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EPA's New Source Performance Standards - 2014

The EPA has issued a revised Standard of Performance for Greenhouse Gas Emissions from New Electrical Generating Units, still subject to a comment and review period.

The basic standards put forth are as follows:

- Coal-fired units – 1,100 lbs-CO₂/MWh, over a 12-month operating period;
- Coal-fired units that choose to average their emissions over a seven-year period – 1,000 to 1,050 lbs-CO₂/MWh, over that 84-month operating period;
- Gas-fired turbines larger than 850 mmBtu/hr – 1,000 lbs-CO₂/MWh; and
- Gas-fired turbines smaller than 850 mmBtu/hr – 1,100 lbs/MWh

The 850 mmBtu/hr is the thermal input and defines the size of the power plant. The 1000-1100 lbs-CO₂/MWh is the emission standard for that size. The actual rated output of the power plant is a function of the fuel type and its efficiency.

This is how the suggested standard translates into actual power plant sizes for the various fuel and power plant types:

Fuel	Baseline Report														
	Natural Gas			Bituminous Coal				Subbituminous Coal				Lignite			
Carbon Factor - lb-CO ₂ /mmBtu	116.4	116.4	116.4	203.3	203.3	203.3	203.3	208.8	208.8	208.8	208.8	215.6	215.6	215.6	215.6
Power Plant															
- Type	SC	NGCC	NGCC	PC	SCPC	USCPC	USCPC	PC	SCPC	USCPC	USCPC	PC	SCPC	USCPC	USCPC
- Heat Rate (HHV) - Btu/kWh	9452	6313	6848	9276	8721	8412	7580	9276	8721	8412	7580	9276	8721	8412	7580
- Efficiency - HHV%	36.1%	54.0%	49.8%	36.8%	39.1%	40.6%	45.0%	36.8%	39.1%	40.6%	45.0%	36.8%	39.1%	40.6%	45.0%
- Efficiency - LHV%	40.1%	60.0%	55.3%	40.8%	43.4%	45.0%	50.0%	40.8%	43.4%	45.0%	50.0%	40.8%	43.4%	45.0%	50.0%
- Thermal Input - mmBtu	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850
- Rating - MW@850 mmBtu/hr	89.93	134.64	124.12	91.63	97.47	101.05	112.14	91.63	97.47	101.05	112.14	91.63	97.47	101.05	112.14
Emissions - lb-CO₂/MWh															
- Unabated	1100.0	734.7	797.0	1886.0	1773.2	1710.3	1541.2	1937.2	1821.3	1756.7	1583.0	2000.0	1880.3	1813.7	1634.3
- Applicable Threshold	1100	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
CCS % required to meet threshold	0.0%	0.0%	0.0%	47.0%	43.6%	41.5%	35.1%	48.4%	45.1%	43.1%	36.8%	50.0%	46.8%	44.9%	38.8%
Natural Gas HHV	21,501			SC - Simple Cycle GT				PC - Pulverized Coal				SCPC - Supercritical PC			
Natural Gas LHV	23,860			NGCC - Nat Gas Combined Cycle GT								USCPC - Ultra Supercritical PC			

DOE baseline Carbon Factors

This is a summary of the key findings and assumptions embodied within the proposed ruling:

The proposed ruling:

1. The basic ruling puts forth the notion of separate standards for coal vs. natural gas fueled power plants. There is no logic offered as to why this determination was made, but it seems clear that this was a concession to the coal industry.
2. And that, simple-cycle gas turbines can be applied, without abatement, to back up wind and solar renewable resources.
3. The ruling argues that partial Carbon Capture & Sequestration (CCS), as applied to coal fired power plants, is “proven” by the five demo projects cited in the background information provided.
4. It also argues that imposing CCS on coal plants won’t affect consumer electricity pricing because no one is building coal plants anyway.

5. It argues that since there are no demo projects that apply CCS to natural gas combine cycle power plant (NGCC), CCS for gas is therefore unproven and since NGCC-CCS is “unproven”, EPA cannot mandate its use.
6. They argue that mandating CCS on coal will help bring the technology into use, although no one is expected to use it, per point 4 above.

The reality:

- There is no difference between CO₂ from a NGCC or coal power plant...it’s just CO₂.
- The same Post Combustion capture technology can be applied to either NGCC or coal.
- Yes, there are cost differences between applying CCS to a coal plant vs. a NGCC plant. These differences are associated with the CO₂ flue gas concentration. Coal flue gas is typically 12% CO₂ and NGCC flue gas is 4% CO₂.
- The de facto standard at the local Public Utility Commission (PUC) has been Coal-CCS vs. unabated NGCC for the last 5-years.
- There are no new coal projects, other than those few subsidized Demo Projects mentioned, and no new projects in the planning stages.
- We’re not on the CCS “learning curve”, nor are we on the trajectory to achieving the 2°C/450 ppmv atmospheric CO₂ target. It is not even clear if this is the target.
- The ruling does not provide any mechanisms/platforms to establish a cost for CO₂ emitted.

The irony:

- If coal had not proceeded with demo projects and therefore were to fall into the “unproven” category, would coal still have had to deploy with CCS?
- And, why would anyone spend money to establish that NGCC-CCS is viable, when that would then set a new “proven” standard, obligating its use?
- There is a complete absence or any mention of the actual climate change targets in the proposed ruling. There are references to climate change, but only in the abstract.
- The BACT -Best Available Control Technology or BSER-Best System of Emission Reduction bases for this ruling are, by definition, a BAU-Business as Usual approaches, because they apply a commercial availability/readiness test to their implementation.
- The term BSER was used to cover the combination of power plant and CCS, as applied to NGCC. This is an artificial point of difference between CCS applied to coal vs. gas to affect separate “readiness” outcomes.

Right now, the debate centers around whether Coal-CCS has been demonstrated enough, or even at all. The coal industry is suggesting, not. And, the House Energy & Commerce Committee is investigating the EPA on that determination.

And, the U.S. House of Representatives is also offering its own version of any ruling that seems to be supportive of the coal industry and with what appears to be an implementation in 2050, maybe. They ask that:

- Best System of Emissions Reduction (BSER) be demonstrate within coal category as:
 - One continuous 12-month run of by each of (6) separate units at (6) separate locations, that,
 - Collectively represent the operating characteristics of different US locations,
 - Each of which, must operate on a full commercial basis for an entire 12-month period.
- And, that results from demonstration projects cannot be used in demonstrating the BSER
- And, that there be a separate sub-category for (3) separate units operating on coal with average heat content of 8300 Btu/lb. (lignite)

It is also clear that a couple of factions in this debate are using to current low gas price to deflect criticism of the ruling itself.

Make no mistake.

Any root cause analysis on the negative impact on the coal industry will focus squarely on the EPA ruling, not the price of natural gas. Yes, the price of natural gas has had an enormous impact, but it has been that of an accelerant, not the root cause.

There are four things that are really clear to me:

1. There is no “forcing function” applying pressure to reach a climate change target...there is no target or cost associated with emitting CO₂, and the standard, such as it is, is “Business as Usual”, so how can there be any pressure applied? No one is asking, “If we do it this way, do we achieve the target?” What target?
2. The EPA, through this ruling, gives every impression it does not want to capture CO₂.....probably because they have no clue on how they would dispose of it, once captured. It is the “you break it, you own it issue”. They don’t want to own it. This ruling insures they do not capture CO₂, yet attempts to create the appearance of action or progress on the climate issue.
3. Because of this ruling, CCS is on life support, with no one is really advocating for its use. It is still the only approach that can deal with CO₂ at the scale of the problem, however. It will return to favor, someday and likely emerge first in China.
4. The outstanding growth in gas turbine industry sales in support of U.S. NGCC deployment will continue, uninterrupted for the foreseeable future.

Corrected version

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