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TO: Members of the Natural Resources Board

FROM: Scott Hassett, Secretary

SUBJECT: Background Memo for Hearing Authorization for Creation of Chapter NR 432 specifying the process of allocation of NO_x allowances for the Clean Air Interstate Rule NO_x Annual Trading Program and the NO_x Ozone Season Trading Program.

Introduction

On May 12, 2005, the United States Environmental Protection Agency (EPA) published the final version of the Clean Air Interstate Rule (CAIR) in Federal Register, 70 FR 25162. CAIR is a requirement to reduce the interstate transport of pollutants that significantly contribute to nonattainment of ozone and fine particles (PM_{2.5}) pollution. The program is directed at reducing nitrogen oxides (NO_x) and sulfur dioxide (SO₂) emissions from the electric power sector across a 28-state region of the Eastern United States, including Wisconsin and the District of Columbia. The EPA is requiring these states to revise their state implementation plans (SIPs) to include control measures to reduce emissions of NO_x and/or SO₂ before 2009 and again by the final compliance date in 2015.

Based on an assessment of the emissions contributing to interstate transport of air pollution and available control measures, EPA determined that achieving required reductions in the identified states by controlling emissions from power plants is highly cost effective.¹ The EPA developed a model cap and trade program for the states to achieve emission budget milestones set by CAIR.

CAIR is implemented in two phases. For NO_x, Phase I is 2009-2014 and Phase II is 2015 and later. For SO₂, Phase I is 2010-2014 and Phase II is 2015 and later. Across the 28-state CAIR region, EPA estimates NO_x reductions from 2003 emission levels in Phase I of 53 percent and in Phase II of 61 percent reduction. For SO₂, the reductions will be 45 percent in Phase I and 57 percent in Phase II from 2003 SO₂ emission levels.

Overview of CAIR Model Trading Program

The backbone of the CAIR program is the optional trading program administered by the EPA covering the emissions from electric generating units (EGUs) larger than 25 megawatt electrical (MWe). This program consists of three separate markets: annual SO₂ emissions, annual NO_x emissions and ozone-season NO_x emissions. The NO_x markets create two separate compliance requirements – the annual market addresses PM_{2.5} concerns and the seasonal market addresses ozone concerns. CAIR establishes a budget for emissions of NO_x and SO₂ for each state affected by CAIR. The states are required to meet these budgets. EPA's preferred approach is the model trading program administered by the EPA. If the state chooses to participate in the federal trading program, this budget is the number of allowances the

¹ The definition of a power plant covered under CAIR is: "a stationary, fossil-fuel-fired combustion turbine serving at any time, since the start-up of the unit's combustion chamber, a generator with nameplate capacity of more than 25 MWe producing electricity for sale." Cogeneration plants are defined as "a cogeneration unit serving at any time a generator with nameplate capacity of more than 25 MWe and supplying in any calendar year more than one-third of the unit's potential electric output capacity or 219,000 MWh, whichever is greater, to any utility power distribution system for sale."

state has the discretion to allocate to sources. EPA has provided one “model” approach for that allocation, but provides flexibility for states to allocate NO_x allowances differently and still use the federal trading structures. If a state chooses not to adopt the trading program, it either has to demonstrate legally enforceable programs that will reduce emissions sufficiently to meet the prescribed budget or be subject to federal regulation under a federal implementation plan (FIP).

Annual SO₂ Emissions Market – Model Rule

The annual SO₂ budget for Wisconsin is 87,264 tons in 2010 and 61,085 tons in 2015. The CAIR SO₂ trading program relies upon SO₂ allowances under Title IV of the Clean Air Act. Pre-2010 Title IV SO₂ allowances can be used for compliance with CAIR. Sulfur dioxide reductions are achieved by requiring sources to retire more than one allowance for each ton of SO₂ emissions. The emission value of an SO₂ allowance is independent of the year in which it is used rather it is based upon vintage year (i.e., the year in which the allowance is issued). Sulfur dioxide allowances of vintage 2009 and earlier offset one ton of SO₂ emissions (a retirement ratio of 1:1). Allowances of vintage 2010 through 2014 offset one-half (0.5) of a ton of emissions (a retirement ratio of 2:1). Allowances of vintage 2015 and beyond offset roughly one-third (0.35) of a ton of emissions (a retirement ratio of 2.86:1). The allowances for SO₂ have already been allocated in perpetuity under the Acid Rain Program. Other than the retirement ratios, there are no further restrictions on the use of banked SO₂ allowances.²

Annual NO_x Emissions Market – Model Rule

The annual NO_x budget for Wisconsin is 40,759 tons in 2009 and 33,966 tons in 2015. The CAIR annual NO_x trading program relies upon CAIR annual NO_x allowances allocated by the states. The NO_x SIP call allowances (for years 2003-2008)³ and CAIR ozone-season NO_x allowances (see below) cannot be used for compliance with the annual CAIR reduction requirement. Each state will have a share of the compliance supplement pool (CSP) that is comprised of 200,000 CAIR annual NO_x allowances of vintage year 2009. The state may distribute the CSP allowances based upon criteria for early reduction and extreme hardship. There are no restrictions on the use of the banked annual allowances or CSP allowances.

Ozone Season NO_x Emission Market – Model Rule

The ozone season NO_x budget for Wisconsin is 17,987 tons in 2009 and 14,989 tons in 2015. The CAIR ozone-season NO_x trading program relies upon CAIR ozone-season NO_x allowances allocated by the states. Pre-2009 NO_x SIP Call allowances can be banked into the program and used by CAIR-affected sources for compliance with the CAIR ozone-season NO_x program. NO_x SIP Call allowances will not be issued after 2008. Banked NO_x SIP Call allowances cannot be used to meet the annual NO_x emissions budget. There are no other restrictions on the use of banked allowances.

² Banking of allowances allows a unit to reserve or “bank” an allowance for use in a future year. For example, a unit may be allocated allowances in 2009 that it may not use in 2009. Those allowances would be banked and would be available to the unit to use in future years for compliance.

³ The NO_x SIP call required a number of eastern states to submit state implementation plans to reduce NO_x emissions to mitigate ozone transport in the eastern United States. Wisconsin was not required to submit a SIP. All of the states involved met the requirements by participating in the NO_x Budget Trading Program administered by the USEPA.

Flexibility for States in Development of NO_x Trading Programs

For the most part, states have to implement the trading program as dictated by the EPA in the model rule. The states do have explicit flexibility in determining the following aspects of the program:

- Development of NO_x allocation methodologies provided allocation information is submitted to EPA in the required time frame. This includes:
 - Cost of allowance distribution
 - Frequency of allocations (permanent v. periodically updated)
 - Basis for distribution (heat-input v. power output)
 - Use of allowance set-asides and their size (new source, energy efficiency, development of IGCC, renewables or small units).
- Provisions that allow individual units not regulated under CAIR to opt-in to the trading program so long as the units comply with Part 75 monitoring requirements.

“Abbreviated SIP” Option

The EPA has created an “abbreviated SIP” option as an alternative to requiring a state to submit a full CAIR SIP. The abbreviated SIP allows the state the discretion in allocating the NO_x allowances while reducing the administrative burden on the state with respect to the implementation and administration of the other aspects of the trading program including all aspects of the SO₂ emission markets and the compliance aspects of the NO_x Annual and Ozone Season markets. These aspects are implemented and administered by the EPA.

1. Why is this rule being proposed?

This rule is being proposed to comply with the federal requirement promulgated in the Clean Air Interstate Rule (CAIR) to reduce reductions emissions of SO₂ and NO_x in order to address the issue of interstate ozone and fine particle pollution. The Department proposes to fulfill this requirement by participating in the federal trading programs for major EGUs and using the abbreviated SIP option.

The CAIR allows states to participate in the federal program and have the discretion to make some alterations to the NO_x allocation structures in the CAIR trading programs for both the NO_x Annual market and the NO_x Ozone Season market. The Department proposes that the state will submit an “abbreviated SIP” which will consist of the Department rules detailing the NO_x allocation structure. All other aspects of the CAIR program, including the SO₂ Annual market, will be implemented and administered by the EPA.

The Department is proposing to use the abbreviated SIP option for two major reasons. First, it allows a state the discretion of creating a NO_x allocation structure that promotes environmental values in Wisconsin through the encouragement of the development of renewable energy by rewarding energy efficiency and promoting new generation. Second, it significantly limits the administrative burden for Wisconsin by establishing a rule that is primarily administered by the EPA.

2. Summary of the rule

The guiding principle for the development of the Department’s proposed rule was to utilize the federal rule to the maximum extent except where there is explicit authorization for state discretion and there is a strong rationale for the exercise of that discretion. The rationale was based on creating a rule that provides for equal or better environmental protection, is cost effective, improves the ability of the emission market to determine the least cost emission reduction, reduces the burden on the development of new generation, promotes energy efficiency, encourages renewable energy development, simplifies the rule structure and reduces the administrative burden. The proposed draft rule details the NO_x allocation structure that would apply to both the annual and ozone season programs. Table 1 is a comparison of the NO_x allocation structure for the FIP and the proposed draft rule.

Table 1: Comparison of the NO_x Allocation Structure for the Federal Implementation and the Proposed Draft Rule

	Federal Implementation Plan	Proposed Draft Rule
Allocation basis- existing units	Heat input	Electrical output
Allocation basis- new units	Electrical output	Electrical output
Data used for baseline	Highest three years of five years of data	Highest three years of five years of data
Updating unit baseline	Permanent, once established	2011 and every five years thereafter
Updating state total baseline	2011 and every year thereafter	2011 and every year thereafter
Level of allocation	Unit level	Unit level
Reallocation	2011 and every year thereafter	2011 and every year thereafter
Length of allocation	Initial 2009-2014 allowances allocated, then four years in advance of vintage yr starting in 2011	Initial 2009-2014 allowances allocated, then four years in advance of vintage yr starting in 2011
Fuel weighting	1.0 for Coal 0.6 for Oil 0.4 for all others	No fuel weighting
New unit set-aside	Phase I: 5% Phase II: 3%	Phase I: 7% Phase II: 7%
Treatment of Renewable Energy	No inclusion of renewable energy	New renewable units able to apply to the main allocation pool once baseline established
Treatment of Energy Efficiency Projects	No inclusion of energy efficiency projects	Energy efficiency addressed through output based allocations
Treatment of Clean Coal Projects	No preference	No preference
Oversubscription to set-aside	Pro-rata reduction	Pro-rata reduction
Underscription to set-aside	Re-distribution to the main allocation pool	Re-distribution to the main allocation pool
Treatment of Combined Heat and Power units	Boiler units: (Useful Thermal Output/ 0.8) + (Electric generation * 3,413 mmBtu/MWh) Combustion Turbines: (Useful thermal output/0.8) + (Electrical generation * 3,413 Btu/KWh)	All units: (Useful output / 3.4 mmBtu/MWh) + (Electrical Generation Output)
Compliance Supplement Pool	Allocated based upon early reductions or extreme hardship	Allocated based upon early reductions (with lower emission rate than FIP) or extreme hardship.

The differences and the rationales between the FIP and the proposed draft rule are explained in the sections below.

a. Allocation Basis – existing units

The proposed draft rule calculates existing unit baselines using generation output data instead of heat input as in the FIP. There are a number of reasons for using output instead of heat input in calculating the unit baselines.

Most of the benefit from instituting an output based allocation structure stems from rewarding energy efficiency. In a cap and trade program such as CAIR, this increased energy efficiency does not necessarily result in a reduction in emissions since the number of allowances (representing the number of allowable tons of NO_x emissions) stays the same in the program. Instead, energy efficiency reduces the demand for the NO_x allowances since an efficient unit will need less allowances for compliance and in turn reduces the price of the allowances in the market thereby reducing the cost of compliance for all units in the market.

Allocating to existing units based upon output simplifies the program structure by treating units the same regardless of when the unit commenced operation. Under the FIP, new units (commencing operation on or after January 1, 2001) receive allowances based on the unit's output whereas existing units receive allowances based on heat input. Treating units differently, based on commencement operation date, creates a market imperfection that affects the market's ability to accurately access the least cost control.

Using generation output as a basis for allocation ties the NO_x emissions directly with the economic commodity – electricity. This direct tie better approximates the real cost of emissions to society and allows the market to more effectively determine the least cost control.

Although there is no guarantee how electric utilities will use their allowances, under an output based allocation scheme, units in Wisconsin's ozone nonattainment areas would receive a smaller allocation than under a heat input based scheme. More NO_x emission reductions in the nonattainment area means improved air quality in the area that most needs the emission reductions. The net result is a better environmental dispatch of the allowances for Wisconsin, even though the total state allocation stays the same.

The EPA argues that existing units should receive allocations based upon heat input because the historical generation data is uncertain and not subject to CEM reporting requirements like the historical heat input data. Although this may be true, there are a number of sources of generation data that have been certified by the units for the Energy Information Administration, the Wisconsin Public Service Commission and the Clean Air Markets Division of the USEPA. Additionally, a number of states have successfully relied upon generation data for allocations under the NO_x SIP call such as Massachusetts, Connecticut and New Jersey. Illinois is proposing to base its CAIR NO_x allocations to existing units on output generation as well.

In summary, calculating existing unit baselines using generation output improves the trading program through encouraging energy efficiency, reducing cost of compliance and simplifying the market structure.

b. Updating of Unit Baseline

Under the FIP, the unit baseline, once calculated, does not change. This means that older plants will continue to receive allowances based on their historic heat input, even if their operation declines over time or even if they are shut down. New plants, on the other hand, will always receive allowances based on their first few years of operation, which are often low operating years, even if they operate at a higher level in the future.

For existing units, unit baselines will be initially established using 2000-2004 data in 2007. Under the proposed rule, the unit baseline is updated first in 2011 and then every five years thereafter. Updating of the unit baseline is an important aspect of having a unit baseline based upon generation output. In a program that allocates based upon a permanent baseline there is no incentive with respect to allocations to change the unit's energy efficiency since it will not change the allocation. In an updating baseline system, a unit will be rewarded for energy efficiency upgrades. The rewards are based on the unit consuming less fuel to get the same amount of energy and not being penalized for a reduction in fuel consumption.

Updating a unit baseline results in rewarding those units that have installed energy efficiency technology with the benefits as discussed in Section I above as well as creating an emissions market that more accurately represents the market that is producing the economic good. An emission market that is a good representation of the current electric market means that there is less distortion in the market leading to a more efficient distribution of allowances to the least cost control.

The updated baseline keeps the allocations in line with the actual operation of the plants. It phases out allocations to plants that are no longer running and increases allocations to new plants as they provide increased generation to consumers.

The EPA argues that updating unit baselines will create an incentive for a plant in a competitive electricity market to run more in order to qualify for more allowances in the next allocation period and that this results in higher potential emissions and higher compliance costs. However, this "generation subsidy" is small compared to other components of operating cost and other imperfections in the electricity market tend to limit this effect. Furthermore, Midwest Independent Systems Operators (MISO), not the individual utility, dictates the volume of electricity generated.

Utilities have argued that updating the unit baseline will decrease needed certainty in the number of allowances they will receive in the allocation. Under the FIP, there is uncertainty in the number of allowances since the state baseline is updated in 2011 and every year thereafter. Additionally, under the proposed draft rule, the utilities will have the certainty of the allocations for 2009 – 2014 in 2007 and then starting in 2011, allocations four years in advance of the compliance year.

Another argument against an updating unit baseline structure is that it discourages utilities from retiring older units because the utilities will lose the allowances associated with this unit once it stops generating. First, allowing units that are not contributing an economic good to continue to receive allowances does not make economic sense since it is rewarding units simply because the units were operating prior to 2001. Second, under the proposed draft rule, the update occurs every five years starting in 2011, so a retired unit will continue to receive allowances until the next update. For example, the update occurring in 2011 would use data from the years 2005-2009. If a unit was retired

in 2010, it would still receive an allocation until the next update occurs in 2016 since it has operating data upon which the unit baseline would be determined. This lag time between when a retired unit stops operating and when a retired unit stops receiving allowances would allow the utility to bank those allowances from the retired unit to use elsewhere for compliance. So, a unit would not be considered fully retired and not receiving allowances until, in an updating year, the unit had not generated electricity for five years.

c. Fuel Weighting or Fuel Adjustment Factors

Under the proposed draft rule, fuel adjustment factors are not used. Fuel adjustment factors are used in the FIP to better approximate allocation of allowance to the higher emitters. Essentially, the fuel adjustment factor acts as a subsidy for the higher emitting units. The adjustment approximation bypasses the market to determining which unit is cost effective to have controls installed and which is cost effective to buy those allowances from the market. The fuel adjustment factors assume an efficiency rate across all units which is a gross simplification of the vast array of units in the market. Instead, by eliminating fuel weighting, the market incorporates the complex mix of variables, including unit efficiency, in determining which units should buy additional allowances from the market.

The elimination of the fuel adjustment factors reduces the distortions in the marketplace as discussed above. This allows the trading program market to do a more effective job of determining the most cost-effective compliance mix.

Fuel weighting allocates allowances with the highest factor for coal fired units, next highest for oil fired units and the lowest factor for natural gas fired units. This is directly opposite to the state energy priorities detailed in Wis. Stat. 1.12(4)(d).

d. Size of New Unit Set-Aside

The size of the new unit set-aside is two percent higher in Phase I and four percent higher in Phase II than in the FIP. The major reasoning for setting the size of the new unit set-aside larger than the FIP is based upon the estimate of new generation growth of 2.5 percent developed by the Wisconsin Public Service Commission. Under this conservative estimate of growth, the staff determined that new generation in Wisconsin would need a 7 to 11 percent set-aside. A new unit set-aside that is large enough to accommodate all new units will reduce the uncertainty for new units associated with having to buy allowances from the market for operation. This results in a better environment for the development of new, more efficient, generation.

Additionally, under the proposed draft rule, if a new unit set-aside is undersubscribed (allowances left over after the application period), these leftover allowances are re-distributed to the main allocation pool. Therefore, if for a particular year, the new unit set-aside is too large the units in the main allocation pool will receive the left-over allowances in time to use those allowances in that compliance year.

e. Treatment of Renewable Units

Under the proposed draft rule, new renewable units are eligible to receive allowances from the main allocation pool once the renewable unit establishes a baseline.

Inclusion of new renewable units in the allocation structure encourages and rewards the development of renewable energy. Through the development of more renewable energy, the demand for allowances for compliance will decrease and will result in a decrease in the cost of an allowance.

Additionally, by having renewable units eligible for allowances, it creates a compliance option for EGUs. For instance, an EGU can develop a new renewable unit, receive the allowances associated with the generation from that renewable unit and use those allowances for compliance at another unit.

f. Treatment of Combined Heat and Power Units

Under the FIP, thermal energy produced by combined heat and power units (CHPs) is adjusted using an assumed 80 percent efficiency rate for all units. Under the proposed draft rule, thermal energy is assumed to have a 100 percent efficiency rate like the efficiency rate used for electricity. CHPs have higher efficiency and lower emissions than traditional coal fired plants. The proposed draft rule uses the same methodology for all technologies and all fuels consistent with the approach for non-CHPs.

g. Compliance Supplement Pool

The FIP distributes the compliance supplement pool (CSP) to units that apply for the allowances based upon early emission reductions or based on extreme hardship using the criterion outline below. Only CSP allowances allocated in 2009 become part of the program.

Distribution based on Early Reduction – Under the FIP, a unit may apply for early reduction credits from the CSP if the following criteria are established:

- if the unit's average annual NO_x emission rate from 2007 or 2008 is less than 0.25 lb/mmBtu;
- if the unit is included in a NO_x averaging plan under the Acid Rain Program for such year;
- if the unit's NO_x averaging emission rate for such year equal to or less than the actual weighted average NO_x emission rate for the year before such year; and
- if the unit achieves NO_x emission reduction in 2007 and 2008.

Distribution based on Extreme Hardship – The EPA's determination of extreme hardship is based on whether "the compliance with CAIR NO_x emissions limitation for the control period in 2009 would create an undue risk to the reliability of electricity supply during such control period." The demonstration by the generator must include a showing that it would not be feasible for the owners and operators of the unit to:

- obtain a sufficient amount of electricity from other electricity generation facilities; or
- obtain sufficient amount of CAIR NO_x allowances to prevent such undue risk.

The proposed draft rule would alter the structure in allocating the CSP allowance in one respect. For early reduction credit the unit's average annual NO_x emission rate from 2007 or 2008 would be less than 0.15 lb/mmBtu instead of the 0.25 lb/mmBtu emission limit stated above. This emission level

represents the level in the NO_x SIP call as well as the modeled 2009 emission rate for the CAIR. The criteria for eligibility for extreme hardship in the proposed draft rule would be the same as the FIP.

3. How this proposal affects existing policy.

This proposal is consistent with existing state statutory policy for ozone rules under s. 285.11(6), Wis. Stats., to revise and implement state implementation plans for the purpose of prevention, abatement and control of air pollution in Wisconsin.

4. Has the Board dealt with these issues before? If so, when and why?

Most recently the NRB adopted ch. NR 428 in 2000 regulating the emissions of NO_x from certain EGUs in the state. The regulations became part of the 1-Hour Ozone Attainment Demonstration for southeastern Wisconsin and primarily involved operation and performance requirements for new and existing stationary sources above specified size thresholds. The new source requirements apply in 6 southeastern Wisconsin counties while an existing stationary source program applies to those same 6 counties plus Sheboygan Co.

Prior to NR 428, the agency developed and held hearings on a regulation proposal addressing EPA's NO_x SIP call (1997). The proposed NO_x SIP call program incorporated a NO_x emissions allocation and trading structure similar in general structure and approximate control level to the proposed Ozone Season NO_x program addressed here. The call to Wisconsin for a NO_x SIP to address both 1-hour ozone and 8-hour ozone interstate transport was withdrawn by EPA in 2000 pending resolution of litigation surrounding both the NO_x SIP call and the new 8-hour ozone standard. It has not been reinstated to address the current 8-hour ozone standard because this CAIR SIP addresses the same issue.

The Department has historically addressed source-specific SO₂ emissions limitations for specific industrial facilities associated with monitored SO₂ nonattainment and has developed state regulations (NR 409) implementing both Wisconsin Acid Rain statutes and a federal Acid Rain control program. NR 417 and NR 418 regulate SO₂ emissions from the major electric generating units. The SO₂ allowance allocations associated with the federal acid rain program provide the credits further regulated under the CAIR SO₂ trading program. The SO₂ control portion of CAIR will initially be federally-administered under a federal implementation plan and are not addressed in this proposed rule.

5. Who will be affected by the proposed rule? How will they be affected?

The Department has identified 90 fossil-fuel fired electric generating units that may be affected by the CAIR in the state. All affected sources under the CAIR must comply with the requirements of the rules. This includes obtaining the necessary number of allowances for each compliance year to cover the emissions from the unit and with the monitoring, reporting, and recordkeeping requirements of the rules. The affected units may comply with the requirements 1) by installing pollution control devices; 2) by transferring excess allowances from other units in the utility's system or 3) by buying additional allowances from the market. Additionally, utilities that do not use all of a single unit's allowances may transfer those allowances to other units in its system or sell those excess allowances in the market.

Renewable units that generate electricity may also be impacted by the proposed rule. Under the proposed draft rule, a new renewable energy unit will be eligible to receive allowances that it then can sell in the allowance market to offset the higher costs often associated with the development of renewable energy.

6. Information on environmental analysis

An environmental analysis of the impact of the proposed rule revisions is not needed because these changes are considered to be a Type III action under s. NR 150.03(3), Wis. Adm. Code. A Type III action is one that normally does not have the potential to cause significant environmental effects, normally does not significantly affect energy usage and normally does not involve unresolved conflicts in the use of available resources.

7. Initial regulatory flexibility analysis

Under Wisconsin law, none of the electric generating units that are impacted by the CAIR are a small business. CAIR imposes no reporting, compliance or performance standards on small businesses.

As part of the federal rule promulgation process, the EPA is required under the Regulatory Flexibility Act to consider potential impacts of proposed regulations on small entities. The small entity definition used by EPA includes: (1) electric utilities that produces 4 billion kilowatt-hours or less; (2) a small governmental jurisdiction that is a government of a city, county, town, district, or special district of less than 50,000; and (3) a small organization that is any not-for-profit enterprise that is independently owned and operated and is not dominant in its field. After considering the economic impacts of the rule on small entities, EPA has concluded that these rules will not have a significant economic impact on a substantial number of small entities and has determined that it is not necessary to prepare a regulatory flexibility analysis for this rule.