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December 13, 2013

Ms. Gina McCarthy, Administrator
US Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

RE: Comments regarding development of carbon dioxide regulations for existing power plants.

Administrator McCarthy:

The State of Wisconsin appreciates the opportunity to provide comments regarding development of carbon dioxide (CO_2) regulations for existing power plants under section 111(d) of the Clean Air Act. In September 2013, the U. S. EPA (EPA) issued a series of questions to states for response. This letter and attachment responds to those questions and relays major concerns that have been identified through review of the issues and stakeholder engagement.

To begin, we must emphasize that the technical comments set forth below should not be interpreted as the State of Wisconsin's endorsement of this initiative. Given that EPA has not yet provided a rule proposal for comment, these comments are necessarily preliminary in nature, and we reserve the right to revise these comments and the related underlying assumptions in response to any specific proposal. Furthermore, this response does not waive any future legal claims that the state may have regarding the promulgation or enforcement of the regulations.

We note that there are significant legal issues regarding EPA's authority to regulate CO_2 emissions from existing power plants and important policy concerns regarding this regulation. As noted in a November 4, 2013 letter from Governor Walker to EPA Administrator Gina McCarthy, Wisconsin derives over half of its electricity from coal-fired generation, and a number of coal units have already shut down. This approach risks continued access to Wisconsin's most reliable energy source and our ability to provide affordable energy to the citizens of Wisconsin.

The Wisconsin Department of Natural Resources (WDNR) worked with the Public Service Commission of Wisconsin (PSCW) and the State Energy Office (SEO) to evaluate issues related

to developing CO_2 requirements for power plants. The WDNR also received input from seven electric utilities, two industrial groups, a prominent environmental group, a citizens' utility group, a statewide business association and an academic energy policy researcher. Based on this work, we have identified the following issues and concerns.

- **CO_2 is not like other air emissions.** There are no readily available back-end control technologies that reduce emissions of CO_2 from power plants. Regulation of CO_2 emissions therefore requires a different type of regulatory approach than that applied to other air emissions. Any regulation of CO_2 emissions must consider the specific situation of each utility, including the size, age, and debt load of its fleet, and must allow utilities to comply via off-site programs to reduce CO_2 emissions (e.g., via renewable electricity and energy efficiency).

- **Cost is an important concern for the State of Wisconsin.** EPA must ensure that costs incurred under any requirement for the "best system of emission reduction" (BSER) are minimized by providing states maximum flexibility in determining BSER and allowing maximum flexibility in compliance options. States must be able to set compliance deadlines that allow utilities to pay off existing debt on their power plants and pollution control equipment. Since 2000, Wisconsin utilities have invested over 3.2 billion dollars in air pollution control equipment and efficiency upgrades for existing power plants. Setting fixed compliance dates could strand this debt and make the installation of new, cleaner replacement generation more costly.

- **Existing state programs that reduce CO_2 emissions.** Wisconsin has had a state Renewable Portfolio Standard (RPS) since 1999 and a very effective, utility-funded energy efficiency program called Focus on Energy (Focus) since 2002. We estimate that the RPS and Focus programs have resulted in avoided CO_2 emissions equivalent to roughly 10 percent and 7 percent of total 2005 emissions, respectively. The RPS and Focus programs have significant tracking and verification systems in place and should qualify as compliance mechanisms for any potential CO_2 regulation affecting existing power plants.

- **Credit for CO_2 reductions already achieved.** Wisconsin utilities have already invested significant money to build new, more efficient power plants and retire older units. Wisconsin utilities have invested over 4.5 billion dollars for 4,200 megawatts (MW) of new coal and natural gas generation since 2000. In addition, over 2.3 billion dollars is invested in approximately 1,100 MW of renewable electricity for meeting the state RPS requirement. Wisconsin ratepayers have also contributed over 469 million dollars to the Focus program and other efficiency efforts since 2000. Since 2005, as a result of these combined actions, the power plant fleet heat rate (efficiency) has improved by approximately 9 percent and overall CO_2 emissions have been reduced by approximately 16 percent. Wisconsin's early actions and investments should be credited under a CO_2 regulation for power plants. In order to credit these and other early CO_2 reduction measures, states should be able to credit actions back to 2000.

- **Biomass energy.** We submit comments and suggestions on two issues related to biomass energy: 1) BSER performance standards for power plants should not apply to any portion of biomass co-fired with fossil fuel, and 2) biomass should be considered a carbon neutral energy source and be creditable for demonstrating compliance with a fossil fuel BSER

performance standard. Biomass energy qualifies as a renewable fuel under the state RPS, and the state follows state-certified sustainable forestry practices to ensure the carbon-neutrality of biomass fuels. This sustainable forestry program is successful and could serve as a model for the country. Wisconsin utilities have already installed approximately 132 MW of woody biomass-fired capacity and are co-firing waste wood and paper in several other units. All of these investments should count towards compliance with any regulation of CO_2 emissions.

While this letter highlights our major concerns and recommendations, an attachment is provided to this letter which explains our high-level concerns along with other identified concerns in greater detail and describes existing state programs that should be relevant under the development of CO_2 regulations for existing power plants.

In conclusion, after lengthy discussions between Wisconsin state offices and with our stakeholders, and assuming EPA decides to move forward with the development of BSER guidelines under section 111(d) of the Clean Air Act, the State of Wisconsin recommends a regulatory structure that allows states to balance carbon reductions with minimal cost to consumers.

Sincerely,

Phil Montgomery Chairperson Wisconsin PSC	Eric Callisto Commissioner Wisconsin PSC	Ellen Nowak Commissioner Wisconsin PSC

Cathy Stepp
Secretary
Wisconsin DNR

Cc:
Bob Norcross, Administrator, Division of Gas and Energy, PSCW
Pat Stevens, Administrator, Division of Air, Waste and R&R

Attachment: Discussion of Major Issues and Response to EPA Questions Related to Developing a BSER CO_2 Performance Standard for Existing Power Plants

Attachment

Discussion of Major Issues Related to Developing a CO_2 BSER Performance Standard for Existing Power Plants.

This attachment provides additional information related to developing CO_2 performance standards for existing power plants. The attachment is organized to be responsive to four questions posed by the U.S. Environmental Protection Agency (EPA).

For further information regarding this attachment, please contact Bart Sponseller at (608) 264-8537 or Bart.Sponseller@Wisconsin.gov.

Section 1. Response to EPA Question 1

EPA Question 1. What is state and stakeholder experience with programs that reduce CO_2 emissions in the electric power sector?

- *What actions are states, utilities, and power plants taking today?*
- *How are these emissions reductions measured and verified?*
- *How are interstate effects accounted for?*

A. Summary of Recommendations - Question 1

The State of Wisconsin has three overall recommendations in responding to EPA's question related to existing programs that reduce CO_2 emissions:

1) Wisconsin's Renewable Portfolio Standard (RPS) and utility-funded energy efficiency and renewable electricity program (Focus on Energy) must be allowed to count towards compliance with any electric utility CO_2 regulation, including both past and future measures;
2) Voluntary programs that reduce CO_2 emissions from the power sector and that have systems to verify avoided generation and/or emissions should also qualify; and
3) Renewable electricity generated out-of-state and owned or contracted for by Wisconsin utilities should be credited to the state of Wisconsin and Wisconsin utilities.

B. Extended Discussion – Question 1

Overall CO_2 emissions from power plants in Wisconsin decreased 16% from 2005 to 2012,[1] with a particularly sharp decline between 2011 and 2012. The overall trend of reduced CO_2 emissions from power plants is attributable to a number of different factors, including but not limited to:

1) **Improved heat rates** of the Wisconsin generation fleet due to efficiency upgrades, retirements of older, inefficient capacity, and construction of new, more efficient capacity. Overall heat rates decreased by 9% from 2005[2] to 2012, and CO_2 emission rates at Wisconsin power plants have declined 10% over this time period;
2) **Wisconsin's Focus on Energy program**, which is funded by utilities and provides incentives for installation of energy efficiency and renewable energy measures, and which has reduced CO_2 emissions by approximately 7% from 2005 levels;
3) **Wisconsin's state Renewable Portfolio Standard (RPS)**, which requires 10% renewable generation by 2015, and which has reduced CO_2 emissions by approximately 10% compared to 2005 levels; and
4) **A number of state initiatives and voluntary programs**, although the magnitude of the emission reductions achieved by these programs is generally smaller than that from the RPS and Focus on Energy programs.

This response is organized around these four types of CO_2 reduction programs. We describe these measures, along with the structure of these programs and estimates of avoided emissions, in detail below. It is notable that the RPS and Focus on Energy programs have extensive systems in place to measure and verify renewable electricity generation, avoided electricity generation and/or CO_2 emissions reductions attributable to the programs. At the end of this discussion in Item 5, we address how these measures are relevant under section 111(d) and make recommendations to EPA about how a program could be structured to allow these compliance mechanisms.

1) <u>Heat Rate Improvements at Facilities</u>

Heat rates at EGUs in Wisconsin have been steadily improving over the time period analyzed (1997-2012), as shown in Figure 1. These improvements have been driven by the utilities themselves and by the economics involved in producing electrical power. Figure 1a shows heat rates for coal and natural gas-fired power plants in the state, along with the overall average for all power plants. During this time period, heat rates decreased on average 0.5% per year at coal-fired plants and 2.9% per year at natural gas-fired plants, for combined reductions of 4.0% and

[1] Based on data reported by the generators to U.S. EPA and downloaded from the Air Markets Program Data website: http://ampd.epa.gov/ampd/.
[2] Throughout this discussion, we compare emission reductions to 2005 emissions levels because this was the year that power plant emissions peaked in the state.

21%[3] for coal- and natural gas-fired plants, respectively, from 2005 to 2012. Overall heat rates decreased by 9% and the CO_2 emission rates declined 10% over this time period (Figure 1b). These heat rate reductions occurred because of a combination of closure of older, inefficient units, construction and operation of newer, more efficient units, and adjustments made on-site to improve operation of existing units. See Table 1 for a list of plant closures and openings. The CO_2 emissions illustrated below were reported to EPA for compliance with other air quality programs, so the verification of these emissions already lies with EPA. Looking into the future, a number of additional coal unit closures are planned, as well as several conversions of coal-fired units to natural gas energy (Table 1). These actions will contribute to additional improvements in utility fleet heat rates in the future.

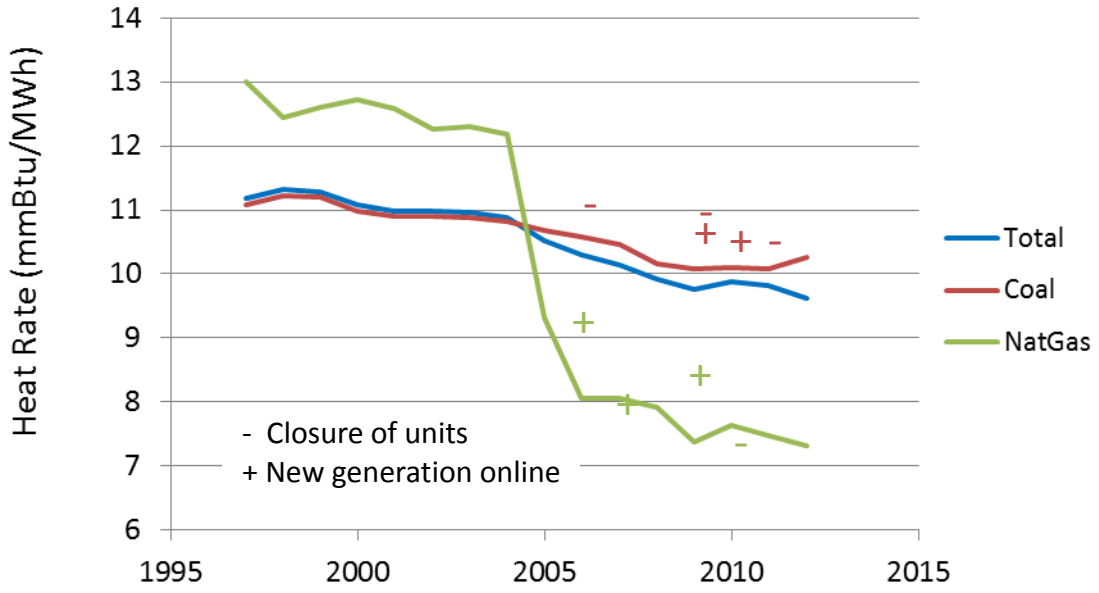
Table 1. List of power plants in Wisconsin that retired, began operations or switched fuels since 1997 and planned future changes.

Facility	Capacity (MW)	Units	Type of facility and date changed
Plant Retirements			
Alma	63	1-3	Coal, retired 2005
Manitowoc	46	5-7	Coal, retired 2010
Port Washington	322	1-4	Coal, retired 2005
Pulliam	53	3-4	Coal, retired 2008
Rock River	150	1-2	Natural gas, retired 2009
New Generation Capacity			
Elm Road	1234	1-2	Coal, operational 2009 & 2010
Fox Energy	310	1-2	N. gas combined cycle, operational 2005/2006
Port Washington	1090	11, 12, 21, 22	N. gas combined cycle, operational 2005/2008
Riverside Energy Center	600	1-2	N. gas combined cycle, operational 2005
West Campus Cogeneration	150	1-2	N. gas combined cycle, operational 2005
Weston	519	4	Coal, operational 2008
Fuel Switching			
DTE Stoneman	50	1-2	Former coal-fired plant, converted to firing wood in 2010
Planned Future Actions			
Retirements of coal units	717	9 total	Planned for 2015 and 2016
Conversion (coal→n. gas)	297	5 total	Planned for 2015 and 2016

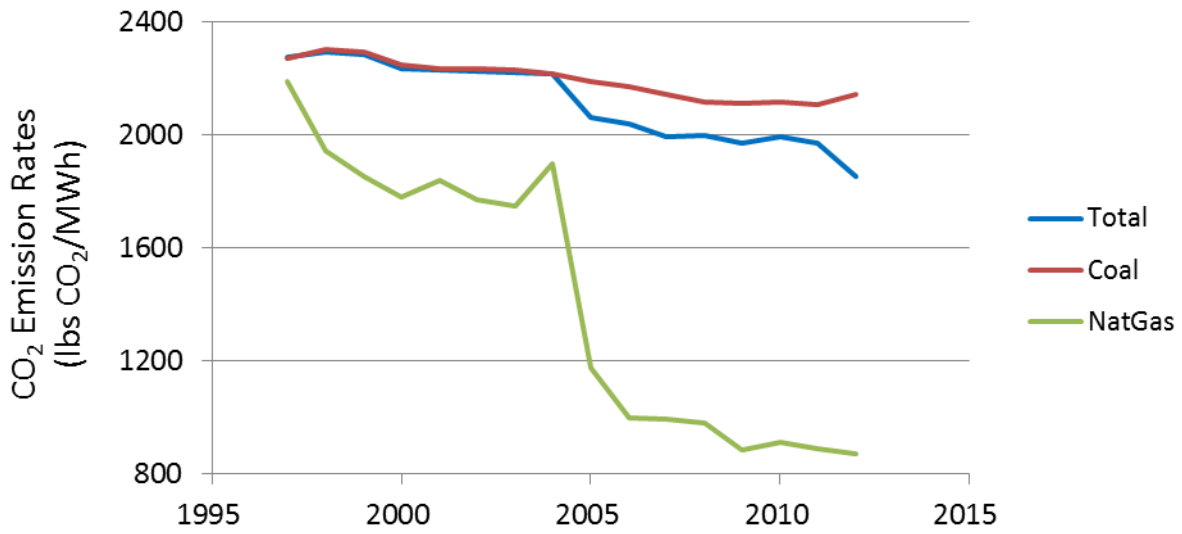
[3] The emission rate decrease is 40% for the years 2004-2012 because of the new combined cycle units installed in 2005.

Figures 1a and 1b. Heat rates (a) and CO_2 emission rates (b) for coal-fired, natural gas-fired, and average fleet power plants in Wisconsin.

a) Heat Rates



b) Emission Rates



Note: The heat rates and CO_2 emission rates are derived from CO_2 emissions, fuel consumption (mmbtu) and generation (MWh) data obtained from EPA's Clean Air Markets Division, http://ampd.epa.gov/ampd/. Years when units closed or began generation are marked with "-" and "+", respectively.

2) Focus on Energy Program

Program Description Since 2002, Wisconsin has operated a very effective statewide energy efficiency and renewable energy program, Focus on Energy. The program seeks to reduce energy use primarily by providing financial incentives for customers to purchase products and services that achieve energy efficiency or to install renewable generation. Wisconsin's electric and gas utilities (including investor-owned utilities, municipal utilities, and retail electric cooperatives) collectively fund Focus on Energy and recover their contributions from their customers through rates. The Focus on Energy program is designed and run by an independent third-party administrator, under the oversight of the Public Service Commission of Wisconsin (PSCW).

The PSCW, with guidance from State statute, sets goals for Focus on Energy that, in addition to saving energy, include avoiding "adverse environmental impacts from the use of energy." To help measure achievement of its environmental goal, Focus on Energy tracks the emissions reductions associated with the energy savings it has achieved, including reductions in CO_2, NO_x, SO_2 and mercury. Focus on Energy also estimates the monetary value of those emissions reductions and includes those estimates in its calculations of program cost-effectiveness.

Measurement and Verification The PSCW contracts for independent, third-party evaluation of Focus on Energy. Using a combination of methods that include participant surveys, engineering reviews, and on-site metering of energy use, independent evaluators seek to estimate the amount of energy savings achieved in connection with Focus on Energy to a high degree of statistical certainty. (For example, evaluation activities during the 2011-2014 contract period are designed to estimate savings for all Focus activities at a 90% confidence level with ±10 percent precision. This "90/10" goal is an industry standard for energy efficiency evaluation.)

These measurements result in two energy savings estimates. "Gross" energy savings include all savings associated with program activities. "Net" (or "additional") savings only include those savings that evaluators conclude were directly attributable to the influence of Focus on Energy.

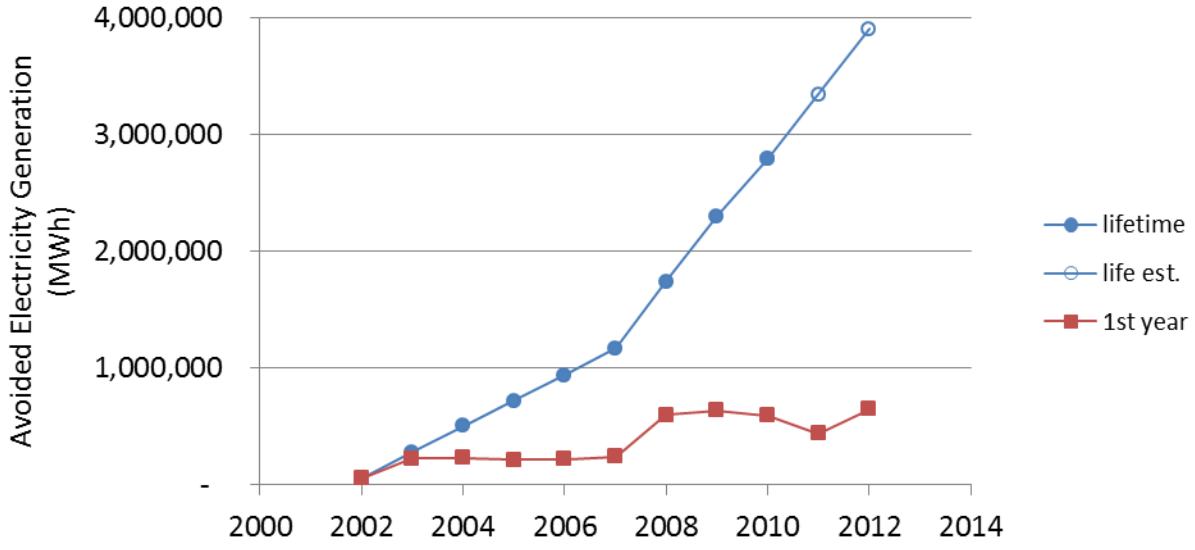
Avoided Generation and Emissions To estimate total emissions reductions achieved by Focus on Energy, net savings are multiplied by emissions factors that are calculated for each measured pollutant, including CO_2. Program evaluation staff have calculated emissions factors by 1) using EPA's Acid Rain Hourly Emissions Data to identify emissions for Wisconsin power plants operating on the margin; 2) averaging emissions for all marginal plants in each hour of the year; 3) calculating a weighted average of emissions across all hours, using load shapes developed specifically for Focus programs to take into account the timing of savings; and 4) updating emissions factors on an annual basis by using a time-series regression equation. This method is designed to align Focus methods with the World Resource Institute's Greenhouse Gas Protocol Initiative and provide the most nuanced possible estimate of actual emissions reductions within the state.

We believe the most relevant measure of avoided CO_2 emissions for a program to regulate CO_2 emissions from existing power plants would be on a "lifetime" basis, where "lifetime" includes the cumulative emissions that were avoided in a given year by all measures installed in that and previous years that are still in place. For example, if a type of measure had an average lifetime of 9 years, the lifetime avoided emissions for 2012 would include those from measures installed in years 2004 to 2012. These values were calculated by the PSCW through 2010. Values for 2011 and 2012 are estimates, but actual values could be calculated if time permitted. Figure 2 also shows the avoided generation and emissions for the first year the measures were installed.

We estimated that the lifetime avoided gross electricity generation for the Focus on Energy program was 3.9 million MWh for 2012 (Figure 2), and the lifetime avoided "net" electricity generation was 2.6 million MWh for the same year (not shown). This avoided generation corresponds to lifetime avoided emissions of 3.2 million metric tonnes of CO_2 (Figure 3), or emissions reductions of 7% of 2005 peak emissions.

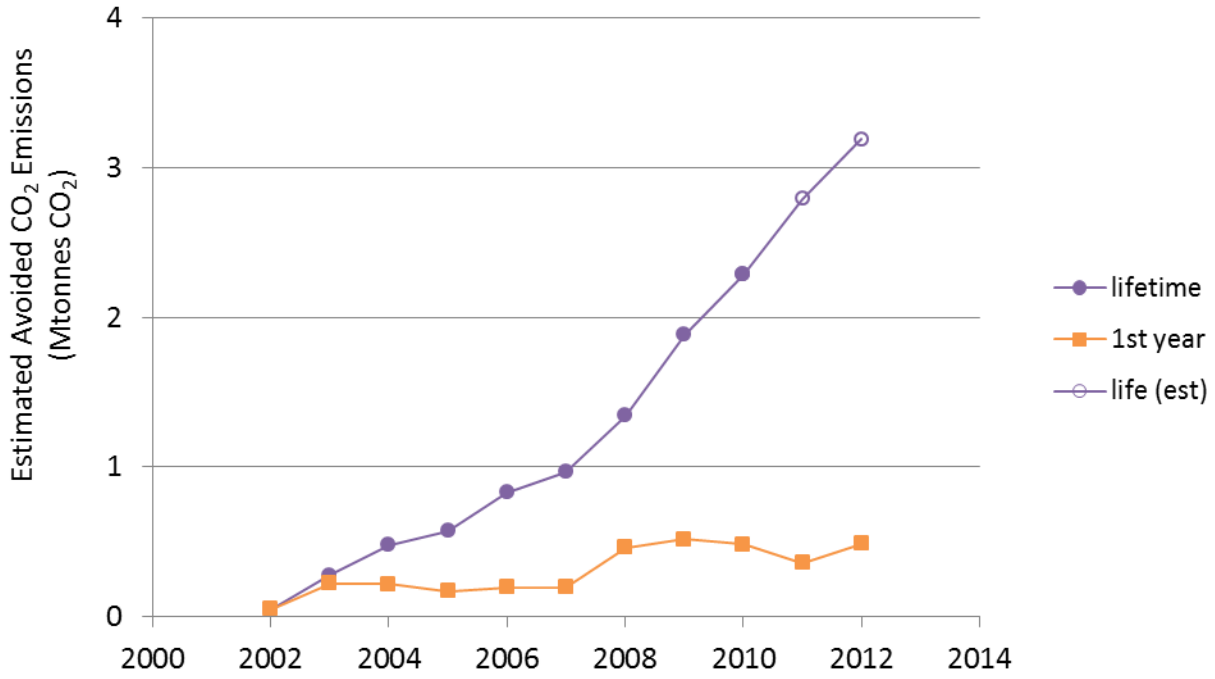
As demonstrated, Wisconsin has many measures currently in place that should be allowed to count towards compliance with this regulation.

Figure 2. Estimated Gross Electricity Generation Avoided due to the Focus on Energy Program.



Note: Avoided generation is shown for the first year the efficiency measures were in place and for the cumulative measures in place in a given year ("lifetime"). The open symbols were estimated using average lifetimes of measures.

Figure 3. Estimated CO_2 Emissions Avoided due to Gross Electricity Savings Under the Focus on Energy Program.



Notes:

1) Emissions were estimated using an emission factor developed by the Focus on Energy program which assumed the measures displaced marginal electricity production. Units are million metric tonnes.
3) Data shown are for emissions avoided due to measures enacted that year ("1st year") and for cumulative avoided emissions due to all measures in place that year ("lifetime"). The open symbols with solid lines were estimated using average lifetimes of measures.

3) <u>State Renewable Portfolio Standard</u>[4]

<u>Program Description</u> Wisconsin's Renewable Portfolio Standard (RPS) has a statewide goal of 10 percent of all electric energy consumed in the state being renewable energy by the year 2015. The RPS was established by Wisconsin Statute § 196.378 and applies to all electric providers that serve retail customers in Wisconsin.[5] The RPS requires Wisconsin retail electric providers to annually report renewable energy sales and activity to the Public Service Commission.

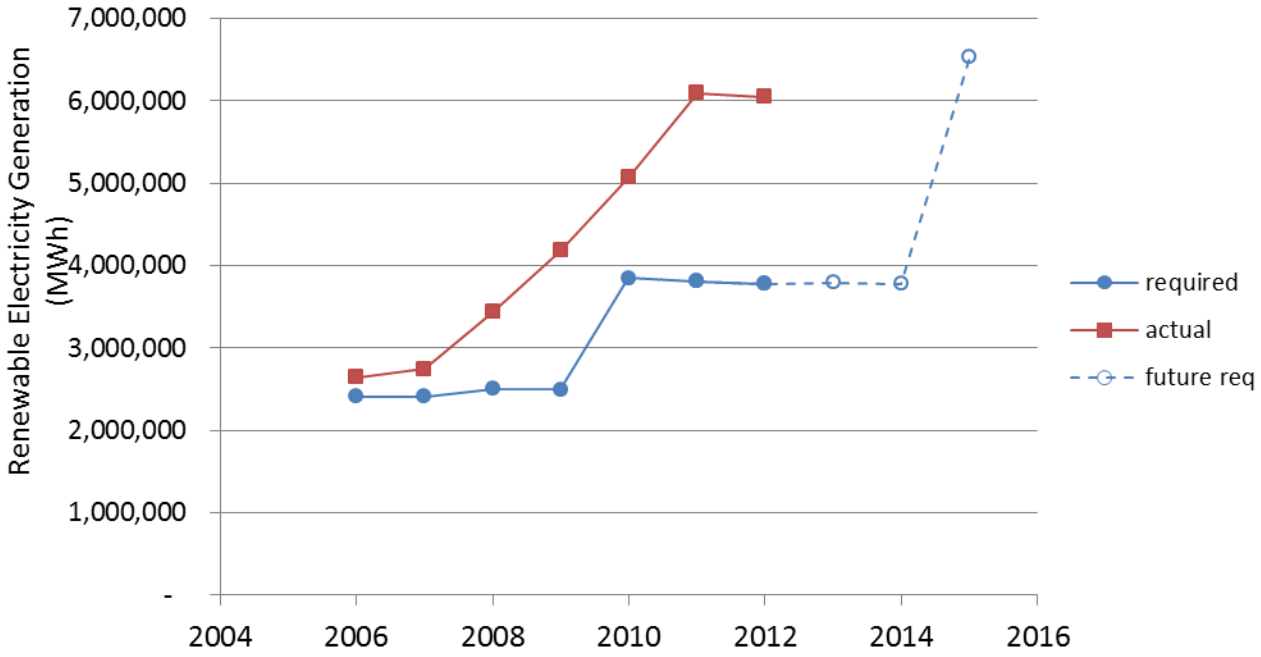
For each calendar year (CY) from 2006 through 2009, electric providers were required to meet a baseline percentage equal to the average of the electric provider's renewable energy percentage for the years 2001 through 2003. Beginning in CY 2010, electric providers were required to achieve a renewable energy percentage at 2.0 percent above their respective baselines. For CY 2012 through 2014, electric providers are required to maintain a renewable energy percentage at

[4] The information in this section was adapted from the Public Service Commission of Wisconsin (PSCW) Memorandum on 2012 Renewable Portfolio Standard compliance, with the exception of the estimates of avoided CO_2 emissions, which were conducted for these comments.

[5] These electric providers include all investor-owned utilities, municipal utilities, and electric cooperatives that serve residential and business customers in the state.

2.0 percent above their baselines. In order to comply with the RPS in 2015 and thereafter, electric providers will need to meet and sustain a level that is 6.0 percent above their respective baselines. These requirements are shown graphically in Figure 4.

Figure 4. Wisconsin Renewable Portfolio Standards and Actual Renewable Generation.



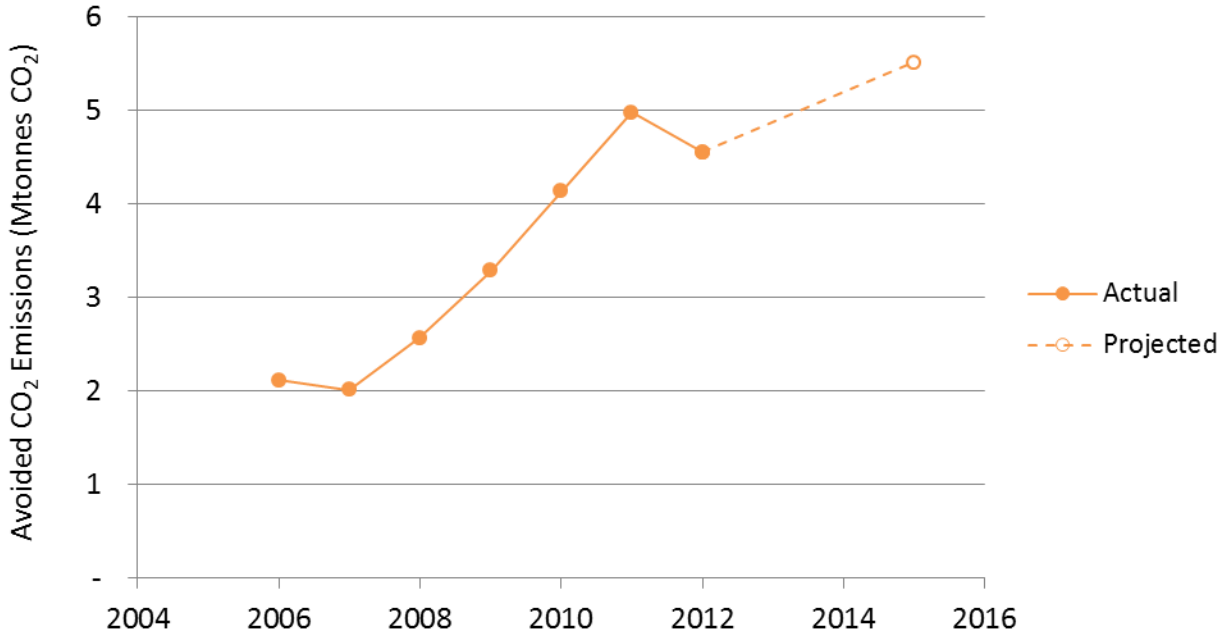
Note: The requirements shown for future years are based on aggregated electric provider requirements as opposed to the overall 10% statewide goal. This data does not include renewable electricity sold through individual utility green pricing programs.

Electric providers achieve compliance with their RPS requirements by selling electricity to their retail customers from renewable resources and by using Renewable Resource Credits (RRC) created in previous years. An electric provider creates bankable RRCs when it sells electricity from renewable resources in excess of that year's RPS requirement.

Measurement and Verification Electric providers use the Midwest Renewable Energy Tracking System (M-RETS), an electronic renewable energy tracking database, to track their renewable energy and to demonstrate RPS compliance. The PSCW tracks renewable energy using M-RETS and electric provider data. In order to avoid double-counting of renewable electricity, M-RETS requires generators to report all of their generation to M-RETS and to attest that the unit is not registered in any other tracking system. M-RETS further verifies all reported data and has established accounting procedures to prevent internal double-counting as well as double-counting between different tracking systems. The PSCW does not currently track CO_2 emissions avoided by the Wisconsin RPS or voluntary renewable energy. For construction cases before the Commission, PSCW staff will use pertinent CO_2 estimates provided by utilities for modeling assumptions.

Generation and Avoided Emissions All electric providers have met their requirements through CY 2012 and, due to the RPS, have increased the statewide percentage of electric retail sales from renewables from 3.78 percent in CY 2006 to 8.79 percent in 2012. This represents an increase of renewable energy from 2,664,228 Megawatt-hours (MWh) in CY 2006 to 6,049,427 MWh in CY 2012 (Figure 4).[6] In order to achieve RPS requirements in 2015, Wisconsin electric providers are entering into new purchase power agreements with independent power producers that own renewable facilities – primarily wind and biogas facilities. In a joint venture with a Wisconsin paper company, one electric provider recently put into service the 50 MW Rothschild Biomass Cogeneration Plant, which will burn wood waste in order to generate electricity for the electric grid and heat for the paper company's industrial processes. We estimated the CO_2 emissions avoided by the RPS program resulted in approximately a 10% emissions reduction from 2005.

Figure 5. Estimated CO_2 Emissions Avoided to the Wisconsin RPS.



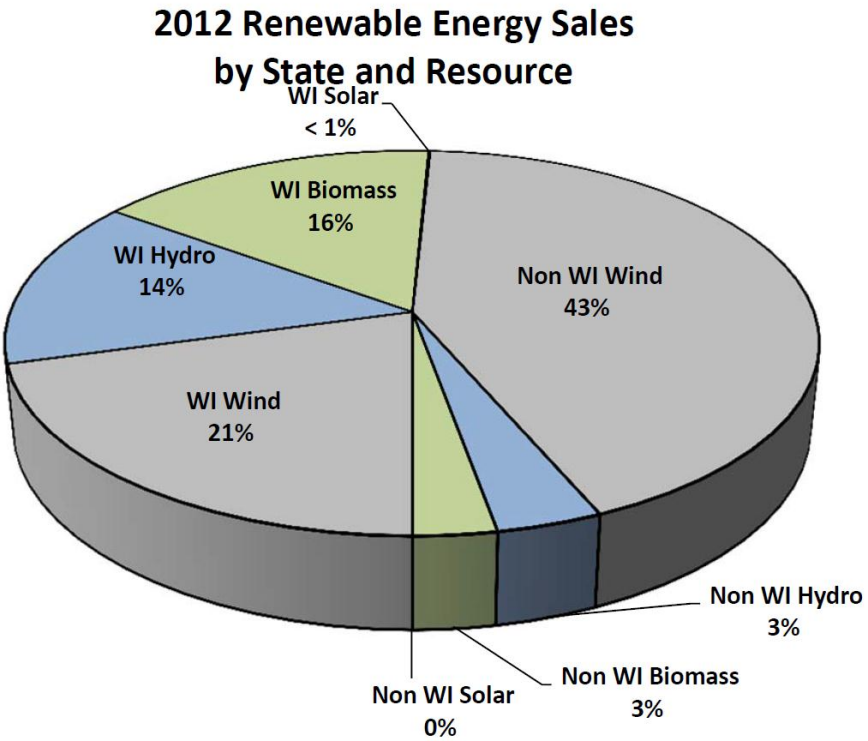
Note: The open symbol and dotted line shows estimated emissions that would be avoided if each utility meets its requirement for 2015. Units are in million metric tonnes. The data does not include renewable electricity sold through individual utility green pricing programs.

Out-of-State Renewables It is essential that Wisconsin be able to count the out-of-state renewables generation that was paid for by Wisconsin utilities for compliance with the state RPS for compliance with a § 111(d) regulation. The Wisconsin RPS allows electric providers to procure renewable energy that is generated either in-state or out-of-state. In practice, about half of the renewable electricity used for compliance with the state RPS is generated in-state (Figure 6). The remainder primarily is generated in Minnesota, Iowa or Michigan. All renewable generation that is eligible for the Wisconsin RPS must come from a facility that is providing energy to Wisconsin retail customers. This means that the Wisconsin electric provider must

[6] The reduction in renewable generation in 2012 was due to lower production of hydroelectric power owing to the 2012 drought.

either own the facility or have a purchase power agreement with an independent power producer that owns the facility. The Wisconsin RPS considers in-state and out-of-state renewable generation, as well as other states RPS programs, by utilizing the MRETS tracking system described above.

Figure 6. State Origin of Renewable Electricity Sold in Wisconsin in 2012.



Note: This data includes renewable electricity used for compliance with the state RPS and sold through individual utility green pricing programs.

4) Voluntary Programs and State Initiatives to Reduce CO_2 Emissions

Voluntary Utility Energy Efficiency Programs In addition to the statutorily prescribed energy efficiency and emission reduction programs, a number of additional, utility-specific energy savings and conservation activities that are overseen by the PSCW exist. In the past, verification of the avoided generation associated with these activities was less rigorous than that for the Focus on Energy program, and the magnitude of the avoided emissions averaged around 10% of that from the Focus on Energy program. However, the PSCW is actively working with the utilities to improve verification.

Green Pricing of Renewable Electricity In addition to renewable electricity used for compliance with the state RPS, Wisconsin electric providers offer opt-in voluntary programs, known as "green pricing programs," to their retail customers. These programs use renewable resources separate from what is required by the RPS law. These programs often include utility-scale renewable energy projects and/or distributed generation owned by the retail customer. These

programs have averaged around 7% the generation of that used under the RPS program. All electric providers that have green pricing programs track the renewable energy in M-RETS, with the exception of one small electric cooperative.

Other Programs The Wisconsin State Energy Office (WSEO) was awarded an Energy Efficiency and Conservation Block Grant from the U.S. Department of Energy as part of the American Recovery & Reinvestment Act. This award funded three different projects focused on retrofits, lighting and education. WSEO is now working to close out the program and is working on compiling and reporting data on this grant. Avoided generation from this grant is preliminarily estimated to be roughly 1% of that from the Focus on Energy program.

The State of Wisconsin also has programs in place to reduce the energy consumption of state-owned facilities and to increase the amount of renewable electricity used by state facilities. Additionally, a number of smaller programs focus on, for example, increasing energy efficiency at craft breweries, providing technical assistance to municipalities, schools and others with energy efficiency projects, and removing barriers to industrial energy efficiency and combined heat and power projects.

5) Relevance of Programs Under Section 111(d) and Recommendations to EPA

The emissions reductions from Wisconsin's Renewable Portfolio Standard and the Focus on Energy program must be credited to the state as a compliance mechanism for any regulation EPA develops. These programs have achieved and will continue to achieve significant reductions in CO_2 emissions, at a cost to Wisconsin's ratepayers, and both have extensive systems in place to measure and verify avoided generation and/or avoided emissions. Both programs should readily fit under an existing source regulation, and reductions already achieved should be credited as well as future reductions. However, given the statewide structure of the Focus on Energy program (in which utilities fund a centralized program to promote energy efficiency and renewable electricity), EPA must ensure that its regulation allows such programs to count towards compliance. Voluntary and state-run programs whose emissions reductions can be verified should also qualify for compliance.

It is also essential that EPA allow renewable electricity that was generated out-of-state and was owned by or contracted for by Wisconsin utilities to be used for compliance with Wisconsin's obligations under this rule. The Wisconsin utilities and ratepayers paid for this generation, which should be credited to them. More generally, EPA should write into their guidelines that renewable electricity be credited to the utility (or state) that owns or contracts for that generation. This would ensure equity between states in their handling of renewable electricity and ensure that no renewable generation is double-counted. It also allows for more cost-effective compliance with the regulations.

Section 2. Response to EPA Questions 2, 3 & 4

EPA Question 2. How should EPA set the performance standard for state plans? Options include considering: (a) onsite actions, (b) shifts in generation, (c) offsite actions.

- *Which approaches should be included? Source- or system-based?*
- *Connection between measures used for compliance and those used in setting the limit?*
- *What should be the form and specificity of the performance level(s) in EPA guidelines?*
- *When can emission reductions from existing power plants be achieved?*
- *How should a facility's "remaining useful life" be considered?*

EPA Question 3. What requirements should state plans meet in developing their plans? What flexibilities should EPA provide.

EPA Question 4. What can EPA do to facilitate state plan development and implementation?

Because the responses to EPA's Questions 2 through 4 are closely related, we have combined the responses below. For ease of reference, we have provided a summary of our recommendations followed by an in-depth discussion.

A. Summary of Recommendations - Questions 2, 3 & 4

1) SIP Process

SIP Deadlines – EPA needs to provide at least 3 years from the time the BSER guidelines are finalized until SIPs must be submitted. EPA should also allow states to obtain additional time for SIP submittal based on need.

SIP Flexibility – EPA should allow states to comply with BSER through programmatic alternatives that are equivalent to a BSER requirement for the power plants.

SIP Coordination – EPA should allow a SIP process where states can collaborate across state-lines and with the independent operator systems (ISO) in both formulating BSER performance standards and in demonstrating compliance.

2) Credit for Reductions Already Achieved

Investments and Reductions - Wisconsin utilities have made significant investments and achieved significant CO_2 reductions since 2000. Refer to Item 2 of the extended discussion for details.

3) Source-based vs. System-based BSER

BSER Guidelines – Section 111(d) of the Clean Air Act mandates that EPA set enforceable guidelines and that states have the responsibility for setting the BSER performance standard.

Complexity – Wisconsin believes that source-based standards are more straightforward. System-based performance standards will be resource intensive to determine and may create in-equities between utility systems.

Regulatory Precedent – Source-based performance standards are consistent with past power plant regulations formulated in meeting Clean Air Act requirements. EPA has not previously promulgated a regulation, including for regulations under section 111(d), based on system-based emission limitations.

System Ownership and Operation – Establishing system-based performance standard assumes actions for portions of the electric system that is under different ownership or control from that of the operators of the power plants regulated under section 111(d).

Renewable Energy – EPA should not include use of renewable energy in setting a performance limit. Renewable energy is not equally available to all utilities and may have negative impacts on system operations if not integrated over the appropriate timeframe.

Assumed Electricity Loads – EPA should not build assumptions about future electricity loads into a performance limit.

Utilization of Existing Fossil Fuel Capacity – A performance standard needs to allow full use of existing fossil fuel-fired capacity.

4) Factors in Setting a Performance Standard

Source Categories - States should have the flexibility to differentiate BSER requirements based on the type of combustion turbine or boiler, type of fuel (including whether bituminous or subbituminous coal), cost-effectiveness, the power plant size and age, and its remaining debt.

5) Form of a BSER Performance Standard

Mass vs. Emission Rate - States should be allowed to structure the BSER as either a mass or emission rate requirement.

Utilization of Existing Fossil Fuel Capacity – A performance standard needs to allow full use of existing fossil fuel-fired capacity.

6) Compliance Timeframes

CAA Requirements – The CAA does not specify a compliance timeframe under section 111(d). Section 111(d) directs EPA to follow section 110 SIP process. Section 110 does not require a compliance timeframe for a non-NAAQS pollutant such as CO_2.

State Flexibility – The states need to be afforded the flexibility to determine reasonable compliance dates based on achievability and on a timeframe that avoids stranding existing plant debt.

Compliance Timeframes – The states should be afforded a minimum of 7 years from finalization of BSER guidelines for compliance with a BSER requirement. States should also be allowed to grant additional time as needed to address remaining plant life or investments or if an extension will yield a better long-term outcome. Further, states should be able to grant additional time on a utility system basis.

Factors considered in proposing this compliance timeframe include:

- Significant plant upgrades can take 5 or more years to completion.
- New combined cycle plants in Wisconsin require roughly 7 years for completion.
- Time must be provided to implement renewable energy in a manner that avoids negative impacts to the generation system.
- Utilities need time to pay off existing debt on coal-fired generation. Major investments are amortized over 20 to 30 year periods, thus investments made since 2000 will still need to be paid off over the next 10 to 20 years.

7) Compliance Flexibility

Credit for Achieved CO_2 Reductions – EPA should allow States to count CO_2 reductions from utility actions back to 2000 in demonstrating compliance with BSER (refer to Item 2 in the extended discussion for details).

Utility System Compliance Measures – Utilities should be able to show compliance on a utility system basis and utilize CO_2 reductions from any non-utility fossil fuel reduction project or end-use efficiency measures upon adequate verification.

CO_2 Credit Verification – CO_2 emission reductions quantified through state and utility programs that measure reductions in fossil fuel use should be allowed for compliance.

Emissions Averaging – States should be allowed to structure BSER compliance so that utilities can average emissions across their systems, across state lines, or over the ISO regions.

Extensions and Electric Reliability – States should be allowed to grant both short- and long-term extensions (3 to 5 years) for power plants on either a unit- or system-wide basis.

Biomass – EPA should be considered carbon neutral by default and allowed for use in complying with a fossil fuel BSER performance standard (refer to Item 6 on Biomass).

8) Biomass

Fossil Fuel BSER Performance Standards – Biomass fuels, fired in any amount along with fossil fuels, should not be subject to a CO_2 performance standard under this rule-making.

Allowing Biomass for Compliance with a Fossil Fuel Performance Standard - Biomass energy implemented under an existing RPS requirement or derived from, among others, sustainable forestry practices and certification programs (either state or federal), derived from fire hazard reduction projects or invasive species removal, municipal solid waste, industrial biomass process waste, clean demolition biomass, and biogas derived from landfills, manure or biomass digesters,

or wastewater treatment plants should be considered CO_2 neutral and creditable towards compliance.

9) PSD/NRS Permitting

Permitting for CO_2 Reduction Projects – EPA should exempt projects that reduce CO_2 emissions from PSD/NSR permit requirements.

B. Extended Discussion – Questions 2, 3 & 4

1) SIP Process

SIP Deadlines EPA needs to allow states a minimum of 3 years to submit a SIP and a mechanism to allow additional time as needed.

The President directed EPA to finalize BSER guidance by June 2015 and directed states to submit SIPs by June 30, 2016. Wisconsin cannot practically evaluate power plants and consider pertinent variables in determining BSER within thirteen months. In addition, any performance standards or program implemented by Wisconsin will have to be placed into state rule. Currently, the Wisconsin rulemaking process alone takes roughly 3 years. Therefore, Wisconsin anticipates that formulating performance standards followed by incorporation into rule will take 4 or more years to accomplish.

Section 111(d) requires EPA to establish a SIP process "similar" to the SIP process set forth in section 110. Section 110, which applies to NAAQS pollutants, requires SIP submittals within three years of issuance of a NAAQS. CO_2 is not a NAAQS pollutant and does not have the same short-term health-related impacts of a NAAQS pollutant. Therefore, EPA should allow at least the same or more amount of time for a CO_2 SIP submittal.

For these reasons, EPA should allow at least 3 years for developing a CO_2 SIP and provide the flexibility to extend the SIP submittal timeframe as needed.

SIP Flexibility Wisconsin assumes that EPA will provide guidance for determining a performance standard in the form of an emission limitation. However, EPA should also allow the states to develop programmatic alternatives that are equivalent to BSER. This flexibility should include use of existing state RPS and energy efficiency programs, among others, that reduce non-utility fossil fuel use. Other alternatives may include tax-based programs, regulating dispatch through the independent system operators (ISO), or including load service entities (LSE), that act as a utility but do not operate power plants, under the compliance requirements.

SIP Coordination EPA should also allow states to coordinate with other states and ISOs in developing requirements and allowing compliance at the utility system including across state boundaries. States should also be allowed to designate responsible parties other than the power plant operators. This approach may be the best means for allowing compliance flexibilities for multi-state utilities or compliance options that involve supply-side elements not under the control of power plant operators.

2) Credit for Reductions Already Achieved

Wisconsin Utility Investments Wisconsin electric utilities have made major investments, as summarized in Table 2, that have resulted in significant CO_2 emission reductions (refer to Section 1 for further technical details). These investments have been made in response to the retirement of older less efficient power plants, growth in energy demand, state RPS standards and state and federal air emission requirements. These investments do not include those made by power plant operators in order to meet water quality and solid waste environmental requirements.

Table 2. Certain Wisconsin Utility Investments Since 2000.

Category	Action	Capital Cost ($)	Capacity (MW)
Existing Plants	Efficiency upgrades	184,002,375	
	Air Pollution Control Equip.	3,079,602,468	
		3,263,604,843	
New Capacity	Coal	2,904,806,000	1,753
	Coal to Natural Gas (planned)	70,000	297
	Combine Cycle	1,602,823,930	2,150
		4,577,629,930	**4,200**
New Renewable	Wind	2,061,114,924	1,018
	Biomass	255,000,000	100
		2,316,114,924	**1,118**
Electricity Efficiency Programs	Focus on Energy Program	**469,099,037**	
Total Capital Cost		**$10,626,448,734**	

Historic CO_2 Reductions EPA needs to allow credit for actions implemented since 2000 that have reduced power plant CO_2 emissions. EPA can provide credit by allowing states to use these reductions in complying with the BSER requirement.

Wisconsin utilities have been steadily reducing CO_2 emissions since 2000. Wisconsin utilities have improved the average power plant fleet heat rate (efficiency) by approximately 9% and reduced total CO_2 emissions by approximately 16% since 2005. We estimate that our Renewable Portfolio Standard (RPS) has reduced total Wisconsin CO_2 emissions by approximately 10% and our major electric end-use efficiency program reduced CO_2 emissions by approximately 7%. Refer to Section 1 for details of CO_2 emission reductions.

To credit past actions, EPA should consider the following:

a. EPA should allow states to use a period of years around 2005 to determine an average baseline for calculating CO_2 emission credits. States should be allowed to adjust this baseline to account for specific actions back to 2000.

b. Creditable actions should include, among other actions, the retirement of coal-fired generation, repowering and refueling to cleaner fuels, installation of natural gas fired

generation, installation of distributed generation and renewable energy, and the reductions from electric end-use efficiency programs.

c. EPA needs to allow credit for all actions taken by Wisconsin utilities in meeting requirements of Wisconsin's RPS requirement. This includes credit for biomass fuels classified as renewable energy under the RPS. To date, Wisconsin utilities have installed approximately 132 MW of woody biomass-fired capacity and currently co-fire waste wood and paper in several other power plants.

d. EPA needs to allow credit for electricity end-use measures implemented in accordance with Wisconsin's Focus on Energy program and other state programs. The efficiency improvements from these programs have been carefully tracked and verified. Refer to Section 1 for detailed discussion of the Focus on Energy program.

e. EPA should also credit voluntary programs and conservation activities that reduce CO_2 emissions from the power sector. Wisconsin utilities have programs and systems in place to verify avoided generation and emissions.

3) <u>Source-based vs. System-based BSER</u>

Wisconsin has reviewed whether BSER performance standards should be set by considering only source-based (power plant) measures for reducing CO_2 emissions or by taking a wider system-based approach that includes power plant measures, transmission improvements, options to decrease electricity load and installation of renewable or cleaner generation. While EPA is considering whether to take a source or system-based approach in setting performance standards, Wisconsin believes that EPA needs to consider the following factors:

a. The majority of Wisconsin stakeholders have indicated that performance standards should be based on what can be achieved at the power plants.

b. Wisconsin is extremely concerned that accounting for actions over the utility system (system-based approach) in order to set performance standards will be very complicated to assess, will require significant state resources in developing a SIP and will result in inequities among the regulated entities.

   The power plants in Wisconsin that may be regulated under this requirement are significantly different in scale and operations. Some utilities operate multiple generation units, own the electric distribution systems and have ready access to renewable electricity. In contrast other utilities purchase most of their power, while yet others only own and operate a single plant. In these cases, basing emission limits on system-wide actions will produce very different performance standards for each utility.

c. Setting a limit based on system-wide actions does not appear consistent with past EPA determinations of BSER under section 111(d) or other federal regulations applicable to power plants.

   For example, section 111(d) requires BSER performance standards for municipal solid waste (MSW) landfill gas emissions. Although, recycling and waste reduction can reduce the

amount of landfill gas generated, EPA did not consider these options in formulating BSER for MSW landfill gas.

The power sector has been regulated under various parts of the CAA. In these actions, EPA has consistently developed regulations based on actions and controls limited to the power plant level. For example, under the mercury and air toxics standards rule (MATS) EPA determined that efficiency gains within the power plant are applicable for purposes of reducing emissions associated with electricity generation. However, EPA did not go beyond the plant in evaluating ways to reduce electric generation. Likewise, EPA did not evaluate options to reduce electricity load demand in setting Clean Air Interstate Rule (CAIR) state emission budgets, although EPA had more flexibility to do so.

d. Not all components of the electric utility system are under the control of the regulated entities. As previously noted, the plant, transmission system and distribution system are in many cases owned or controlled by different entities. For example, many of the Wisconsin transmission lines are owned by the American Transmission Company (ATC) which operates independently from the power plant operators. In another example, approximately 50 Wisconsin municipalities are load serving entities (LSE) that purchases 50% to 70% of the electricity they provide to their customers. In this case, the electric system is controlled by four different distinct entities: the power plant operators, the independent system operator (ISO), ATC, and the LSEs. Therefore, assuming a BSER performance standard based on actions across these systems would be problematic.

   In addition, power plant operators cannot control electric demand to the extent that future loads will match assumptions used in setting a BSER performance standard. One reason is that the dispatch of generation units today is controlled more by the ISO than the power plant operators. Another reason is utilities may be able to implement electric end-use efficiency measures, but they cannot ultimately control the electricity demand in areas with population growth or when other measures for pollution reduction such as electric vehicles are being encouraged. Therefore, it is problematic for EPA to build assumptions about future electricity loads into a performance limit.

   Under these circumstances, Wisconsin believes that setting the performance standard based on system-wide actions will create difficulties, inequities and disincentives among the regulated power plants.

e. EPA should not assume that renewable or distributed energy can be adopted in setting a BSER performance standard. This type of energy generation often comes in smaller increments and cannot fully replace individual fossil fuel generation units. Another factor is that renewable energy is often only available on an intermittent basis and typically is not dispatchable (except for biomass) in response to demand. These factors have already resulted in several impacts to Wisconsin plant operations. One impact seen is that coal boiler operators have had to reduce firing loads in order to accept the renewable electricity when it was available instead of calling for renewable energy when it is optimal to reduce the coal boiler load. This has led to these coal units operating at less efficient load point and with increased CO_2 emission rates. Another impact has been lower sales of electricity from coal plant. In this case the utility must pay for the renewable electricity as well as pay for the coal plant. This means either electric rates must increase or it will take longer to pay off the coal plant, possibly delaying retirements.

Another factor to consider is that renewable generation resources are not available to all utilities on an equal basis. For example, Wisconsin utilities purchase a significant amount of wind energy from Iowa and Minnesota. This is because wind generation resources within Wisconsin are not as available or cost-effective when compared to wind energy from those states. In addition, the ability to access this energy is very dependent on transmission capabilities. This transmission access may not be equally available to all utilities at this time.

For these reasons, renewable energy should not be assumed in setting a BSER performance standard. Rather, renewable energy should be available as a compliance option. In this way utilities can integrate renewable energy into their systems in the appropriate manner for both cost-effectiveness and optimal CO_2 benefit.

4) Factors in Setting a Performance Standard

BSER guidance should allow states to determine the achievable CO_2 reductions for each power plant. At a minimum, states must be able to consider factors applicable to the generating unit and supporting facilities such as the type of generation unit, fuel types, size, age, cost-effectiveness and remaining debt. In addressing these factors, it is equally important to consider different types of coal fuels. For example, Wisconsin utilities switched from bituminous to subbituminous coal in order to meet early federal Acid Rain SO_2 emission requirements. This switch often resulted in a decrease in boiler efficiency. Another important factor is that bituminous and subbituminous coals have different CO_2 emission rates.

5) Form of a BSER Performance Standard

The BSER guidance should allow states to structure the BSER performance standard as either a mass or emission rate requirement. A mass based approach may more readily facilitate emissions trading, but an emission rate approach may be necessary in allowing power plants to utilize full unit capacity in responding to ISO dispatch orders. Allowing an emission rate approach may also be necessary to allow full use of the newer, more efficient coal capacity recently built in Wisconsin. In response to a CO_2 rule, this more efficient coal generation may be dispatched more heavily to meet regional load demands. However, assuming a mass cap for the individual power plant or utility may actually hinder the most efficient dispatch of power plants on a regional basis. Also, as noted above, reduced loading may actually prolong the time until coal plant debt is paid and the units can be retired.

6) Compliance Timeframes

Wisconsin believes that EPA must allow a minimum of 7 years after BSER guidelines are finalized before requiring compliance with a source-based BSER performance standard. Further, Wisconsin believes that states should be able to grant additional time to an individual unit or a utility as a whole. If EPA uses the alternative approach of setting a performance standard based on system-wide actions, then Wisconsin believes the compliance timeframes must also be longer.

Enabling states to identify appropriate compliance timeframes based on achievability and need is the best way of ensuring that utility operators can utilize the full breadth of available compliance options including: power plant upgrades, renewable generation, new natural gas generation, transmission upgrades, major industrial energy repowering projects and energy end-use

efficiency measures. In addition, states should be allowed to grant long-term compliance extensions based on need. Extensions should also be allowed in order to accommodate options that result in better long-term and more cost-effective reduction approaches.

EPA should consider the following in evaluating compliance timeframes and requirements:

a. Compliance costs will increase dramatically if current debt in coal plants is stranded or generation is retired prematurely. Since 2000, Wisconsin utilities have invested over 3.2 billion dollars in upgrades and air pollution control equipment for existing power plants (Table 2, below). This debt is generally amortized over a 20 to 30 year period and will be ongoing debt for a significant period into the future. Ratepayers will have to pay this cost regardless of whether the plants are still operating.

b. EPA has the authority to allow flexible compliance timeframes based on achievability and need. As previously stated, section 111(d) directs EPA to establish a SIP process similar to section 110. Section 110 does not set compliance timeframes for non-NAAQS pollutants such as CO_2. Section 111(d) also directs EPA to allow methodologies that account for the remaining lifetime of power plants. These factors indicate that states should be able to set different compliance timeframes or requirements based on achievability and the remaining useful life of each power plant.

c. Significant efficiency upgrades to existing power plants are expected to take at least 4 to 5 years from planning to operation. In one ongoing Wisconsin project at a 1,000 megawatt (MW) power plant to increase efficiency, upgrades for the steam turbine and coal pulverizers will take more than 4 years from planning to completion. As a note, the capital investment for this type of project is expected to be on the order of 130 million dollars.

d. EPA should consider that if the compliance time is too short, the electric utilities may not be able to have sufficient time for installing renewable or more efficient generation. Instead, the utilities may have to rely more heavily on upgrading existing older plants. Currently, one new combined cycle unit being evaluated for installation in Wisconsin may take seven or more years from planning to commission. As previously described, it may also take considerable time to integrate renewable energy into the generation supply without adversely affecting current operations. A short compliance deadline may forego these approaches

7) <u>Compliance Flexibility</u>

Wisconsin believes that maximum compliance flexibility is necessary under a CO_2 BSER requirement for power plants. This compliance flexibility should consider the following:

a. All stakeholders agree that credit for any type of CO_2 reduction should be allowed towards compliance as long as there is adequate quantification and verification.

b. CO_2 emissions are very consistent for the specific types of fossil fuels (e.g. natural gas, subbituminous coal, bituminous coal, petroleum coke, distillate oil, etc…) and are not affected by the type of combustion unit. Therefore, quantifying emission reductions can simply be accomplished by tracking fuel consumption and does not require intensive emissions monitoring. Thus, EPA should allow CO_2 reductions from any residential,

commercial or industrial end-use efficiency and repowering projects where the reduction in fuel use has been quantified.

c. The BSER guidance should allow utilities to demonstrate compliance on a system-wide basis and in a manner that credits improvement in both the supply-side and demand side systems.

d. EPA should allow states to use their RPS and energy end-use programs in demonstrating compliance. Wisconsin has programs in place that carefully track electric generation reductions and related CO_2 emission reductions.

e. EPA should allow states to use existing systems for tracking renewable electricity, such as the M-RETS system discussed in Section 1.

f. EPA should allow states to designate compliance requirements to the utility, the utility system or to other responsible parties. One example may be that compliance is demonstrated by the ISO. Another example is to have load selling entities (LSE) demonstrate compliance with CO_2 requirements. The states should have the option under any rule structure to make these decisions.

g. As discussed in Section 1, renewable electricity generated out-of-state and owned or contracted by Wisconsin utilities should be creditable towards meeting Wisconsin utility BSER requirements.

8) <u>Biomass</u>

Biomass energy is an extremely important energy source for Wisconsin that should be viewed as carbon neutral. The State of Wisconsin believes that biomass should not be subject to a performance standard when co-fired with fossil fuels. Rather biomass energy should be allowed for compliance with BSER requirements. In addition, any biomass energy generation implemented according to state RPS requirements should be creditable towards compliance with a BSER performance standard.

Wisconsin also believes that the states are in the best position for determining whether biomass should be considered carbon neutral based on factors specific to each state or region. States, at a minimum, should be able to certify CO_2 neutrality for biomass harvested under state or federal sustainable forestry practices and for energy derived from, among others, industrial and commercial process biomass waste, municipal solid waste, landfill gas, anaerobic digester gas, and wastewater treatment plant gases.

In looking at this issue, we believe that EPA should consider the following:

a. The Wisconsin RPS requirement identifies biomass as a renewable resource. Wisconsin utilities have installed or converted over 132 MW of biomass fired capacity. Utilities are also co-firing additional fossil fuel capacity with waste paper and biomass. These actions should be creditable towards compliance with a BSER CO_2 performance standard.

b. Wisconsin is home to a substantial paper industry. This activity results in woody waste and waste paper product at the plant that is typically used for steam and electric power. EPA

must not set a precedent that this biomass should be regulated in the same manner as fossil fuels.

c. Wisconsin has a best management practices program structured to address different sustainability issues including forest regeneration, water quality and wildlife habitat. In additional, both the state forests and many private forests enrolled in the state's managed forest program receive certification of sustainable forestry under national and internationally accepted standards. Much of the woody biomass currently fired by utilities is collected under these programs and therefore should be accepted as CO_2 neutral by EPA. Wisconsin believes that each state is in the best position to evaluate these factors and determine requirements for sustainability and CO_2 neutrality. The same should be applicable for biomass harvested according to federal sustainable forestry guidelines.

d. Biomass harvested as part of a fire hazard reduction activity or that results as clean-up from natural disasters should be considered CO_2 neutral.

e. The use of woody biomass helps to maintain the large forest base in Wisconsin. For EPA to set a default that woody biomass is not CO_2 neutral may result in fewer acres kept in forest and a net increase in CO_2 emission due to land-use change. Once again, the states are often in the best position to make these determinations.

f. One utility fires woody waste obtained from the demolition of buildings and waste obtained by removal of invasive trees by municipalities. These practices are beneficial to avoiding generation of landfill gases and restores native sustainable species. Burning of these types of biomass fuels should be considered CO_2 neutral.

g. Biogas energy from digesters and landfills should be considered CO_2 neutral. Wisconsin is home to a large dairy industry with an increasing number of manure and waste digesters that produce biogas for electricity generation. In addition, landfills and wastewater treatment plants are working to capture methane gases for electric generation. These practices have obvious environmental benefits and also reduce methane GHG emissions to the atmosphere.

h. EPA should consider establishing a process whereby a utility operator or operator of a monoculture biomass crop or forest can demonstrate a closed loop system or the appropriate carbon rating.