COMMENTS SUBMITTED BY A MEMBER OF THE TURBINE INLET COOLING ASSOCIATION BEFORE THE ENVIRONMENTAL PROTECTION AGENCY
ON
111(D) CARBON POLLUTION STANDARDS FOR EXISTING POWER PLANTS
NOVEMBER 7, 2013

Good morning. My name is Guy Frankenfield. I am here representing my company, DN Tanks, and the Turbine Inlet Cooling Association ("TICA"). DN Tanks is a member of TICA, a trade association that promotes the development and exchange of knowledge related to turbine inlet cooling (TIC), for enhancing power generation. We commend EPA for taking important steps to reduce greenhouse gas emissions, and we want to highlight the role that turbine inlet cooling technologies can play in achieving these reductions at a relatively low cost.

Turbine inlet cooling technologies can dramatically improve capacity at clean natural gas units, reducing the need for dirtier coal plants. As EPA has noted, natural gas-fired power plants have substantially lower greenhouse gas emissions than coal-fired power plants.[1] However, we are not maximizing the use of these relatively clean units. As temperatures rise, gas turbine units become less productive, losing as much as 20 percent of the system's rated capacity when temperatures reach 100 degrees, as is shown in Figure 1. The cumulative impact of this loss is substantial. For instance, in 2011, power generation capacity loss in summer exceeded 33,000 MW from natural gas systems,[2] as shown in Table 1. Most of this loss could be recovered by TIC technologies.

This drop in productivity occurs at precisely the time when electricity demand is at its highest, as a result of high air conditioning use. To meet that high demand, utilities turn to less efficient and higher emitting units to supplement their decreased generation. Turbine inlet cooling technologies address this problem by cooling the air before it enters a combustion turbine system, thereby restoring most of the capacity of the unit and increasing the amount of electricity it can produce. In so doing, TIC technologies restore higher capacity to natural gas turbines, even during the hottest days of summer, eliminating the need to deploy less efficient and higher- emitting plants when consumer demand peaks.

Turbine inlet cooling is both cost effective and adequately demonstrated. With installation costs for a variety of TIC technologies ranging from only a few dollars to a few hundred dollars per kilowatt, existing natural gas plants can reduce their emissions

1. Environmental Protection Agency, September 25, 2013, "Natural Gas," (http://www.epa.gov/cleanenergy/energy-and-you/affect/natural-gas.html).
2. U.S. Energy Information Administration (EIA), 2011, "Electric Power Annual," Table 4.3 (http://www.eia.gov/electricity/annual/).

by making a relatively modest investment, as shown in Figure 2. By encouraging the use of turbine inlet cooling, EPA can lower the cost of compliance for the Rule. Moreover, TIC technologies can be installed on turbines of virtually any size, and there are currently hundreds of installations across the United States, as shown on the Turbine Inlet Cooling Association's website.[3]

These benefits will only be realized with a system-wide approach to emission reductions. The Rule is most likely to directly limit carbon emissions from high-emitting power plants. Most natural gas-fired plants will meet any emission limit set under 111(d), thus removing any incentive to install TIC technologies. However, utilities should be encouraged to reduce emissions where it is the simplest and most cost-effective. By allowing states to credit natural gas units for increasing their capacity (thereby reducing the use of higher emitting plants), EPA can support the transition to relatively cleaner natural gas. In other words, the entire power system should be allowed to work together to achieve state emission targets.

EPA should clarify in its emission guidelines that states can trade emission credits across fuel types and allow flexibility for states to achieve emission limits. EPA should clarify that TIC technologies and other supply-side investments at natural gas units are among the options that states may adopt in developing their state equivalency plans. States, in turn, should adopt policies that allow gas units to generate credits for becoming more productive and reducing emissions from the least efficient and dirtiest plants.

In sum, turbine inlet cooling technologies increase the productivity of relatively clean natural gas power plants, and EPA should design a rule that encourages their use.

Thank you,

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[3] Turbine Inlet Cooling Association, July 20, 2012, "Partial Database of Turbine Inlet Cooling (TIC) Installations," (http://www.turbineinletcooling.org/data/ticadatap.pdf).

Figure 1: Enhancement Capabilities of Turbine Inlet Cooling Technologies

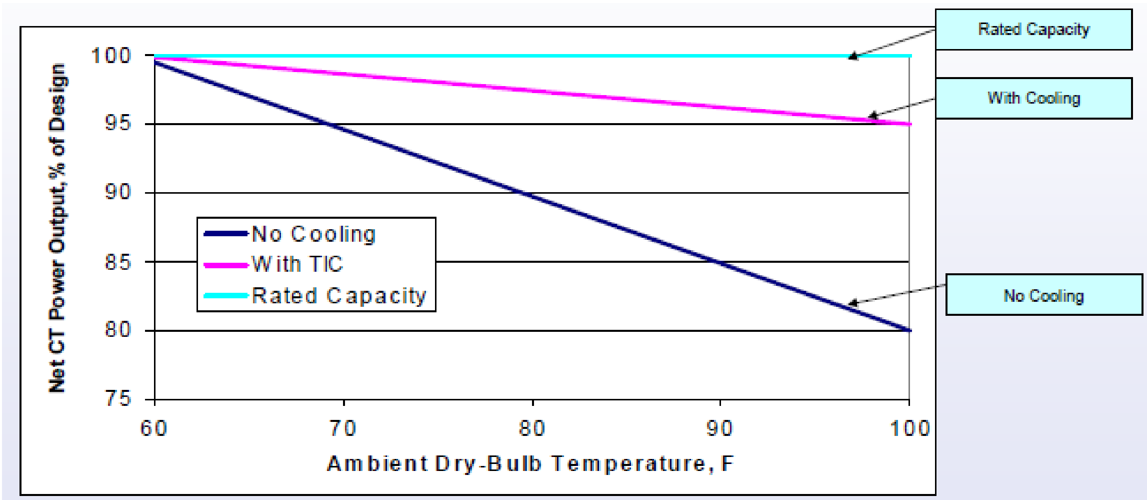
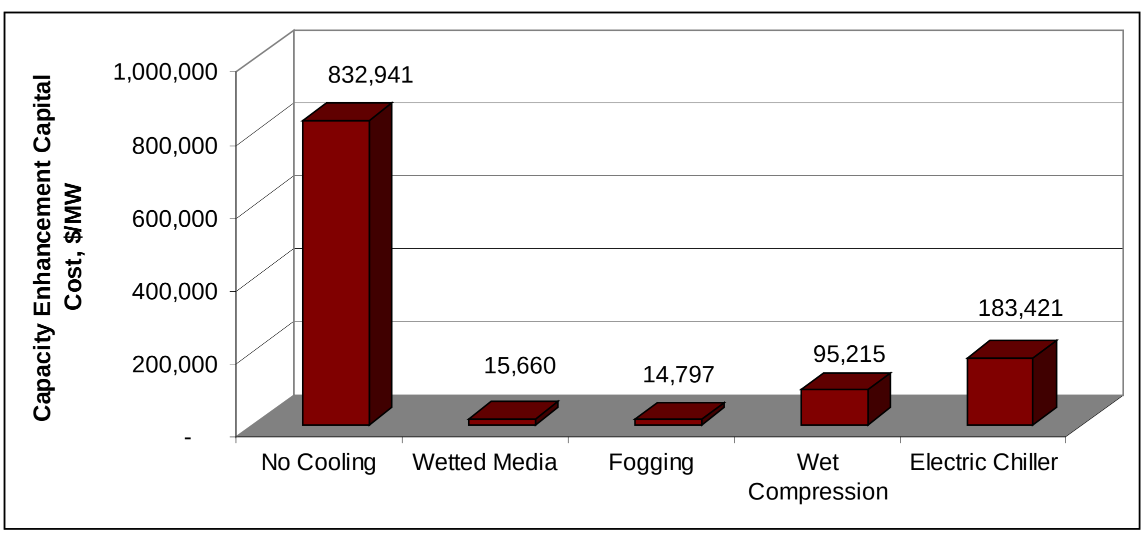


Table 1: U.S. Power Generation Capacity During Winter and Summer (EIA 2011)

Fuel	Winter Capacity, MW	Summer Capacity, MW	Capacity Loss in Summer Relative to Winter, MW
Coal	320,185	317,640	2,545
Petroleum	55,179	51, 208	3,971
Natural Gas	448,456	415,191	33,265

Over 33,000 MW of natural gas-fired electric power generation capacity is lost during summer.

Figure 2: Low Cost of Turbine Inlet Cooling Technologies for Capacity Enhancement



317 MW Cogeneration System Snapshot at 95^{o}F DB and 80^{o}F WB