State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Scott Walker, Governor
Cathy Stepp, Secretary

101 S. Webster St.
Box 7921
Madison, Wisconsin 53707-7921
Telephone 608-266-2621
TTY Access via relay - 711

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Ms. Gina McCarthy, Administrator
Attn: Docket ID No. EPA-HQ-OAR-213-0495
EPA Docket Center
U.S. EPA
Mail Code 2822T
1200 Pennsylvania Ave. NW
Washington DC 20460

RE: Technical Comments Regarding New Source Performance Standards (NSPS) for Greenhouse Gas Emissions from Stationary Sources: Electric Utility Generating Units

Dear Administrator McCarthy:

The Wisconsin Department of Natural Resources (WDNR) is providing these comments regarding the new source performance standards (NSPS) regulating power plant carbon dioxide (CO_2) emissions as proposed by the U.S. Environmental Protection Agency (EPA) on January 8, 2014 *(79 FR 1430)*. These comments are in addition to, and separate from, comments submitted to EPA by the WDNR in conjunction with several signatory Commissioners of the Public Service Commission of Wisconsin (PSCW) regarding this same issue. The joint PSCW and WDNR letter highlighted overarching concerns to the state agencies charged with regulating Wisconsin electric utilities. Many of the issues raised in that joint letter are explained in greater detail in these comments.

The WDNR must emphasize that the comments set forth below should not be interpreted as the State of Wisconsin's endorsement of this initiative. We note significant policy and legal issues regarding EPA's authority to regulate CO_2 emitted from new electric power plants. Therefore, these comments do not waive any future legal claims that Wisconsin may have regarding the promulgation or enforcement of the regulations.

The NSPS proposes CO_2 emission limitations for new coal-fired power plants based on the application of carbon capture and sequestration (CCS) control technology and for new combustion turbines based on the emissions level inherent to new units. We have identified a number of issues regarding this proposal as outlined below. We must highlight, though, our very significant concern that the NSPS will effectively prohibit siting new coal-fired generation in Wisconsin and within the utility sector as a whole. This impact will result in greater reliance on natural gas fired generation, potential electric reliability issues, added costs, and inequity among states.

In addition, the EPA's analysis of CCS for this proposal is problematic and not consistent with establishing NSPS requirements under the CAA. In fact, we note that there are no installations of CCS that have been determined feasible or cost-effective under best available control technology (BACT) or have been required under any other regulation for fossil fuel power plants. There are few installations of CCS operating to provide CO_2 for industrial purposes. In all other cases, CCS is being installed or operated in conjunction with Department of Energy Funding. Clearly, CCS has not been shown to be viable through BACT determinations and therefore should not be required under the proposed NSPS requirement.

Ultimately, the proposed rule will likely delay utility sector CO_2 emission reductions because of the CCS requirement for new coal-fired generation. One of the primary compliance options to any utility sector NSPS will be to replace existing generation with new, more efficient generation. However, because new coal generation cannot be constructed under EPA's proposal, utilities are likely to keep existing, less efficient coal generating units operating beyond their normal lifetime. The outcome may very well be that CO_2 emissions will not be reduced as rapidly as intended under the rule.

For these reasons, among others, the WDNR requests EPA to consider the following comments and re-examine the proposed NSPS rule. Any modification going forward should be premised on an acknowledgement that CCS is not adequately demonstrated for purposes of setting a coal-fired NSPS.

1. The NSPS based on CCS is inconsistent with the historic interaction between NSPS and the Prevention of Significant Deterioration Requirements for Best Available Control Technology (BACT).

The Clean Air Act established both the prevention of significant deterioration (PSD) program and the NSPS program (under which this rule is being proposed) to address air pollutants emitted by new sources. The PSD program specifically requires a new generating unit to implement BACT, which is the maximum degree of emission reduction determined on a case-by-case basis after taking into account energy, environmental, and economic impacts. The BACT case-by-case approach will address and implement, where feasible, newer technologies such as CCS. Further, BACT limits, by definition, cannot be less stringent than limits under any applicable NSPS standard for the same pollutant. NSPS standards, on the other hand, are uniform standards that must be broadly achievable within a source category. Therefore, a natural outcome of the CAA program structure is that the proposed NSPS should not be more stringent than a BACT standard that would be determined for an individual generation unit. By establishing CCS as the required control technology under NSPS, EPA is setting a standard more stringent than BACT for CO_2. This is highlighted by the following points.

The WDNR has already performed CO_2 BACT determinations for three significant power and steam generation projects in Wisconsin; none of these cases determined CCS to be feasible or cost-effective for BACT. One of these determinations was for the Elm Road coal-fired generation plant operated by We Energies. This plant began operation in 2009 and represents the latest, most up-to-date coal generation technology for a power plant; yet, even in this case CCS was deemed neither feasible nor cost-effective. We are not aware of any change in conditions in Wisconsin that would make CCS viable as the CO_2 BACT for any of these past determinations. Further, we are not aware of any power plants nationally where CCS has been determined to be BACT. Therefore, EPA cannot reasonably conclude that CCS should be required under a NSPS when it has not yet been required under a BACT determination for coal-fired generation.

Further, CCS cannot be used in setting an NSPS because, as acknowledged by EPA, it is an emerging technology that has not yet been implemented for purposes of controlling utility sector CO_2 emissions. As EPA notes in the rule's preamble, CCS has only been installed on a few power plants. Five of these plants are supplying CO_2 for industrial purposes and oil recovery. In the remaining cases, CCS is being implemented under Department of Energy funded projects. These cases, therefore, do not prove that CCS is viable for regulatory purposes, even for a top control BACT requirement, for the coal-fired utility sector as a whole. In this context, "coal-fired utility sector as a whole" means coal-fired generation (including the different types and size of coal generation units) able to be located anywhere in the country. This concept is further discussed in Section 2A.

This information demonstrates that CCS has not risen to the level of setting a coal-fired generation NSPS. In no case should an NSPS emission limitation be based on a technology that has been found to be

technically or economically infeasible under every BACT assessment conducted for CO_2. Therefore the use of CCS to establish an NSPS is counter to the principle that the NSPS be feasible and cost-effective for the coal-fired utility sector as a whole. If EPA continues to contend that CCS is the appropriate basis in setting the NSPS, the rule must also allow for a case-by-case alternative emission limitation similar to the BACT determination analysis.

2. CCS is inconsistent with the plain language of section 111 of the Clean Air Act (CAA)

Section 111(b) requires EPA to set emission standards for any source category whose emissions endanger public health and welfare. These standards may distinguish among classes, types, and sizes within the source category. This standard is defined as:

> *"...a standard for emissions of air pollutants which reflects the degree of emission limitation achievable through the application of the best system of emission reduction which (taking into account the cost of achieving such a reduction and any nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated."*

Based on these requirements, the assumed use of CCS in setting the NSPS for coal-fired generating units does not meet the plain language of Section 111 of the CAA for the following reasons:

A. <u>CCS has not been adequately demonstrated to be available and achievable now for the utility sector as a whole as required under Section 111</u>

As set forth in *National Lime Association vs. EPA*, 627 F.2d 416 (D.C. Cir. 1980), CCS must be reasonably feasible, available, and cost-effective now and at any location. For purposes of this NSPS, the potential sites that must be evaluated for CCS feasibility and cost must include any site where a coal-fired generating unit is currently operating. This is necessary because the rule must allow for a currently operating EGU to be replaced by a new unit firing the same or similar fuel. These achievability criteria are also supported by the requirement in Section 111 to update the NSPS every eight years based on emission reductions "achieved in practice." The logic inherent in this updating requirement clearly indicates an expectation that the standard should reflect control technology installations that have already occurred within the source category.

In this context, CCS has not been adequately demonstrated as being currently available anywhere a coal generating unit could reasonably be anticipated to be sited. Our conclusion is based on the fact that, to date nationally as noted in Section 1, there are no full-scale installations of CCS operating within the utility sector. In addition, as we describe in Section 3, carbon sequestration sites remain unproven and unavailable for potential coal-fired generation in the vast majority of states.

B. <u>Section 111 does not require a predetermined amount of emission reduction or the forced development of an "emerging" technology</u>

One reason EPA gives for requiring the use of CCS is that no other technology, including power plant efficiency measures, results in adequate emission reductions. EPA, in its analysis, appears to have ruled out the use of generation equipment efficiency measures at the plant or alternative combustion technologies such as oxy-firing.

This approach to setting the NSPS is incorrect. Under the definition of the standard, as previously cited, there is no set level of emission reduction that must occur. Rather, EPA is simply directed to identify

emission reductions that are achievable, while also considering, cost and other environmental factors, regardless of the scale of the emission reductions.

EPA also states that CCS is the appropriate basis for NSPS because it will force the use of an emerging technology. This simply is neither the function of the NSPS nor consistent with the plain language of Section 111. Rather, as discussed, the NSPS is supposed to be derived based on a technology that is achievable for the utility sector as a whole for each type of coal-fired generation unit. Section 111 further ensures that a technology is well beyond the emerging technology phase. This intent is demonstrated by the CAA providing the administrator the ability to set standards for different types of sources within a category to ensure that emission limitations are clearly feasible throughout the source category. This conclusion is supported by statements in the D.C. Circuit Court of Appeals case *Sierra Club v. Costle*, 657 F.2d 298 (D.C. Cir App 1981).

C. CCS will create an inequity between states that is inconsistent with the CAA

As described in the discussion of EPA's analysis, the majority of carbon sequestration capacity is unproven and not even potentially available in a number of states. Therefore, any requirement to use CCS under the NSPS will result in coal-fired power plants being feasible in only a very few locations nationally for the foreseeable future. At a minimum, the NSPS will cause costs between states to be dependent on highly variable CO_2 transportation costs. For the many states without proven CCS capacity, these costs will be prohibitive (see Section 3B).

EPA states that the alternative is to install natural gas fired generation plants. However, there are many locations that do not have natural gas available. Therefore, forcing dependence on one fuel or another will create significant electric reliability concerns for many areas.

For these reasons, the NSPS as currently proposed will clearly result in creating a competitive economic advantage for a few states while prohibiting the ability to site coal-fired generating units and creating additional and significantly varied costs for the majority of states. This outcome, as discussed by the D.C. Circuit Court of Appeals case *Sierra Club v. Costle*, 657 F.2d 298 (D.C. Cir App 1981), is not allowed under the CAA.

3. EPA's analysis supporting the required use of CCS for the NSPS is problematic and incomplete.

A. Carbon sequestration capacity is not proven and available at all potential sites of a new coal-fired generating unit

As discussed in Section 2, if CCS is used in setting the NSPS for coal-fired generating units, it must be available and achievable to the utility sector as a whole. CCS does not meet this test for the following reasons.

First, carbon sequestration resources are not proven and available for the vast majority of states, including Wisconsin. EPA identifies a total of between 2 to 20 billion metric tons of carbon storage capacity in North America.[1] However, EPA also acknowledges that virtually all of this capacity remains unproven. Therefore, in setting the NSPS, EPA relies on a prediction that sequestration capacity will be tested and proven as needed. Relying on a future unproven condition in this manner does not equate to the

[1] National Energy Technology Laboratory: Carbon Dioxide Storage Program. http://www.netl.doe.gov/research/coal/carbon-storage/research-and-development (accessed Feb 5, 2014).

sequestration as being available and achievable for purposes of setting the NSPS. Therefore, EPA must rely only upon proven sequestration sites in the analysis of CCS.

Second, fourteen states, including Wisconsin, do not have any geologic formations suitable for carbon sequestration according to EPA's analysis. For Wisconsin, this means the closest potential carbon sequestration site is in Decatur, IL (part of the Illinois Basin). This testing site is over 200 miles from the closest existing Wisconsin power plant and over 500 miles from the farthest Wisconsin plant. Further, there are no existing CO_2 pipelines from Wisconsin to the Illinois Basin. Thus, CO_2 sequestration is not currently available at any site in Wisconsin where a coal-fired power plant is most likely to be located in the future.

Therefore, due to the unproven nature of almost all carbon sequestration capacity and lack of capacity in a significant number of states, EPA cannot reasonably conclude that carbon sequestration capacity, and thus CCS, is available to the utility sector in each and every state. We note that the availability of carbon sequestration is one factor that clearly limits the feasibility of CCS. Moreover, carbon sequestration has not been proven on a long-term basis. In addition, as discussed in Section 1, CCS has not been implemented within the utility sector to the extent necessary for setting an NSPS.

B. EPA's NSPS analysis of CCS does not account for the cost and issues related to transporting CO_2 to proven carbon sequestration sites.

The NSPS analysis is lacking in that EPA assumed that CO_2 would not be transported farther than 50 miles. However, based on the lack of proven sequestration sites and lack of any sequestration capacity in a number of states, EPA must yet account for the feasibility and cost of transporting CO_2 from potential sites of new coal-fired generating units to currently proven carbon sequestration sites. As discussed, the potential sites for new coal plants are the locations of currently operating coal-fired generating units. EPA should consider the following points in addressing CO_2 costs.

When transporting CO_2 greater than 50 miles, EPA assumed the cost would be insignificant compared to other costs related to CCS. This simply is not true. For example, for a 550 MW supercritical coal generating unit, EPA estimated that the equipment necessary for removing CO_2 at the plant would cost on the order of $267 million.[2] In comparison, under a BACT analysis for one source, the WDNR determined that constructing a CO_2 pipeline to the closest potential sequestration site (Illinois Basin) would cost approximately $405 million – nearly twice as much as the control technology itself. Even though this source was smaller than the 550 MW plants considered in EPA's analysis, CCS was not cost-effective and was not determined to be BACT for this source.

Another analysis of CO_2 sequestration costs for Wisconsin utilities resulted in an estimate of $550 million to $1 billion capital cost for a pipeline network that would be required to serve Wisconsin coal-fired generation.[3] This estimate reflects the cost of building the CO_2 pipelines in corridors for access by multiple power plants.

This data shows that CO_2 transportation cost is a significant cost component of CCS for any new electric generation unit in Wisconsin. We note that these presented costs do not include the additional costs associated with operating CO_2 pipelines. Also, in addressing CO_2 transportation, EPA must address the

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[2] DOE/NETL, 2011; *Cost and Performance of PC and IGCC Plants for a Range of Carbon Dioxide Capture*, DOE/NETL-2011/1498, Department of Energy and National Energy Technology Laboratory.

[3] PSCW and WDNR, 2010; *An Investigation to Explore the Potential for Geologic Sequestration of Carbon Dioxide Produced by Wisconsin's Electricity Generation Fleet*, Public Service Commission of Wisconsin and the Wisconsin Department of Natural Resources.

difficulties, logistics and significant additional expense of placing pipelines and facilities in urban areas. Much of Wisconsin's coal generation is located in urban areas and raises significant question as to the feasibility and the costs estimated for CO_2 pipelines.

C. EPA is applying the NSPS to a range of sizes and types of generation technology that were not evaluated in EPA's analysis of CCS.

EPA evaluated the cost of CCS based on applying the technology to a 550 megawatt (MW) supercritical bituminous boiler. Therefore, the proposed NSPS should not apply to other types of coal generating units whose fundamental characteristics or application are significantly different from the surrogate coal-fired generating unit evaluated by EPA. This exemption should, at a minimum, apply in the following cases.

Currently, there are 746 steam generating units between 25 and 550 MWs in size listed in EPA's National Electric Energy Data System database. These generating units are comprised of fluidized bed boilers, stoker boilers and conventional pulverized coal boilers. EPA must acknowledge that many of these units are serving specific needs and cannot simply be replaced by a large supercritical boiler or natural gas fired generation. EPA must also consider that these types of boiler technologies are many times the base technology for combined heat and power (CHP) applications. Therefore, a NSPS analysis and limit must be developed specifically for and allows for the continued use of these types and sizes of coal-fired generation units. The current proposed limit was developed solely for large supercritical boilers and does not address these other technologies.

The proposed NSPS will also apply to any boiler technology for generating electricity that may emerge or be developed in the future. One example is oxy-firing, which has the potential to significantly increase the efficiency of boilers and decrease CO_2 emissions as compared to the super-critical coal-fired boiler assumed in the analysis. This oxy-firing boiler technology could have the potential to achieve significant emission reductions at potentially lower cost than CCS. However, oxy-firing cannot be considered as a stand-alone option if it cannot meet the CCS-based NSPS. Thus, the NSPS could effectively prohibit the use of this and other emerging boiler technologies, even if they provide a better overall outcome.

D. The base emission rate assumed before the application of CCS is not reflective of real-world emission rates for new coal generation.

In setting the NSPS, EPA assumes a base emission rate of 1,800 CO_2 pounds per megawatt-hr (lbs/MWh) for a supercritical coal-fired generation unit. The Elm Road power plant operated by We Energies is comprised of the latest, most efficient and well-operated coal-fired generation units in the national fleet. However, the demonstrated Elm Road CO_2 emission rate is 1,950 lbs/MWh, well above EPA's assumed base rate.

E. EPA cannot rely on natural gas fired generation in demonstrating that CCS for the coal-fired NSPS is feasible or achievable.

A premise EPA uses in demonstrating that CCS is achievable is that it believes no new coal-fired generating units will be built for the foreseeable future. Instead, the utility industry will only build natural gas-fired generating units. EPA therefore concludes that CCS will not be needed in any case. This assumption conflicts with the definition of adequately demonstrated control technology, as described in Section 2, in a number of ways. First, the NSPS must be set on what can be achieved for the coal-fired generation source category and not be based on the assumption that this generation will be replaced by natural gas. Second, EPA relies on future potential conditions in the analysis in determining that the NSPS is feasible. EPA does not consider, for example, that the cost of natural gas may rise, making the installation of coal-fired generation necessary. Third, EPA further substantiates the proposed coal-fired

NSPS by saying that natural gas generation can be placed anywhere that CCS is not feasible. In making its determination, EPA cannot make these caveats and assumptions. Instead, it must simply evaluate whether CCS is presently available and achievable for construction of new coal-fired electric generating units where coal-fired generation is currently operating.

EPA's approach in assuming that all new electricity can be generated from natural gas is a dangerous precedent. Widespread replacement of coal-fired generation with natural gas may result in an over-reliance on natural gas generation, which can affect electric reliability and cause significant added cost to the residential, commercial and industrial users of natural gas. Wisconsin has already seen natural gas shortages for industrial facilities in the state during the winter of 2013-2014.

4. Biomass fuels should not be regulated if co-fired with fossil fuel and should be creditable towards meeting the fossil fuel NSPS.

The proposed rule will regulate EGUs combusting biomass fuels any time fossil fuels comprise more than 10 percent of the heat input to the unit. For example, if the unit is fired by 50 percent biomass and 50 percent fossil fuel based on heat input, the biomass fuels will be subject to the same CO_2 emission limitation as the fossil fuels. This situation is common, as the most efficient and reliable approach is to burn biomass in conjunction with fossil fuels.

Biomass CO_2 emissions should not be regulated under the NSPS coal CO_2 emission limit regardless of what portion is fired with coal or other fossil fuels. Doing so will only penalize the use of biomass energy when there are many biomass fuels, including those harvested under sustainable forestry practices, that are beneficial in reducing CO_2 impacts fossil fuels. Rather, EPA should provide credit from the use of biomass fuels towards meeting any fossil fuel CO_2 emission limitation. At a minimum, EPA should not regulate biomass CO_2 emissions under the same rule as the proposed NSPS for coal-fired generation or allow states to determine the CO_2 neutrality of different biomass fuels.

Wisconsin believes that the following types of biomass should be considered CO_2 neutral:

- Forest biomass and industrial or commercial by-products collected under sustainable forestry programs
- Biomass harvested as part of a fire hazard reduction activity or that is collected during clean-up from natural storms or disasters.
- Biomass harvested as pre-commercial thinning, slash or tree residue.
- Biomass obtained from the demolition of buildings and waste obtained from removal of invasive trees by municipalities.
- Biogas energy from digesters and landfills.
- Bioenergy derived from municipal solid waste.

5. Simple cycle combustion turbines (SCCTs) and efficient combined heat and power (CHP) generating units should not be regulated under the proposed NSPS.

A. <u>Simple cycle combustion turbines should not be regulated under the proposed NSPS.</u>

EPA believes that most simple cycle combustion turbines (SCCTs) will not be subject to combustion turbine CO_2 emission limitations proposed in the NSPS. EPA believes this exemption will occur because most SCCTs are used in meeting peak electricity demands and will therefore operate less than the applicability threshold of 33% of each SCCT's generating capacity. EPA further believes this exclusion is technically appropriate for SCCTs operating below this threshold (*79 FR 1434*).

The WDNR agrees that SCCTs should be exempt from the proposed NSPS rule. However, EPA should take the additional action of expressly writing in the rule that SCCTs are not subject to the rule regardless of operating levels. One of the primary reasons to make this adjustment is that the rule, as proposed, will still create a compliance burden in that the operators will have to show that the SCCTs are exempt. Further, operators may start to curtail operation of the new more efficient SCCTs in order to keep them below the 33% applicability threshold. This result may actually increase CO_2 emissions by spreading generation to older, less efficient SCCTs.

Also, SCCTs should be excluded from the rule as they represent a very small portion of the CO_2 emitted by the utility sector. For example, in Wisconsin SCCTs account for only 2% of the utility sector's CO_2 emissions. Finally, the emission limits proposed for SCCTs will not result in any definable reduction in CO_2 emissions. The limit is based on the use of modern, efficient SCCTs. In siting a new combustion turbine, the owners and operators will want to obtain the most efficient SCCT possible as fuel consumption is a primary cost in generating electricity. Therefore, there is no need to regulate SCCTs under the proposed NSPS, especially when most units will be exempt and no additional CO_2 reductions will be achieved for those new units that are subject to the emission limitation.

B. Combined heat and power (CHP) generating units should not be subject to the NSPS CO_2 emission standards.

EPA and the Department of Energy have long promoted CHP as one of the best pathways for both producing useful energy and reducing CO_2 emissions. As currently structured, the rule will apply to any CHP unit selling more than one-third of its electric generating capacity to the grid. This potential applicability creates a significant disincentive for new projects that would only be viable if they sell electricity to the grid. In addition, applicability of the NSPS standard may actually result in the loss of current CHP capacity. For example, Manitowoc Public Utility (MPU), in Manitowoc Wisconsin, currently operates solid fuel fired fluidized bed boilers to generate electricity for the City of Manitowoc and to supply thermal heat to nearby industry. CCS cannot be expected to be cost-effective for this type of electric supplier. Currently, the proposed regulation would likely prohibit the facility to replace these units using the same fuels in the future. The result may be that the facility discontinues operation instead of efficiently providing power and heat to end-users at lower CO_2 rates than can be achieved by separated dedicated power systems serving each need.

The proposed NSPS rule does credit the thermal energy used by CHP applications towards meeting the CO_2 emission limit. Directionally, then, EPA is working to incent CHP under the NSPS rule. However, a more practical and streamlined approach is to simply exclude efficient CHP from regulation under the proposed NSPS rule. Exempt CHP could potentially be defined as projects achieving a 75% overall efficiency. However, the appropriate level should be further evaluated. This recommended approach will actually encourage the addition of CHP electricity to the grid.

6. Conclusion

The WDNR strongly believes that the NSPS for coal-fired power plants cannot be based on the use of CCS at this time. The WDNR also believes that EPA must correct the NSPS for a number of deficiencies and modify the rule to exclude sources that are inappropriately regulated. To do otherwise will create significant issues within the utility sector moving forward and may even delay reductions in CO_2 emissions.

The WDNR appreciates the opportunity to provide these comments.

Sincerely,

Bart Sponseller
Director, Bureau of Air Management

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