August 4, 2011

EPA Air Docket Center Nos. EPA-HQ-OAR-2009-0234 & EPA-HQ-2011-0044
United States Environmental Protection Agency
Mail Code 2822T
1200 Pennsylvania Avenue, NW
Washington, DC 20460

The Alliance for Industrial Efficiency (the Alliance) is grateful for the opportunity to comment on the proposed "National Emission Standards for Hazardous Air Pollutants From Coal- and Oil-Fired Electric Utility Steam Generating Units (EGUs) and Standards of Performance for Fossil-Fuel-Fired Electric Utility, Industrial-Commercial-Institutional, and Small Industrial-Commercial-Institutional Steam Generating Units" rule and the proposed amendments to the "New Source Performance Standards (NSPS) for Fossil Fuel-Fired Electric Generating Units" rule (hereinafter NESHAP and NSPS, respectively). The following comments apply to both rules.

The Alliance for Industrial Efficiency is a diverse coalition that includes representatives from the business, environmental, labor and contractor communities. We are committed to enhancing manufacturing competitiveness, reducing emissions, and creating jobs through industrial energy efficiency, especially through the use of Combined Heat and Power (CHP) and Waste Heat Recovery (WHR). We believe energy efficiency will play a critical role in facilitating compliance with EPA's Clean Air Act rules, as efficiency both reduces compliance costs and helps ensure the continued reliability of our electricity system as utilities adjust to the new standards. EPA appears to share this belief. Indeed, in the proposed rule, EPA reports that even very modest energy-efficiency investments could reduce implementation costs by $2 billion in 2015, $6 billion in 2020, and $11 billion in 2030."[1] The Agency's analysis would show even greater savings if it included a broader suite of energy-efficiency improvements. Moreover, the proposed rule includes a number of provisions designed to encourage facilities to incorporate energy efficiency into their compliance strategies. These comments offer several recommendations to strengthen these provisions in both the NESHAP and NSPS rules.

In particular, our comments offer five suggestions. First, EPA should modify its sensitivity analysis to reflect a more robust set of energy-efficiency assumptions. Second, we agree that it is appropriate to recognize the environmental benefit of electricity generated by CHP units by accounting for the

[1] U.S. Environmental Protection Agency, 76 Fed. Reg. 24976, 25074 (Table 23), May 3, 2011, "National Emission Standards for Hazardous Air Pollutants From Coal and Oil-Fired Electric Utility Steam Generating Units and Standards of Performance for Fossil-Fuel-Fired Electric Utility, Industrial-Commercial-Institutional, and Small Industrial-Commercial-Institutional Steam Generating Units."

benefit of on-site generation, which avoids losses from the transmission and distribution of the electricity; however, we encourage EPA to incorporate a larger multiplier in the final rule. Third, we encourage EPA to incorporate a net output-based standard in the final rule. Fourth, we believe that EPA should account for thermal output in addition to electric output in its output-based emissions limits. Fifth, we concur that building of replacement power through CHP could be considered "installation of controls" at the facility, and that such actions (both on and off-site) – assuming approval by the permitting authority – should be eligible for a one-year compliance extension.

1. EPA Should Modify Its Sensitivity Analysis to Account for Greater Energy-Efficiency Savings

As EPA recognizes, "energy efficiency can be an important part of a compliance strategy for this regulation. It can reduce the cost of compliance, lower consumer costs, reduce emissions, and help to ensure reliability of the U.S. power system."[2] We are pleased to see that the proposed rule includes a sensitivity analysis for an energy-efficiency case.[3] This analysis clearly demonstrates that even modest energy-efficiency investments can dramatically lower compliance costs. In fact, EPA's analysis finds that appliance efficiency standards mandated by existing statutes and rate-payer funded energy-efficiency programs alone can reduce the cost of implementing the rule by $2 billion in 2015, $6 billion in 2020, and $11 billion in 2030."[4] Moreover, energy efficiency can enhance system reliability by "augment[ing] currently projected reserve capacities."[5] We commend EPA for recognizing the role of energy efficiency in reducing compliance costs, enhancing reliability, and reducing emissions. Nonetheless, we believe that these conclusions could be strengthened through a more robust sensitivity analysis. We urge EPA to refine its sensitivity analysis to take a more ambitious view of available efficiency policies.

As an initial matter, EPA's analysis likely understates the benefits of the limited policies it considers. While EPA's Integrated Planning Model ("IPM") provides a sense of general trends, it does not allow for more granular predictions. Energy-efficiency investments are likely to be concentrated in densely populated areas with the highest demand. This means that even the limited policies included in the existing sensitivity analysis are likely to have even greater benefits than the IPM runs suggest.

EPA erroneously assumes that the selected efficiency programs will have similar levels of effectiveness through 2050.[6] In fact, both state and federal policymakers are making significant

[2] 76 Fed. Reg. at 25073; *see also* 75 Fed. Reg. 45229 (Clean Air Transport Rule, NOPR) ("Policies that will promote efficient use of electric power can be an integral, highly cost-effective component of power companies' compliance strategies."); Jennifer Macedonia *et al.*, Bipartisan Policy Center, June 2011, "Environmental Regulation and Electric System Reliability" (promoting energy efficiency as a way to reduce peak loads, avoid the need for 1:1 replacements as generators retire, and to help maintain system reliability).
[3] *See* 76 Fed. Reg. 25056-58, 25073-75.
[4] 76 Fed. Reg. at 25074 (Table 23).
[5] 76 Fed. Reg. at 25075.
[6] *See* 76 Fed. Reg. at 25073-74 (noting that EPA assumed that the modeled "impacts continue through 2050.").

progress in the area of energy efficiency.[7] Accordingly, the potential for fuel savings through energy efficiency are substantially greater than EPA estimates. To capture these potential savings, EPA should refine the analysis to include a more comprehensive suite of energy efficiency policies.

We recommend that EPA modify its analysis to reflect the recommendations of the State Energy Efficiency (SEE) Action Network, which seeks to assist state and local governments in their implementation of cost-effective energy-efficiency policies and programs over the next decade. The SEE Action Network's recommendations emerged from eight working groups comprised of the nation's leading voices on energy efficiency.[8] The eight working groups have finalized their blueprints and the collective recommendations should be released in the near future. Of particular note, the Industrial Energy Efficiency/ CHP Working Group aims to "install 40 gigawatts of new, cost-effective CHP by 2020."[9] Because the SEE Action Network is chaired by the Department of Energy and the Environmental Protection Agency, its recommendations reflect the Administration's view about the most cost-effective options for securing a clean-energy future.[10] As such, these recommendations provide a reasonable data point for a refined sensitivity analysis. This more robust analysis is important because it will provide a more accurate depiction of compliance costs.

While we recognize that EPA cannot mandate that facilities adopt these energy-efficiency policies in the context of these rules,[11] we agree with the Agency's finding that "the positive effects of these policies on the cost of the rule to industry and consumers could be a strong incentive to undertake them as a part of an overall compliance strategy."[12] We believe that EPA should modify the sensitivity analysis to reflect the SEE Action Network's more ambitious energy-efficiency policies and engage in an outreach and education effort with regulated entities about their findings. Moreover, while EPA cannot mandate energy efficiency, it can urge state environmental regulators

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[7] *See, e.g.,* Rachel Gold and Steven Nadel, ACEEE, May 2011, "Appliance and Equipment Standards Jobs: A Moneymaker and Job Creator in all 50 States" (http://aceee.org/files/pdf/white-paper/Appliance%20and%20Equipment%20Standards%20Jobs_1.pdf) (considering the combined impacts of the standards already in place as of December 2010, most of the standards revisions DOE is now working on and will complete by 2013, and the consensus standards in pending legislation); *See also* Jennifer Macedonia *et al.,* Bipartisan Policy Center, June 2011, "Environmental Regulation and Electric System Reliability," at 39 (http://www.bipartisanpolicy.org/sites/default/files/BPC%20Electric%20System%20Reliability.pdf) (noting that "energy efficiency continues to improve").

[8] Executive Committee members include representatives from the National Council of State Legislatures, the Conference of Mayors, the National Governors Association, the National Association of Energy Service Companies, the Business Council on Sustainable Energy, Natural Resources Defense Council, the American Council for an Energy-Efficient Economy, the National Association of Clean Air Agencies, a number of utilities and public utility commissions, among others.

[9] Todd Currier and Greg White, March 25, 2011, "Industrial Energy Efficiency/ CHP Working Group Executive Summary" (http://www1.eere.energy.gov/seeaction/pdfs/seeaction_ie_chp_executive_summary_052311.pdf).

[10] *See* State Energy Efficiency Action Network Fact Sheet (http://www1.eere.energy.gov/see_action_network/pdfs/see_action_fact_sheet_may_2011.pdf) (visited June 21, 2011).

[11] 76 Fed. Reg. 25073 (noting that energy efficiency is largely out of EPA's "direct control").

[12] 76 Fed. Reg. 25073 (also noting that "this rule can provide an incentive for action to promote energy efficiency.")

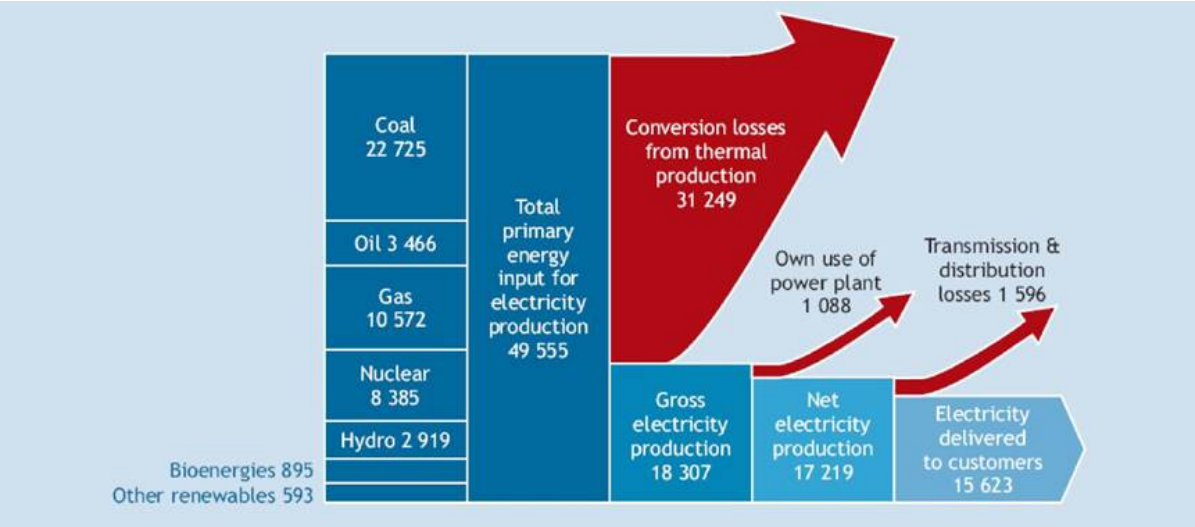
to view compliance extension requests more favorably from facilities that have made efforts to advance energy efficiency.[13]

2. The Rule Should Fully Account for Avoided Transmission and Distribution Losses

In the NSPS Rule, EPA requests comment "on whether it is appropriate to recognize the environmental benefit of electricity generated by CHP units by accounting for the benefit of on-site generation which avoids losses from the transmission and distribution of the electricity."[14] We agree that these avoided losses should be recognized. Indeed, such savings are one of the key benefits of distributed generation,[15] and we commend EPA for trying to find a way to account for this benefit in the NSPS rule. As an initial matter, we urge EPA to account for avoided line losses in the NESHAP rule as well.

As the following figure illustrates, roughly two-thirds of energy inputs (68 percent) are simply emitted into the air with conventional generation, with a mere 32 percent actually delivered to customers. A sizeable portion of this loss can be attributed to transmission and distribution (1,596 TWh or 9 percent of net electricity production in the figure below). The unfortunate results are lost competitiveness and jobs, as well as increased emissions. By recognizing the transmission and distribution benefits of CHP and WHR, EPA can help incentivize investments in these technologies.

Losses from Conventional Power Generation[16] (TWh)



[13] 76 Fed. Reg. 25057.
[14] 76 Fed. Reg. 25071.
[15] *See, e.g.*, U.S. EPA., Combined Heat and Power Partnership: Efficiency Benefits ("Because CHP is more efficient, less fuel is required to produce a given energy output than with separate heat and power. Higher efficiency translates into…reduced grid congestion and avoided distribution losses") (http://www.epa.gov/chp/basic/efficiency.html) (visited June 21, 2011).
[16] International Energy Agency, 2008, "*Combined Heat and Power: Evaluating the benefits of greater global investment,*" at 6 (Figure 3) (http://www.iea.org/papers/2008/chp_report.pdf).

We believe, however, the suggested 5-percent multiplier for line losses is too low. According to EIA data, national, annual electricity transmission and distribution losses average about 7 percent (6.7%) of the electricity that is transmitted in the United States,[17] costing nearly $26-billion in foregone revenue in 2009 alone.[18] These losses are even greater during peak hours. In fact, a recent report by the Regulatory Assistance Project finds that a grid segment or area with average line losses of 7 percent could have marginal line losses of 20 percent at the time of the system peak.[19] Studies at Carnegie Mellon University and MIT have shown that one megawatt-hour (MWh) of local generation, like CHP, can displace up to 1.47 MWh of central generation, suggesting a 47 percent benefit for efficient CHP.[20] While 47 percent is clearly not a reasonable multiplier, these numbers nonetheless imply the CHP benefit should be well above 5 percent. Moreover, where facilities can credibly demonstrate higher local or regional line losses (which can be verified by a third party), a larger multiplier may be appropriate. In addition to being more efficient and less polluting, CHP and WHR projects significantly reduce line losses, free existing transmission, provide less expensive back-up electricity, and generate sustainable base-load power. The final rule should adopt a multiplier that fully credits the transmission and distribution savings of CHP and WHR and therefore incentivizes such investments.

3. The Rule Should Incorporate a Net-Output-Based Standard

We are grateful that both the NSPS and NESHAP include output-based standards. As EPA notes in the preamble to the NSPS, "[b]y relating emission limitations to the productive output of the process, output-based emission standards encourage energy efficiency because any increase in overall energy efficiency results in a lower emissions rate. Output-based standards provide owners/operators of regulated sources with an additional compliance option (i.e., increased efficiency in producing useful output) that can result in both reduced compliance costs and lower emissions."[21]

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[17] US Energy Information Administration, Frequently Asked Questions: How much electricity is lost in transmission and distribution in the United States? (http://www.eia.gov/tools/faqs/faq.cfm?id=105&t=3); *see also* U.S. Energy Information Administration, *DOE/EIA-0348(01)/2,* 2009, United States Electricity Profile (Table 10: "Supply and Disposition of Electricity, 1990 Through 2009 (Million Kilowatthours)") (http://www.eia.gov/cneaf/electricity/st_profiles/us.html; Table 10) (line losses calculated as ["estimated losses" divided by "total disposition" minus "direct use"]*100 or [260,581/ (4,002,522-126,938)]*100 = 6.7%)].

[18] U.S. Energy Information Administration, Form EIA-861, "Annual Electric Power Industry Report" (Table 8: "Retail Sales, Revenue, and Average Retail Price by Sector, 1990 Through 2009") (reporting average retail prices of 9.82 cents/ kWh in 2009); *Id.* (Table 10: "Supply and Disposition of Electricity, 1990 Through 2009 (Million Kilowatthours)") (reporting 260,581 million kilowatt hours in estimated losses in 2009) (9.82 cents * 260,581 million kilowatt hours = $25.6 billion).

[19] Jim Lazar & Xavier Baldwin, Regulatory Assistance Project, "Valuing the Contribution of Energy Efficiency to Avoided Marginal Line Losses and Reserve Requirements," July 2011, at 2 (explaining that "marginal losses avoided are much greater than average losses on a utility distribution system" because "losses grow exponentially with load.").

[20] Masoud H. Nazari and Professor Marija, Oct. 2010, "Enhancing Efficiency and Robustness of Modern Distribution Systems" (reporting 270 billion KWh in transmission and distribution losses in US in 2007; concluding that one MW of correctly located distributed generation can displace, on average, 1.5 MW of grid generation).

[21] 76 Fed. Reg. at 25063.

Traditional "input-based" regulations set emission limits based on the amount of fuel used (e.g., pounds of pollutant per million BTUs). This approach has contributed to the inefficiency of our electrical production system by discriminating against energy efficiency. We are very pleased that EPA's most recent Clean Air Act rules have reversed course and use output-based standards.[22] By expressing emissions limits as emissions per unit of useful energy output (e.g., pounds per megawatt hour), this approach rewards generators that have the highest "output" of megawatt hours and the lowest "output" of pollutants. We appreciate that EPA has reaffirmed its commitment to output-based standards in these rules and believe that this will further elevate energy efficiency as a compliance option. Nonetheless, we believe that these efficiency benefits can be strengthened through the use of a net-output based standard.

Net-output based standards create incentives for even greater efficiency. By basing output-based standards on net-energy output, facilities would have an incentive to minimize parasitic energy demands from pollution control equipment. While we recognize the potential "monitoring difficulties" associated with tracking on-site energy use, we also note that utilities should be eager to accurately measure their power output, since this determines their potential revenue. Given that inclination, we believe that such difficulties should not be insurmountable. As such we support the use of net output-based standards in both the NSPS and NESHAP.

4. The Rule Should Account for Thermal Output from CHP and Waste Heat Recovery Systems

As EPA recognizes in the definitions to the proposed rule, cogeneration units produce "both electrical (or mechanical) and useful thermal energy from the same primary energy source."[23] The proposed NESHAP rule further defines "gross output" in a way that credits useful thermal energy recovery from CHP and WHR operations.[24] Despite this, the rules' output-based emissions limits only appear to consider electrical output.[25] In doing so, the rule fails to account for one of the principle benefits of cogeneration.

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[22] *See, e.g.*, 76 Fed. Reg. at 25124-28 (Tables 1 & 2); US EPA, Mar. 21, 2011, "National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters, Final Rule," 76 Fed. Reg. at 15687-91 (http://edocket.access.gpo.gov/2011/pdf/2011-4494.pdf); *see also* EPA has used an output-based approach for the new source performance standards (NSPS) for NOx from utility boilers, NSPS for mercury from coal-fired utility boilers, and cement kilns. For instance, the most recent *New Source Performance Standards for Stationary Gas Turbines*, 71 Fed. Reg. 38482, 38483, July 6, 2006, provides turbine owners with the option of using an output-based standard for calculating NOx emitted per unit of useful recovered energy. In its final NESHAP rule for the Portland Cement Manufacturing Industry, 75 Fed. Reg. 54970, 55052, Sept. 9, 2010, EPA adopted an output-based methodology for PM, NOx and SO_2.

[23] 76 Fed. Reg. at 25122.

[24] 76 Fed. Reg. at 25123 ("For a cogeneration unit, the gross useful work performed is the gross electrical, including any such electricity used in the power production process (which process includes, but is not limited to, any on-site processing or treatment of fuel combusted at the unit and any on-site emission controls), or mechanical output plus 75 percent of the useful thermal output measured relative to ISO conditions that is not used to generate additional electrical or mechanical output or to enhance the performance of the unit (i.e., steam delivered to an industrial process).")

[25] 76 Fed. Reg. at 25027 (Table 10) (emission limits given as "pounds pollutant per megawatt-electric output (gross)"); 76 Fed. Reg. at 25125-25128 (Tables 1 & 2) (emission limits given as "lb per MWh" and "lb per GWh").

CHP uses a single source for electric generation to create both thermal energy (heat) and electricity. WHR uses industrial waste heat (or other energy-laden waste streams) that is typically released into the atmosphere and, instead, captures that energy to generate emission free electricity and useful thermal heat. Thus, instead of purchasing electricity from a distant electric utility and burning fuel in an on-site boiler to produce heat, an industrial, commercial or residential facility can use CHP or WHR to provide emission-free electricity and efficiently provide both electricity and heat. By providing both power and heat, a CHP facility can be twice as efficient as traditional power generation,[26] while WHR can produce emission-free power from heat otherwise vented into the air. Rather than emitting two-thirds of potential power from smokestacks, facilities using CHP and WHR convert that waste to clean power.

Indeed, as the figure on page 4 of the comments illustrates, as much as 63 percent of total energy inputs are lost as wasted heat with conventional generation. The rule should incentivize CHP and WHR projects, which limit these losses. To that end, the output-based standards in both the NSPS and NESHAP should be modified in the final rule to account for both the thermal and electric generation from covered CHP and WHR systems. Absent this, the limits fail to account for (and incentivize) the full efficiency gains associated with such systems.

5. EPA Should Provide a Compliance Extension for Facilities Seeking To Provide Replacement Power through CHP or Waste-Heat Recovery

We agree with EPA's suggestion that "building of replacement power could be considered 'installation of controls' at the facility,"[27] justifying a one-year extension of the compliance period. We further believe that this extension should apply to off-site power generation in limited circumstances (as elaborated in 5(B), below).

A. EPA Should Provide a Compliance Extension for Facilities Seeking To Provide On-Site Replacement Power

The Clean Act provides flexibility under Section 112 for control methods depending on the nature of the source, with a preference for control strategies that further reduce emissions. This extension should apply to on-site non-conventional replacement generation through CHP or WHR.

While EPA generally acknowledges the adequacy of the three-year compliance schedule for permitting and retrofitting known pollution controls onto existing facilities, the proposed rule suggests permitting authorities consider granting a one-year extension, under the authority of Clean Air Act section 112(i)(3), if needed in order to retire a unit and build on-site replacement power (e.g., combined cycle turbines).[28] We note that CHP and WHR may differ from such stand-alone new turbine generation, in that they are incorporated into existing facilities. Because these

[26] Oak Ridge National Laboratory (ORNL), Dec. 1, 2008, *Combined Heat and Power: Effective Energy Solutions for a Sustainable Future*, at 6 (http://www1.eere.energy.gov/industry/distributedenergy/pdfs/chp_report_12-08.pdf).
[27] 76 Fed. Reg. at 25055.
[28] 76 Fed. Reg. at 25055.

technologies are site-specific, they may require additional time to engineer and permit. Because these technologies create opportunities for fuel savings and associated emission reductions (see *above*), the rule should incorporate provisions (like the one-year compliance extension and output-based emissions standards) to encourage their use.

B. EPA Should Expand Clean Replacement Power Opportunities to Make Retirements a Realistic Compliance Option

Restricting replacement power to on-site equipment significantly reduces opportunities for facilities to invest in clean replacement power and consider retirement as a compliance strategy. Many renewable technologies cannot be installed on the footprint of existing power plants. Moreover, there are many more opportunities for CHP and WHR systems offsite (at industrial facilities). These industrial sites, in turn, can reduce demand and/or sell excess power to affected utilities under long-term contracts, making retirements possible.

Given the same time of replacement, the environmental result would be identical regardless of whether the clean replacement power is secured on-site or off-site. In either case, to determine whether to grant a one-year compliance waiver, a review process by the permitting authority should ensure that the offsite replacement power will reduce emissions and not exceed NESHAP limits to qualify as a control strategy. This notification and review process should ensure that the offsite replacement power will achieve the required emission reductions for the regulated unit in a legally enforceable way.

Allowing off-site clean-power replacement to qualify as a control would help achieve the goals of the President's recent Executive Order (EO 13563) to "improve regulation and regulatory review." This approach allows utilities to meet multiple regulatory programs and make practical investment decisions that minimize compliance costs. The expansion would also potentially support local industries that might not otherwise pursue CHP or WHP investment opportunities.

We urge EPA to clarify that retirement and any clean replacement power that complies with the NESHAP rule, including off-site CHP and WHR, can be deemed "controls" under the Act, thereby allowing the same one-year extension to apply. Absent this clarification and without eliminating the on-site limitation, facilities may be deterred from pursuing the vast array of available clean power technologies, which will ultimately lead to greater fuel savings, emission reductions, and electric grid reliability.

CONCLUSION

Again, we are happy that the proposed rules include provisions to encourage facilities to incorporate energy efficiency into their compliance strategies. We urge EPA to complete a more thorough sensitivity analysis to create a more accurate understanding of the role of energy efficiency in reducing compliance costs for the proposed rules. We also urge EPA to modify the rules as described in these comments to further encourage investments in energy efficiency. Thank you for the opportunity to comment.

Sincerely,

David Gardiner, Executive Director
Alliance for Industrial Efficiency

On behalf of
The Ohio Business Council for a Clean Economy
Ormat Technologies
Recycled Energy Development (RED)
Sheet Metal and Air Conditioning Contractor's National Association (SMACNA)
TAS Energy
United States Clean Heat & Power Association (USCHPA)
Veolia Energy North America