is fairly typical, so this analysis would apply to thousands of Minnesota homes. I have a four ton, 54000 btu/hr geothermal heat pump which the manufacturer, Econar, estimates would heat my house down to an outdoor temperature of 23 below zero. I believe this estimate is accurate. There is an electric resistance heater in the ductwork that is automatically turned on if the heat pump cannot meet the need. So far I have not needed it. I believe that for a house like mine, smaller heat pumps could be installed. To explain this, pretend that my house has 4 one ton heat pumps, A,B,C, and D. 'A' will turn on first and off last, 'B' next, etc. If the temperature outdoors were 50 degrees, 'A' would be cycling on and off just like a furnace while B,C, and D were idle. Somewhere around an outdoor temperature of 46 degrees, 'A' would be running full time. At 45 degrees, 'A' would be running full time and 'B' would start turning on and off. At 30 degrees 'A' would be running full time, and 'B' would be running about 2/3 of the time. Somewhere around an outdoor temperature of 23 degrees, 'A' and 'B' would be running full time, and 'C' would have to start to cycle on and off. At about zero, 'A', 'B', and 'C' would be running full time, and 'D' would start to cycle on and off.

The question becomes how big a heat pump should a person install. My four ton system provides all of my heat. I analyzed weather data from Flying Cloud Airport and determine for a winter a few years ago that a three ton system that would heat my house down to an outdoor temperature of zero before backup heat was needed would have provided 99.2% of my heat. I obviously could have gotten by with a three ton system. What was surprising was the fact that I maybe could have gotten by with a two ton

system. A two ton system would heat my house to an outdoor temperature of 23 degrees. For the winter I analyzed, this would have been 90% of the heat my house needed. I still would have needed backup heat for the other 10%. As for cost, a two ton system would have saved \$3000 in installation cost over a three ton system. For that winter, 10% of my heating load would have been 7.5 million btu. If I used electric resistance heat at \$0.08/kwh, that would be \$122 extra. The electric rate would probably be less than this. A \$100 extra per winter to save \$3000-\$6000 on installation costs is probably worth it.

Now what does this do for carbon dioxide emissions? It all depends on the source of electricity. If we to 20 years into the future and assume our electricity is 20% nuclear, 20% wind, and 60% combined cycle natural gas at 50% efficiency, we find that the CO2 emission to heat our houses is 37% of what it would be using a 95% efficient natural gas furnace. If our electricity supply has a higher percentage of carbon neutral sources such as wind, nuclear, coal with carbon sequestration, solar, etc. then our CO2 emissions for heating our houses decreases further. There is no path to significantly decrease CO2 emissions for heating our houses if we keep installing furnaces. As for state policy, we should mandate that no furnaces be installed that are not high efficiency. The rebates from CIP that are used for high efficiency furnaces can be used for heat pumps or other sources. Tax credits should also be given to help encourage the geothermal industry. We do this for solar and wind, why not geothermal?

*V. Bruce Stenswick, Eden Prairie, MN*

### **RCI 3: Green Building Guidelines and Standards Based on Architecture 2030**

In general, the estimated emissions reductions associated with options in the RCI sector seem low. This is particularly true for RCI-3, Building Standards based on Architecture 2030. It is difficult to make more substantive comments on this section, because the detailed calculations behind the GHG reductions were not included, as they were in the other sections of the report.

*P Reich (Regents Professor, Dept of Forest Resources, U of Minnesota)*

*E Nater (Professor & Department Head, Dept of Soil, Water and Climate, U of Minnesota)*

*S Hobbie (Associate Professor, Dept of Ecology, Evolution, and Behavior, U of Minnesota)*

*J Espeleta (Research Associate, Dept of Soil, Water and Climate, U of Minnesota)*

*C Fissore (Research Associate, Dept of Soil, Water and Climate, U of Minnesota)*

*L Olabisi (Research Associate, Ecosystem Science and Sustainability Initiative, U of Minnesota)*

*A Ek (Professor & Department Head, Dept of Forest Resources, U of Minnesota)*

Where's the recommendation for a simple but very effective and significant CO2 reduction through installation of at least one 4x8 simple solar wall heater on each residence, and a wall full on every big box, warehouse, etc. They're cost effective, can be made for less than \$150 for a 4x8, and the reduction in heating cost, gas or electric (both of which generate CO2) is amazing. There's no excuse for not doing this on a major scale. <http://www.motherearthnews.com/Renewable-Energy/2006-12-01/Build-a-Simple-Solar-Heater.aspx>

*Carol R. Overland, Red Wind*

### **RCI 4: Incentives & Resources to Promote Combined Heat and Power (CHP)**

Co-Production of Electricity and Heat This is always a good idea when it can be done because the most efficient steam turbines used to make electric power (coal, gas or nuclear) all waste about one half of the heat energy and it is now being discharged, usually in a river or cooling towers. The St. Paul High Bridge plant formerly (and perhaps still does) heated much of downtown St. Paul in this manner. In the winter, unused electricity as a byproduct of office building heating could be sold back to utilities.

*Richard J. Petschauer, Edina, MN*

Any promotion of CHP must address fuel used, as two currently proposed would generate much greenhouse gas, specifically Rock-Tenn, which would burn GARBAGE, and Midtown Eco-Crappier, which would burn wood. I also incorporate my biomass comments here: burning biomass and burning garbage is NOT renewable or sustainable and it has very high emissions. Minnesota must eliminate burning -- it has

no part in a CO2 emissions reduction plan. One large problem with promotion of biomass is that in Minnesota, by definition, biomass can include up to 1/3 GARBAGE. In the federal PTC, mixed municipal waste and RDF is considered renewable. That is not acceptable. In Minnesota, biomass is less regulated than other fuel, and efforts are being made to utterly eliminate regulation of burning biomass. The biomass plants do NOT have the same controls operating at the same control efficiency. Biomass units are invariably smaller than coal units and have lower thermal efficiency. Thus they are more likely to sneak under regulatory breakpoints, make cost-effectiveness arguments ... and have high emissions/kWh. Another difference is that SCR for NOx reduction is rarely installed on wood burners for claimed technical reasons, and baghouses for particle control are also rarely installed because of fire issues from carryover of embers. These are also not installed because of the cost – incinerators are not economically sound, and any cost addition would make it unworkable, despite subsidies. An example of the pollution problems of biomass is found in recent news regarding the brand new plants in Virginia and Hibbing run by Laurentian (and not state of the art, they don't build in the controls unless they have to). The Hibbing and Virginia plants are regularly in violation of their permits and will be fined and their permits redone (relaxed to allow increased pollution). The burning of clean wood and biomass generally is misleading, because although clean wood and agricultural biomass is generally lower in sulfur and metals than coal, wood is high in emissions of NOx and various organics. That's not clean. The permits for the Hibbing and Virginia plants were modeled with a combination of biomass and coal, and the straight biomass can't meet those standards. What does that say?

Biomass in Minnesota is not about switchgrass. It's about junk pallets, construction & demolition waste, and garbage. Look at the emission of District Energy. There is not enough clean wood to go around, and District Energy has to get it from way far away and use junk wood because there just isn't enough, and Green Institute in Mpls. abandoned their proposed plant because they found there isn't enough clean wood. Burning wood is not good, because it does indeed emit toxic pollutants, and lots of them.

*Carol R. Overland, Red Wing*

## **RCI 6: Non-Utility Strategies and Incentives to Encourage Energy Efficiency and Reduce GHG Emissions**

Where's the recommendation for a simple but very effective and significant CO2 reduction through installation of at least one 4x8 simple solar wall heater on each residence, and a wall full on every big box, warehouse, etc. They're cost effective, can be made for less than \$150 for a 4x8, and the reduction in heating cost, gas or electric (both of which generate CO2) is amazing. There's no excuse for not doing this on a major scale. <http://www.motherearthnews.com/Renewable-Energy/2006-12-01/Build-a-Simple-Solar-Heater.aspx>

*Carol R. Overland, Red Wing*

## **IV. COMMENTS ON ENERGY SUPPLY**

### **ES 1: Generation Performance Standards**

It is unclear why the reductions from this proposal are not included in the summary of potential reduction options. Even if they may be subsumed under the cap and trade policy, they should be included for consistency with other portions of the report. It is also unrealistic to assume that electricity with a mix of ('75% renewable and 25% wind') could be easily purchased from out-of-state to replace potential Minnesota coal-powered electricity. The states surrounding Minnesota currently have more coal-intensive electricity production than Minnesota does.

*P Reich (Regents Professor, Dept of Forest Resources, U of Minnesota)*

*E Nater (Professor & Department Head, Dept of Soil, Water and Climate, U of Minnesota)*

*S Hobbie (Associate Professor, Dept of Ecology, Evolution, and Behavior, U of Minnesota)*

*J Espeleta (Research Associate, Dept of Soil, Water and Climate, U of Minnesota)*

*C Fissore (Research Associate, Dept of Soil, Water and Climate, U of Minnesota)*

*L Olabisi (Research Associate, Ecosystem Science and Sustainability Initiative, U of Minnesota)*

*A Ek (Professor & Department Head, Dept of Forest Resources, U of Minnesota)*

I believe exempting the Mesaba coal plant from emission standard is not only wrong but unethical. We need to be reducing these toxic gases, not building new plants that increase carbons. I will watch to see who supports the exemption and make sure they are voted out of office or are not appointed again.

*Joel J. Olander GCA, Owatonna*

We strongly feel the Mesaba Energy Project should not be exempt from Minnesota CO2 standards. Mesaba Unit 1 would emit 5.3 million tons per year of CO2. Minnesota is trying to reduce GHG emissions, not increase them. The Mesaba Energy Project is a federally funded demonstration of carbon capture and sequestration which is not possible in Minnesota. If this plant is to be of any benefit to taxpayers or rate payers it must be built closer to the coal, closer to where the power is needed, and closer to a sequestration site. Many other states have cancelled potential coal gasification projects. Minnesota should do the same. Thank you.

*Jim and Steph Shields, Pengilly, MN*

I could not disagree more strongly with the position of the MCCAG in exempting both the Mesaba Project and Big Stone 2 from controlling carbon dioxide emissions. Global warming is a serious problem that requires immediate action. Elimination of carbon dioxide emissions should be a basic part of any new coal-fired power plant, not an augmentation that may or may not be added at some time in the future. Given the threat of ongoing climate change, grandfathering in huge new sources of atmospheric carbon just because they are already in the process of bureaucratic review would be unconscionable. With regard to this report, I support the first goal in Appendix G, specifically that the reasonable approach for all concerned is to keep utilities from making long-term investments in high-carbon-generation technology.

*William Steele, Bovey, MN*

Facts against Mesaba's exemption from CO2 Emission Standards: Mesaba1@2 will emit 10.6 million tons/yr CO2. Existing tech capture only 30% CO. Equipment .cost est.\$1 billion. Not economical. CC equipment not installed until needed by law. Mesaba will add 8 million tons/yr to MN's GHG emissions even with CCS. Conflicts with goal of reduction in MN GHG emissions. Protection denied to citizens when Cos. are given exemption.

*Darrell and Delores White, Bovey, MN*

Please do not build in damaging loophole exemptions into the CO2 policy & rules. This would be unfair to other industries and our future. It is my understanding that exempting the proposed new Mesaba and Big Stone 2 dirty coal plants will result in an additional 4.7 MMtCO2 when they come on line in 2013. Application of the GPS to these coal units would result in GHG reductions of 4.7 MMtCO2 in 2015 and 4.8 MMtCO2 in 2025 (a cumulative reduction of 61.8 MMtCO2.)

*Bill Barton, St Paul, MN*

I have been following the Mesaba Energy Project pretty much since it inception. I am aghast that any project that will pollute the air, water, and land is even given any consideration. Those resources are finite and I have a real problem with someone who does not even live in this area proposing to take those valuable resources away from those of us that do live here. I grew up north of the proposed Mesaba Energy site and have always enjoyed and respected the clean water on the lake where I grew up. I love walking in the woods and breathing the clean air. If the Mesaba project is allowed to be built and they are exempt from any pollution reducing modifications, that amounts to poisoning the earth for present and future generations. When those finite resources/treasures are polluted beyond use, mankind will truly suffer. What will we or our future generations do when there is no more clean water to drink, clean air to breathe, or

clean land to walk? As far as I am concerned, any pollution is too much and any new/additional pollution is unacceptable. Please do not exempt the Mesaba Project from following the guidelines we all should have to adhere to in order to keep our one and only earth a truly great place to live. We need to work harder to keep what we have and not throw it away for something we don't need or want.

*Kathy Krook, Grand Rapids, MN*

Please do not exempt the mesaba project from CO2 emission standards. Please consider our desire for clean air and an environment free of anything that adds CO2 to the air. Thank you.

*Mary Shidele, Grand Rapids, MN*

Do not exempt Mesaba from the CO2 standards. We do not need the power they would generate, and we surely do not need the extra CO2.

*Nicholas Eltgroth, Cohasset, MN*

It is imperative that we work quickly to change our policies regarding CO2 emissions and reduce greenhouse gases. Why on earth is it even being considered to exempt Mesaba from CO2 emissions? What message does this send to individuals who are being encouraged to change their lightbulbs, buy energy star appliances, reduce their fuel consumption, when industry is hurling us towards environmental disaster? I believe government has a responsibility to protect our environment and not industry development. An exemption would certainly be viewed as corruption.

*Barbara Bunte, Grand Rapids, MN*

Please do not exempt Mesaba from CO2 emission standards! This conflicts with the goal of reducing Minnesota's GHG emissions. This would be bad for our environment and bad for our health. Financial issues should not be placed above the long term health and well being of our citizens and our planet. We need to error on the side of our future. Thank you.

*Lisa Bolton, Grand Rapids, MN*

Mesaba Units 1&2 will emit 10.6 million tons of CO2 per year. The Mesaba project does not have a viable plan to capture/sequest carbon. The US Department of Energy recently cancelled its support of carbon sequestration at proposed FutureGen coal plant in Illinois. The DOE cited excessive costs of the carbon capture process. The Mesaba Enenergy Project at this point is only a proposal. The power is not needed in Minnesota and Excelsior Energy has no Power Purchase Agreement, no customer or plan to capture CO2. Even if CO2 Carbon Capture were implemented, Mesaba would still add 8 million tons per year to Minnesota Green House gas emissions. Exempting the proposed high risk Mesaba Energy project from CO2 emission standards is environmentally irresponsible and not in the best interest of the citizens of Minnesota.

*Linda Castagneri, Proctor, MN*

My objection is to the exclusion from the proposed limits of all planned capacity additions that are already at some stage in the regulatory process in Minnesota and that will not meet the threshold.

*Marian Champlin, Bovey, MN*

The Greenhouse Gasbag report makes serious false assumptions about market and need. 1) Market; P. EX-5, para. 1 (and elsewhere?), of the report erroneously assumes a market for power for which there is no market analysis or PPA or other demonstration of need, and which, in fact, does not exist. The MISO queue shows that there is significant generation everywhere, and the typical market for Minnesota excess, Wisconsin and Illinois (Milwaukee and Chicago) is rife with generation, and in Illinois there is 10,000MW

in the MISO queue. <http://www.midwestiso.org/page/Generator+Interconnection> In addition, the NERC Reliability Assessment reflects that there's plenty of generation to meet supply. <http://www.nerc.com/~filez/rasreports.html> The we're going to freeze in the dark in an incubator without a job fearmongering by utilities is patently false. This assumption must be removed, or supporting market analysis be referenced with links (which won't occur because there are none). 2) Need: P. EX-5, para. 1; 1-3; 1-16 – Growth is overstated. As found by Commerce in Monticello Certificate of Need, it's 1.4%, not 2.04%, and with the significant economic downturn, it's lower than that. This is also verified in the NERC annual Reliability Assessments. <http://www.nerc.com/~filez/rasreports.html>

*Carol A, Overland, Red Wing*

I object to this project that would put millions of tons of co2 into our atmosphere. Do not give an exception. The cO2 from this plant needs to be sequestered.

*Nicholas Eltgroth, Cohasset, MN*

The last thing we need is tons and tons more of CO2 pollution. We already have more than is healthy for us and the planet from the surrounding mines. Please do not grant any environmental or pollution exemptions to Excelsior's Mesaba Energy Project. We have sufficient energy without this Project, and the country is on the verge of doing energy efficient and innovative programs in the near future. Do not condemn those of us who live here to unnecessary pollution for an unnecessary project.

*Charles Grant, Nashwauk, MN*

It would be very disappointing if the Minnesota State Legislature were to exempt the Mesaba Energy Project from proposed CO2 and pollution regulations. It is hard to understand how the legislature could take this ill-conceived action, particularly at a time when it is competing with the Governor to impress the electorate with its environmentally progressive stance. If this project were to be built, it would rival Alaska's famous bridge to nowhere as a ridiculous expenditure of tax dollars.

*Stephen Clark, Bovey, MN*

We strongly disagree with MCCAG's recommendation to exempt the proposed Mesaba Energy project from the CO2 emission standards and find this recommendation to be terribly short-sighted in addressing challenges to the earth from global warming. Exempting the proposed Mesaba project from the CO2 standards would significantly undercut any benefits gained from state initiatives to reduce CO2 emissions. Company documents state that the Mesaba Units I and II will emit 10.6 million tons/year of CO2, and Excelsior Energy has no plans to install carbon capture equipment unless it is mandated by law. Besides, we understand that existing technology could capture only 30% of the CO2. The proposed project has been touted as being clean because it could, in some vague, future plan, include carbon sequestration; but not only is this technology unproven, the Minnesota Geological Survey found that the geology of northeastern Minnesota will not work for deep geologic sequestration of CO2, so the CO2 would have to be sent via pipeline to North Dakota or Canada. The necessary equipment and pipeline for this has been estimated to cost \$1 billion dollars and Excelsior Energy's DEIS stated that new public money would be necessary to implement any carbon capture or sequestration. Even if the money was found (and diverted from other important societal needs), and the pipelines were built, the DOE has concluded that carbon capture and sequestration (CCS) could increase the cost of electricity by as much as 40%. So, not only would the public be paying for the costs of building a facility that is completely against the Governor's well-publicized goals for cleaner energy standards, families would have to pay more for this electricity. Finally, even if Mesaba incorporated carbon capture and sequestration into its project, Mesaba would still be adding 8 million tons/year to Minnesota's GHG emissions, and thus would cancel out any gains from other companies' CO2 reductions. What sense does this make? Your Energy Supply Recommendation ES-1: to prevent utilities from making long-term investments in high-carbon generation technology is what we need. Exempting the proposed Mesaba project from this goal smacks of pure political lobbying and completely undercuts the wise intention of your goal. There are so many arguments against Mesaba's planned facility. It is time to adopt policies that are future-oriented such as non-carbon-producing strategies to produce power, as well as

encouraging energy conservation. It s now time to end all consideration of the Mesaba project, NOT give them exemptions that allow them to prolong their efforts toward building their CO2-belching scheme.  
Sincerely,

*Loree and Matthew Miltich, Grand Rapids, MN*

Mesaba should be held to the same standard as any other generating facility; there is no valid reason not to.

*Donald Janes, Dellwood, MN*

I fully support the Mesaba Project and their clean coal technology. If all the coal plants in the world used this technology the environment would be much cleaner. Although not perfect, it's the next step in clean energy.

*Mike Andrews, Grand Rapids, MN*

The planned Mesaba and Big Stone II plants should not be exempt from the next generation power plant guidelines.

*Hillary Oppmann, Minneapolis, MN*

The GHG reductions that could be achieved by refusing to permit the Mesaba and Big Stone II coal plants (and the cost effectiveness thereof) should be included in this analysis. These are the only new coal plants that will likely be built between now and 2025, so they are highly significant. Stopping their construction may be crucial to make progress in GHG reductions, and quantifying these reductions and their cost effectiveness in this report will give us a clearer picture.

*Matthew Tyler, Finland, MN*

Exempting Mesaba Energy from CO2 Emission Standards conflicts with the goal of reducing Minnesota Green House Gas Emissions. Mesaba 1 & 2 will emit 10.6 million tons per year of CO2. Excelsior has no workable plan for the capture and sequestration of CO2. The US Department of Energy cancelled its support of FutureGen, an experimental coal burning plant Illinois, attempting to sequester CO2 emissions. The DOE cancelled its support citing excessive costs; it is now unclear if it will ever be built. Experts found to reduce carbon emissions from coal by just 10% , a volume of CO2 equivalent to all the oil pumped world wide would need to be forced underground at a possible cost of a trillion dollars. The Minnesota Geological Survey concluded that there is a low probability of success in confirming suitable conditions for CO2 sequestration in MN. The Mesaba Energy project has no purchase agreement in place, and therefore no customer to purchase its electricity. The exemption should not be granted for a power generation facility that is not needed and cannot capture or sequester CO2.

*Ronald Gustafson, Bovey, MN*

My company manufactures equipment to reduce air CO2 emissions from industrial power generation plants and we are developing new alternative energy technologies as a result of the climate change concerns. I was formerly the Manager of Alternative Energy Projects for the state of Minnesota and helped develop one of the first climate simulations concerning greenhouse gases (in 1968). I am gratified that the environmental damage from high CO2 emissions is now more accepted by our politicians, the public, and your group and the need for IMMEDIATE CO2 reductions appreciated. Therefore, I am extremely concerned that the climate change advisory group is even considering exempting the proposed Bigstone II and Mesaba coal-fired electric power plants from an otherwise wise choice in limiting new coal-fired power generation in Minnesota (unless or until a cost-effective carbon sequestration method for fossil fuel is developed). I am also concerned that the Group appears to have decided not even to include those plant's CO2 emissions in the reduction calculations. Neither decision makes any rational sense if the goal is to reduce CO2 emissions. Both projects (and the many additional Mesaba units proposed) increase state CO2 emissions by approximately 17%. Since the vote on these exemptions was apparently very close, and their

emissions data not included, I assume many of your members understand how badly such exemptions will reflect on your work. Since these exemptions are so inconsistent with the purposes of your group, I can only assume your concern is that halting projects already in the approval process would cause some financial hardship to the applicants. But construction on these unneeded facilities has not begun. Mesaba has and will remain a complete waste of taxpayer dollars. No private company or individual would be out any money if it cancelled (in fact, the project is so badly conceived it will save taxpayers hundreds of millions of dollars to cancel it now anyway). Bigstone II if operated under any reasonable CO2 limitations would quickly become one of the most expensive electric power generating plants supplying power to Minnesota. It could not compete with amortized (older) coal plants given its high construction costs PLUS the additional CO2 costs anticipated and has nothing new to offer compared with the existing plants. Bigstone II would financially punish ratepayers (individual and business) and reduce the opportunity for lower CO2 options to compete when additional need actually develops. It is far better to terminate this project now; even if it means the minor private costs to date are compensated in some way. The effect of allowing these projects to go forward sets back your group's CO2 reduction goals by tens of years. It does not cost much to stop these counterproductive projects now. I urge your group to include their CO2 emission data and vote for NO EXEMPTION. Thank you.

*Ron Rich, Atmosphere Recovery, Plymouth, MN*

Mesaba energy project must not be exempt from emission polluting regulation. We need to move away from fossil fuels and concentrate our efforts towards renewable energy like wind and solar.

*Chad Johnston, Bovey, MN*

CO2 emissions obviously have a worldwide effect. I hope that you'll allow people who take the time to comment to participate, since global warming is a global problem that will take a global solution. Exempting Mesaba is exactly the WRONG thing to do. Global warming is a huge market failure -- where the tragedy of the commons may be ecosystem collapse, all because we were too greedy to realize that pollution has a VERY REAL price. Please, be a leader. NOW. Not later. Exempting Mesaba is the WRONG thing to do. The Midwest has so much wind it's amazing! And wonderful. Please, let's invest in the future -- not the past.

*Nancy LaPlaca, Denver, CO*

To exempt the Mesaba Project from carbon emission controls is FOOLISH! First, the electricity from the proposed project is not needed. Secondly the environmental impact from such carbon emission would greatly add to our present problem of global warming and climate change. The cost of controlling carbon emission is prohibitive...the ability to control emission is limited...sequestering CO2 is limited and would be costly to transport to where it could be used. This project should not be approved.

*Lyle G. Lauber, Squaw Lake, MN*

Exempting the Mesaba Energy Project from the generation performance standard, while planning to reduce Minnesota's GHG emissions, defies logic and common sense. The policy's stated goal is to prevent utilities from making long-term investments in high-carbon-generating technology; presumably this also applies to a private, for-profit, independent power producer seeking to force its output on Minnesota utilities. This Project is still in the preliminary design phase and the fact that it is in the regulatory process is not a reason to permit it to annually spew ten million tons of CO2 into the atmosphere for possibly 50 years. Excelsior admits that: Mesaba Units I and II will emit 10.6 million tons/year of CO2; carbon capture equipment will not be installed until mandated by law; existing technology could capture only 30% of the CO2; the CO2 most likely would have to be transported by pipeline hundreds of miles to the west; and about 10% of CO2 injected into the ground will not remain sequestered. Even if carbon capture and sequestration (CCS) were implemented, Mesaba would still be adding 8 million tons/year to Minnesota's GHG emissions. The Minnesota Geological Survey has recently concluded that there is a very low probability of success in confirming suitable conditions for deep geologic sequestration of CO2 in Minnesota. The Department of Energy, at page 3 of Appendix A2 of Mesaba's draft EIS, regarding the feasibility of CCS, stated: it could

increase the cost of electricity by as much as 40%; even if the CO2 could be sold for enhanced oil recovery, the revenues would be grossly insufficient to recover the costs of CCS; and without a PUC order incorporating CCS costs within the power purchase agreement (PPA), Mesaba would not be economically viable. Even without the estimated \$1 billion cost for 30% CCS, the Minnesota PUC has determined that Mesaba's electricity is too expensive and that its operational and financial risks should not be imposed on Xcel's ratepayers. The PUC agreed with the ALJs in the PPA docket that: including CO2 in the emissions required a finding that the plant had little or no quantifiable advantage at this time over other coal burning plants and no advantage over baseload generators operating on renewables. The ill-advised Mesaba Project has survived this far only because of \$40 million of public funding and exemptions from Minnesota's laws and rules. CAMP opposes any additional regulatory benefits for Excelsior Energy's Mesaba Project, and it is unreasonable for the MCCAG to recommend this one.

*Charlotte Neigh, Co-Chair Citizens Against the Mesaba Project (CAMP), Grand Rapids, MN*

It is absolutely unacceptable to exempt a proposed power generation plant from CO2 emission standards; specifically the Mesaba/Excelsior Energy gasification plant on the Iron Range. I urge legislatures to confirm their commitment to reduce greenhouse gas, resist pressure from past practices, and stand strong supporting initiatives that promote a sustainable future, and rejecting proposals that would be detrimental. There is no justification to exempt Mesaba/Excelsior Energy, a proposed project that is not based on need.

*Jeanne Newstrom, Bovey, MN*

Mesaba Units I and II will emit 10.6 million tons/year of CO2. Carbon capture equipment will not be installed until mandated by law. The Minnesota Geological Survey has recently concluded that there is a very low probability of success in confirming suitable conditions for deep geologic sequestration of CO2 in Minnesota and would most likely have to be transported by pipeline hundreds of miles to the west. Existing technology could capture only 30% of CO2 and necessary equipment and pipeline has been estimated at \$1 billion. Even if CCS were implemented, Mesaba would still be adding 8 million tons/year to Minnesota's GHG emissions. Action is needed NOW to stop global warming and exempting any power plant from CO2 emission standards is irresponsible and will affect the future of the entire globe in years to come.

*Lee Ann Norgord, CAMP, Bovey, MN*

I do not favor any exemption for either the Mesaba Coal Gasification plant or the Big Stone Power Plant. Neither will help reduce greenhouse emissions. Both will add to further Mercury pollution. I think both are a political Bamboozle!!!

*Donald St. Aubin, Grand Rapids, MN*

Stop this plant it is obvious the scams that are currently being generated are the only energy that it going to come out of it, and it all about the company making money, nothing to do with us here in N. MN and absolutely nothing to do with protecting our world from greedy power hungry elitist snobs.

*Bryan Stenlund, Grand Rapids, MN*

It would be irresponsible to make any exclusion to legislation that is designed to prevent global warming. Also, Dick Stone, Excelsior Energy's VP for Development and Engineering, should not have been allowed to be a member of the Energy Supply Working Group that would give exemptions to Excelsior Energy and Big Stone 2. Global warming is a real threat to the survival of the world as we know it, and CO2 from the Mesaba Project and Big Stone 2 would exacerbate the problem.

*Robert Norgord, CAMP, Bovey, MN*

Please stop the Mesaba Energy boondoggle. It does not sequester carbon. It's just a few crony capitalists exploiting the Iron Range political machine to bleed resources from our efficiently regulated utility system.

My wife and I are retired in northern Minnesota. We object to our tax dollars being used to promote a project that will damage our economy and our environment.

*Bob Tammen, Soudan, MN*

I am writing to object to the MCCAG's recommendation to exempt Excelsior Energy from the carbon emission standards at its proposed Mesaba generation plant. It should be obvious to everyone that carbon sequestration will not occur if this project moves forward. The geology of the local terrain will not allow CO<sub>2</sub> sequestration and the cost of transporting it to an area with suitable geology is prohibitive. Minnesota has mandated that electricity production must come from renewable sources in the near future. Projects such as the proposed Mesaba project fly in the face of that mandate. I suggest that politics be removed from all consideration of this proposal.

*Richard Twaddle, Bovey, MN*

As a citizen of Grand Rapids MN I strongly oppose the MCCAG decision to exempt Mesaba from CO<sub>2</sub> emission standards. You unanimously support 'strong federal standards and requiring high state standards' yet exempt a proposed facility [Mesaba Units I&II] which will emit over 10 and 1/2 million tons per year of CO<sub>2</sub>! Furthermore, 24% of green house gases in MN are from transportation, and most pollution/GHG estimates re: Mesaba don't even factor in the transport of coal! Sequestration of CO<sub>2</sub> in this region, if possible at all, is technologically complicated, and at best, would be inefficient and incomplete! How can a climate change advisory group exempt a proposed project of this magnitude? This is unthinkable. Moreover, Mr. Stone should reclude himself from making decisions re: Mesaba! If we are to address current and future climate change we MUST take action NOW, this according to credible science. There is no good reason for such an exemption. Quite the contrary, now more than ever we are called upon to scrutinize proposed energy producing projects...In looking at the Mesaba project, one is led to question the gross environmental costs, financial costs, and the opportunity cost of all this capital that could be better invested in true alternative energy! Please reconsider this short sighted and ill-conceived exemption! Thank you.

*Jenny M Wettersten, Grand Rapids, MN*

Exemption of the Big Stone 2 and Mesabi coal fired power plants is a lost opportunity. Here are the first two plants slated to be built, and we choose not to take the opportunity to look for a better option than to continue to rely on fossil fuels to provide our energy. These plants should be included in any cap and trade framework.

*Brian Nerbonne, Minneapolis, MN*

#### Debate Over Applying the GPS to Big Stone II and Mesaba Coal Plants

The ES-1 Generation Performance Standard (GPS) was one of the most controversial policies considered by the MCCAG. This standard would prevent Minnesota utilities from making new long-term investments in coal power unless the plants meet a CO<sub>2</sub> emissions standard that in effect would require them to employ carbon capture and storage technology. The GPS described in the policy description set forth in Appendix G was modeled after California's GPS. The MCCAG voted to recommend adoption of a GPS standard that applies to coal plants yet to be proposed (though because the MCCAG did not anticipate any more coal plant proposals during the planning period, there are no actual pollution savings to be had by applying the GPS to them). Many MCCAG members, though not a majority, also supported applying the GPS to currently pending coal proposals (Big Stone II and Mesaba). Since neither of those proposals employ carbon capture and storage technology, applying the GPS standard to pending proposals would bar their construction.

Huge cost and pollution savings from barring construction of unneeded coal plants

An analysis conducted by CCS of the cost and emissions impact of applying the GPS (ES-1) to Big Stone II and Mesaba is presented for informational purposes at page G-2. It indicates that blocking these two new coal projects would yield dramatic cost and pollution benefits -- saving 61.8 million tons of emissions and \$7.4 billion dollars between 2013 and 2025. (These may even be underestimates since CCS assumed rather

low emissions and ignored the costs of future CO2 regulations, among other costs). The reason this analysis showed such large savings relates back to another important finding of the MCCAG process namely that these new coal plants are not needed given the state's existing renewables and efficiency policies. As the state implements the new energy efficiency legislation of 2007, the MCCAG analysis projects that our electricity demand growth rate will shrink from 2.04% (p. EX-5) to a more modest 0.82% (p. 4-2). When this lower demand growth is combined with the effects of the 2007 Renewable Energy Standard (which requires Xcel to get 30% of its power from renewables by 2020 and other utilities to get 25% from renewables by 2025) it results in a steady and sustained decline in state demand for power from coal plants. This declining demand will allow the state to start backing down the operation of existing coal plants and to claim credit for reduced CO2 emissions as a result (see Figure 4-1, which illustrates the sustained drop in emissions from coal caused by the projected drop in demand for coal power).

Since our demand for coal power is projected by the MCCAG analysis to shrink in the years ahead, new coal units are simply not needed to serve Minnesota electric load. Therefore, a policy that prevents their construction saves Minnesota a great deal of pollution and money. There is no need to replace the power the plants would have generated because that power will be replaced by efficiency and renewables as the new laws are implemented. The methodology for calculating these cost and pollution savings presented in Appendix G for ES-1 was disputed by some members of the MCCAG, which is why it is presented for informational purposes only. However, in its fundamentals it is surely sound: any policy that prevents the construction of coal plants that Minnesota does not need will save large amounts of both money and pollution.

No process considers impact of new coal plants on state emission reduction goals  
Members who did not want the GPS to apply to Big Stone II and Mesaba also urged the MCCAG to defer to the judgment of the Public Utilities Commission (PUC) regarding approval of those plants. As the final report notes, the majority on the MCCAG did not favor applying the GPS to Big Stone II and Mesaba because they are currently undergoing regulatory review. (4-4). However, the regulatory review being conducted by the PUC is held under different laws and standards and does not in any way look at the impact these new plants would have on the state's overall emission reduction efforts. The PUC is not considering, for example, which emission sources will have to reduce their emissions if these coal plants are built, or how much those reductions will cost those sources or the state as a whole. The PUC is not asking whether building two large and costly coal plants at a time of declining demand for coal power is part of a least-cost path to achieving our emission reduction goals, nor is any other state regulatory body or process.

Unfounded Assumption That Old Coal Units Will Back Down As New Ones Are Built  
Because the state's need for coal power is projected to decline, the two new coal plants presented an analytical challenge for the MCCAG. If the MCCAG assumed that the plants were built and operated as proposed and that all existing units continued to operate as they do today, it would result in the generation of far more electricity than the state is projected to need (indeed, this will be true to a certain extent even if the new coal plants are not built). Over the objections of several MCCAG members, the final report assumes a backing down of existing units if the Big Stone 2 and Mesaba units come on line in order to balance the supply of electricity with the demand in Minnesota (page EX-5). This is why none of the graphs in the report show the over 5 million tons of CO2 these new plants would suddenly begin emitting around 2013 when they are assumed to come on line. By assuming that existing coal units will suddenly reduce their output if the new plants are built, the report essentially makes these two new coal unit, the largest new CO2 sources built to serve Minnesotans in decade, disappear from the analysis.

Many members of the MCCAG objected to making this unfounded assumption. Backers of the two new coal plants have been promoting them to regulators, ratepayers, and the public as needed to meet increasing demand, not as a way to displace existing coal generation. (And if the point were to displace old coal units, it would likely be far cheaper to construct the new units where the old units are being taken offline to avoid having to build costly new power lines and other infrastructure.) The plants backers are under no commitment to take any of their old coal units offline when the new units come online, and the owners of the other coal plants serving Minnesota have no plans nor any incentives to reduce their output. Given that there is no requirement, plan or incentive to back down existing coal units, it is far more likely that the excess coal power would simply be sold to consumers outside of Minnesota through the regional power market, undermining regional investments in renewables and efficiency. Under the statutory definition of statewide greenhouse gas emissions (Minn. Stat. section 216H.01), the CO2 associated with these coal power exports would still be counted, and rightly so, since it would be every bit as damaging to

the climate as CO2 associated with power consumed by Minnesotans. It was certainly not the intent of the legislature in passing the emission reduction targets to have Minnesota meet them by exporting its extra coal power to others. Indeed, the CO2 reductions associated with the state's energy efficiency efforts and RES are in no small part associated with displaced coal power; to the extent that displaced coal power is simply exported, those policies will have no beneficial effect on the climate. It is critical that Minnesota policy makers keep this all important back-down assumption in mind in the event that the Big Stone II and Mesaba units are actually built. If the state does not translate this assumption into reality by ensuring that older coal units actually reduce their generation, then Minnesota will fall millions of tons short of meeting its emission reduction targets. The 2015 target is particularly in jeopardy, given that backers of the two new coal plants have been hoping to bring them online in 2013.

*Barbara Freese, Union of Concerned Scientists, Minnesota Center for Environmental Advocacy, Izaak Walton League of America - Midwest Office, Fresh Energy, Global Green Energy LLC, Institute for Agriculture and Trade Policy, Clean Water Action, St Paul, MN*

I see no reason for Mesaba Energy to have an exemption from the CO2 emission standards. These standards are in place to protect the public and the environment and should be enforced for everyone and every business.

*William R Wheeler, Bovey, MN*

I own property in Bovey, MN at 23029 Co. Rd. 71, 55709. I have lived in northern Minnesota for most of my life: as a full time resident in my youth and as a summer resident as an adult. I currently live in Columbus, OH which is recognized as having high pollution and bad air quality. Poor air quality in Ohio goes into our lungs and into the soil. Poor air quality in Minnesota goes into the lakes. It is NOT tolerable to allow higher CO2 and GHG emissions for Mesaba development. Natural resources are Minnesota's economic resource and should not be endangered or destroyed by shortsightedness. GHGs worldwide need to be controlled. Please do not exempt Mesabi and Big Stone 2 from the standards necessary to control greenhouse gases. Don't allow a polluter to build in our back yard! Or anywhere on this earth! I'm planning to move back to Minnesota for many reasons. Please do what is necessary to keep one of the reasons valid: It is a cleaner state.

*Heidi Wick, Columbus, OH*

I am against the exemption of MESABA from the CO2 emission standards as this conflicts with the goal of reducing MN GHG Emissions. As a resident of this area I feel that this is a significant health issue for myself and others.

*Nancy Wheeler, Bovey, MN*

The exemption of the Mesaba Energy Project (MEP) from any climate control legislation will make that legislation meaningless. / [Minn. Stat.216B.1694, Subd. 1, Definition. For the purpose of this section, the term innovative energy project means a proposed energy-generating facility or group of facilities, which may be located on up to three sites.]

The above statute concerns the MEP. Exempting the MEP exempts up to six 600 MW generation facilities. Each of these facilities will emit approximately 5.3 million tons of carbon dioxide (CO2) annually, nearly 32 million tons annually if all six were constructed. / The generating units of the MEP are being proposed as capture ready. Excelsior Energy has repeatedly stated that the MEP will be ready to capture 30% of CO2 when mandated by law. 10% of CO2 escapes in the Carbon Capture and Sequestration (CCS) process. That equates to 80% (4.24 million tons per facility or 25.44 million tons total) of CO2 still contributing to global warming.

Please keep in mind the statements of the Department of Energy (DOE) in Appendix A2 of the MEP's Draft Environmental Impact Statement (DEIS). In this four-page section, the DOE clearly states that CCS is not technically or economically feasible for the MEP.

The Public Utilities Commission has determined that the costs associated with the MEP are too high and risky for Xcel's ratepayers. Adding CCS to the MEP raises the cost of the electricity produced by up to 40%. Excelsior Energy wants their project to be exempt from meaningful climate control legislation because of their knowledge and the DOE's findings that it is not feasible for the MEP to capture CO<sub>2</sub>.

Excelsior Energy has been on the receiving end of unprecedented special legislation and monetary handouts for the Mesaba Energy Project. Its time to use common sense and say NO to more legislation that would encourage this project to move forward, a project without any hope of producing cheap or clean energy.

*Amanda Nesheim, Big Fork, MN*

I commend the committee on some excellent next generation standards--however if Big Stone 2 and Mesaba are allowed to go on as planned (projected to emit 5.1 million tons of CO<sub>2</sub> per year) we will never reach our goal of lowering emissions 80% by 2050 (as recommended to avert catastrophic change). Please remove the statement that grandfathers in this old technology and re-consider how to give these power plants the incentive to become next generation plants too.

*Julia Nerbonne, Minneapolis, MN*

Mesaba Units I and II will emit 10.6 million tons/year of CO<sub>2</sub>, and carbon capture equipment will not be installed until mandated by law. But, the Minnesota Geological Survey has recently concluded that there is a very low probability of success in confirming suitable conditions for deep geologic sequestration of CO<sub>2</sub> in Minnesota, and some CO<sub>2</sub> escapes anyway. Existing technology could capture only 30% of the CO<sub>2</sub>, and the necessary equipment and pipeline has been estimated at \$1 billion. The DOE has concluded that: carbon capture and sequestration (CCS) could increase the cost of electricity by as much as 40%. If the CO<sub>2</sub> could be sold for enhanced oil recovery, the revenues would be grossly insufficient to recover the costs of CCS; and without a PUC order incorporating CCS costs within the power purchase agreement, Mesaba would not be economically viable. Even if CCS were implemented, Mesaba would still be adding 8 million tons/year to Minnesota's GHG emissions. We should prevent utilities from making long-term investments in high-carbon-generation technology. This should be immediate - and it should apply to all baseload projects not already in operation.

*Susan Hutchins, Grand Rapids, MN*

How has money and profit become the main consideration in decision making? The idea of exempting the Mesaba Energy project from CO<sub>2</sub> emission standards is shocking. Remember, it's your children and grandchildren who will pay the price of this stupidity with their health and their lives. I was out of town and therefore this email did not make the deadline, but I doubt that input from people matters much anymore. Big business is the god of our times.

*Celeste Kanli, Grand Rapids, MN*

I find it inconceivable that the Minnesota legislature (not exactly a group of emission scientists) can decide that the Excelsior/Mesaba Energy can be exempt from the power company emissions standards. I also find it inconceivable that the legislature can write its own definition of the coal gasification as innovative energy as it pertains to Excelsior/Mesaba Energy. Excelsior/Mesaba Energy has no plans to sequester any of its CO<sub>2</sub> atmospheric emissions, and thus will be a major atmospheric polluter. In these days of increases awareness and knowledge of greenhouse gases and climate change, Excelsior/Mesaba Energy should not be exempt from the emissions performance standards; rather, Excelsior/Mesaba Energy should be held to the highest, scientifically monitored standards. Our future, and that of our grandchildren, depends on it!

*William E Berg, Bovey, MN*

### **ES 3: Efficiency Improvements, Re-powering and Other Upgrades to Existing Power Plants**

Switching From Coal to Natural Gas for Electric Power. I was happy to see that this was not included in the recommendations (that I could find). While natural gas reduces the amount of CO2 emissions, it substitutes this for increased water vapor that is a stronger greenhouse gas than CO2. Furthermore, it causes a significant increase in cost to produce electricity.

*Richard J. Petschauer, Edina, MN*

The report doesn't mention whether life cycle emissions from biomass are considered in the repowering scenario with biomass co-firing. If they are not, the GHG savings from this strategy could be reduced. In addition, the land requirements for this strategy should be considered in the context of the land requirements for other strategies in the report.

*P Reich (Regents Professor, Dept of Forest Resources, U of Minnesota)*

*E Nater (Professor & Department Head, Dept of Soil, Water and Climate, U of Minnesota)*

*S Hobbie (Associate Professor, Dept of Ecology, Evolution, and Behavior, U of Minnesota)*

*J Espeleta (Research Associate, Dept of Soil, Water and Climate, U of Minnesota)*

*C Fissore (Research Associate, Dept of Soil, Water and Climate, U of Minnesota)*

*L Olabisi (Research Associate, Ecosystem Science and Sustainability Initiative, U of Minnesota)*

*A Ek (Professor & Department Head, Dept of Forest Resources, U of Minnesota)*

This option as drafted involves requiring utilities to evaluate their existing generating units for opportunities to improve their emissions profile through a variety of options efficiency improvements, the addition of biomass or other fuel changes, or the additional of carbon capture technology. However, the only option that was considered quantifiable was the option of adding biomass. Initially, the Energy Supply TWG considered adding 8% biomass to coal plants. Later, it decided that this might not be realistic given supply constraints and reduced it to 1% biomass. However, because the MCCAG had already voted on the 8% option, the numbers in the final report assume the CO2 savings and financial costs associated with the 8% option, even though the language on page 4-5 refers to the 1% biomass option. However, it is unclear to what extent the analysis overestimates reductions, since the other unquantified aspects of the policy (like improving efficiency) could increase emissions reductions.

*Barbara Freese, Union of Concerned Scientists, Minnesota Center for Environmental Advocacy,  
Izaak Walton League of America -- Midwest Office, Fresh Energy, Global Green Energy LLC,  
Institute for Agriculture and Trade Policy, Clean Water Action, Saint Paul, MN*

#### **ES 4: Transmission System Upgrading, including Reducing Transmission Line and Distribution System Losses**

The Greenhouse Gasbag report makes a false and unsubstantiated assumption regarding transmission and generation of CO2. EX-10 and ES-4 assumes transmission reduces CO2 generation, which is false, because CapX 2020 would facilitate import of coal generation and therefore increased CO2 emissions. Because no analysis has been completed for increased CO2 production of various scenarios of increased coal generation, using the number of MW in of coal generation in the South Dakota and North Dakota MISO queue, the report should provide an analysis for scenarios of increased CO2 generation assuming 20%, 50%, 80% and 100% of proposed coal generation for South and North Dakota is built.

*Carol A. Overland, Red Wing, MN*

#### **ES 5: Renewable and/or Environmental Portfolio Standard**

In addition, the State of Minnesota must encourage and/or regulate utilities to import additional hydroelectric power in place of coal or nuclear sourced electric power, whenever the choice is available

without building additional dams. Furthermore, it is necessary to evaluate the potential for upgrading existing in-state hydro generation facilities

*Tom Casey, West Metro Global Warming Action Group, Mound, MN*

Facts against Mesaba exemption from CO2 emission standards. Mesaba 1&2 will emit 10.6 million tons/yr.CO2 as is. CC equip. not installed until needed by law. CCS existing tech. capture 30% only, equip. est. \$ 1 billion. Not economical. 8 million tons/yr add to Mn.GHG emissions even with CCS. Conflicts with goal reduction of MN. GHG emissions. Protection is denied to citizens when Companies are exempt.

*Darrell and Delores White, Bovey, MN*

This is another example of where the plan is contrary to the purpose of the Greenhouse Gas Initiative. I refer to this plan as the Governor's Greenhouse Gasbags, or the Climate Change Inaction Plan, because burning biomass and burning garbage is NOT renewable or sustainable and it has very high emissions. Minnesota must eliminate burning -- it has no part in a CO2 emissions reduction plan. One large problem with promotion of biomass is that in Minnesota, by definition, biomass can include up to 1/3 GARBAGE. In the federal PTC, mixed municipal waste and RDF is considered renewable. That is not acceptable. In Minnesota, biomass is less regulated than other fuel, and efforts are being made to utterly eliminate regulation of burning biomass. The biomass plants do NOT have the same controls operating at the same control efficiency. Biomass units are invariably smaller than coal units and have lower thermal efficiency. Thus they are more likely to sneak under regulatory breakpoints, make cost-effectiveness arguments ... and have high emissions/kWh. Another difference is that SCR for NOx reduction is rarely installed on wood burners for claimed technical reasons, and baghouses for particle control are also rarely installed because of fire issues from carryover of embers. These are also not installed because of the cost -- incinerators are not economically sound, and any cost addition would make it unworkable, despite subsidies. An example of the pollution problems of biomass is found in recent news regarding the brand new plants in Virginia and Hibbing run by Laurentian (and not state of the art, they don't build in the controls unless they have to). The Hibbing and Virginia plants are regularly in violation of their permits and will be fined and their permits redone (relaxed to allow increased pollution). The burning of clean wood and biomass generally is misleading, because although clean wood and agricultural biomass is generally lower in sulfur and metals than coal, wood is high in emissions of NOx and various organics. That's not clean. The permits for the Hibbing and Virginia plants were modeled with a combination of biomass and coal, and the straight biomass can't meet those standards. What does that say?

Biomass in Minnesota is not about switchgrass. It's about junk pallets, construction & demolition waste, and garbage. Look at the emission of District Energy. There is not enough clean wood to go around, and District Energy has to get it from way far away and use junk wood because there just isn't enough, and Green Institute in Mpls. abandoned their proposed plant because they found there isn't enough clean wood. Burning wood is not good, because it does indeed emit toxic pollutants, and lots of them.

*Carol A. Overland, Red Wind, MN*

Estimations of the GHG savings from replacing coal and natural gas electricity generated out-of-state with renewable electricity may be low. The report appears to underestimate the proportion of out-of-state electricity that comes from coal. This has the effect of making renewable electricity generation seem less important as an emission reduction strategy than it actually is.

*P Reich (Regents Professor, Dept of Forest Resources, U of Minnesota)*

*E Nater (Professor & Department Head, Dept of Soil, Water and Climate, U of Minnesota)*

*S Hobbie (Associate Professor, Dept of Ecology, Evolution, and Behavior, U of Minnesota)*

*J Espeleta (Research Associate, Dept of Soil, Water and Climate, U of Minnesota)*

*C Fissore (Research Associate, Dept of Soil, Water and Climate, U of Minnesota)*

*L Olabisi (Research Associate, Ecosystem Science and Sustainability Initiative, U of Minnesota)*

*A Ek (Professor & Department Head, Dept of Forest Resources, U of Minnesota)*

The MCCAG Report Assumes RES Costs That are Far Too High The MCCAG analyzed the costs associated with the Renewable Electricity Standard (RES) enacted by the state in 2007. The main reason to look at the cost of this already-enacted law was to model the costs of complying with a cap and trade program. During the course of the MCCAG process, the estimated cost of the RES fluctuated wildly. At the December 5 meeting it was estimated to cost about \$2 billion over the study period (up to 2025). At the January 10 meeting the cost had dropped over three billion dollars to a negative \$1.675 billion. At the January 24 meeting, the cost had skyrocketed and the RES was estimated to cost \$7.5 billion dollars, and this number persists in the final report. The cost/ton of reductions associated with the RES similarly bounced from \$20/ton to a negative \$13/ton and landed at a positive and highly implausible \$56/ton. Had there been another meeting, it is likely these cost numbers would have dropped back down.

This high cost for emissions savings from the RES runs counter to a great deal of other analysis of RESs. A recent detailed study of RESs by the Department of Energy's Lawrence Berkeley National Laboratory shows that RES standards are extremely cost effective and sometimes reduce electric rates. The study looks at results from 28 state or utility-level RES cost studies completed since 1998. It finds that on average state standards will result in a monthly electric bill increase of just 38 cents for a typical residential household. Since the study does not analyze the effect of increased renewable energy use on natural gas markets, which several studies have found would lower demand and prices by increasing competition, the overall energy bill impacts from state RESs would likely be even lower. (This study is further described at the website of the Union of Concerned Scientists.)

The exorbitant RES cost estimate embedded in the final report also runs directly counter to the Integrated Resource Plan recently submitted to the PUC by Xcel Energy. Xcel provides half the retail electric power in the state and bears a disproportionate share of the RES costs given its higher obligations under the law. If the RES actually cost \$7.5 billion to implement over the study period, more than half of that cost should be appearing in Xcel's IRP. In fact, Xcel projects that complying with the RES (assuming a production tax credit in place until 2015) will save it about half a billion dollars compared to a no-wind scenario. Even when Xcel models a scenario with no production tax credit, the cost of the RES scenario is only marginally higher than the no wind scenario (rising from \$60.667 billion to \$60.891 billion). [Xcel Energy 2007 Resource Plan, page 5-12.]

The projection of RES costs is a complex matter, and as the history of the MCCAG estimates shows, changing assumptions can make it dramatically different. There are at least two problematic underlying assumptions that contribute to the MCCAG RES cost estimate being so high:

(1) Wind cost estimate unrealistically high. There was a tremendous increase in the estimated cost of wind power between the November 2007 analysis and January 2008, rising from \$50.60 per megawatt hour to \$153.7/MWh (see page G-63). The component of wind costs responsible for this leap is the capacity cost for wind, which jumped from \$38.9/MWh to \$131.3/MWh. This clearly had a huge impact on the analysis because it now estimates that wind power costs almost three times more than coal power, which is far from the case. The reason this price went up so high apparently relates to a decision to reflect a reduced capacity credit for wind in order to reflect its intermittent nature. However, the reason Minnesota passed such an aggressive RES in 2007 was because the state's very detailed Wind Integration Study showed that adding this quantity of wind to the system could be done with only a modest additional cost to integrate the wind into the current grid. In other words, that study showed that wind's intermittent nature, while not irrelevant, adds to overall costs only minimally. The MCCAG report, by contrast, appears to assume that wind's intermittent nature triples its cost.

Here again there is a dramatic contrast between the assumptions embedded in the MCCAG report (which assume wind costs of \$153.70/MWh) and those made by Xcel in its IRP. Xcel projects far lower wind costs of \$58.50/MWh for 2010-2015 and of \$78/MWh after 2015 when it assumes the production tax credit won't be available. Xcel's estimates include an ancillary service cost based on the Minnesota wind penetration study of 2006. [Xcel Energy 2007 Resource Plan, page 5-12]

(2) New renewables are compared to old coal plants, not new ones. Another analytical problem with the RES calculation is that the cost of new renewables are compared solely to the cost of existing coal, rather than to the much higher cost of new coal plants. We know that the RES has reduced the demand for new coal plants from Minnesota utilities. GRE was formerly a partner in the Big Stone II plant and it cited the RES as among the reasons why it pulled out of that project. Similarly, Xcel formerly had a great deal of new coal capacity in its Integrated Resource Plan.

In a final conference call discussion held by the MCCAG to discuss the draft report, there was general acknowledgment that the wind cost number was very high. However, with the process at its end, this issue was not resolved.

The extremely high cost of the RES is important because the RES is an important part of the cost curve that is fed into the computer model that determines what it would cost Minnesota to comply with a cap and trade program. Moreover, because the cap and trade modeling process derived cost curves for our regional trading-partner states by adjusting the Minnesota cost curve according to the carbon intensity of the various state economies. This means that the impact of overestimating the cost of an RES is amplified throughout the region. While it is difficult to know the impact of this cost overestimation on the cap and trade numbers generally, it could be substantial.

When additional modeling is done under the Midwest Governor s Association process, it is important that it use a more realistic estimate of RES costs.

*Barbara Freese, Union of Concerned Scientists, Minnesota Center for Environmental Advocacy, Izaak Walton League of America -- Midwest Office, Fresh Energy, Global Green Energy LLC, Institute for Agriculture and Trade Policy, Clean Water Action*

## **ES 6: Nuclear Power Support and Incentives**

The Next Generation Energy Act of 2007 (Chapter 136, 2007 Session Laws) sets energy policy goals that: (1) the per capita use of fossil fuel as an energy input be reduced by 15 percent by the year 2015, through increased reliance on energy efficiency and renewal energy alternatives; and (2) 25 percent of the total energy used by the state be derived from renewable energy resources by the year 2025. (Minn. Stat. 216C.05, Sub. 2). This is not good enough. Timelines must be accelerated and goals must be elevated. The citizens of Minnesota, through their elected representatives, must consider global warming as the world emergency it really is. Solving the global warming crisis requires the highest allocation of financial, scientific, and other resources that our world of nations has ever seen beyond the resources devoted to our efforts in world wars, the Marshall Plan, or the Apollo Project. The solution lies partly in research and development of renewable energy resources. Nuclear energy is a **devil s bargain** - a target for terrorists and a dirty, linear chain of events from mining to waste disposal. The solution also requires personal involvement and sacrifice. Citizens must adopt personal conservation measures set forth by our elected leadership and proactively practice sustainable lifestyle choices.

*Tom Casey, West Metro Global Warming Action Group, Mound, MN*

This is probably the single most important way to reduce CO2 emissions and coupled with more plug-in electric/hybrid automobiles has the promise to do more than all the other proposals combined covered in the MCCAG report. Furthermore, it will result in decreased costs of electricity, especially compared to natural gas. This should be given a very high priority with a shorter time frame for a number of nuclear plants. Government loans should be given to utility companies with interest and payback delayed until production begins.

*Richard J. Petschauer, Edina, MN*

Any further analysis of increasing nuclear power to reduce GHG emissions should include a full cradle to grave GHG accounting . The mining, transport, and refining of Uranium is incredibly fossil fuel intensive. Furthermore, nuclear power stations often need supplemental power from the grid to operate safety systems, so this added stress to grid must also be accounted. Finally, the issue of nuclear waste can not be ignored simply because it does not emit GHG.

*Matthew Tyler, Finland, MN*

The option in the table for Nuclear Power (ES-6) was unanimously approved by the group with clarifications. This group was a mixture of business and environmental interests, so I think this represents an indication that the group thought this was an option that could not be ignored. The clarifications were

simply that we needed to assure ourselves of the safety of this. I believe this is based on a lack of understanding of nuclear power. I would recommend a book by Gwyneth Cravens entitled *Power To Save The World: The Truth About Nuclear Energy* to answer any questions concerning safety, nuclear waste, etc. In addition, there is a memo from the Energy Supply Technical Working Group (ES-TWG) of the MCCAG, which was prepared as part of the final report of this working group, that shows the potential cost advantages of nuclear power. This is documented on the MCCAG website at <http://www.mnclimatechange.us/ewebeditpro/items/O3F14774.pdf>. On page 5 of this memo there is a table called Levelized Costs of New Electric Generating Capacity. This table makes it clear that new nuclear power is cheaper than any of the viable alternatives except pulverized coal. Pulverized coal represents a coal plant with no improvements to reduce CO2 emissions...

I still believe that nuclear power is the best method to have a truly substantial impact on greenhouse gas emissions. Wind power can never be more than a minor component because of the unpredictable nature of the power source. If cheap methods of storage can be developed, wind power can be a major contributor. Research has been going on for years for cheap and effective ways to do that. Coal power with carbon capture and sequestration will always be more expensive than nuclear and we will still have the massive amounts of toxic combustion residue to deal with. I would recommend a change in the Renewable Energy Standard to accommodate nuclear power.

*Jerry Hinderman, North Oaks, MN*

Nuclear power - this recommendation does not consider at all the life cycle of CO2 emissions of nuclear, much less the magnitude of the full life-cycle CO2 emissions of nuclear.

*Carol A. Overland, Red Wing, MN*

*"Nuclear Power Support and Incentives (ES-6):* The possibility of a new nuclear power station in Minnesota, though clearly advantageous from the perspective of comparing its GHG emissions to those from coal-fired generation, was an option that the MCCAG believed required more study." Comparing a new nuke with coal is irrational. Rather, if nuclear is to be evaluated, it should be compared with equivalent investment in demand side measures, wind, solar, and storage. Lovins and many others have consistently demonstrated the economic non-viability of new nuclear capacity and the superior economics of demand-side investments. Experience in California has also validated the effectiveness of demand-side investments.

*Alan Muller, Red Wing*

## **ES 8: Advanced Fossil Fuel Technology Incentives, Support, or Requirements, including Carbon Capture and Storage**

Mesaba energy project should not be exempt from pollution emission regulation. We need to move forward and not be implementing 100 year old technologies. Renewable energy is the only way forward if we want to keep our planet from catastrophic changes.

*Chad Johnston, Bovey, MN*

No additional fossil fuel power plants (such as the planned Big Stone 2 and the Mesaba IGCC plants) should be allowed unless they have a functioning carbon dioxide capture and storage/re-use (CCSR) system functioning from their first day of operation. To curb major greenhouse gas emissions and build the infrastructure for a sustainable future, we need to be putting our energy sector financial resources into renewable energy (e.g., wind and solar, with energy storage) and into retrofitting existing fossil fuel plants with CCSR technology. There are several carbon capture technologies currently available at pilot or near-commercial scale around the world that could be used. (See, for example, the Carbon Capture Journal website at <http://www.carboncapturejournal.com/>.) These include CO2 capture using chilled ammonia, monoethanolamine, other amine solvents, Mitsubishi Heavy Industries' proprietary solvent (which has been in commercial use in a urea fertilizer plant in Malaysia since 1999), and CO2 cooling/liquification (Denis

Clodic, et al., France.) Descriptions of systems that collect and store carbon-neutral renewable energy (wind, solar, hydroelectric, etc.), and that can convert captured CO2 to useful products in a carbon-neutral, energy efficient manner, are described in international patent applications PCT/US2008/051533 and PCT/US2008/050805, which will be published about mid-August, 2008. I am very disappointed that the MCCAG was unable to present clear recommendations on implementing Policy Option ES-8, since the final report states (page 37), Emissions associated with electricity generation and imports to meet in-state demand is projected to be the largest contributor to future emissions growth.

*Dr. Dale R. Lutz, Maplewood, MN*

Open Letter to Minnesota Legislature SUBMISSION TO MINNESOTA LEGISLATURE  
REGARDING MINNESOTA LEGISLATURE CLIMATE CHANGE ADVISORY GROUP'S  
RECOMMENDATION TO EXEMPT A PROPOSED COAL-FIRED POWER PLANT, EXCELSIOR  
ENERGY, FROM CO2 EMISSION RESTRICTIONS

I was informed that the Minnesota Climate Change Advisory Group (MCCAG) is recommending to the Minnesota Legislature that Excelsior Energy's proposed coal-fired power plant (supposedly IGCC) can go ahead and burn as much CO2 as they want. According to MCCAG, this coal-fired plant should be exempt from any restrictions on its CO2 emissions.

It would be in the interest of each one of us - wherever we are - not to pursue fossil fuel burning in any of its forms or shapes. Without environment there is no economy. Fossil fuel burning will not only irreparably damage your local environment - I mean it is your Minnesota. Wouldn't you want it to be beautiful and livable? - but it will add GHG to our collective planetary atmosphere.

Imagine YOUR Minnesota being ravaged with Excelsior's fossil fuel operation not for the sake of producing your energy it was already established that Minnesota didn't need more energy, especially not from a coal-fired plant but for its own sake. Excelsior's survival method in No Demand / No Customer situation in Minnesota was to force a local utility into buying its dirty power. The utility said No. No means No. Really!!! (PUC rejects Iron Range power plant project Pioneer Press Nov 1, '07)

Even if you needed to produce more energy, why would you ever go with the environmentally destructive technologies especially those based on fossil fuel burning? To award public moneys to a fossil-fuel burning plant which is proposing to destroy local and global environment by producing energy no one needs is tragic.

It is unbelievable that this Excelsior's proposed coal-fired plant received millions from the Renewable Development Fund. When did fossil-fuel burning, which is choking our Planet to death, become renewable??? This question, though, is not meant to trigger the blah blah on IGCC, ZLD and CCS. I am really not interested in indulging in false hopes which are propping Ole King Coal and driving each one of us to extinction. Gassing the planet with fossil fuel burning (includes nuclear) is a job almost completed. What more is there to be said about fossil fuel burning than that we need to abolish it immediately?

Many within Minnesota Climate Change Advisory Group do not agree with the MCCAG final decision, which is recommending to Minnesota Legislature to exempt Excelsior's proposed coal-fired plant from CO2 emissions restrictions. Many members of MCCAG are representatives from local community, faith and environmental groups who joined hoping to ensure the wellbeing of their environment. I believe that they participated in a stakeholder consensus building process, which was rigged from start.

It is safe to conclude this because among other things, the State of Minnesota already invested millions of public monies into Excelsior's cause, gave this corporation power to exercise eminent domain meaning to kick people off their land for new transmission lines and exempted Excelsior from public hearing in determining whether power is needed. (Coal gasification arguments Nov 21, '03 MPR) Also, Excelsior's VP, Richard Stone acts as a member of the MCCAG's Energy Supply Technical Working Group, which convinced the MCCAG to recommend to the Governor that this project be allowed to proceed. (Letter to Legislators Feb 18, '08 Citizens Against the Mesaba Project <http://www.camp-site.info/letter.html>) Many of Excelsior's executives have been involved in companies that were fined \$25 million for manipulation of California's energy market. (Public Citizen, Nov 10, 2003 Minnesota's Excelsior Energy to Receive \$800 million in Loan Guarantee in Energy Bill). They also have ties to NRG Energy Inc. which filed for bankruptcy in 2003 taxing its parent company Xcel Energy Inc. with \$752 million (NYTimes May 15, 2003 NRG Energy Files for Bankruptcy Protection). Xcel Energy is a local utility in Minnesota that refused to buy dirty energy from Excelsior's proposed coal-fired plant. Xcel owns

two nuclear plants involved in controversy over their nuclear waste storage. More on Xcel:

[http://en.wikipedia.org/wiki/Xcel\\_Energy](http://en.wikipedia.org/wiki/Xcel_Energy)

Dear Minnesota Legislators, your decisions about fossil fuel burning in Minnesota are of concern to all of us. I live in Ottawa, Ontario and I am very concerned about Excelsior's proposed coal-fired plant in your state. This is so because accumulation of Greenhouse Gases in this planet's atmosphere through fossil fuel burning sees no boundaries. It affects us all however close or far we happen to be from those coal-fired plants. In addition, Excelsior coal-fired plant wastewater would discharge into the Upper Mississippi River watershed. (Excelsior Energy Announcement Agreement to undertake major water quality improvement program - paragraph 2 - January 21, '08)

<http://energyfacilities.puc.state.mn.us/documents/16573/Excelsior%20Press%20Release-ZLDWQ.pdf>

Ottawa's watershed is part of the Mississippi watershed. Billions tons of Excelsior's heavy metals would end up in this watershed. Excelsior's heavy metals are directly connected to the wellbeing of my unborn child. Brain damage and birth defects result from ingesting water, food and air contaminated with heavy metals.

Excelsior fled from its previously selected East Range site because of the Lake Superior watershed requirement for Excelsior to have Zero Liquid Discharge wastewater treatment facility ( Excelsior Energy: Environmental Consciousness or Desperation? January 25, 2008, Ed Anderson Co-Chair, Citizens Against the Mesaba Project CAMP <http://www.camp-site.info/> scroll down) At the end, even if it was implemented, Zero Liquid Discharge facility still needs to find dumping grounds for hazardous solid waste, which is byproduct of coal-fired plant wastewater treatment. Your decisions concern Life on this Planet, including your own life. The times when we could observe the smoke of burning bodies from our green soccer fields is gone because the fire is catching on. Why fan the fire? Extinguish it starting with Excelsior!

[FYI: <http://www.camp-site.info/> <http://www.mncoalgasplant.com/> Ivona Vujica [ivujica@gmail.com](mailto:ivujica@gmail.com) Ottawa.

IGCC stands for Integrated Gasification Combined Cycle. Read more about IGCC:

<http://www.energyjustice.net/coal/igcc/factsheet.pdf> ZLD stands for Zero Liquid Discharge It is a factory on its own:

<http://www.hpdsystems.com/en/industries/zeroliqidischarge/> <http://www.hpdsystems.com/en/industries/industrysolutions/power/>

Instead of forsaking your water to the private water treatment interests, keep it clean and public. Don't build fossil fuel burning plants. Go green. Invest in a mix of renewable technologies for every building in Minnesota. CCS stands for Carbon Capture and Sequestration. In addition to dumping CO<sub>2</sub> in the atmosphere, CCS approach would also dump it in the ground. But why pursue CCS when the only recourse to our collective survival is abolition of fossil fuel burning. People are ready for the green economy. GHG stands for Greenhouse Gases such as CO<sub>2</sub> and Methane Minnesota Climate Change Advisory Group <http://www.mnclimatechange.us/ewebeditpro/items/O3F15517.pdf>. What is Excelsior Energy? [http://www.excelsiorenergy.com/mesaba/description\\_frame.html](http://www.excelsiorenergy.com/mesaba/description_frame.html)

Later Submission: Correction regarding info on Mississippi watershed While Ottawa, Ontario is located in the Mississippi Watershed of Eastern Ontario, Mississippi watershed in Eastern Ontario is different from the Mississippi watershed in Minnesota. Located in the Upper Mississippi watershed, Excelsior Energy would be discharging its waste and cooling water close to the source of the second longest river in the U.S., which starts at Lake Itasca in Minnesota and ends at Gulf of Mexico, passing through major U.S. cities. Billions tons of Excelsior's heavy metals would end up in this watershed. Heavy metals impact the wellbeing of unborn children. Brain damage and birth defects result from ingesting water, food and air contaminated with heavy metals. Corrected version available at :

<http://floodiceorfire.wordpress.com/2008/04/25/excelsior/>

*Ivona Vujica, Ottawa, Canada*

Exemption of Big Stone II and Mesaba is beyond the scope of the charge of the group, and contrary to the charge to devise a plan to **REDUCE** CO<sub>2</sub> emissions. The Mesaba Project does nothing to reduce CO<sub>2</sub> emissions. Advanced Fossil Fuel Technology has been reviewed in great and exhaustive detail by the PUC and the ALJs in their report to the PUC, where it was found that IGCC does not provide superior environmental performance (emissions profile sucks), and is not in the public interest. There is no basis for a recommendation for further study, it's been studied enough, and such a recommendation is against evidence in the record of the Mesaba Project. From the ALJs' recommendation: The MPCA compared the Project's carbon dioxide emissions with three other existing facilities and with EPA's three types of future generic plants. Again, the MPCA presented its comparisons as percentages by which the other actual or

hypothetic facilities varied from the Project's emissions. The MPCA employed pounds of CO<sub>2</sub> per million BTUs as the unit of comparison:

<u>Plant</u>	<u>CO<sub>2</sub></u>
Wabash	-9.5%
Existing PC with BACT controls	+10.3%
Desert Rock SCPC	+2.8%
SWEPCO Hempstead USC PC	+0.5%
EPA generic subbituminous SC	-4.2%
EPA generic subbituminous IGCC	-17.0%
EPA generic subbituminous USC	-13.3%

The MPCA's analysis establishes that carbon dioxide emissions from other technologies are expected to be lower than the expected carbon dioxide emissions from the Project. The recommendation of the Greenhouse Gasbag group is uninformed and against evidence. There is no justification for wasting further time on advanced technologies.

*Carol R. Overland, Red Wing*

## **ES Other Comments**

Near the bottom of the table is a line that shows the cost and effectiveness of the Renewable Energy Standard that has been enacted in Minnesota. The cost of this standard is \$7.5 billion between 2008 and 2025. And the cost per ton of CO<sub>2</sub> emissions reduced is \$56/ton. This is a cost based mostly on importing wind power. It is difficult to accommodate this power in the grid because it is not base load, that is, it cannot be predicted when the wind will blow and the wind power generated at night may not be usable when the load requirements are significantly less.

The recently enacted Consumer Incentive Plan (CIP) requires annual energy savings of 1.5%. If these savings are actually achieved it will be even more difficult to accommodate this wind power because existing power plants will have to be cycled off and on or idled. These plants produce power at a significantly lower cost than wind power and there are other costs of cycling these plants in addition to the cost differential of the basic source. These costs have not been adequately taken into account in this analysis.

*Jerry Hinderman, North Oaks, MN*

New NASA satellite studies and others show increasing evidence that the fine particulates of wood combustion/wood smoke and others contribute heavily to climate change. This is because pollution in clouds thins cloud formation and interferes with the seeding of rain and snow. Burning biomass is not clean energy. Wood may be green, but the combustion is the problem. The fine particulates harm the air, our lungs, water, food supply and the planet. The dioxins in wood smoke are bioaccumulative and are implicated in reproductive defects. PLEASE CONTACT me, Julie Mellum, 612-926-109, for more information. Or see [www.burningissues.org](http://www.burningissues.org).

*Julie Mellum, President, Take Back the Air, Minneapolis, MN*

I am concerned that giving the Mesabe project an exemption from emission standards will allow pollutants into the atmosphere resulting in global warming at a time when it should be our primary concern.

*Kenneth Hamilton, Waseca, MN*

Sierra Club MCCAG Comments. Energy Supply Sector. Author: Dale Lutz.

Part 1 of the report, in the middle of page 37 states: Emissions associated with electricity generation and imports to meet in-state demand is projected to be the largest contributor to future emissions growth, Fig. 1-2 on page 38 estimates the electricity (consumption based) contribution to gross GHG [greenhouse gas]

emissions to increase from 40 MMtCO<sub>2</sub>e [million metric tons of CO<sub>2</sub> equivalent] in 2000 to about 65 MMtCO<sub>2</sub>e by 2025. The figure also shows that this sector is expected to produce the largest absolute increase in gross GHG emissions between now and 2025.

Executive Summary Figure EX-3 (part 1, page 15) assumes completion of the Big Stone 2 coal-fired plant and the Mesaba IGCC coal-fired power plant (without arguing for or against them.) These facilities are projected to produce 5.1MMtCO<sub>2</sub>e/yr (million metric tons of CO<sub>2</sub> equivalent per year.) It also assumes backing down of other facilities to match demand if these plants come on line. The rule of holes states that when you find yourself in a hole, the first thing you should do is stop digging yourself deeper. Since coal-fired power plants are the largest single source of carbon dioxide emissions, one of the most obvious ways to address climate change is not to build or expand new coal-fired power plants, which commit us to carbon emissions from these facilities for decades.

Recently NASA Scientist Dr. James Hansen sent a letter to Governor Pawlenty expressing grave concerns around global warming related to the Big Stone II coal plant proposal sharing statements such as, A direct implication is that we cannot be aiming for a 50, 80, or 90 percent reduction of emissions. We must transition over the next several decades to practically zero net CO<sub>2</sub> emissions. Thus our energy focus must be to develop carbon-free energy sources and energy efficiency.

The Sierra Club is opposed to new coal fired power unless projects can be demonstrated to mine coal responsibly, burn it cleanly, and does not contribute to global warming. Right now, coal meets none of these criteria. While IGCC designs may be more compatible with carbon capture and storage (CCS or sequestration), no approach currently exists to do so on a commercial basis. All new coal plants should be built with the potential to sequester CO<sub>2</sub>. Big Stone II and Mesaba have not demonstrated a realistic capacity to do so. Aside from these considerations, these projects have not adequately demonstrated that they are needed. Big Stone II and Mesaba plants should not be allowed to go forward without having carbon capture and sequestration/re-use in place and operating as soon as the plants are brought on-line.

This approach is at least partially supported in Appendix G, Energy Supply Sector Policy Recommendations, under Policy Number ES-8, which the Minnesota Climate Change Advisory Group (MCCAG) voted unanimously as recommended for further study. The policy goals for ES-8 state that, For coal to play a significant role in Minnesota's future energy system, its overall environmental profile must improve and come as close as possible to producing zero CO<sub>2</sub> emissions, while producing energy that is both affordable and reliable. The Timing portion of the goal statement says, By 2020, the Upper Midwest Region (Minnesota, Wisconsin, and North and South Dakota) should have at least two IGCC [Integrated Gasification Combined Cycle coal plant] projects with carbon capture and storage through design, construction, and into full operation. (One of the specific IGCC demonstration projects mentioned is Excelsior Energy's Mesaba project in northeastern Minnesota.) This will require plant re-design, as well as establishing and implementing a credible plan for dealing with the captured CO<sub>2</sub> (including associated legislation and infrastructure.) In the meantime, the Sierra Club believes that any additional electricity generation capacity added should be carbon-neutral with priority placed on energy efficiency measures and renewable energy (such as wind and solar - either from commercial providers or as distributed generation by individual consumers.)

The ES-8 Implementation Mechanisms section also mentions IGCC in conjunction with renewable energy, such as wind power and/or hydrogen production, possibly referring to Xcel Energy's Wind to H<sub>2</sub> project with the National Renewable Energy Laboratory in Colorado. Sierra Club is opposed to increased electricity generation from nuclear power. Although nuclear power produces less CO<sub>2</sub> than fossil alternatives, nuclear power is not safe, affordable, or clean with currently available technology and practice. Mining uranium risks workers' health and creates toxic residues. Clean energy resources are sufficient to address climate change and are cheaper than nuclear power. In addition, the huge investment to bring additional nuclear facilities online would siphon capital from much more cost-effective uses of financial resources, especially investments in efficiency.

The Minnesota Climate Change Advisory Group (MCCAG) voted unanimously to recommend for further study of Energy Supply working group proposal ES-6, Nuclear Power Support and Incentives. According to an April 16, 2008, article in the St. Paul Pioneer Press (page 1C), Xcel Energy said it wants to extend the lives of its two reactors at the Prairie Island nuclear power plant near Red Wing by another 20 years and also boost their power generation. That would require approval by the Minnesota Public Utilities Commission to allow Xcel to store more spent radioactive fuel in containers on the grounds of the plant, which is next door to the Prairie Island Mdewakanton Dakota community. An article in the same newspaper the next day (April 17, 2008, page 2C) stated that The Prairie Island Indian Community Tribal

Council said Wednesday that it has 'very serious concerns' about a proposal by Xcel Energy to extend the license of its Prairie Island nuclear power plant another 20 years. ... 'We're extremely concerned about the prospect of re-licensing the Prairie Island plant, or any nuclear power plant, at this time,' Prairie Island Tribal Council President Ron Johnson said in a statement. This brings up issues of public resistance to nuclear power, nuclear waste disposal, nuclear proliferation, susceptibility to terrorist attacks, and environmental justice for groups disproportionately affected by nuclear waste, such as Indigenous populations like the Prairie Island Mdewakanton Dakota community.

Sierra Club requests any further study of nuclear power includes at a minimum: inclusion of groups disproportionately affected by nuclear power plant siting and waste storage; siting, risk, and costs associated with waste disposal; the impact on nuclear energy prices with the repeal of the Price-Anderson Act which acts as a government subsidy by severely limiting the liability of nuclear power plant owners in the case of accidents, and the level of government subsidy (including existing subsidies like the Price-Anderson Act) required to make nuclear energy cost-competitive with other energy sources.

Energy Supply policy proposal ES-3, Efficiency Improvements, Re-powering, and Other Upgrades to Existing Plants, was unanimously approved as an 8% (later revised to 1%) biomass co-firing at coal-fired power stations. This proposal was modeled such that Wood wastes and forest residues are the major form of biomass to be used, at a flat price of \$2.5/million British thermal units (MMBtu), in 2005 dollars. The Sierra Club is concerned that this policy would encourage increased deforestation and illegal logging. The study apparently does not consider the additional vehicle emissions from transporting the forest residue to the coal-fired plants. Please see Sierra Club's comments on the Agriculture, Forestry, and Waste Sector in which we share more detailed concerns around biomass.

If, after all energy efficiency measures are met and renewable energy supply is exhausted, actual need for a new coal-fired power plant can be adequately demonstrated, (which we believe is an incredibly difficult case to make considering changes in investor status, as well as Department of Commerce testimony suggesting adequate need was not demonstrated in the Big Stone II proposal as two examples.) we require that the coal-fired plants must also have in place the best available pollution control equipment, to avoid release of soot and carbon particulates that contribute to global warming and serious health and environmental hazards, as well as the various toxins associated with wood smoke at uncontrolled facilities. Furthermore, there is increasing competition for wood wastes and forest residues, as described in the St. Paul Pioneer Press article from April 6, 2008 (page 7D), titled Once waste, sawdust fetches big price. The subtitle reads, Sawmill byproducts find a ready market among dairy farmers, pallet makers and other manufacturers. The article states that these sawdust buyers are paying up to \$50 a ton or more. That's double what they paid a year ago, some say. A sawmill operator is quoted as saying, "It's gotten to the point where wood shavings, which are popular with horse farms, are worth more than the lumber. ... We use every part of the tree. It's become so valuable you can't afford to not sell everything."

Energy Supply proposal ES-1, a General Performance Standard, was passed by the advisory group by a simple majority, with 16 objections. The policy goal was to prevent utilities from making a long-term financial commitment to base-load generation plants with carbon dioxide (CO<sub>2</sub>) emissions in excess of 1,100 pounds of CO<sub>2</sub> per megawatt-hour (MWh). However, At its last meeting, the MNCCAG decided that this option would not apply to the planned Big Stone II and Mesaba coal plants. Therefore, no benefits or costs are ascribed to this option. We recommend that Big Stone II and Mesaba be required to meet this standard. MNCCAG fails to realize the impact of locking Minnesota into decades of energy generation by allowing current coal-fired power plant proposals, namely Big Stone II and Mesaba, to be excluded from global warming pollution reduction recommendations. Failing to address these proposals will result in significant increases of CO<sub>2</sub> emissions which directly contradicts the state's goal to reduce emissions. The cost analysis applied to Big Stone II and Mesaba only included construction and operation costs, thus it does not take into account the increasing cost of coal and potential for costs around carbon regulation. Even without the full analysis of high social, environmental, and financial costs, had MNCCAG applied the expected emissions and cost of these projects to the Final Reports recommendations, the state would be saving a tremendous amount of pollution and money in its plan for addressing global warming.

*Cesia Kearns, Sierra Club, Minneapolis, MN*

Exemption of Big Stone II and Mesaba is beyond the scope of the charge of the group, and contrary to the charge to devise a plan to REDUCE CO<sub>2</sub> emissions: The report assumes exemption of two large CO<sub>2</sub>

emitters, Big Stone II and Excelsior Energy's Mesaba project. This exemption is stated, but the statute provides only for the group to: (7) evaluate the option of exempting a project from the prohibitions contained in section 216H.03, subdivision 3, if the project contributes a specified fee per ton of carbon dioxide emissions emitted annually by the project, the proceeds of which would be used to fund permanent, quantifiable, verifiable, and enforceable reductions in greenhouse gas emissions that would not otherwise have occurred. Minn. Stat 216H.02, Subd. 4(7)

*Carol A. Overland, Red Wing, MN*

## **V. COMMENTS ON TRANSPORTATION AND LAND USE**

### **TLU 1: Improved Land-Use Planning and Development**

As co-chair of the Land Use and Transportation Committee I can say our group concurs with much of the report. We might suggest you look at density bonuses to assist developers; look at better regulation of ex-suburban growth (nothing beyond the MUSA line, for instance, a practice not applied now); and encouraging employers to provide greater flex time schedules and work-at-home or satellite office possibilities. We once led the nation in this regard but we have fallen off substantially -- this would reduce stress on current infrastructure and reduce carbon via less commuting. We strongly endorse smart growth, too, but realize there may exist other modalities of density that would work just as well. We strongly support the integration, rather than separation, of retail, commercial development and housing, which is addressed somewhat here but we would love to see an even stronger case made for it. Thanks for your efforts.

*Frank Jossi, Co-chair, Land Use and Transportation Committee, Minneapolis*

The report cites an extremely (and in our view unrealistically) low rate of growth for projected vehicle miles traveled in MN. The projections of vehicle miles traveled (VMT's) used in the report came from MNDOT, which claims that because VMT's appear to have 'leveled off' in the last two years, VMT growth between now and 2025 will be one-third of what it was between 1990 and 2000 (0.8% annually, in other words). We think this is very tenuous logic, and it leads to a low projection of gasoline consumption. Our analyses (Olabisi et al. 2008) indicate that VMT growth between now and 2025 will average 1.8% annually, barring a severe, extended economic downturn. The result is that projected improvements in transportation efficiency included in the report have seemingly low impact.

*P Reich (Regents Professor, Dept of Forest Resources, U of Minnesota)*

*E Nater (Professor & Department Head, Dept of Soil, Water and Climate, U of Minnesota)*

*S Hobbie (Associate Professor, Dept of Ecology, Evolution, and Behavior, U of Minnesota)*

*J Espeleta (Research Associate, Dept of Soil, Water and Climate, U of Minnesota)*

*C Fissore (Research Associate, Dept of Soil, Water and Climate, U of Minnesota)*

*L Olabisi (Research Associate, Ecosystem Science and Sustainability Initiative, U of Minnesota)*

*A Ek (Professor & Department Head, Dept of Forest Resources, U of Minnesota)*

Policy Option: TLU-1 Improved land use planning and development strategies. Primary author Brett Smith.

While they are separated out here in the comments form, in the body of the report, the recommendations which address the goal of reducing the vehicle miles traveled are grouped together. Since our comments on these strategies are similar for most of the individual policies, our comments on them are collected here and simply referenced at other points in the comment form. First, we commend MNCCAG for recognizing the significance of a reduction in vehicle miles traveled and for proposing creative and credible approaches to reducing this key variable. Given the large share that the transportation sector contributes to Minnesota GHG releases and given the additional benefits to things such as air quality, congestion, land use, etc., a reduction in VMT is a crucial accompaniment to strategies to clean up our fuels and improve the efficiency of our vehicles. These comments apply to TLU-1 (Land Use), TLU-2 (transit, bikes, and walking), TLU-5 (transportation pricing), and TLU 9 (workplace tools). Taken together, these strategies would significantly impact GHG emissions from the transport sector.

While we commend MNCCAG for endorsing all of these programs, either unanimously or with a super-majority, we are disappointed in the lack of emphasis on implementation strategies and follow up. While there are lots of good ideas for implementation, we do not have confidence that there is a commitment on the part of decision makers who will influence these projects to actually carry them out. Just as one example of this lack of commitment is the Governor's veto of funding for the Central Corridor Light Rail system. This action flies in the face of the unanimous recommendation to expand transit and does not bode well for the implementation of programs in this area. While other programs may not be actively opposed we do not see, at this point, a real commitment on the part of governments or businesses to take the steps necessary to reduce VMT significantly.

A final comment is the cursory way in which these policy recommendations were summarized in the body of the report rather than in the appendices. It seems like the public in reading this report would be/is trapped between an Executive Summary or Report that contains insufficient detail and appendices which contain too much.

*Cesia Kearns, Sierra Club, Minneapolis, MN*

With 25% of MN's carbon emissions coming from transportation and the rapid rise in VMT in the past decade, this seems a critical area for the State and its partners to focus their efforts. We need to invest as much as possible as soon as possible to expand transit options in the state. More public transit that is also frequent and affordable will get people out of their cars. More transit oriented development is key. Invest in pedestrian and bicycle infrastructure and make the Twin Cities the Copenhagen of the U.S. Segregate bike streets, prioritize bikes over cars, and create a bike culture where bikes are fast and easy and we too could be closing in on a goal of 50% of daily trips made by bicycle.

*Hillary Oppmann, Minneapolis, MN*

### **TLU 3: Low-GHG Fuel Standard**

The write-up on TLU-3 makes no mention of the work of Prof. David Tilman of the Univ. of Minn. who states that the rush to meet rising ethanol mandates causes grasslands and forests to be plowed under. This releases CO<sub>2</sub> at a much greater rate than any savings that can be achieved, even under the most optimistic scenarios on the rest of the process. I have heard no one refute that claim. In addition, there have been several recent studies indicating that increases in ethanol mandates have contributed substantially to rising world food prices. The section on Key Uncertainties in TLU-3 makes no mention of those points.

*Jerry Hinderman, North Oaks*

Policy Option: TLU 3: Low GHG fuel standard. See comments for TLU 1 and TLU 6

*Cesia Kearns, Sierra Club, Minneapolis, MN*

I am concerned about the lack of sustainability around biofuels, particularly ethanol derived from corn. Pushing for more ethanol use is not the solution. There are too many negative consequences for our land, water and food supply. We should push for reduced consumption and improved mileage standards. Cars and trucks with the best mileage rating/lowest carbon emission should be taxed at a lower rate.

*Hillary Oppmann, Minneapolis, MN*

### **TLU 6 Adopt California Clean Car Standards**

Policy Option: TLU-6 Adopt California Clean Car Standards. Primary author Brett Smith.

The Sierra Club commends MNCCAG for adoption this recommendation by a majority vote. This is an issue where the vested interests of some participants (i.e. the auto dealers and manufacturers) resulted in a great deal of misinformation and unnecessary debate. The fact that the TLU Technical Working Group

was loaded up with individuals representing organizations with a vested interest in defeating this recommendation made the process very difficult. It is laudable that a majority of the MNCCAG members supported this recommendation. The troubling fact is that those who are attempting to implement this recommendation at the Legislature this session are getting no help at all from the Governor who is supposed to be committed to reducing GHG s. We fear that this is just one very obvious example of a broader pattern in which the recommendations which are somewhat politically controversial will not be a part of the Governor's agenda.

*Cesia Kearns, Sierra Club, Minneapolis, MN*

## **TLU 9: Workplace Tools to Encourage Carpooling, Bicycling, and Transit Ridership**

This section is mislabeled online as Procurement of Efficient Vehicles (p. 5-6). I strongly support this and all the other policy options that shift people to more physically active forms of transportation. Please make sure this guidance gets down to the county and local levels.

*Bill Ostrem, Northfield Area Task Force on Non-motorized Transportation, Northfield*

## **TLU 13: Reduce Maximum Speed Limits**

The West Metro Global Warming Action Group is in full agreement with reducing maximum vehicle speed limits.

*Tom Casey, West Metro Global Warming Action Group, Mound*

Adoption of the Green Slow Moving Vehicle action symbol to encourage motorist's to VOLUNTARILY reduce speed. This effort has been going forward at the grassroots' for over two year's and has major support both within the state and globally. Thru education and market pressure, changing behavior by showing motorist's a better way to drive is a long lasting change in driving habits. Our symbol includes a educator for the back of the vehicle and a dashboard reminder to remind motorist's to set cruise control at maximum efficiency performance. We have received recognition from many sources; including, University of MN. newspaper, Duluth News Tribune, various small town newspaper's, MN Public Radio, KUMD, Wildside News, and even a article in a Large Irish Newspaper. The program is practically free and encourages voluntary behavior change in the best American Tradition. I encourage you to at least investigate our web site at [WWW.greenslowmovingvehicle.com](http://WWW.greenslowmovingvehicle.com).

*Fulton Hanson, Green Slow Moving Vehicle, Hinckley*

I support the reduction in speed limits. It requires no new technology, can immediately be implemented, and has the side benefit of saving lives. I know there will be some initial backlash, but we need to make some tough choices that require some behavior changes by individuals, not just mandates on industry.

*Brian Nerbonne, Minneapolis, MN*

## **TLU 14: Freight Mode Shifts: Intermodal and Rail**

The West Metro Global Warming Action Group is in full agreement with the transition from truck to rail transportation.

*Tom Casey, West Metro Global Warming Action Group, Mound*

## **TLU: Other Comments**

Plug-In Electric Hybrid Cars.

Except for long trips, very little gasoline would be needed. Charging at night during off-peak hours would minimize the need to increase electric transmission capacity. This compliments nuclear power plants that are more efficient at full capacity; electric rates at night could be lower. This also has the benefit of reducing dependence of foreign oil.

*Richard J. Petschauer, Edina*

Page 5-5 TLU Area 1: Reduce VMT

The information in parenthesis (This flat VMT is from MDOT projections assuming that higher fuel prices and other factors dampen VMT growth) is confusing or incorrect. A 15% reduction in per capita Vehicle Miles Traveled in Minnesota by 2025 would come from implementation of the six strategies recommended by the MCCAG, not projected flat VMT absent implementation of any strategies. MnDOT's December 2007 projection for VMT growth of 0.9 percent per year is less than what growth has been historically (2.2 percent per year), but VMT is projected to continue to grow in part because of an expected increase in Minnesota's population.

*Barb Thoman, Transit for Livable Communities, Saint Paul, MN*

## **VI. AGRICULTURE, FORESTRY AND WASTE MANAGEMENT (AFW)**

### **AFW 1: Agricultural Crop Management**

This item: "**Agricultural crop management:** Implement programs that incentivize growers to utilize cultivation practices that build soil carbon and reduce nutrient consumption. By building soil carbon, CO<sub>2</sub> is indirectly sequestered from the atmosphere. New technologies in the area of precision agriculture offer opportunities to reduce nutrient application and fossil fuel consumption." [6-4] is valid and appropriate, but seems to be directly contradicted by this one: "**Expanded use of forest and agricultural biomass:** Expanded use of biomass energy from residue removed from forested areas during treatments to reduce fire risk, crop residues, or purpose-grown crops can achieve GHG benefits by offsetting fossil fuel consumption (to produce either electricity or heat/steam). Programs to expand sustainably procured biomass fuel production will likely be needed to supply a portion of the fuel mix for the renewable energy goals of ES-5." [6-4] Depletion of soil carbon is a direct consequence of increased removal of crop residues and conversion of additional land to annual energy crops. These practices should NOT be encouraged in the name of GHG reduction.

*Alan Muller, Red Wing*

### **AFW 3: In-state Liquid Biofuels Production**

The West Metro Global Warming Action Group encourages the use of biomass energy, other than food sources, for biofuels.

*Tom Casey, West Metro Global Warming Action Group, Mound, MN*

I am concerned about how biofuels will be produced in MN. While I might support use of perennial prairie grasses, I am to the large scale conversion of CRP land and wetlands to cropland.

*Julia Nerbonne, Minneapolis, MN*

Biofuel production is causing an increase in worldwide food costs. This is already threatening to destabilize developing nations where food is a huge percentage of people's expenditures. We must consider this effect as we contemplate devoting more of our land to biofuel production. Also, we should consider the Nature Conservancy report that shows net carbon loss from corn-based ethanol production on lands converted from prairie, wetlands, forest, etc. to cropland. This issue must be addressed if we are to see any gain at all from our biofuel use.

*Brian Nerbonne, Minneapolis, MN*

## **AFW 4: Expanded Use of Biomass Feedstocks for Electricity, Heat and Steam Production**

The West Metro Global Warming Action Group encourages the expanded use of biomass energy from residue of the wood processing industry.

*Tom Casey, West Metro Global Warming Action Group, Mound, MN*

Sierra Club MCCAG Comments. Sector: Agriculture, Forestry, and Waste. Policy Option: AFW-4, Expanded Use of biomass feedstocks for electricity, heat, or steam. Authors are Brett Smith and Lois Norrgard.

We commend MNCCAG for recognizing the potential significance of biomass as a renewable energy source to substitute for more problematic energy resources such as coal, oil, natural gas, or nuclear power. We believe that under proper conditions, biomass can be a useful addition to our renewable resource base. With that said, we want also to note the many caveats and preconditions that must be met if biomass is in fact going to be a truly clean and renewable resource. To MNCCAG's credit many of the conditions noted by the national Sierra Club policies are also recognized in the AFW-4 document. This AFW list includes proper siting, proximity of source to use, impact on water supply and quality, control of air emissions, solid waste management, cropping management, nutrient management, soil and non-soil carbon management, and impacts on biodiversity and wildlife habitat.

To these concerns, we would add requirements regarding the right to know and the right to participate in the decision making process be met. In addition, we are concerned that permits be written in a way which guarantees that dirty biomass such as treated wood or RDF not be included. The Club firmly opposes the incineration of mixed municipal solid waste or refuse derived fuel and firmly opposes the use of our native, natural forest lands as a source for biomass removal - especially Federal forestlands. Because of its historic commitment to forest protection, the club generally opposes the expansion of forest biomass production. In 2006, the Club adopted the following policy statement: The Sierra Club opposes the unsustainable exploitation of forest ecosystems. Typical practices use waste wood from harvest operations to run semi-portable milling equipment, undermining efforts to restrict forest cutting in remote, pristine and fragile areas. The use of forest residues from logging or forest fires is widely proposed as a source of renewable energy with limited or no net greenhouse gas emissions. However, there is little likelihood that the current energy resource provided by forest biomass can be increased sustainably.

The Sierra Club opposes biomass energy projects that use federal lands as a source of supply. Sierra Club entities may support small-scale forest biomass-to-energy projects on non-federal lands where they are carefully monitored and designed as part of a sustainable system equal to that required for Forest Stewardship Council certification. Particular Concerns regarding using forests as source for biomass:

1. Forests have the highest value of all land types for ecosystem services. \$33 trillion / 28 million acres = 1.2 million /acre. Bob Costanza at the University of Vermont developed a methodology that assigns a monetary value to 17 ecosystem services. These include soil formation, recreation, nutrient cycling, water regulation and supply, climate regulation, habitat, flood and storm protection, food and raw materials production, genetic resources, atmospheric gas balance and pollination. A team of researchers from the United States, Argentina, and the Netherlands has put an average price tag of US\$33 trillion a year on these fundamental ecosystem services, which are largely taken for granted because they are free. That is nearly twice the value of the global gross national product (GNP) of US\$18 trillion. What is the value of forests ecosystem services compared against industrial logging? [1] Adapted from R. Costanza et al., *The Value of the World's Ecosystem Services and Natural Capital*, Nature Vol. 387 (1997), p. 256, Table 2.

2. The Sierra Club opposes use of green woody biomass for energy production derived from National Forests. The National Forests should be a magnificent system of public lands managed to maintain and restore the health and integrity of ecosystems, providing all Americans with an outstanding natural legacy that will be passed along unimpaired to future generations. Primary objectives should be to protect environmental values such as clear water, clean air, wildlife habitat, and biological diversity and to provide the nation with an ample source of wilderness, undiminished open spaces, and access to outdoor recreation.

The protection and enhancement of these values will be considered the prime domain of the National Forests as they are increasingly absent, or unavailable, from private lands. The National Forests should serve as the cornerstone for large-scale ecosystem protection and conservation of an interconnected network of wildlands in America. It is of great concern to the Sierra Club that in Minnesota the intermixture of State and National Forest lands makes it virtually certain that some of the input for increased biomass production would come from National Forests.

3. The Sierra Club has determined that use of woody biomass for energy production is less efficient than other renewable biomass. (i.e. diverse native prairie used for biomass/biofuel production) Other sources may also have additional environmentally promising consequences. Burning of wood for energy releases carbon rapidly and requires many decades of forest renewal to sequester the same amount. It is a myth that woody biomass is carbon neutral, especially in the timeframes that MCCAG is working under. It would only be around 2050 that we would be adequately re-sequestering the carbon that the burning of wood today would emit. Other renewable sources may yield a much more rapid return and be more desirable in other ways than use of woody biomass. Burning of wood is also an instantaneous release of carbon which would take decades to release through decay.

4. Minnesota lacks a systematic program to measure biomass removal for energy use and lacks long-term ecological studies of the impact of such removals. It is imprudent to rush unchecked into massive use of woody biomass without additional research to assess its relative value compared to other renewable forms, as well as its impact to other ecosystem services from our forests such as wildlife habitat, clean water, clean air, recreation and carbon sequestration. Regardless of the exact total of woody biomass currently removed from Minnesota forests for energy purposes, there is no question that the amount is massive compared to only a few years ago. The Sierra Club is concerned that across the landscape the impact from the use of our forest lands for biomass production has been far underestimated.

5. Sierra Club supports additional research and consideration of our forestlands as carbon sinks for present and future sequestration over the use of our natural forests as biomass source. The Club opposes any additional harvesting pressure on Minnesota forests until the issues of climate change and carbon sequestration can be taken into account for the aggregate effects of all projects aimed at energy production under the concept of renewable resources. The scientific community is not in agreement as to biomass fuels carbon spectrum over time. Younger forests have shallower roots and if managed by frequent rotations will likely deplete surface nutrients and compact soils. Stands managed as old growth sequester more carbon: (study of forests in British Columbia) 25 year old forest: 12,000 lbs of carbon / 25 = 480 lbs of C per acre per year x 44/12 = 1,760 lbs of CO<sub>2</sub> per acre per year 120 year old forest: 128,000 lbs of carbon / 120 = 1,066 lbs of C per year per acre x 44/12 = 3,909 lbs of CO<sub>2</sub> per acre per year.

6. Massive amounts of forest biomass removal proposed from this new Industry must be carefully analyzed. Using large amounts of coarse and fine woody debris from logging sites either at the time of harvest or by return visits for collection can be a problem for ecosystems. The contribution of woody residue to soils, new growth, biodiversity, and animal habitat is unquestioned. Logging already typically results in leaving much less residue on the ground than naturally occurring blow downs, etc. Removal of woody biomass, including residues, at the currently existing aggregate level has unknown consequences for the forest ecosystem. This is especially true of fine woody debris for which there is little science at all.

7. Wood burning for energy may not be a viable industry for the future. New science increasingly points out that burning wood for energy is not carbon neutral, enhances climate change, enhances small particulates in our air creating health risks, and may not be a long term viable industry to be pursued at this time. In addition:

8. We question the safety the ash being generated by this industry. Are these agricultural sources for using the ash and/or are there landfills for handling the overflow? Are we equipped for handling large amounts of ash? 9. Other impacts of this increased extraction to our forest lands in particular wildlife impacts threatened and endangered species, lynx, boreal owl, migratory songbird populations as well as many others. Conversely, the Club is particularly supportive of combined heat and power systems that produce both electricity and steam or other useful heating or cooling services. This support for CHP does not extend to coal fired power plants, but makes no other qualification.

To summarize, the Club supports properly designed and managed biomass projects, but has a number of concerns about such projects and believes, essentially, that the devil is in the details. Using biomass for electricity, heat, or steam generation can be supported, but only under carefully analyzed and controlled conditions. The Club is particularly supportive of combined heat and power projects. The

MNCCAG report seems to agree with our general approach; however, care must be taken with each individual project to assure that it meets the necessary conditions.

*Cesia Kearns, Sierra Club, Minneapolis, MN*

## **AFW 5: Forestry Management Programs to Enhance GHG Benefits**

The West Metro Global Warming Action Group (WMGWAG) encourages the increased plantings of fast-growing, environmentally sustainable agricultural and forestry species in appropriate locations. The West Metro Global Warming Action Group encourages the improvement of urban forestry management in local city and county parks, as well as housing and commercial real estate developments, to help achieve the 25% canopy cover objectives stipulated for 2025.

*Tom Casey, West Metro Global Warming Action Group, Mound, MN*

As noted in the General Comments on Process, serious questions have been raised by Professor Peter Reich and his colleagues at the University of Minnesota about many of the recommendations related to this sector. They are also the main authors of the Minnesota Terrestrial Carbon Sequestration Report to the Department of Natural Resources, *The Potential for Terrestrial Carbon Sequestration in Minnesota*. They raise particular objections regarding AFW-5, which appears to greatly overestimate the reductions available from forest management. For example, the experts challenge the MCCAG assumption that there are a million acres available in the state for new forests, and also challenge the assumed rate at which new forests would sequester carbon. They estimate that rather than sequestering 8.4 million tons in 2025 through restocking (under item D), that option could reasonably be expected to sequester only 0.7 million tons by that year.

Had this information been before the MCCAG during its deliberations, there is little doubt MCCAG would have relied far less heavily on reductions in this sector, and would have pushed even harder for reductions from other sectors. It is critical that, in the ongoing process of selecting policies to achieve the state's reduction goals, Minnesota policymakers adjust the MCCAG recommendations to reflect new data such as this.

*Barbara Freese, Union of Concerned Scientists, Minnesota Center for Environmental Advocacy, Izaak Walton League of America -- Midwest Office, Fresh Energy, Global Green Energy LLC, Institute for Agriculture and Trade Policy, Clean Water Action, Saint Paul, MN*

The Mesaba plant should not be exempted from this document. The tremendous loss in long term carbon sinks from the loss of forest ecosystems due to the Mesaba CG power plant goes against all science data. We lose a couple of square miles from the plant footprint alone, then the thousands of acres lost from ROW for transmission lines, railroads, roads, etc. that will never be forest again. Combine this with the carbon additions from several train loads of coal train diesel exhaust from the locomotives transporting coal from their distant source (Montana, Wyoming, Western ND or possibly worse yet- mountain top removal in West Virginia). Geologically, the Mesaba CG plant cannot sequester CO<sub>2</sub> in the ground at the northern Minnesota sites. Add to this the loss of the resource to forest industry and the fragmentation of the forest ecosystem and it is not worth any benefits. I see no reason why this Mesaba power plant deserves exemption as it will significantly increase GHG, lose our carbon sinks (trees), hurt forest industry (renewable product), impair forest health, and reduce populations of forest interior animals.

*Harry Hutchins, Grand Rapids, MN*

This item is of concern: "**Enhancement/protection of forest carbon sinks:** Through a variety of programs, enhanced levels of CO<sub>2</sub> sequestration can be achieved and carbon stored in the State's forest biomass. These include reforestation programs, restocking of poorly stocked forests, urban tree programs, wildfire risk reduction, and other forest health programs." [6-4] Promotion of biomass burning is associated with curious conclusions that greatly increased rates of cutting are appropriate (Massachusetts, Idaho ....) Similarly, "forest health programs" all too often turn out to be euphemisms for unwise cutting. Thus, I see

potential for very perverse outcomes. The report proposes *"Expanded Use of Biomass Feedstocks for Electricity, Heat, or Steam Production"*. *The potential feedstocks associated with this policy are biomass normally unused under any existing program, meaning: • Any organic material grown for the purpose of being converted to energy. [...]"* [I-44]. However, no feedstock can be "converted to energy" short of the use of nuclear reactions. We can only oxidize carbon to carbon dioxide and hydrogen to water..... This suggests a misunderstanding so fundamental that it is difficult to respond to it. The provisions for encouraging biomass burning take no notice of the increased air pollution that would result.

In Table I-8 "ethanol plant energy use per gallon of ethanol" is identified as 33,330 btu (natural gas) plus 0.75 kWh of electricity, equivalent to about another 6500 btu, for a total of about 40,000 btu/gal. The lower heating value of ethanol is 76,000 btu/gal, leaving a net energy value of about 36,000 btu/gal, disregarding all the other inputs (!). This alone should be enough to show that the mass-production of corn-ethanol as a motor fuel is unwise and all incentives for the growth of this industry should be eliminated as soon as possible.

The report proposes to address this issue by using "renewable energy"--biomass--to operate ethanol plants. But *"The emissions from the renewable energy inputs were assumed to be zero."* [I-32] Obviously this is not the case and quantified "benefits" based on this assumption are invalid.

*Alan Muller, Red Wing*

## **AFW 7: Front-End Waste Management Technologies**

The Association of Minnesota Counties (AMC) and the Solid Waste Administrators Association (SWAA) appreciate the opportunity to comment on the Minnesota Climate Change Advisory Group's (MCCAG) recommendations. This letter of comment will focus on Waste Management Policy Recommendations in the Agriculture, Forestry and Waste Management section, namely AFW-7 and AFW-8, one of which has been identified as one of the top three areas where greenhouse gas reductions could be achieved. Due to the brief comment period, AMC and SWAA both reserve the right to make future comments on these and other related issues should they arise.

While there was a county representative on the MCCAG, we do not feel there was ample time or opportunity allowed for county participation outside of the Technical Working Groups. Counties are responsible for implementing many of the programs MCCAG made reference to in their recommendations and there has been minimal to no allowance for in-depth county input on those matters. Overall we believe that the recommendations MCCAG developed, in particular those involving local units of government, need more input from local units of government if counties are expected to carry out the work.

Counties have been managing recycling and solid waste management programs since the 1990s, and the outcomes are outlined in the State's annual SCORE report. The current recycling levels for the State are primarily the result of county investment in the waste management system. We are committed to continuing our current efforts in the area of solid waste management and recycling. However, if increased goals are to be achieved it is clear that there will need to be more dollars available for these efforts. According to the 2007 Pollution Control Agency's (PCA) 2007 Solid Waste Policy Report, in 2006 counties spent over \$42 million of county funds on SCORE-related activities and the state contribution was \$14 million. The report indicates that this county investment is in addition to undocumented dollars spent by other local units of government, such as cities and townships on programs for recycling, household hazardous waste, and waste education.

**AFW-7 Front End Waste Management Technologies, Recycling:** AMC and SWAA agree with the concept outlined in AFW-7 that focuses on front-end aspect of waste management. However, as the target for waste reduction increases, it becomes increasingly expensive, comparatively, to recycle and reuse each additional item. Recycling consists of five different activities:

Separation of the material to be recycled

Collection of the recyclable materials

Preparing those materials for market

Transportation of the material to a market

Conversion of these materials by manufacturers into new products

Each of these activities consumes resources, including energy, and may produce adverse environmental impacts in excess of those consumed by proper local reuse, conversion, or disposal. This is especially true in the rural areas of the state, which are far from reasonable end markets and transportation costs are high.

These facts make it very important for the state to not establish blanket mandates, but to allow the local conditions to set the means and methods of reclaiming materials for reuse or recycling. The market for reclaimed materials has not developed to the point where the revenues from the collected materials can fully support recycling programs. The reality is that reclaimed materials seldom match the consistency and quality of virgin materials and thus increased demand does not necessarily equal higher prices for recyclables. The opposite supply and demand economic law, however, does apply to recyclables -- increased supply of reclaimed materials usually reduces the market price. Providing increased economic incentive for collection activities without effective market development may exacerbate the situation and lower the values of the reclaimed materials.

Increased education, public advertising, and increased hours of operation can increase overall participation and diversion. However, a point can be reached when recycling practices mature and costs associated with increasing yields exceed the benefits. The recycling rate will become flat because it will reach an inevitable plateau. There is some room to improve the existing county systems, but there is a limit. Any significant gains in recycling will come from either development of markets for materials presently being thrown away or development of cheaper ways to recycle. It is time for federal and state policy makers to consider financial measures for recycled material that would create meaningful incentives for recycling and enable local governments to keep and expand the recycling programs they offer.

**Source Reduction.** Many businesses and industries have implemented solid waste reduction activities as part of their business plans; however, additional improvement is advised. As prices of raw materials and energy resources rise, there will be a greater incentive for industries to use these materials more efficiently to reuse or recycle many wastes and by-products. There is a need to expand the Pollution Control Agency's Beneficial Use Rule. This new procedure allows, where possible, industrial waste to be recycled or reused, thus diverting this waste stream from either an industrial or sanitary landfill. Further work should expand the 2007 CD&I Report to address the industrial waste stream throughout the entire state. Significant source reduction for residents requires actions outside a county's sphere of influence, and a large reduction in waste production would require national action.

**Composting.** The goals of environmental protection via composting of yard wastes are best met when the composting occurs very close to the property producing the yard waste. Back yard composting eliminates the costs and environmental effects of transporting the waste to a central site as well as the finished compost. This is particularly true of greater Minnesota where the population density is 1/30th of that of the Metro area. Central composting facilities may be useful for sources separated organic wastes that would otherwise take up landfill space or processing facility capacity. Such facilities should be encouraged, but not mandated. Planning and implementing of these facilities must be done from a local perspective to make them effective.

**AFW-8 End-of-Life Waste Management Practice.** Landfilled Waste Methane Presently in Minnesota, four of the 21 active municipal solid waste (MSW) landfills are required to either install an active gas collection system or prove that their Non-Methane Organic Compound (NMOC) emission rate is less than 50 Mg/year, under the New Source Performance Standards (NSPS). These four landfills represent 70 percent of the state's MSW land disposal capacity and three are considering landfill gas-to-energy projects and one currently operates a gas-to-energy project. The remaining landfills in Minnesota are small rural county landfills which face a number of challenges with respect to landfill gas-to-energy projects. Rural settings make an energy recovery project more expensive to convey the energy to distant energy customers. Most of these landfills are not designed to promote the production of landfill gases and do not receive sufficient quantities of wastes to make an active gas collection system economically feasible.

**WTE Preprocessing.** A requirement for all waste to be pre-processed prior to combustion in a waste-to-energy (WTE) facility to remove non-combustible materials (e.g., metal and glass) would not necessarily increase the efficiencies in a mass-burn WTE facility. In order to remove such materials in a front-end process, the waste would need to be hand sorted, or shredded and mechanically processed into a refuse derived fuel. The former would not be practical at medium and large WTE facilities due to large volumes of wastes while the latter would significantly increase the amount of un-processed wastes being land filled, losing the benefits of energy recovery. Waste to energy facilities reduce the generation of methane, these facilities are a good end-of-life waste management option and counties will continue to work with the state to receive support and guidance on the development of these facilities.

**Conclusion.** The MCCAG participants worked through many issues in a very short period of time and their efforts to talk about greenhouse gas emissions are greatly appreciated. After a brief review of the suggestions we feel that several questions and concerns remain and need to be discussed surrounding

the area of solid waste management. An overarching concern is that the report projects a decrease in waste generation by 2025. Despite all efforts made in the state, waste generation continues to rise and absent significant state and federal policy initiative and investments waste generation will continue to rise through 2025. There are many different possibilities that could be looked at more closely to achieve increases in recycling rates and it is of our opinion that this will only be achieved through a variety of fundamental changes in how recycling is conducted or overseen. County organizations would welcome participation in any future discussions about implementation of these goals.

The Association of Minnesota Counties and the Solid Waste Administrators Association thank you for the opportunity to provide the MMCAG group with our initial comments. If there are any questions please contact Annalee Garletz, at 651.789.4322. Thank you for considering our concerns.

*Annalee Garletz, for the Association of Minnesota Counties and the Solid Waste Administrators Association, St Paul, MN*

**EUREKA RECYCLING S COMMENTS TO MCCAG REPORT - AFW SECTIONS** The following are the comments that Eureka Recycling is submitting regarding the final draft report issued by the Governor s Minnesota Climate Change Advisory Group.

We have been following with interest the work of the Agriculture, Forestry, and Waste Working Group, particularly their work and considerations given to the issues encompassed in the recommendations that are presented in AFW-7 and AFW-8. We would first like to preface these comments with the recognition and acknowledgement that many people put in an extraordinary amount of work to develop these recommendations. We would like to thank them for their time and effort. However, we also feel that we need to say that we feel that this process was too compressed for time in order to allow for the full vetting and consideration of all the issues and the true costs or benefits of their implementation. In addition, all the appropriate organizations were not included in the process and their expertise was either ignored or excluded, particularly around the issues of environmental justice, waste prevention, composting, and recycling. We certainly hope that this will be corrected in the ensuing actions as the Policy Designs that are outlined in AFW-7 and AFW-8 are begun to be considered for implementation. Our organization is the state's sole environmental and non-profit organization working on waste reduction issues and other organizations, such as EJAM, are working on environmental justices and should be included in the next phase as these policies begin to be enacted.

The report can easily be misinterpreted to believe that the goals of AFW-7 and AFW-8 can both be met. The case is that the GHG reductions are an either/or scenario. The intent of these goals needs to be clearly understood and stated. The AFW-7 policies are described as Front-End Management of the MSW stream. These goals are attainable, more affordable, and contribute to a more sustainable future in Minnesota, and because of these reasons, they need to be prioritized ahead of any of the End-of-Life Management goals. AFW-8 policies and goals are meant to be considered and enacted only after the achievement of AFW- 7 initiatives. As the document is currently constructed, AFW-8 assumes the failure of the achieving the Front-End Management goals, but we believe that will only happen if there is not enough financial support dedicated and statutory will afforded to AFW-7 initiatives. We also believe that the externalized costs of WTE and land-filling need to be included when evaluating the impacts of not achieving the goals of AFW-7.

**AFW-7:** The greatest gain in achieving GHG reductions would obviously be met by the attainment of the AFW-7 goals. This would also be the most cost effective manner to do so. The goals outlined in this policy are to achieve a recycling rate of 60% by 2025 and a composting rate of 15% during that same period. Throughout our observations of the process we often heard the comments that these numbers are not achievable, that recycling rates have leveled off and stabilized over the past decade. Yet during this time there has been a continued erosion of public spending on the recycling and composting, with no new significant investment in the development of new infrastructure. Public monies should be aimed at increasing the viability of composting not incineration or land-filling. By shifting public dollars towards composting infrastructure, Minnesota can experience similar increases in diversion goals to those seen in Canada, California, and cities in many other parts of the world.

In Toronto, the implementation of curbside organics collection resulted in a 14% increase in diversion. Two years after launching their program, San Francisco went from under 48% to a 67% diversion rate with recycling and organics collection. These cities responded to a state-led vision of comprehensive organics composting, not increased investments in disposal. These goals are achievable and

realistic, but require a committed and dedicated effort to achieve. There are also a multitude of mechanisms outlined in the AFW-7 that would facilitate reaching the goals of a 60% recycling rate and a 15% composting rate, but currently they are simply recommended mechanisms. We believe that the manner to best achieve these goals is to evaluate and prioritize these mechanisms while at the same time monitoring the progress toward the goals. At certain milestone dates, if a certain rate of progression to achieve those goals is not being met, then a progression of mandatory implementations of these mechanisms should be enacted in order to attain the desired rates of recovery.

**AFW-8:** Eureka Recycling does not support the land-filling or the incineration of waste. We have experienced and have helped others to experience the ability to not create waste none at all. So we do not to engage in the battles about which disposal method is preferred since ultimately neither is necessary. We are trying to reach the ultimate goal while we operate a very real and practical waste reduction and recycling operation right here in the Twin Cities. We advocate only for what we have experienced is possible in practical application. That said, we also find much the same. This solid waste policy, like MPCA strategic plans and much other state and county policy over the past ten years, is heavy in its preference for WTE over land-filling. We do not oppose this stance since it is encompassed in a battle between disposal methods that we do not fight. We also do not support it. The designers of this policy seem certain that burning trash versus burying it is preferable. That is not our issue with this report.

Our concern in this report is the lack of vision that created the kind of change we experienced over the last 20 years when we went from negligible recycling rates to today's nationally recognized rate. Instead we see the consistent implication that garbage is renewable with the required investment in the disposal infrastructure to claim this misnomer that outspends any proposals for source reduction, recycling, or composting in this or any past solid waste policy. This policy ignores the fact that WTE facilities and methane collection from landfills are not run for energy production and only produce a miniscule amount of energy in terms of potential to meet Minnesota's energy needs. Rather, WTE facilities and landfills are run as a way of making disappear our unwanted discards (our valuable resources) in a way that this report itself concludes will create polluting greenhouse gases and even dioxin. And all for a one-time, limited production of energy that eliminates the potential for harvesting and securing the massive amount of energy that is embedded in these items beginning with the mining process through to the ultimate end of life (burning or burial) of that material. And, in the case of compostable materials, burning or burying these materials eliminates the opportunity to get compost and soils back on to the state's farm fields.

We also know that this report inaccurately states the costs to achieve the stated goal of a 90% recovery rate of methane over the lifespan of a landfill. The goal of AFW-8 explicitly states that methane capture rate will be 90% for the entire lifecycle of the landfill, not just during the post cell-closure years. There are many widely varying estimates of what the current methane capture rate is at modern designed landfills from 46-75%. IPCC recently came out with an estimate that the capture rate may be as low as 23%. The cost estimates that are incorporated into the report were provided by a national waste management landfill owner, not independently verified. In addition, they are exclusively including pricing to increase the recovery rate of methane only after the LGE equipment has been installed. For example, a majority of food-wastes that are emplaced in a landfill decompose anaerobically (the decomposition process that generates methane) within the first 120 days of being dumped. It is usually up to 5 years before an active disposal cell is closed and methane capturing equipment is installed. Due to this, the cost calculations for the impact of this policy of reaching the 90% recovery goal are grossly understated, and the impacts on landfill operations are not currently understood.

Thanks for allowing us the opportunity to comment. We would like to know what the next steps in this process are and if we can receive a copy of all the comments. If you have any questions, please contact Tim Brownell at (651) 222-7678.

*Timothy Brownell, Eureka Recycling, Minneapolis, MN*

The MCCAG final report represents an important first step in helping the state find a way to meet its statutory emission reduction targets. However, we have concerns regarding the following broad issues within the Waste (AFW 7 and 8) policy options. The report can easily be misinterpreted to believe that the goals of AFW-7 and AFW-8 can both be met. Throughout the process, it was agreed by the MCCAG that the front-end waste practices, such as recycling and composting, are preferable to end-of-life practices due to their lower costs and higher greenhouse gas reductions. The greatest gain would be met by the attainment of the AFW-7 front-end waste management goals. These goals are achievable and realistic, but

require a committed and dedicated effort to be achieved. There are mechanisms outlined in the document that would facilitate reaching these but, currently they are simply recommended mechanisms. These mechanisms should be stepped up requirements that would reach significant milestones and further incentivize and/or mandate if the milestones are not met. As it is currently designed, these recommended mechanisms are purely voluntary which is a not different from the current status quo which has resulted in over \$312 million dollars worth of recycles being incinerated and landfilled in Minnesota annually.

*Shalini Gupta, Izaak Walton League of America, St Paul, MN*

**“Changes in municipal solid waste management practices:** *By concentrating on enhancing the source reduction, recycling, and composting practices in the State, significant GHG emission reductions can be achieved. Also, for waste remaining after full implementation of these “front-end” practices, appropriate GHG-beneficial “end-of-life” practices should be implemented including enhanced landfill gas collection & utilization and pre-processing of waste being sent to waste to energy recovery facilities.”* [6-4, 6-5] These goals for source reduction and recycling are appropriate and desirable: *Source Reduction—Achieve a 0% per capita increase by 2020 and a reduction of waste generation per capita of 3% by 2025. Recycling and Composting—Achieve a recycling rate of 50% by 2011 and 60% by 2025, and a composting rate of 10% by 2012 and 15% by 2020 (for a total diversion rate of 75% by 2025).* On the other hand, the projected continuation of incineration (35%) is NOT desirable. Garbage incineration is highly unpopular with informed citizens and is a big source of harmful air pollutants and toxic ash.

Table I-40 seems to project the incineration of 598,345 tons/year of food scraps. This would be irrational because food scraps are better composted or anaerobically digested. They usually have little heating value due to their high moisture content. Similarly, the projected incineration of 293,138 tons/year of "yard trimmings" would be irrational because this material would be better chipped/composted for use as mulch/compost. The projected incineration of 1,188,804 tons/year of "mixed municipal solid waste" is both unacceptable and unnecessary because properly organized "zero waste" programs will not leave this supply of such material. Overall, the proposals for waste management in this report are significantly better than recent MPCA documents.

*Alan Muller, Red Wing*

## **AFW 8: End-of-Life Waste Management Practices**

As an architect concerned about energy and the environment, I am disturbed by a growing trend of Waste-to-Energy plants that burn garbage to create steam for electricity. Burning garbage has significant health impacts, even with controls on specific emissions (not all emissions are controlled, and the levels of toxics emitted do not advocate a healthy life for the children growing up nearby). The solution to trash is composting, recycling, and reduction, moving towards a Zero Waste Initiative. When trash is a fuel, it encourages more trash generation, which is counterproductive to the true trash solutions. Methane captured from Anaerobic Digestion is a more environmentally responsible energy source, to ultimately replace the fossil-fuel form of natural gas. Solar technology is becoming excitingly more available, providing higher output and becoming less expensive. Wind is already a proven technology. Ground-source Heat pumps (aka Geothermal) are great methods to heat homes from the year-round available 55 degree earth. Conservation, although less sexy, is the most effective energy source, by reducing the need in the first place. I implore less burning, reducing carbon emissions, and more forethought in refreshingly modern technology. Thank you for thinking truly sustainably.

*Terry Olsen, AIA, LEED AP, Saint Paul, MN*

The Minnesota Resource Recovery Association believes that there were inaccuracies in calculating the actual net GHG decrease offered by waste-to-energy. Applying the EPA conversion factor to 2005 actual MSW disposal data, the figure of 189,834 MTCE of total GHG emission reductions from MSW is far too low. We believe that for 2005, the total GHG emission reductions from MSW going to waste to energy including electricity generated and recyclables recovered should be 792,958 MTCE. The USEPA figure does not accurately reflect all the variables that must be considered in this equation.

*Michael Reed, Minnesota Resource Recovery Association, Saint Paul, MN*

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of reaching the 90% recovery goal are likely highly understated, and the impacts on landfill operations are not currently understood.

*Shalini Gupta, Izaak Walton League of America, St Paul, MN*

## **AFW Other**

The MCCAG final report represents an important first step in helping the state find a way to meet its statutory emission reduction targets. However, we do have concerns regarding the following broad issues within the AFW policy options. Namely, the report relies too heavily on assumed large reductions associated with biofuels and biomass. With biofuels, the analysis assumed business as usual growth in overall transportation fuel consumption in the state which inflates the projected need for biofuels. Also, it did not take into consideration possible greenhouse gas emission issues related to land use change which could change the profile of the fuels. With biomass feedstock availability, estimates should in the future include quantities available following sustainable harvesting guidelines. Soil carbon sequestration rates associated with certain crops and practices (such as no-till) are also still uncertain, with numbers used in the analysis highly variable and needing verification with ongoing research. These uncertainties mean the state will likely need to adopt policies to reduce emissions from other sectors in addition to those recommended by the MCCAG.

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The MCCAG has an important and challenging goal: to help our state envision and plan for a lower carbon emissions future. This is an incredibly important and imperative task. We applaud this goal and all of the hard work that has gone into the current MCCAG recommendations. However, in our view, the MCCAG recommendations have an unrealistic (and potentially detrimental) reliance on how much GHG emissions reductions can be attributed to agricultural and forest lands and practices from 2008 to 2025. By recognizing these problems early, the state can focus sooner on the most important and effective steps needed to reduce emissions in technologically, economically and politically viable ways.

Our evaluation suggests that the current recommendations involving agriculture and forestry may be over-optimistic by >26 MMtCO<sub>2</sub>e of GHG reductions for the year 2025 (Table 1). In other words, the current recommendations promise four times more emissions reductions than can realistically be expected from these sectors. We reach a similar conclusion regarding MCCAG's recommendations for the entire 2008-2025 period. The phantom 26 MMtCO<sub>2</sub>e of GHG reductions represent half of the total reductions in the entire set of Recommendations for all sectors. Moreover, costs associated with GHG reductions associated with agriculture and forestry are likely under-estimated and require substantial adjustment. These are all major concerns.

However, our concern about the Recommendations extends beyond the specific issues regarding the details of each of the ways agriculture and forestry can or cannot reduce GHG emissions (and we note that we believe each can play a role, although likely smaller than envisioned by the MCCAG recommendations). Instead, our concern is that the MCCAG Recommendations, if seriously overstated, will distract the state of Minnesota from emphasizing the most important and effective emission reduction approaches, preventing the state from achieving real emissions in line with its ambitious and laudable emissions reductions targets, which include conservation and aggressive reduction of fossil fuel use.

Before focusing in detail on specific issues in the MCCAG recommendations, it may be useful to clarify who we (the co-signers of this commentary) are and how our expertise and experience are relevant to the issues raised. Collectively we are faculty and post-doctoral scholars in several departments at the University of Minnesota, and include two Department Heads and one Regents Professor. Much of our research, teaching, and outreach work is and has been on topics related to issues addressed in the recommendations. For instance, we are the main authors of the Minnesota Terrestrial Carbon Sequestration Report to the Department of Natural Resources, The Potential for Terrestrial Carbon Sequestration in Minnesota. We also collectively have been active in studying Minnesota's forests, agricultural systems, grasslands, soils, ecology, biofuels, and energy systems, and how these will respond to a variety of local and global environmental changes. Hence, we have been active in many of the areas addressed in the MCCAG recommendations.

Table 1. Here we compare our evaluations with those presented in Table EX-3 (Agriculture, Forestry, and Waste Management Policy Recommendations) in the MCCAG Executive Summary; the MCCAG values were in the fourth column in this table (labeled as 2025 GHG Reductions). When we did not examine the policy we assigned the same value to our analysis as in the MCCAG plan, these values are in italics, and listed ne in the notes. The GHG reductions are on an annual basis for the year 2025.

Policy Number	Policy Recommendation	MCCAG 2025 GHG reductions (MMtCO <sub>2</sub> e)	Our 2025 GHG reductions (MMtCO <sub>2</sub> e)	Notes (ne = not examined)
AFW-1	A. Soil C management	1.3	0	
	B. Nutrient management	1.3	1.3	ne
AFW-2	A. Preserve land	0.44	0	
	B. RIM-CE	0.19	0.10	
AFW-3	A. Ethanol C content	2.2	1.1	
	B Biodiesel displacement	0.19	0.19	ne
	C. Gasoline displacement	9.1	0	
AFW-4	Expanded use of biomass feedstocks	3.8	3.8	ne
AFW-5	A. Forestation	2.2	0.22	
	B. Urban forestry	2.7	0.89	
	D. Re-stocking	8.4	0.7	
AFW-6	Forest protection	2.7	0	
Totals for AFW1-6		34.52	8.30	

Although the majority of our comments below address the AFW1 through 6 recommendations, we have several comments about other sections (detailed below), as well as general comments.

First, the report does not address the relative uncertainty of the various GHG reduction strategies. GHG emissions reductions associated with land use conversions are generally more uncertain than reductions associated with lowering fossil fuel consumption.

Second, the methodology is inconsistent throughout the report. In some cases, life cycle emissions of proposed actions are taken into account, while in other cases they are not—with no clear justification. The report states that all emissions from electricity consumption that occurs within Minnesota are included in the analysis; however, in some cases these emissions are not considered (see more detailed explanation below).

Third, the language on ‘cost effectiveness’ is not consistent throughout the report. It is telling that the phrase ‘cost effective’ appears in the energy supply recommendations, but barely (if at all) in the agriculture, forestry, and waste management recommendations. According to MCCAG’s own analysis, several of the energy supply recommendations entail a negative cost—which suggests that they are ‘cost effective’.

In our view, the MCCAG recommendations have an unrealistic reliance on how much GHG emissions reductions can be attributed to agricultural and forest lands and practices from 2008 to 2025, and underestimate the GHG reductions that could be made in other sectors.. This could potentially be detrimental to the goals of making significant reductions in GHG emissions by 2025. In Table 1 we compare the MCCAG estimates and our estimates of the MMtCO<sub>2</sub>e from the various recommendations in AFW-1 through AFW-6, using the year 2025 for comparison with values in the Recommendations. According to the Recommendations, 66% of the entire set of emission reductions targeted for the period 2008 to 2025 would come from agriculture and forest management (including ethanol production)[AFW-1

to AFW-6] and 38% solely from land sequestration. Unfortunately many of these projected carbon reductions are likely substantial overestimates. Additionally, especially for forest land, the varied ownership (and associated objectives), globally influenced marketplace for forest products, and long startup time required, make the degree of reliance on forest lands unrealistic. This focus on agriculture and forestry as a source of GHG reductions (especially if overly optimistic), and the notion that we can rely on these to bail us out until 2025 (and beyond), makes it less likely that we will take the bold steps necessary to reduce emissions in substantive and technologically viable ways.

Concerns regarding the GHG emission reductions estimates from specific MCCAG policy options result from possible problems with the estimates of per acre GHG emissions offsets as well concerns about other issues, such as the availability of land for specific options. One further point on this latter issue involves the need to account for the land needed for all of the proposed changes. In total, MCCAG recommendations require 1,000,000 more acres for forests; 200,000 more acres for RIM-CE; more acreage for biofuel production; and reduced rates of loss of forest land. Yet the MCCAG plan does not make clear where these lands will all come from. An analysis needs to be conducted of the amount of farmland and other land that would be available for bioenergy production and C sequestration under various economic scenarios.

### **Agriculture, Forestry and Waste Management Recommendations**

Below we discuss the 12 quantified recommendations under AFW-1 through 6 (and for most of them provide an evaluation vis-à-vis the GHG reductions, relative to the MCCAG's numbers). In terms of those GHG reductions, as a standard reference point we'll contrast with the 2025 GHG annual reductions from the list of MCCAG recommendations.

#### **AFW1 Agricultural Crop Mgt**

A . Soil C management. Based on the recent analyses done for the MN DNR (**The Potential for Terrestrial Carbon Sequestration in Minnesota (2008)**), there is no statistical evidence that no-till provides a positive rather than a zero or negative impact on soil C storage. In essence, there is no scientific confidence that no-till provides any enhanced soil C sequestration. [Although this uncertainty is mentioned in the MCCAG Appendix, it is not considered in the recommendations themselves.] Our conclusion: the GHG emissions offset in AFW-1A should be zero (instead of 1.3 MMtCO<sub>2</sub>e). In addition to the statistical analysis made in **The Potential for Terrestrial Carbon Sequestration in Minnesota, 2008**, we offer the following points.

Micrometeorological flux research, which directly measures CO<sub>2</sub> fluxes between the field and the atmosphere, shows that there is no measurable difference between no-till and conventional tillage in side-by-side comparisons. These data have been collected by at least two research groups, led by John Baker (Rosemount Minnesota) and Sashi Verma (Lincoln, Nebraska). Likewise, nearly all studies based on soil sampling that sampled at least 40 cm deep show no significant difference between no-till and conventional tillage. The work of Dolan et al. (2006), which includes extensive deep soil sampling, shows that the overall contents of organic carbon in no-till and conventional tillage are very similar, but there is a difference in its distribution in the soil profile. As one might expect, organic carbon is highest at the surface in no-till (where residues remain at the surface to decompose) and decreases with depth; in conventional tillage (where surficial organic residues are buried during the tillage process) there is an increase in organic carbon just below the depth of tillage.

Although the jury is still out on this controversy, most of the more recent and the more rigorously designed studies are reaching the conclusion that there is little if any carbon sequestration benefit associated with reduced tillage. There are other environmental benefits (erosion control among them) associated with reduced tillage, as well as lower fuel usage (and hence, emissions) due to a reduction in the numbers and intensity of tillage passes on the field.

One of the items that is commonly brought up in support of the no-till/conventional tillage argument is that tillage increases aeration of the soil (true) and that this is the reason we have observed a significant reduction in organic carbon following conversion of prairie to row-crop agriculture. (This theory does not take into account the significant reduction in organic matter inputs associated with perennial prairie, which has a much more extensive rooting system and also accrues carbon for a longer period during the year.) Mike Sadowsky, a microbial ecologist in the Department of Soil, Water, and Climate, has stated that he feels that any soil that is sufficiently well-aerated to support the growth of roots (as agricultural soils are) of our annual crops is also sufficiently well-aerated for microbes to decompose organic matter, and that additional aeration will have only a minor impact.

For all of the above reasons, the safest assumption is that no-till has no effect on soil C sequestration.

B. Nutrient Management. We did not have the time yet to look at this in detail.

#### **AFW 2 Land-Use Management for Protecting and Enriching Soil C.**

A (Preserve land). These calculations seem inappropriate to us, at least as they are described in the document. Why does preserving land count as a carbon reduction? Our conclusion: the GHG emissions offset here should be zero, instead of 0.44 MMtCO<sub>2</sub>e.

B (RIM-CE). This could be promising. However the gains are all predicated on being able to obtain either liquid fuel or power from the biomass. The former is not yet viable (see our comments on AFW-3 below) and it is not clear just how much of these GHG emission offsets are being attributed to cellulosic ethanol rather than co-combustion. Additionally full life cycle analyses are not incorporated into these analyses; these would reduce the GHG reductions that would be achieved. Our conclusion: given these uncertainties, we suggest that a more realistic estimate is 0.10 rather than 0.19 MMtCO<sub>2</sub>e

#### **AFW 3 Biofuels**

In general, this section is poorly worded and it is difficult to follow the logic presented. Therefore, we provide an evaluation that is uncertain since we were not always clear exactly how the MCCAG estimates were made.

A. Ethanol C content. It is not clear whether all of the relevant ethanol GHG emissions (for which reduced carbon emissions during production are counted in this policy) are included in the Existing Actions accounts. For example, the line in Figure EX-3 deflects very little from the reference case emissions line (also thought of as the business as usual line). Table I-9 list the ramping up of ethanol production to meet renewable energy goals. If these emissions are included in the reference case projections (before or after accounting for Existing Actions) then the reductions attributed to use of biomass in ethanol production would appropriately count. We assume that is the case, but it would be good for this to be addressed explicitly.

Additionally, the Recommendations do not include the life cycle emissions from the renewable energy inputs to the reduced-carbon ethanol plants (these emissions are assumed to be zero, when in fact they could be substantial). Based on emissions reductions from substituting biomass for coal (and considering the lower GHG emissions associated with natural gas use), we estimate that biomass use would offset roughly half of the carbon emissions when life-cycle costs of biomass production are included. Our conclusion: the 2025 value should be 1.1 rather than 2.2 MMtCO<sub>2</sub>e

B. (small and we skipped it so far, but hope to address it)

C. 35% gasoline displacement. This very large GHG reduction seems inappropriate to us because it assumes we will reduce emissions by substituting fuel from biomass for gasoline using a technology (cellulosic ethanol) that is not commercially viable in 2008 and that can not be counted on to be viable by 2020 or 2025. We note that it is possible that the technology will be developed to generate liquid fuel and power from biomass within the next 5, 10, or 20 years, but we simply do not know whether and when this will become a reality and not a dream. Therefore, although assuming static technology is not realistic, it is also not realistic to depend on GHG reductions from technologies that are not operationally viable at present or in the near future. The Recommendations include gasoline displacement beginning in 2008. We don't see how this can be included.

Furthermore, there are large differences in the life cycle emissions of cellulosic feedstocks. Not all of these feedstocks would represent a reduction of 66% below corn ethanol emissions; this would be important once production of cellulosic ethanol began on a large scale. Our conclusion: the GHG emissions offset here (just in AFW-3 C) should be zero, instead of 9.1 MMtCO<sub>2</sub>e. Clearly there is considerable potential for this technology but it would more be more appropriately counted in a plan that targeted emissions reductions strategies further out in time (e.g., 2025-2040). If in a few years (or a dozen years) a viable cellulosic ethanol industry appears imminent over the next several year time horizons, it would be sensible to include this policy option in a GHG reduction plan.

#### **AFW 4**

(We have not looked at this substantively. Thus we keep the values in Table 1 intact)

#### **AFW 5**

A. Forestation. The Recommendations call for 1 million acres of new forest in Minnesota. Where will the land come from to support 1 million new acres of forest in Minnesota? Almost all land in the state is either already in forests, is in agriculture, or is in prairie, wetland, urban land or other uses that are also of value.

There is high demand for agricultural land wherever that is feasible, as well as development and parcelization pressures in the forest biome portion of the state.

The needed 1,000,000 acres of new forests will be extremely difficult to find under any realistic scenario. Although it might be possible to incentivize afforestation by payments to landowners, perhaps funded by sale of carbon allowances in a cap and trade program, the cost would most likely be prohibitive; especially anywhere that agriculture is a viable alternative. Agricultural land rented for anywhere from \$32 (Kanabec County) to \$125 (Sibley County) per acre in 2006 (Center for Farm Financial Management). Prices have escalated in the last two years, however, due to high grain prices. This would represent, more or less, a baseline for annual costs to incentivize landowners to convert lands to forest. At \$40 to \$100 million per year for 50 years, this is most likely cost-prohibitive. This does not include costs for establishment or maintenance of these lands.

Establishing new forest lands in the forested biome portion of the state will also be a challenge, as the vast majority of productive, accessible lands are already in use, largely as forests. Clearly there are some candidate lands that could be used in this context, but a goal of 1 million acres (representing a 6% increase in forest coverage) seems unlikely given the constraints.

Additionally, there would be difficulties in preparing and establishing a million acres of new forest by 2025. As an example, this might require 500 trees per acre or 500,000,000 seedlings in total. That is about 50 years production from our state nurseries (which produce about 10 million seedlings per year). These seedlings also cost about \$0.25 each about \$90 for 500, i.e., for an acre. The cost for the million acres of tree seedlings is thus \$90 million; and that is but one-third to one-fourth of the establishment cost, aside from land costs.

Additionally, the first few years following forestation will have very low (or even negative) carbon sequestration- that is not what the tables in the MCCAG Recommendations suggest.

Finally, there is some evidence (Gibbard et al. 2005) that warming effects that occur as relatively reflective agricultural lands are converted to darker forests that absorb more sunlight can offset some or all of the climate cooling effects of taking more CO<sub>2</sub> out of the atmosphere during forestation. A general conclusion has been that, although increasing C storage in forest biomass would have a cooling effect on climate (by reducing atmospheric CO<sub>2</sub> concentrations), in some regions conversion from grasslands or agricultural landscapes to forests could have a net warming affect given the lower albedo of forest vegetation.

Our conclusion: if 200,000 acres of land could be found for new forests (which we view as extremely optimistic) GHG emissions offset here would be 0.44 MMtCO<sub>2</sub>e, instead of 2.2 MMtCO<sub>2</sub>e. However, if changes in reflectivity offset half of that cooling effect, the gain would be 0.22 MMtCO<sub>2</sub>e.

#### B. Urban forestry.

The MCCAG recommendations are to increase the density of urban forests by planting an additional ≈32 million urban trees by 2025. The Recommendations assume a multiplier effect due to savings on building heating and cooling, such that from 2008 to 2025 the total C reductions attributed to increased tree density in urban forests is 3.88 times the actual C sequestration in the added trees. The MCCAG assumes a C sequestration rate in trees of ~6 kg C/tree/yr (~15 kg CO<sub>2</sub>/tree/yr) and a current urban tree cover of 37.4% for Minnesota, with a density of 189 trees/ha (~76 trees/acre), based on data from Nowak et al (2001). Additional trees planted in existing urban forests will not necessarily grow as fast as the current population of trees, because with a 37% canopy cover of larger older trees, there will be considerable competition for light, water and other resources from the existing trees. Based on tree responses to competition, the planted trees are likely to grow from as little as 20% to as much as 80% as much as the existing trees, with a growth rate of 50% a reasonable if crude estimate. We therefore first multiply the totals for each year (e.g., 2025) in Table I-19 of the AFW Appendix by 0.50 to account for this lower growth rate (yielding a value of 1.35 instead of 2.70 MMtCO<sub>2</sub>e for 2025 for example). This reduction applies to both the C sequestered in each tree and to the added GHG reductions from energy savings in buildings, as these are calculated by MCCAG as a direct multiplier of that in-tree C sequestration. Additionally, urban trees live on average approximately 32 years (Clemson Extension 1997), with substantial mortality in the first year following planting. Between 36 and 45% of all trees died in a 12 or 13 year interval in two Midwestern cities (Kielbaso 2008).

What would the impacts of mortality be on achieved C sequestration? To estimate this we assume 25% mortality within a year of planting and an additional 1% (of the original pool) mortality for each subsequent year, over the 2008 to 2025 period. However, urban trees that are planted and die during the 2008 to 2025 period are likely to decompose during that period, so no C uptake accomplished by any tree

that dies before 2025 should be counted for any year. Thus, the achieved C sequestration in 2008 for trees planted in 2008 should be multiplied by 0.75 to account for mortality. As each successive year includes sequestration accomplished by trees planted in all years from 2008 onward, the mortality rate used for all years beyond 2008 should be the average of the mortality rates of all years up to the year in question. As an example, for 2012 mortality would be 29% for those planted in 2008, 28% for those planted in 2009, 27% for those planted in 2010 and 26% for those planted in 2011, and 25% for those planted in 2012 with the average for all trees planted of 27%. Thus the achieved C emissions reduction for 2012 should be multiplied by 0.73 to account for this. By 2025 the mortality of trees of all age classes would average  $[0.43+0.25]/2 \approx 34\%$ , thus the achieved C sequestration would be 66% of that if all trees had survived.

Conclusion: once mortality is accounted for, the total urban forestry C sequestration achieved in 2025 would be 0.89 MMtCO<sub>2e</sub>; (2.70 MMtCO<sub>2e</sub> x 0.5 x 0.66). We view even this estimate as still optimistic as (a) it ignores any shortfall in planting >1.7 million urban trees annually from 2008 to 2025, which is a magnificent challenge, (b) ignores possible changes in albedo with urban forestation that could warm rather than cool the planet, (c) ignores the fact that any new urban tree planted during this initiative that replaces an existing large canopy tree that dies between 2008 and 2025, but that displaces a tree that would have otherwise been recruited to replace the dead tree, should be removed from the extra C sequestration account (but was not); (d) ignores the social challenges of convincing home-owners and residents that greater tree density is desirable in yards, parks, and other urban areas, (e) and assumes that the MCCAG estimates of substantial energy savings per tree from reduced heating and cooling costs are accurate.

D. Re-stocking. The GHG emissions reductions due to re-stocking in the MCCAG Recommendations seem unrealistically high. According to this policy, we will sequester carbon (thereby offsetting emissions) by planting additional trees in fully half of the states' forests by 2025—the costs and challenges are hugely underestimated and the success (or added C sequestration) per acre is overestimated. Forests as surveyed get counted as understocked when they have a lower density or basal area than is considered possible for the site type. However, less than full stocking occurs for a variety of reasons, all of which involve some real-world constraint to the establishment and/or growth of trees. It might be because there is a lot of shrub/brush competition, too many deer, the site was degraded during prior harvesting, a disease has taken out a large fraction of the trees, soils are rocky or wet, there was poor weather during the period of forest establishment for shade intolerant species (that are unlikely to establish later), etc. It is not the equivalent of say, leaving 100 acres out of 200 fallow, with the fallow 100 ready to be cropped indistinguishably from the other 100. Overcoming those barriers is not trivial and the efforts and costs are considerable. Even if trees are successfully under-planted, their growth for the next 10 years or so will typically be very slow, as (a) poorly stocked patches in poorly stocked stands are likely areas of poor site quality, (b) many if not most (except in unstocked stands) planted seedlings will encounter considerable competition for light and resources from the existing (and much larger) cohort of trees, as well as from brush and shrubs. Thus, gains (in C sequestered) will be muted by competition, herbivores, poor conditions, etc. Additionally, per tree, it will be much more expensive to establish new trees in the forest as compared to open or fallow areas.

It is also difficult to imagine a scenario in which we can realistically successfully get to even 25% of 8 million acres Recommended for re-stocking. The scope of this endeavor, and its challenges and costs are immense. Re-stocking 2 million acres would represent a remarkable achievement and come at considerable monetary cost.

Our conclusion: one-third of the gain per acre (of what is in the MCCAG plan) is a more realistic (yet still optimistic) assumption than the MCCAG Recommendations. If true, the cost per MMtCO<sub>2</sub> would be \$99 MMtCO<sub>2e</sub>, making this an extremely expensive option. Additionally re-stocking even one-fourth of the targeted acres would be a major accomplishment. Combining the lower GHG emission offset per acre with a lower estimate of acres re-stocked translates into a GHG emissions offset of 0.7 MMtCO<sub>2e</sub> per year, instead of 8.4 MMtCO<sub>2e</sub> per year.

#### **AFW6. Forest Protection; Reduced clearing and conversion.**

The key premise of this strategy is highly problematic. The notion that Minnesota lost 500,000 acres of forest land from 1989 to 2001 (as described in the 1990 to 2003 FIA surveys) is probably not true (see below). This loss however is the basis of GHG emissions included as part of the 2005 base line for Minnesota, so maintaining forest land area at a stable level (no loss, no gain) qualifies as a reduction in GHG emissions according to the MCCAG plan.

The FIA surveys are among the best long-term and wide-ranging forestry data bases in existence, but they are imperfect. A Minnesota-specific analysis by Alan Ek and colleagues (Ek et al 2005) noted a

number of ways the FIA surveys would have led to an erroneous measure of loss of forest land. We quote from that document: “Importantly, the apparent difference in total forest area largely disappears when adjustments are made for changes in procedure that affected 2001 estimates of reserved and other forest class estimates. In fact, the 1990 reserved forest description was not a field plot-based estimate. Rather, it was an estimate based on aerial photo interpretation plots and imputation methods (see section 4.21 of Jaakko Pöyry Consulting, Inc. [1992] for a description of this methodology for reserved forest). Beginning in 2000 (post blowdown) the BWCAW and other reserved forest became a regular part of the FIA survey. Thus the decline of 171,173 acres in reserved forest area from 1990 to 2001 was not real—it was actually the result of moving from an assumed forest area in 1990 to one based on actual field data for 2001.”

Additionally, upon inspection of the Other forest columns in Table 1.3, it appears that a large portion of the 1990 age class 15 and other acres were reclassified in 2001 to nonforest, i.e., a marsh or wetland with trees class. From Appendix Table 2.4, it appears that acreage came largely from the very slow growing lowland black spruce forest type, and to a lesser extent from the lowland tamarack type. Thus, much if not all of the loss in other forest acreage came from reclassification rather than actual forest change.

Notably, we are quite confident that we have not lost forest reserves from 1990 to 2001 (as they are protected by law, etc); yet the FIA assessments included a 171,000 acre loss in this category. This seems like strong evidence in favor of Ek’s analysis that no real change occurred during the period 1989 to 2001. [Additionally, the target year for MCCAG is 2005; the FIA analysis is for a period that ended four years before that in any case]. Hence, a realistic assessment is likely that forest land area in Minnesota has remained stable (no consistent change) over the past several decades (including in 2005 the base year for MCCAG). This is consistent with the rest of the eastern U.S., where, if anything, forest lands have been increasing slightly.

Our conclusion: there should be no credit given in terms of GHG emissions reductions from maintaining the status quo of no change in forest land area in the state. Make that zero instead of 2.7 MMtCO<sub>2e</sub>.

**Over-arching issue** (raised earlier, regarding the land base needed for all of this).

Many of the recommended practices require no loss, and in some cases, increases, in land in agriculture or forests. It is not clear how we will stop the loss of forest and agricultural lands to development (stopping the loss will be required for this plan), nor where the 1 million new acres of forest land (a 6% increase) will come from, and whether biofuel production will reduce production of food or other forest products.

### **Summary**

It appears that the projections made in the parts of the MCCAG plan that we examined (parts of AFW1-6) are unrealistic; and thus we believe these need to be re-examined very carefully. Our main concern about the plan, however, is not these specific concerns about the details of each of the ways agriculture and forestry can reduce GHG emission, as we believe each can play a role, although likely smaller than envisioned by the MCCAG plan. Instead, our concern is that this plan can have unintended consequences by distracting us from, and reducing emphasis on, the important things we really need to do to reduce emissions in substantive and technologically, economically and politically viable ways.

For the AFW-1 through 6 categories we evaluated, our estimate is a total of 8.30 MMtCO<sub>2e</sub> instead of 34.52 MMtCO<sub>2e</sub>. That is a huge difference: 26.22 MMtCO<sub>2e</sub>. This difference of ≈26 MMtCO<sub>2e</sub> of GHG emissions reductions represents 50% of the GHG emissions reductions that are being targeted for years 2015 through 2025 by the entire MCCAG Recommendations. We believe that reductions in GHG emissions can be achieved more realistically and in an economically much more advantageous way from energy conservation, improved fossil fuel use efficiency, reduced fossil fuel use, development of alternative energy sources and other mechanisms that carry less of the load in the current MCCAG plan than do agriculture and forestry. Politically perhaps it is easier to target agriculture and forestry for the major part of this job, but if this is based on unrealistic assumptions we would be making a sizeable mistake.

Therefore, the focus on agriculture and forestry, and the notion that we can rely on these to meet our statewide GHG emissions reductions until 2025 (and beyond) reduces the likelihood that we will take the bold steps necessary to reduce emissions in substantive and technologically viable ways - through energy conservation, improved fossil fuel use efficiency, reduced fossil fuel use, development of alternative energy sources such as wind and the transmission and storage capacity to move and manage that power, among other policy options.

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**Detailed comments by these authors on the individual recommendations for other MCCAG report sectors are provided in appropriate sections.**

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*J Espeleta (Research Associate, Dept of Soil, Water and Climate, U of Minnesota)*

*C Fissore (Research Associate, Dept of Soil, Water and Climate, U of Minnesota)*

*L Olabisi (Research Associate, Ecosystem Science and Sustainability Initiative, U of Minnesota)*

*A Ek (Professor & Department Head, Dept of Forest Resources, U of Minnesota)*

## VII. COMMENTS ON CROSS CUTTING ISSUES

### CC 3: State and Local Government GHG Emissions (Lead-by-Example)

The report should include the recommendation that each local government unit will, in consideration of mandates to reduce GHG emissions, establish a citizen advisory group to help identify reduction efforts, assist with implementation, encourage resident participation, and hold the local government unit accountable to reduction targets.

*Tom Casey, West Metro Global Warming Action Group, Mound, MN*

### CC 4: Public Education and Outreach

In addition, the state government should initiate a major public relations campaign, aimed at the general public, which is designed to communicate in layman's language a summary of the MCCAG Report. Furthermore, funds should be allocated for long-term, public outreach programs, including teaching key actions that individuals can take to save Minnesota for future generations.

*Tom Casey, West Metro Global Warming Action Group, Mound, MN*

### CC Other

A key item is missing. That is, "First, do no harm." Measures to abate global climate change should not, for example, subject people to increased levels of harmful air pollution. (This would occur if the misguided proposals to increase "biomass" and garbage burning were implemented, especially since the PCA is proposing to ease rather than strengthen regulatory requirements.)

Climate change is indeed a "global" problem. The atmosphere is sufficiently well mixed that CO2 emissions in one locality are probably equivalent to those in another in terms of their climate-forcing consequences. It follows that efforts to abate climate impacts should consider the global picture. For example, smokestack emissions of CO2 are only one impact of coal. Impacts of extraction, transport, and waste disposal need also to be considered.

*Alan Muller, Red Wing*

## **VIII. COMMENTS ON CAP AND TRADE**

### **C&T 1: Program**

I fully support a regional or statewide cap, trade and auction bill for the Minnesota

*Lindsay Dahl, Minneapolis, MN*

The Cap on Carbon must punish BioFuels for making global warming worse and lying to us about everything it has been proven it does not actually do. Biofuels need to be phased out quickly and plugin cars need the subsidies instead.

*Neal Lesmeister, Brainerd Climate Change Activists, Baxter, MN*

I believe the clear and present danger that this country faces today is Global Warming. That is, the made up theory that mankind is somehow, by our actions, warming the earth. Mounting evidence now suggests that any kind of climate change is not caused by human action but by naturally occurring phenomenon in a 1500 year solar cycle of the sun. For centuries, the earth's climate has been running through cycles of cold and warmth. For instance, historical records indicate that when the Vikings occupied Greenland, wheat was grown. That is, until an ice age made it too cold to grow crops and caused a slow starvation of the Viking population on that continent. In addition, temperature records from ice cores verify that the earth's climate has been indeed going through various cycles of cooling and warming. Given these facts, are we as a state prepared to enact upon the Minnesota economy something so devastating and haneous as cap and trade? The economic consequences of such a policy would be catastrophic for the residents of this great state. Businesses would be ruined, lives ruined, families would be forced to undergo severe hardship due to loss of jobs, and increased living expenses. All due to a group of shallow minded politicians worshipping at the altar of global warming. I agree that we need to be good stewards of our natural resources, but this is insanity. Average Minnesotans know that global warming is a scam. Hopefully, they will make this known at the ballot box before greedfy selfish politicians have a chance to wreck our state.

*Johnny Wong, Little Canada, MN*

Policy Option: CT-1 Cap and Trade Program. Primary authors are Brett Smith and Michelle Rosier.

Sierra Club commends MNCCAG recommendation by majority (with nine objections) of a regional cap and trade program. A cap and trade program is critical in the suite of policies necessary for Minnesota to achieve its greenhouse gas reduction goals. Sierra Club also commends MNCCAG for recommending a broad multi-sector approach to cap and trade. The inclusion of sectors beyond the power sector, such as transportation fuels, industrial boilers and processes, fossil fuels used in residential and commercial buildings, municipal waste incinerators, landfills, and large confined animal feeding operations is a key design feature of an effective cap and trade system. We also commend MNCCAG for proposing a system that covers all six greenhouse gases listed in Minnesota statute.

While Sierra Club applauds MNCCAG s support for a cap and trade approach, we are troubled by the inability of MNCCAG to come to any agreement on several key design elements of such a program. The following design features are essential for an effective system: 1.)Allocation of greenhouse gas allowances should be 100% auctioned for public benefit; including, a transition to a statewide green energy economy, with funds to go to areas such as: energy efficiency, renewable energy, transit, and assistance to consumers. 2.)Phase-in auction as necessary to protect consumers and industry from sudden price

increases; 3.) Protections to avoid windfall profits to polluting entities that are allocated free greenhouse gas allowances during a phase-in auction; 4.) Avoid loopholes, like offsets or price caps on allowances, which risk achieving reduction goals established by the cap; and 5.) Equity to communities at risk of disproportionate economic and environmental impacts.

If Minnesota is committed to achieving the goals established by the legislature in 2007, an enforced, firm cap is essential in the cap and trade program the state participates in. In addition, Minnesota should be committed to ensuring the program is as effective as possible while paying close attention to how the costs and benefits of such a program are distributed.

Sierra Club is committed to addressing climate justice to ensure that low income individuals and communities, Indigenous Peoples, and communities of color are not disproportionately burdened and share in the benefits of global warming solutions. MNCCAG's seeming omission of these concerns reflects, at least in part, the makeup of the panel and the interests which the members represent. This bias must not be continued as we move forward in implementing a cap and trade program. Low income individuals and communities, Indigenous Peoples and communities of color must be included in decision making for this approach to be truly successful. This issue will be discussed further in our comments on the Market Advisory Committee

*Cesia Kearns, Sierra Club, Minneapolis, MN*

Cap and Trade, the Chicago Climate Exchange and Europe too is a product of the Joyce Foundation. Forget Cap & Trade, it must be Cap and Tax, Cut and Tax. Trade only allows buying permission to emit CO<sub>2</sub>, allowing continuation of production of CO<sub>2</sub> for those who can afford it or have the ability to pass costs on to consumers. Utilities would be major participants in this scheme, using it to continue business as usual. The exchange also profits. It's like promoting health insurance when people need HEALTH CARE. Cap and Trade is a false panacea that does nothing, another Gasbag idea. If you want to have an impact on REDUCTION of greenhouse gas, remove Cap & Trade from consideration, and start Cap, Cut and Tax immediately.

*Carol A. Overland, Red Wing, MN*

When recommending the implementation of a cap-and-trade greenhouse gas emission trading program, it is necessary to study the successes and failures of policies that have come before. The Kyoto Protocol, although not ratified in the United States, has many ideas that can be replicated in an alternative program and many ideas that can be modified for the better. The MCCAG has found that the implementation of a national program could be far preferable to a state or regional program. I agree with this statement, but also believe that a global program would be preferable to a national program. The Minnesota Climate Change Advisory Group should not limit itself to a national program. Instead, it should recommend and push for a global cap-and-trade program to replace the soon to be expired Kyoto Protocol.

The possible harmful effects of Global Warming are too detrimental to be allowed to continue. There is no doubt that the earth's temperature is rising and there is enough probable cause that this natural event is enhanced by human action and that human action needs to be controlled in order to avoid these inevitable disasters associated with Global Warming. This is not just a problem for the Midwest, the United States, the developed countries, or the developing countries. It is a problem that affects the world, and so a global policy must be negotiated and put into effect. However, I don't believe the solution to this problem is the Kyoto Protocol.

The Kyoto Protocol has more costs than benefits, and there are no government incentives or practical measures to assure compliance (Wilcoxon para 9). The brunt of the policy's economic costs fall on developed countries because the Kyoto Protocol lacks the active participation of developing countries. A policy must be created that ensures emissions limits for all parties involved. After an analysis of the Kyoto Protocol's faults, Peter J. Wilcoxon and Warwick J. McKibbin suggest a standard cap and trade plan that, like the Kyoto Protocol that allows a country to sell their carbon emissions in order to pay for emissions reduction credits, but with a few adaptations. Wilcoxon has a Ph.D. from Harvard and is an economics professor at Syracuse University and McKibbin also has a Ph.D. from Harvard and is an international economics expert in Australia.

In this plan, all emissions trading will be done domestically, although international cooperation will be needed to negotiate a system, evaluate the price of carbon, inspect reduction levels and enforcement and to encourage the common goal of reducing emissions levels (Wilcoxon para 18). Long-term permits, each worth one ton of carbon emissions, would be distributed to involved countries. These permits signify the amount of carbon emissions a country may exhaust. A country would be given 95% of its 1990 emissions levels in permits (Wilcoxon para 12). These permits could be domestically traded, rather than internationally traded, at a standard rate between energy businesses. Firms that can cut emissions cheaply will do so and then sell unneeded long-term permits to those whose emissions are increasing (Wilcoxon para 13). Energy companies that fall short of their emissions goals must buy additional short-term permits at the end of each year to make up the difference. To boost incentives to cut emissions, the long-term permits will be much cheaper than the short-term permits. The prices of these permits will be flexible, and increase and decrease within each country with further findings on Global Warming (Wilcoxon para 14-17).

Developing countries will receive long-term permits that exceed their carbon dioxide outputs. This is a compromise between a lack of emissions limits and the strict emissions limits pushed for by developing and developed countries respectively. Once a developing country meets its maximum level, short-term permits will be sold. The profit from the unused, long-term permits will go to encourage direct investment in low-carbon energy generation in [their] econom[ies] (Wilcoxon para 22). These levels will be gradually decreased as a developing country's carbon dioxide outputs increase, thus insuring the eventual decrease of emissions out puts.

The non-compliance of countries and a lack of enforcement is a major fault of the Kyoto Protocol. Because the value of a long-term permit depends on the amount of emissions in an economy over time, poor monitoring of emissions will sow doubt about the true levels of emissions and decrease the value of holding a permit (Wilcoxon para 23). This will encourage countries to comply with lowering their emissions levels in order to raise the values of the holding permits. Unlike Kyoto, imperfections are self-contained (Wilcoxon para 23). Because emissions trading and enforcement is done domestically, non-compliance will only hurt the insubordinate country. The other countries will not have to get involved to protect their own permit values and the insubordinate country will find it in its best interest to raise the values of its permits by complying to its emissions reductions.

The use of the Clean Development Mechanism and joint implementation will be continued as before. The Clean Development Mechanism (CDM) allows a developed country to receive emissions credits for helping another developing country reduce emissions. Joint Implementation is similar to CDM but involves a developed country helping another developed country by investing in emission reduction products. (Saundry para 31-36) These activities provide countries that fall short of reducing their emissions within their own nation opportunities to still meet their targets after calculating in other forms of emissions reduction credits. Emissions credits will be given for emissions reducing projects sponsored in other countries, but the majority of reduction must be done within one's own country. This will ensure a reduction of emissions in order to meet permit levels.

This plan revises the Kyoto Protocol by lowering the staggering economic costs directed at developed countries, boosting incentives to comply and enforcement of compliance, and involving developing countries. Containing emissions trading within a country will make enforcement and incentives more effective. Business will be controlled by its own national government. The national government will have a better ability to control its businesses than a vaguely-comprised foreign force. The whole system will be simplified because the power regulating the reduction of emissions and the power enforcing the reduction will be the same. A global inspection committee will be formed to ensure fair regulation and enforcement in all countries involved. The gradual involvement of developing countries will encourage both developing and developed countries to comply. It will quell the fear of eventual takeover by major developing powers and also promote global community and teamwork for a global issue.

For this plan to become a global policy, George Bush must first appoint a panel of experts to draft a version that can be provided to other nations. A spokesperson from this panel must meet with the heads of other nations in order to promote interest and support. Although negotiations are already underway in Bonn, Germany, the United States should present its plan during the Copenhagen negotiations in 2009. If the Minnesota Climate Change Advisory Group is interested in this policy option, action must be taken as soon as possible to engage support from political groups in Minnesota and in the United States.

The panel of experts must be prepared to discern skepticism that this proposal is indeed beneficial for not just the United States but the world, that is more effective and less costly than the Kyoto Protocol,

and that it is possible. This will be the most difficult part of implementation, because the United States, by its decision not to ratify the Kyoto Protocol, has been stereotyped as opposed to global cooperation in the fight against Global Warming. This stereotype could be erased by showing commitment to the cause with the implementation of stricter emissions regulations amounting in a sizable difference in United States carbon levels independently of the Kyoto Protocol.

Whole countries sucked underneath the rising ocean, harsh and unpredictable storms causing millions of dollars in damage and taking millions of lives, and the depletion of freshwater reserves resulting in the eventual destruction of the human race, are what await us in the future if action is not taken against Global Warming. Whether caused by man or nature, the world is warming and action must be taken to stop it. Global Warming is a global issue. In order to create a policy to combat these possible detrimental effects of Global Warming, the countries of the world need to put aside their differences and come together. Global Warming is a social trap- a situation in which the conflicting parties, by each rationally pursuing their self-interest, become caught in mutually destructive behavior (Myers 727). But even though Global Warming is a problem of the world, it can also be applied to the individual. In order for the problem of Global Warming to be solved, each person must realize that their individual behaviors involving the burning fossil fuels in their daily lives do contribute to this global problem. Emissions reductions treaties can be signed, governments can invest money in renewable energy technologies, and businesses can improve efficiency by reducing emissions outputs, but for a policy to be truly successful, the change must be in the minds of the people.

*Katherine Bies, Plymouth, MN*

One of the most important recommendations of the MCCAG is the recommendation to enter into a regional cap and trade program of the sort currently being set up under Midwest Governor s Association Accord. As the report makes clear, however, a cap and trade program is not a substitute for other sector-specific policies, but a complement to them and a way to ensure actual emission reductions. The costs of the cap and trade program varied greatly over the course of the MCCAG process, as various underlying assumptions and inputs were changed. The results of such modeling, while helpful in informing the MCCAG discussion, reflect large and important uncertainties. There are two important assumptions embedded in the cap and trade computer modeling that are worth noting and which would have the effect of greatly overestimating the cost of the cap and trade:

**Overpriced RES Embedded in Cost Curves** The computer modeling that projected the costs of a cap and trade program are based on a set of reduction options and their costs (as estimated through this MCCAG process), which are lined up in order of cost/ton to form a cost curve.

An important element of the cost curve is the Renewable Electricity Standard (RES), which is expected to reduce power sector emissions substantially. As is discussed in the comments attached to ES-5, the MCCAG greatly overestimated the cost of the RES, in part because it greatly overestimated the cost of building new wind. The impact of this cost overestimate was amplified because the cost curves for all the other states in the region were derived from Minnesota s cost curve. A more accurate estimate of the costs (or savings) associated with the RES could substantially change the projected costs of the cap and trade. **Assumption of No Federal Cap and Trade**

The cap and trade modeling assumed that there would be no federal cap and trade program during the study period (through 2025), nor any other federal law requiring CO2 emission reductions or imposing a cost on emissions. While this assumption may have been analytically necessary, it runs counter to the widespread expectation that a cap and trade program is likely to be enacted in a few years. The effect of this assumption is to exaggerate the cost of launching a regional cap and trade program.

*Barbara Freese, Union of Concerned Scientists, Minnesota Center for Environmental Advocacy,  
Izaak Walton League of America -- Midwest Office, Fresh Energy, Global Green Energy LLC,  
Institute for Agriculture and Trade Policy, Clean Water Action, Saint Paul, MN*

## **C&T: Market Advisory Group**

MNCCAG recommends that a Market Advisory Group be created to assist in developing the proposed regional cap and trade program in terms of scope, design, and implementation plan. The description of this Group is sketchy in the Cap and Trade Chapter with the only detail being that it be made up of experts. As

noted above, given the track record so far of the experts chosen for MNCCAG, it is imperative that representatives of low income groups and people from Indigenous communities and communities of color those most likely to bear the brunt of climate change and GHG reduction strategies- be represented on this Group. It is interesting to note that the California process is cited as a positive example here, since many environmental justice groups have come out against the cap and trade program being proposed in that state. To avoid this kind of conflict and ensure a just policy approach, low income and minority groups must be significantly included in the program development process as full participants of the Market Advisory Group.

*Cesia Kearns, Sierra Club, Minneapolis, MN*

## **C&T Other**

This is considered to not be cost effective and any benefits are dubious. It is also fraught with concern for fraud with money being approved by administrators and passing through intermediate brokers who have a motivation to overstate claimed CO2 reductions. A bureaucratic nightmare that cannot really be evaluated and not needed.

*Richard J. Petschauer, Edina, MN*