

# Memorandum

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**To:** Roy Thilly and Tia Nelson, Co-Chairs, Governor's Task Force on Global Warming  
**CC:** Members of the Technical Advisory Group  
**From:** George Edgar and Kris Krause, Technical Advisory Group Co-Chairs  
**Date:** 05/07/2008  
**Re:** Recommendations for Data Collection – Updated per input from the Task Force

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At the request of the Task Force, the Technical Advisory Group (TAG) has prepared a set of recommendations regarding data which would be useful in analyzing the greenhouse gas emissions in the state going forward. During the process of developing input to reasonably model current emissions, the TAG found some situations where robust data existed, and other areas where very little credible data was available. There were also cases where the Work Groups included data collection recommendations as part of policy templates. These have been incorporated into the following recommendations.

An over-arching recommendation is that there must be one point in state government that brings all of the data together. The person or department that is charged with this responsibility must have the appropriate authority to request specific data in a timely manner from other departments of the government. It must be adequately funded. The data must be easily accessible and understandable by the general public. And it must be consistently reported in a timely manner so that it will be useful to policy makers.

It is important to note that this data collection charge is intended to be a comprehensive “top down” effort to quantify the net greenhouse gas emissions in the state for purposes of setting, tracking and ultimately evaluating the effectiveness of various policies and progress toward a statewide reduction target. The data collection is not intended to provide a mechanism for registering offsets or for purposes of regulation. A separate methodology(ies) for measuring and verifying greenhouse gas emission reductions and sequestration benefits from offset projects will need to be developed.

In contrast, it should be noted that the State of Wisconsin has signed on to “The Climate Registry”. Implementation of the registry, even on a voluntary basis in the state, should provide another source of data. This would be “bottom up” data, and it is hoped that over time both processes would converge to a great extent.

Finally, given the effort to date and the ultimate objectives, the TAG recommends that a process and framework for monitoring the effectiveness of policies to reduce GHG emissions should be established. This should include an assessment of an appropriate modeling capability to support such efforts and responsibility for maintaining and updating the model. The central data point in state government, described earlier in this memo, would be a logical place to assign this responsibility.

Following are recommendations related to specific data sets.

1. Continue to maintain the Wisconsin Energy Statistics Report. The data in this report proved to be invaluable, and the ability to download parts of the report directly from the internet was a helpful feature.
2. Land use data: implement the attached recommendation from the Agriculture and Forestry Work Group. The TAG asked the Agriculture and Forestry Work Group to put together a recommendation because of the amount of work they did during the process of developing policy templates. It was known from the beginning of the process that a central source for data regarding land use did not exist, or was not available in a manner that facilitated analysis useful in the process of evaluating sinks and sources of carbon emissions. Where data does exist, the frequency of collection did not support the level of detail desired to track changes effectively. Land use changes have an impact on many of the policies being considered by the Task Force.
3. Augment the reporting of greenhouse gas emissions from stationary sources to include the emissions from small and medium sources and to include methane and nitrous oxide emissions from combustion sources. This recommendation grew out of a policy template prepared by the Industry Work Group.
4. Collect data on mobile sources per the recommendation of the Transportation Work Group in their policy template: *“Reform Transportation Planning and Funding to Reduce VMT”*.  
  
*“The appropriate state agencies should calculate appropriate GHG emissions from transportation sources annually. The inventory should discuss the potential impacts of reduction policies (e.g. vehicle efficiency, carbon content of fuels) to assess the effectiveness of these policies and report on progress toward the desired emission reduction targets.”*
5. End use data: opportunities to collect additional data regarding end use should be considered by the Wisconsin Public Service Commission. It may be appropriate to utilize the Act 141 EE docket as a forum for this discussion.

We hope that this is helpful. Please let us know if you have any questions.

To: Technical Advisory Committee of the WI Governor's Task Force on Global Warming

From: Agriculture and Forestry Workgroup Co-Chairs Bill Oemichen, WFC and Todd Holschbach, TNC

Re: Recommendations to address data gaps associated with greenhouse gas inventories of land use in Wisconsin

### *I. Introduction*

The WI Governor's Global Warming Task Force has identified data gaps related to patterns and trends in land use change as the greatest need for a complete Greenhouse Gas (GHG) accounting across the state of Wisconsin.

The Agriculture and Forestry Workgroup is coordinating with the Technical Advisory Group (TAG) to describe these data gaps and recommend the development of a long-term complete land-based carbon accounting system to address this issue.

The program should be assigned to a state agency(ies) or university department with expertise in land cover monitoring and data analysis and should be provided adequate ongoing funding. The program should produce statistically valid time series data, at intervals of not less than every two years, which can be used to estimate the net carbon emissions due to land cover throughout the state. The data should be provided for the smallest land areas practical, no larger than a county basis, and should be derived both from satellite observations and field sampling. The program should stay informed of the scientific literature on land use and carbon emissions in order to obtain the most relevant and valid data sets possible. However, where possible, data should be valid over time to allow long term trend analysis. Although the program should focus on carbon emissions, the state should authorize the program to produce additional land use data on topics such as forest cover, agricultural land use, urbanization, etc.

## *II. Scope*

The land-based carbon accounting system will address the magnitude of GHG sources and sinks from current land use and assess impacts of changes to carbon stores due to changes in use or management of lands.

A complete land-based carbon accounting system will increase the State of Wisconsin's ability to conduct GHG inventories and trend analysis. This will inform current and future policy decisions and implementation. An important aspect of any system will be the ability to present the current status of GHG inventories, monitor future changes in response to any policies or practices, and make projections into the future.

## *III. System Requirements*

The development of a comprehensive land-based GHG accounting system requires detailed information and analysis to accurately depict the carbon stocks on the landscape and how these stocks change with changes in land use and management. Emissions from stationary sources such as power plants can be readily calculated and measured. However, emissions and removals from land use dynamics, land use change and changes in land management require a multi-faceted approach to accurately track them.

A land-based GHG accounting system tracks changes in land use over time, in addition to sources and sinks of carbon (as CO<sub>2</sub> and other non-CO<sub>2</sub> GHGs) associated with the land use before, during and after change. It is equally important to assess the emission and sequestration rates of the various land uses and management regimes and the life-cycle carbon impacts of the various products from the working landscape (e.g. food and feedstock, biofuels, durable wood products, etc).

Developing a baseline is an important first step in this effort. This baseline should be an appropriate reference year conducive to policy decisions. The assessment of current emissions and removals of GHGs and carbon stores and changes should then be made annually and compared to both the baseline and the previous years.

To build this system, multiple data sources are needed. Table 1 summarizes the various information components of a land-based accounting system, examples of specific types of information, and the source and availability. Data gaps are detailed below.

Further discussions about the design and implementation of a GHG accounting system will need to assess the ability of the state to conduct measurements of GHG emissions and removals as compared to modeling of these flows with verification.

The resources needed to develop and implement a system have not yet been estimated.

Table 1 - Information Components of a Land-Based GHG Accounting System

<b>Information Components</b>	<b>Examples</b>
Land Use and Cover Change	<ul style="list-style-type: none"> <li>• Satellite imagery such as Landsat images collected on an annual basis</li> <li>• GIS analysis to detect changes in cover and use</li> </ul>
Agriculture	<ul style="list-style-type: none"> <li>• Crop or pasture type</li> <li>• Estimates of biomass accumulation</li> <li>• Estimates and measurements of appropriate carbon pools</li> <li>• Estimates of rate of carbon loss due to changes in use or management</li> <li>• Tillage practices</li> <li>• Life-cycle carbon analysis of agricultural products</li> </ul>

Information Components	Examples
Forestry	<ul style="list-style-type: none"> <li>• Forest type and management</li> <li>• Estimates of biomass carbon accumulation and decomposition rates</li> <li>• Estimates and measurements of appropriate carbon pools</li> <li>• Estimates of rate of carbon loss due to changes in use or management</li> <li>• Carbon content of forest products and rate of retirement or disposal</li> <li>• Life cycle analysis of forest products</li> </ul>
Grasslands and Wetlands	<ul style="list-style-type: none"> <li>• Estimates and measurements of appropriate carbon pools</li> <li>• Estimates of rate of carbon loss due to changes in use or management</li> <li>• Estimates of biomass carbon accumulation and decomposition rates</li> </ul>
Urban and Sub-urban areas	<ul style="list-style-type: none"> <li>• Estimates and measurements of the carbon sequestration rates for the urban forest</li> <li>• Estimates of the energy use impacts of the urban forest</li> <li>• Carbon emission and sequestration rates of public open space</li> <li>• Estimates of rate of carbon loss due to changes in use or management</li> </ul>

#### *IV. System Outputs*

A land-based carbon accounting system will provide a complete GHG accounting for land-based activities in Wisconsin. The system should also have the capability to make projections about future trends and monitor results of land-use changes and management activities.

The system will support the development of appropriate policies related to climate change and provide guidance for land use and management decisions. An important benefit of a robust GHG accounting system is that the system's uncertainty and risk reduction informs better decisions.

#### *V. Additional Research*

More research is needed on the impacts of land-use of GHG emissions as well as the sequestration dynamics of the landscape. The list below represents examples of additional research that will be needed to support a land-based GHG accounting system and land-use decision making in a potentially carbon constrained future.

- Life-cycle carbon accounting for agricultural and forest products and by-products.
- Impacts of climate change on carbon dynamics within the landscape
- Co-benefits or secondary impacts associated with carbon conservation decisions
- GHG (both CO<sub>2</sub> and non-CO<sub>2</sub>) monitoring and measurement techniques
- Economic and socio-cultural analysis of carbon based land use and management decisions

We believe this additional work would greatly benefit the implementation of a Wisconsin greenhouse gas reduction plan. Thank you for your consideration of our data collection recommendations to close gaps associated with greenhouse gas inventories of land use in Wisconsin.

## **Air Emissions Inventory Reporting**

**Recommendation:** Amend NR 438, Wis. Adm. Code, to 1) lower the carbon dioxide (CO<sub>2</sub>) emissions reporting threshold for all stationary sources from 100,000 tons/year to 10,000 tons/year and 2) add the reporting of methane and nitrous oxide emissions from stationary combustion sources that report CO<sub>2</sub> emissions.

**Policy Description:** This recommendation would amend an existing regulation. It proposes to adjust the current CO<sub>2</sub> emissions threshold and require the reporting of combustion-related methane and nitrous oxide emissions from these sources. This recommendation would result in a more robust greenhouse gas (GHG) emissions reporting system. This in turn would lead to a more comprehensive, empirical statewide GHG emissions inventory for stationary sources. It would not change the reporting methods or emission estimation methodology.

**Background:** The Wisconsin Air Emissions Inventory (ARS- Annual Reporting System) program, outlined in Ch. NR 438, Wis. Adm. Code, requires facilities to report their annual air emissions and sets reporting thresholds for different pollutants. Currently the reporting threshold for CO<sub>2</sub> is 100,000 tons/year. This provides CO<sub>2</sub> emissions data from utilities and very large industrial combustion sources, but leaves a substantial information gap for emissions from medium and small sources. Macro-level emission estimates for these sources are possible through the use of “top down” inventories (such as the WRI inventory), but these techniques have limitations. Methane is not currently included in ch. NR 438, however it is one of the primary anthropogenic GHGs and thus should be included in an effort to construct an inventory of these emissions. Nitrous oxide is currently included in NR 438, with a reporting threshold of 6000 lbs. Under this proposal, all nitrous oxide emissions related to combustion would be reported concurrently with the methane and CO<sub>2</sub> emissions.

The lowering of the CO<sub>2</sub> reporting threshold was proposed by the Industry Work Group. It grew out of frustration at the lack of emissions data from all but the largest industrial sources, and the difficulty in developing policy recommendations for emission reductions in the absence of this information. With their proposal the Industry Work Group sought to close this important information gap while minimizing the reporting burden on industry and small businesses. The Work Group’s intent was to provide a reliable macro-measure of statewide industry GHG emissions, as well as a facility-specific micro-measure baseline (for covered facilities) to enable the tracking of progress in reducing GHG emissions. In addition, the Work Group felt that a reporting system would encourage voluntary reductions by companies by serving as a feedback loop that would make them aware of their facility emissions and emission trends.

As requested by the Task Force Co-Chairs, the Technical Advisory Group (TAG) is considering a number of proposals to address overall statewide data and information needs to better inform future climate change policy decisions. The Industry Work Group proposal was included in this process; the TAG supported their proposal and decided to add the methane and nitrous oxide emissions reporting requirement to the recommendation.

**Who would be affected and how:** In developing this proposal, the Industry Work Group performed an analysis to assess the impacts on industry. The analysis assumed natural gas as the

fuel source, a CO<sub>2</sub> reporting threshold of 10,000 tons/year and no change in other emission reporting requirements. The analysis concluded that a source that emits 10,000 ton/year CO<sub>2</sub> from fuel combustion should already be reporting to the emissions inventory since their fuel combustion-related nitrogen oxides (NO<sub>x</sub>) emissions would exceed the reporting threshold of 5 tons/year of NO<sub>x</sub> emissions. Thus, lowering the CO<sub>2</sub> reporting threshold should not pull new sources into the reporting requirements. Furthermore, there are default emission factors for CO<sub>2</sub>, methane and nitrous oxide from stationary combustion based on the type and amount of fuel consumed. With fuel data already being reported to the emissions inventory, this proposal should place minimal additional reporting burden on facilities.

In addition, coal and oil fired sources would report their methane emissions, which they currently do not. These sources are not new to emission inventory reporting and there would be little additional impact to them from this requirement. In addition, CO<sub>2</sub> emissions would be reported from the use of limestone in emission control equipment and from the production of cement or lime.

This policy proposal will help fill the medium to small stationary source information gap and provide more information on large stationary sources. Using ARS data on reported fuel usage and calculating the CO<sub>2</sub> emissions, it is estimated that an additional 150-250 facilities would be required to report their emissions. This would yield an estimated 5-6% increase in reported facility level CO<sub>2</sub> emissions beyond what is currently reported to ARS. This more comprehensive emissions inventory would include data on the number of sources, industry type and size, location, annual emissions and emission trends. It should be noted that while this recommendation begins to address medium to smaller sources of CO<sub>2</sub> emissions, it doesn't address the very large number of diffuse, small sources – i.e., those with less than 10,000 tons of CO<sub>2</sub> emissions.