May 9, 2014

EPA Docket Center (Air Docket)
United States Environmental Protection Agency
Mail Code: 2822T
1200 Pennsylvania Avenue, NW
Washington, DC 20460
Attention: Docket ID Number: EPA–HQ–OAR–2013–0495

Re: Standards of Performance for Greenhouse Gas Emissions from New Stationary Sources: Electric Utility Generating Units; 79 FR 1430-1519 (January 8, 2014)

The Institute of Clean Air Companies (ICAC) appreciates the opportunity to comment on EPA's proposed Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units. ICAC is the national non-profit trade association of companies that supply air pollution control and monitoring systems, equipment, reagents, and services for stationary sources. ICAC has promoted the air pollution control industry and encouraged the improvement of engineering and technical standards since 1960. Our members include over 90 companies who are leading manufacturers of equipment to control and monitor emissions of particulate matter (PM), volatile organic compounds (VOC), sulfur dioxide (SO_2), nitrogen oxides (NOx), hazardous air pollutants (HAP), mercury, acid gases, and greenhouse gases (GHG). Comments pertaining to a number of issues regarding the proposed rule are provided below.

Overarching Comments

ICAC's primary concern with the proposed rule is that it relies on the faulty presumption of the existing commercial availability of carbon capture (CC) technology for coal-fired units. We believe that in its determination of Best System of Emission Reduction (BSER) adequately demonstrated, EPA erred in its assumptions and reliance on the progress and future viability of four facilities' CC technologies, and their application to larger pulverized coal-fired units. Finally, we are concerned that EPA has ignored extensive past experience and many of the practical aspects of bringing a complex emission control technology to the commercial demonstration

stage. As a result, the proposed standards have created a business environment that delays future investment in CC technology.

On February 11, 2014 Julio Friedmann, deputy assistant secretary for clean coal at the Department of Energy (DOE), testified before the House Energy and Commerce Oversight and Investigations Subcommittee. ICAC agrees with many of the points made by Mr. Friedmann in both his written and oral testimony[1] including:

1) Coal fuels approximately 40 percent of our domestic electricity production, and as the Energy Information Administration (EIA) recently pointed out in the Annual Energy Outlook 2014 reference case, coal will continue to be one of the two most important sources of electricity generation through 2040;

2) In his oral testimony, Mr. Friedmann said it was "unquestionable" that coal would remain an essential element of a "vibrant" American energy portfolio but said it would be difficult to reduce greenhouse gas emissions and address climate change without the use of CCS technologies. "It's a technology that we simply need to have," Friedmann said.

3) DOE's Clean Coal Research Program, in partnership with the private sector, is focused on maximizing efficiency and environmental performance, while minimizing the costs of these new technologies. Research is focused on developing technology options that dramatically lower the cost of capturing carbon dioxide (CO_2) from fossil fueled energy plants.

Mr. Friedmann made a critical distinction between first-generation technology and second-generation technology, and stated that second-generation technology was a decade away. ICAC agrees with this realistic timeline, and although he made his comments in the context of associated costs, the practical implication of his testimony is that CC technology is not yet ready for commercial deployment on a wide scale, and especially for new pulverized coal-fired units. From a policy perspective, it is important to recognize that CC technology is only in its nascent stages today, and EPA's proposed rule should aim to remove barriers and incentivize the next steps towards further development, demonstration and commercial acceptance.

ICAC believes that the proposed rule takes away any incentive for making the incremental improvements in CC technology that are necessary for moving from first-genertion to second-generation technology, and the ultimate deployment of CC technology on a widespread basis at least cost. In our view, the practical aspects of developing a technology - such as trial-and-error with different processes and coals, and operating for extended periods of time at multiple sites

[1] Statement by Dr. S. Julio Friedmann Deputy Assistant Secretary for Clean Coal U.S. Department of Energy Before the Committee on Energy and Commerce Subcommittee on Oversight and Investigations U.S. House of Representatives, Carbon Capture and Storage, February 11, 2014, see http://docs.house.gov/meetings/IF/IF02/20140211/101742/HHRG-113-IF02-Wstate-KlaraS-20140211.pdf.

while carefully evaluating balance-of-plant impacts – have been short-circuited by EPA's blanket assertion that CC technology is commercially demonstrated.

Another practical aspect of developing new technolgy is obtaining project financing. Financing an unproven technology is extremey difficult, and commercial sources of financing are currently extremely problematical. Unfortunately, we disagree with Mr. Friedmann's optimistic assessment of the viability of DOE's recently announced $8 billion guaranteed loan solicitation. Because most CC technologies are in the early stages of development, it is too risky to consider debt financing to support continued R&D efforts including scale up and initial full-scale demonstrations. Because of this, ICAC believes that the loan guarantee program is not the correct mechanism for financial support to mitigate the significant risks of our member companies, as well as the risks to early adopters of our technologies to be effective in supporting the development of CC technology beyond the nascent stage it is in now. The risk of still-born CC technology in the U.S. may mean the technology will be need to be developed elsewhere.

Finally, in the proposed rule, the small data set of only four facilities that EPA relied upon for its BSER determination[2], already problematic because of insufficient sample size, presumes any new coal-fired EGU will be an IGCC rather than a PC fired unit designed to a supercritical or ultrasupercritical steam cycle. EPA would be better served by having CCS performance data on PC-fired units of which there are approximately 1300 in the U.S.[3] serving much of the country's baseload, along with nuclear plants, as opposed to IGCC.

The IGCC technology although introduced in 1985 at a commercial demonstration scale has since attracted interest in only four sites in the US. The primary reasons appear to be its high cost and reliability issues. Its overall efficiency is similar to that of a supercritical pulverized coal system; as a result recent new coal fired power plant construction (over 15,000 MW worldwide) has been of supercritical or ultra supercritical pressure.

We will amplify some of our general concerns with the proposed rule more specifically below.

Specific Comments

EPA Cannot Base its BSER Adequately Demonstrated Determination of the Four Facilities Cited in the Proposed Rule

EPA's assessment that nearly all of the coal-fired units that are currently under development are designed to use some type of carbon capture and squestration (CCS) and therefore proves the commercial availability of CCS fails to recognize that all of the projects identified are

[2] *Federal Register*, 79 FR 1435, January 8, 2014.
[3] At the end of 2012 there were 1,308 coal-fired generating units in the United States, totaling 310 GW of capacity. http://www.eia.gov/todayinenergy/detail.cfm?id=15031.

government sponsored technology *demonstration* projects. None of these projects were *commercial* endeavors and none would have been undertaken without the financial assistance of the U.S. or Canadian governments. EPA's position that construction of, or the intent to construct a CCS plant proves the commercial availability of CCS technology is flawed. While it is true that two projects are in construction, the Boundary Dam project in Canada and the Kemper County project in Mississippi, both are extremely expensive for both capital and operating costs and could never compete in the established commercial market for electricity sales. The cost of electricity from these projects would be prohibitive.

The other CCS projects cited, Texas Clean Energy and the Hydrogen Energy California (HECA) project (both IGCC applications) have yet to begin construction and continue to experience delays in obtaining financing in a large part due to the risk profile of these unproven technologies. Given the approximate 2X cost overruns that have been experienced at the two most recent large scale IGCC projects, Edwardsport and Kemper County, the financial community will have great difficulty assessing the risk of lending to these two new IGCC projects. If in fact the Texas Clean Energy and the HECA projects come to financial close in 2014 and are constructed it will be at least 2020 before they complete construction and have any indication if they can be operated successfully. If these two projects prove technically successful, it will take several more years of operation to verify the long term performance and maintainability of the technologies in order to prove whether these projects are an economic success and commercially viable.

Given the projected cost of these IGCC projects the list of companies that have the financial capability to take on the risk of development is very limited. In addition, the time it takes to bring any large project from concept to commercial operation can be 10 years or longer. It will be decades before any of these CCS technologies reach the nth-of-a-kind status where the technology and financial risks have been clearly established and widespread acceptance and deployment of the technologies can be expected.

In 2008 DOE began selection of ten large scale projects that were chosen to demonstrate CO_2 capture technologies. Kemper County, Texas Clean Energy and the HECA projects were part of these ten projects. Three of the ten projects were industrial scale non-power generation projects. One of the three industrial projects has been completed and is in operation, another is in start-up and one has been delayed approximately five years. Of the remaining seven power generation projects, the Kemper County Project is in the late stages of construction with startup delayed again until the 4^{th} quarter of 2014, two have been cancelled due to the inability of the utilities, AEP and Basin Electric, to find the means of cost recovery for their portion of the cost share for the projects, and the NRG, Texas Clean Energy, HECA, and the FutureGen 2.0 projects are all delayed, primarily due to challenges of obtaining project financing due to the unproven nature of the technologies. While the government funding being provided is very generous it is still insufficient to push most of these projects to completion. The financial markets have no interest in the first-of-a-kind nature of these projects and demand *commercial* guarantees and limits of liability that are untenable for the developers and technology suppliers of these first-of-a-kind systems. It is why these projects have been designated as technology

demonstrations. They are being built to demonstrate the potential for technological and economic viability of each of these CCS technologies to see if they in fact can survive in an open and competitive *commercial* market.

Enhanced Oil Recovery has Limited Potential to Defray the Costs of CCS Technologies

The use of CO_2 for enhanced oil recovery (EOR) is cited as an enabler for CCS technologies. The sale of CO_2 to oil field operators for EOR does in fact provide some offset to the cost of CCS. However, the price EOR operators are willing to pay for CO_2 from a CCS facility relative to the cost required to capture, clean and compress the CO_2, is far from sufficient to make the electricity produced by a CCS facility competive in the power sales markets. In addition, many oil fields are not able to utilize CO_2 flooding as an enhanced production method and in most cases the oil fields that are amenable to CO_2 use are located in remote areas far from electricity load centers, where large power plants would need to be sited in order to meet electric demands. This results in either long pipelines to deliver CO_2 to the oil fields or long transmission lines to deliver to load centers.

While the ability to capture CO_2 at a reasonable cost is important it is only half of the CCS equation. Much is yet to be proven regarding the permanent storage of CO_2 in deep geologic formations. While many good CO_2 storage sites have been identified through the DOE-sponsored CO_2 regional storage programs, not every power plant is located on or near favorable geology for CO_2 storage. Hundreds of miles of pipelines would have to be built to service these facilities adding to the already high cost of CO_2 capture. In addition, public acceptance of these storage facilities has yet to be determined along with all of the local permitting and regulatory impacts that will have to be defined.

Until CO_2 capture technology has been demonstrated as technically and economically feasible and the regulatory and liability issues surrounding long term storage of billions of tons of CO_2 have been clearly defined, it is unreasonable to place the financial burden of CCS on every household in the US while the rest of the world continues to emit CO_2 unabated from their fossil fired power generating facilities.

The Proposed Rule is Inconsistent with the Statutory Definition of NSPS and the Historical Interpretation of the Clean Air Act

NSPS are to "reflect the degree of emission reduction achievable through application of the best system of emission reduction which (taking into account the cost of achieving such reduction and any non-air quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated." The format of NSPS can vary from category to category (and even from facility to facility type within an NSPS).

Although such standards are based on the effectiveness of one or more specific air pollution control systems, section 111(b)(5) provides that the EPA may not prescribe a particular technology that must be used to comply with an NSPS, except in the instances where the Administrator determines "it is not feasible to prescribe or enforce a standard of performance." ICAC wishes to point out in this rulemaking that an NGCC is not "an air pollution control system" but an alternative way to convert certain fossil fuels into energy and electricity, and for this reason, has always been a distinct source category. Thus it does not meet the definition of a "best system of emission reduction." By allowing coal plants only with CCS (a technology that is not commercially available or demonstrated), EPA is mandating the selection of NGCC technology, if not explicitly but by default, which is contradictory to EPA policy that EPA cannot mandate technology or interfere in commercial markets. Finally, the fact that sequestration has numerous significant non-air quality impacts that are unresolved and or poorly understood, makes EPA's stated reliance on CCS for coal generation to meet the standard inconsistent with the statutory definition of NSPS.

ICAC also cites the EPA memorandum dated January 4, 1979 by David Hawkins[4], then Assistant Administrator for Air, Noise and Radiation, to regional administrators, that describes the relationship between BACT and NSPS and how the NSPS definition has been applied:

> *"In setting the NSPS, for example, emission limits are selected which can reasonably be met by all new or modified sources in an industrial category, even though some individual sources are capable of lower emissions. Additionally, because of resource limitations in EPA, revision of new source standards must lag somewhat behind the evolution of new or improved technology. Accordingly, new or modified facilities in some source categories may be capable of achieving lower emission levels than NSPS without substantial economic impacts. The case-by-case BACT approach provides a mechanism for determining and applying the best technology in each individual situation. Hence, NSPS and NESHAPS are Federal guidelines for BACT determinations and establish minimum acceptable control requirements for a BACT determination."*

In this memo it is clear that NSPS are generally achievable standards for a source category and generally lag behind BACT in stringency. BACT is a technology-driven standard that raises the bar, so to speak, as new control technologies become available. As we have described in our comments, the proposed NSPS cannot reasonably be met by new coal generation because it relies on a technology that is not yet commercially available or demonstrated. Because CCS is not yet available or demonstrated, CCS cannot even be considered BACT, much less NSPS.

Conclusion

For the past 40-50 years, ICAC members have invested in technologies and produced innovations that have allowed industries to meet the challenges of reducing emissions from

[4] http://www.epa.gov/ttn/nsr/psd1/p8_8.html.

stationary sources. As a result of investments in R&D supported by our members, DOE, and our customers, innovations have been developed over time that have resulted in improved efficiencies and decreased costs of compliance. This has occurred as a result of well-timed emissions regulations that were built upon the technical capabilities of proven emission control systems that were commercially available at the time the regulations were put in place.

ICAC members are currently investing their financial and intellectual capital in advancing CC technologies to support future needs to reduce carbon emissions from power generating and industrial sources. However, in the case of the proposed limits for GHGs for new stationary sources, ICAC believes that these regulations do not reflect the current status of the proven economic viability of CC technologies for deployment across the broad range of coal generating equipment. This creates a situation where it is highly unlikely that power producers will be able to justify the financial risks of proceeding with a multi-billion dollar project to build a modern high-efficiency power project without the assurance and that there are guarantees that the CC technology can meet the new standards. As a result, we believe that EPA's assumptions that there will be no new pulverized coal fired boilers built in future will be a self-fullfilling prophecy.

In addition, ICAC and its members believe that because the proposed standards do not accurately reflect the current status and availability of CC technology, this standard could have very significant unintended consequences that will be detrimental to the the country's efforts to reduce carbon emissions, including:

- The elimination of the potential for modernizing the coal-fired power fleet and achieving significant reductions in carbon dioxide and other polutants by replacing aging low-efficiency power plants with modern high-efficiency super- and ultra-critical pulverized coal boilers.

- The most likely elimination of new pulverized coal (PC) boilers built under this proposed standard will result in the elimination of a market for CC technology. As a result, even with some government support for the necessary R&D, there is no incentive for private and public companies to continue investment in innovations and advancements of their CC technologies.

- Elimination of the incentive of a market for CC technologies for new coal-fired plants will mean that advanced CC technologies will not be available to address carbon emissions from existing coal-fired power plants and other large sources of carbon emissions such as gas-fired power plants and large industrial facilities.

Finally, ICAC believes that the 1990 Clean Air Act Amendments (CAAA), which were developed to regulate Criteria Pollutants and Hazardous Air Pollutants (HAPS), may not be appropriate for addressing an issue as complicated as the impact of emissions of greenhouse gases on climate change. The strict language in the CAAA that defines the process for developing New Source Performance Standards does not allow for any flexibility in the regulation. Flexibility is critical in this situation, which depends upon the availability of new and emerging carbon capture

technology, as it provides safety valves that help mitigate risks to technology developers and to early adopters of the technology. Therefore, ICAC recommends that climate change may be better regulated through legislation specifically designed to address complicated, economy-wide issues.

The Institute appreciates the opportunity to participate in this public comment process and looks forward to working with the Agency as it finalizes its proposed GHG standards for new EGUs. Please contact ICAC's Director of Government Affairs Doug Austin at (202) 367-1114 with any follow-up questions regarding ICAC's comments.

Sincerely,

Betsy Natz
ICAC Executive Director