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MJB&A Summary ■ December 21, 2018 (last updated January 31, 2019)

Summary of EPA's Review of Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units (the 111(b) rule)

On December 20, 2018, EPA published proposed revisions to the existing standards of performance for greenhouse gas (GHG) emissions for new, modified, and reconstructed electric utility generating units (EGUs) that EPA promulgated in October 2015 (the 2015 Rule).[1] In the *Review of Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units* (Proposed Rule), EPA is proposing to amend its finding that new coal-fired steam EGUs could meet a standard based on partial carbon capture and storage (CCS) and find that the best system of emission reduction (BSER) is the most efficient demonstrated steam cycle in combination with the best operating practices. EPA is also proposing revisions to the standards of performance for reconstructed steam EGUs, the maximally stringent standard for large modifications of steam EGUs, and separate performance standards for new and reconstructed coal-refuse fired EGUs. EPA is not proposing any changes to the standards of performance for new or reconstructed stationary combustion turbines.

This summary outlines EPA's rationale for these proposed changes, key areas for comment, and reviews the existing performance standards. Comments are due to EPA by March 18, 2019.[2]

Background

On April 13, 2012, EPA proposed new source performance standards (NSPS) for GHGs from fossil fuel-fired EGUs.[3] On January 9, 2014, EPA released a supplemental notice identifying partial CCS as BSER for coal-fired EGUs, which EPA finalized on October 23, 2015.[4] The final action also included standards for reconstructed steam generating units as well as for units that undertake large modifications. EPA did not issue a standard for small modifications.[5] With respect to new and reconstructed combustion turbines, EPA finalized a standard based on efficient natural gas-fired combined cycle (NGCC) as BSER. For non-base load natural gas-fired and multi-fuel fired stationary combustion turbines, EPA finalized a heat input-based clean fuels standard. EPA did not promulgate a standard for modified stationary combustion turbines due to lack of information.

Multiple parties filed petitions for reconsideration and judicial review of the 2015 Rule. The D.C. Circuit case has been in abeyance since April 28, 2017 following EPA's announcement that it would review the 2015 Rule in response to President Trump's Executive Order on Energy Independence.

1 83 FR 65424.

2 EPA is requesting that commenters identify the unique identifier to which the comment is responsive (e.g., C-1, C-2, etc.).

3 77 FR 22392.

4 80 FR 64510.

5 EPA notes in the preamble of the proposal that it continues to review whether it has sufficient information to establish appropriate standards for small modifications and is seeking comment in this rulemaking on options to determine an appropriate standard. (C-2)

In the Proposed Rule, EPA is proposing to revise BSER for coal-fired steam EGUs to be supercritical steam conditions for large units and subcritical steam conditions for small units. EPA is also proposing revisions to the standards of performance for reconstructed steam EGUs and separate performance standards for new and reconstructed coal-refuse fired EGUs. Finally, EPA is proposing to revise the maximally stringent standard for large modifications of steam EGUs. Any changes finalized pursuant to this proposal will be codified in subpart TTTT of part 60 of Title 40 of the CFR.

EPA is not proposing any changes to the standards of performance for new or reconstructed stationary combustion turbines but is taking comment on whether and how to address concerns raised by stakeholders in the 2015 rulemaking process regarding any changes that might be necessitated by the increased utilization of simple cycle aeroderivative turbines.

EPA notes in the preamble that for the 2015 Rule, EPA concluded that even in the absence of the finalized performance standards, few, if any, fossil fuel-fired steam EGUs would be built in the foreseeable future. In the Proposed Rule, EPA continues to believe that few new, reconstructed, or modified sources will trigger the proposed provisions. Consequently, EPA projects this proposed rule will "not result in significant carbon dioxide (CO_2) emission changes or costs."

Table 1 provides an overview of the proposed key changes to the 2015 Rule.

Table 1. Proposed Key Changes to the 2015 Rule

Issue	2015 Rule	Proposed Amendments
Covered Sources for 111(b)	Newly constructed, modified, and reconstructed fossil fuel-fired utility boilers and IGCC units and newly constructed and reconstructed stationary combustion turbines. Covered EGUs must be capable of combusting more than 250 MMBtu/h heat input of fossil fuel and supply a generator capable of providing greater than 25 MW net to a utility distribution system.	No proposed revisions

Issue	2015 Rule	Proposed Amendments
Excluded Sources	• Units capable of burning 50 percent or more non-fossil fuel, so long as they are subject to a federally enforceable permit that limits their use of fossil fuels to 10 percent or less of their heat input capacity on an annual basis • A CHP unit will be an affected unit unless it is subject to a federally enforceable permit that limits annual total electric sales to less than or equal to the unit's design efficiency multiplied by its potential electric output or 219,000 MWh, whichever is greater • Combustion turbines that are physically incapable of burning natural gas • Municipal waste combustors and commercial or industrial solid waste incinerators	Clarifying definitions proposed for non-fossil and CHP units
Best System of Emission Reduction	Fossil fuel-fired electric utility steam generating units • New: highly efficient supercritical pulverized coal (SCPC) boiler implementing partial CCS technology • Modified: unit-specific emission limitation consistent with each modified unit's best one-year historical performance • Reconstructed: most efficient demonstrated generating technology for these units Stationary combustion turbines • Base load natural gas-fired: use of efficient NGCC technology • Non-base load natural gas-fired: use of clean fuels (i.e., natural gas with an allowance for a small amount of distillate fuel) • Multi-fuel-fired: use of clean fuels (e.g., natural gas, ethylene, propane, naptha, jet fuel kerosene, distillate oils 1 and 2, biodiesel, and landfill gas)	Fossil fuel-fired electric utility steam generating units • New: most efficient generating technology with best operating practices • Modified: not changed • Reconstructed: most efficient demonstrated generating technology for these units Stationary combustion turbines • No proposed revisions

Issue	2015 Rule	Proposed Amendments
Performance Standard for Fossil-Fuel Fired Steam EGUs	New, modified, and reconstructed fossil fuel-fired electric utility steam generating units • New: 1,400 lb CO_2/MWh gross • Modified: best annual performance demonstrated from 2002 to date for large modifications (modifications resulting in an increase in hourly CO_2 emissions of more than 10 percent); withdrawing proposed standard and delaying standard for small modifications • Reconstructed (large): 1,800 lb CO_2/MWh gross for sources with heat input > 2,000 MMBtu/h • Reconstructed (small): 2,000 lb CO_2/MWh gross for sources with heat input < 2,000 MMBtu/h	New, modified, and reconstructed fossil fuel-fired electric utility steam generating units • New (large): 1,900 lb CO_2/MWh gross for sources with heat input > 2,000 MMBtu/h • New (small): 2,000 lb CO_2/MWh gross for sources with heat input ≤ 2,000 MMBtu/h • Coal Refuse-Fired Sources: 2,200 lb CO_2/MWh gross • Modified: best annual performance demonstrated from 2002 to date for large modifications (modifications resulting in an increase in hourly CO2 emissions of more than 10 percent); but emission limit for any unit is no more stringent than the limit for the appropriate category of new sources • Reconstructed (large): 1,900 lb CO_2/MWh gross for sources with heat input > 2,000 MMBtu/h • Reconstructed (small): 2,000 lb CO_2/MWh gross for sources with heat input < 2,000 MMBtu/h • Coal Refuse-Fired Sources: 2,200 lb CO_2/MWh gross
Performance Standard for New and Reconstructed Stationary Combustion Turbines	• Base load natural gas-fired: 1,000 lb CO_2/MWh gross for all sizes of base load units, calculated on a 12-operating month rolling average basis; optional 1,030 lb CO_2/MWh net • Non-base load natural gas-fired: 120 lb CO_2/MMBtu, calculated on a 120 operating month rolling average basis • Multi-fuel-fired: 120-160 lb CO_2/MMBtu, calculated on a 12-operating month rolling average basis	No proposed changes for new or reconstructed stationary combustion turbines

Legal Basis

In the 2015 Rule, EPA explained that section 111(b) of the Clean Air Act requires EPA to make an endangerment finding for source categories. Once EPA makes such a finding, the Agency must promulgate standards of performance for new sources within such category. EPA explained that the endangerment finding is made for the source category and not for any particular pollutant. EPA also noted that even if it were required to make an endangerment finding for CO_2 emissions in order to regulate them from fossil fuel-fired EGUs, there is a rational basis for doing so given that emissions from such EGUs are "almost three times as much as the emissions from the next ten [stationary] source categories, combined, and that the CO_2 emissions from even a single new coal-fired power plan may amount to millions of tons each year."

While EPA is proposing to retain this statutory interpretation, the proposal states that various stakeholders have made arguments opposing such views. In the Proposed Rule, EPA states that it will "consider comments on the correctness of the EPA's interpretation and determinations and whether there are alternative interpretations that may be permissible." EPA notes that it will consider comments on the issue of whether it is correct to interpret the endangerment finding as a finding that is only made once for each source category and whether GHG emissions are different such that it would be appropriate to conduct a new endangerment finding.

EPA also seeks comment on whether the Agency has a rational basis for regulating CO_2 emissions from coal-fired EGUs and whether it would have a rational basis for declining to do so given: "the ongoing and projected power sector trends have reduced CO_2 emissions from the power sector" and "no more than a few coal-fired EGUs can be expected to be built, which raises questions about whether new coal-fired EGUs contribute significantly to atmospheric CO_2 levels."

Applicability

The Clean Air Act defines new or modified sources as any stationary source that commences construction or modification after the publication of the *proposed* regulation. Thus, any performance standards that EPA finalizes pursuant to this Proposed Rule will apply to EGUs that commence construction, reconstruction[6], or modification after the publication of this proposal in the Federal Register. EGUs that commenced construction after the date of the 2015 Rule's proposal, January 8, 2014, and before the date of this proposal will remain subject to the 2015 standards. Similarly, any new and reconstructed stationary combustion turbines commencing construction on or after January 8, 2014 will continue to be subject to the 2015 Rule standards.

Under this proposal, EGUs affected by GHG standards under section 111(b) of the Clean Air Act continue to include steam generating units (utility boiler or IGCC) and stationary combustion turbines (simple cycle and combined cycle) with a base load rating greater than 250 MMBtu/h of fossil fuel and serve a generator capable of supplying more than 25 MW-net to the grid. However, in this proposed revision, EPA is proposing changes to the exempted units.

Sources not covered under the 2015 Rule included: (1) non-fossil units, (2) industrial CHP units, (3) stationary combustion turbines not physically capable of combusting natural gas (not connected to a natural gas pipeline), (4) municipal waste combustors and commercial and industrial solid waste incinerators, and (5) certain projects

[6] Reconstructed sources are existing steam generating or combustion turbine sources that on or after June 18, 2014 have: (1) made changes to the unit that exceed 50 percent the expected capital cost of a new comparable facility, and (2) are technologically and economically feasible to meet the applicable standards

under development. In this proposal, EPA is proposing to alter the exemptions for non-fossil units and industrial CHP units.

EPA is proposing that the non-fossil unit exemption would be revised to apply to those units capable of *deriving* 50 percent or more *of the heat input* from non-fossil fuel *at the base load rating* (emphasis highlights the proposed changes). EPA explains that these changes are consistent with the original intent to only cover fossil fuel EGUs and to ensure that solar thermal EGUs with natural gas backup burners are exempted. EPA is proposing to include heat input from non-combustion sources (e.g., solar thermal) in the definition of base load rating. To determine the design efficiency, EPA is proposing to allow the Agency to approve alternative test methods to those specified in subpart TTTT.

For CHP units, the proposed revision would also continue to exempt industrial units with federally enforceable permits limiting annual net-electric sales to no more than the unit's design efficiency multiplied by its potential electric output or 219,000 MWh or less (whichever is greater). However, the current approach allows the unit to subtract the purchases power of the thermal host facility. As written, this can result in multiple CHP units claiming the same electricity from the thermal host. EPA is proposing that to determine the net electric sales, the purchased power would be limited to the percentage of useful thermal output provided to the host facility by the CHP unit claiming the deduction.

EPA notes if it does not finalize any of the exemption changes noted above, the 2015 Rule would continue to be applicable.

New Steam Generating Units

Rather than partial CCS for new coal-fired steam EGUs, as finalized in 2015, EPA is proposing to define BSER as the most efficient demonstrated steam cycle in combination with the best operating practices. EPA is proposing that supercritical steam conditions for large units and subcritical steam conditions for small units as well as best operating practices for both represents BSER for new coal-fired steam EGUs. EPA notes that supercritical steam conditions encompass both ultra-supercritical and advanced ultra-supercritical steam conditions.[7] Best operating practices include, but are not limited to, installing and maintaining equipment to maximize the overall efficiency and to operate the unit to maximize overall efficiency. EPA also notes that the cooling system can significantly impact efficiency. EPA is seeking comment on any additional information not considered by the Agency in the BSER analysis.[8]

Standard of Performance

EPA is proposing to revise the performance standards for large units (sources with a heat input rating of greater than 2,000 MMBtu/h) to 1,900 lb CO_2/MWh-gross. For small units (sources with a heat input rating of less than or equal to 2,000 MMBtu/h), EPA is proposing a performance standard of 2,000 lb CO_2/MWh-gross. EPA is also proposing to allow units to demonstrate compliance on a net basis.

Rationale

EPA explains that its primary reason for proposing revisions for new coal-fired EGUs "is the high costs and limited geographic availability of CCS." However, EPA stresses the value of having a standard that would allow a new coal-fired power plant to be constructed. EPA cites public comments stating that there is "value in maintaining the ability to develop non-natural gas-fired base load generation that is not captured in economic

[7] EPA defines supercritical, ultra-supercritical, and advanced ultra-supercritical as steam generators that operate at pressures greater than 3,205 pounds per square inch (22 megapascals) and temperatures greater than 1,022 degrees Fahrenheit (550 degrees Celsius).

[8] Comment C-3.

dispatch models." This value includes: "historically stable fuel prices; fuel security (i.e., the ability to store significant quantities of fuel onsite), and the site-specific job and economic development considerations (e.g., local mining and power plant jobs, maintaining an active rail line, maintaining the property tax base, and in the case of coal refuse, remediation of existing environment concerns)."

EPA explains that the 2015 Rule concluded that the Levelized Cost of Electricity (LCOE) for a new coal plant with partial CCS was reasonable because it was comparable to the LCOE associated with the construction of a new nuclear power plant. Additionally, EPA concluded in the 2015 Rule that partial CCS increased capital costs about 20 percent, which was reasonable when compared to prior Clean Air Act rulemakings.

In the Proposed Rule, EPA challenges both of these bases for determining a standard based on partial CCS in the 2015 Rule. EPA explains that the 2015 Rule assumed that nuclear generation and coal-fired generation were similarly attractive for purposes of fuel diversity. EPA is now reevaluating that assumption. Specifically, EPA is requesting comment on whether it was correct to conclude that nuclear capacity is more attractive than coal as an option for fuel diversity.[9] In favor of nuclear, the preamble states that "in light of potential future costs associated with GHG emissions, nuclear projects provide a significant price stability guarantee" and "incremental generating costs for nuclear projects are lower than for coal-fired EGUs." However, EPA notes that the LCOE for new nuclear EGUs is higher than developers may be willing to accept. Citing the Summer and Vogtle nuclear power plants, EPA notes that there have been "significant delays and cost overruns", which would make developers less interested in nuclear as a fuel diversity option.

The Proposed Rule reevaluates the costs assumptions for partial CCS including those related to CO_2 transmission and storage (T&S) costs and EGU capacity factors and finds that the LCOE and capital costs associated with partial CCS are higher than estimated in the 2015 Rule. Additionally, stating that an increasing number of coal-fired power plants are changing from base load to variable load, EPA compares the dispatch of coal-fired EGUs relative to variable operating costs to note that due to the relatively high operating costs of CCS compared to other environmental controls, "a BSER based on partial CCS increases the variable operating costs of new coal plants to significantly greater than existing coal-fired EGUs without GHG controls." Thus, EPA concludes that in an economic dispatch system, "a new coal-fired EGU with partial CCS would dispatch after the majority of existing coal-fired EGUs." Of note, the Proposed Rule explains that EPA's cost assumptions do not account for any potential benefits of reduced criteria and GHG emissions due to the use of CCS, EPA is requesting comment on whether those should be considered.

Based on this analysis, the Proposed Rule concludes that many coal-fired EGUs operate at variable load making it more difficult for new EGUs to recoup additional control costs. Thus, EPA is proposing that partial CCS is not reasonable.

In addition to partial CCS, EPA also evaluated co-firing with natural gas, the use of CHP, the use of a hybrid power plant, the use of IGCC technology, and efficient generation. Based on this evaluation, EPA proposes BSER for new coal-fired EGUs to be the most efficient generation technology available—the use of supercritical steam conditions (a SCPC or supercritical circulating fluidized bed (CFB) boiler) for large EGUs and the use of best available subcritical steam conditions for small EGUs in combination with best operating practices and dry cooling.

[9] Comment C-6.

Of note, the Proposed Rule explains that EPA's cost assumptions do not account for any potential benefits of reduced criteria and GHG emissions due to the use of CCS, EPA is requesting comment on whether those should be considered.[10]

Reconstructed Steam Generating Units

The 2015 Rule defined BSER for reconstructed steam generating units as the most efficient demonstrated generating technology available for the unit. EPA finalized BSER for large units (sources with a heat input rating of greater than 2,000 MMBtu/h) based on SCPC or supercritical CFB boiler techniques with a performance standard at 1,900 lb CO_2/MWh-gross. For small units (sources with a heat input rating of less than or equal to 2,000 MMBtu/h), EPA based BSER on subcritical boiler technology with a final performance standard of 2,000 lb CO_2/MWh-gross.

In the Proposed Rule, EPA is proposing to revise the standards for reconstructed steam generating EGUs in order to be consistent with the standards for new EGUs by replacing the prior performance standards with higher emission rates for large and small EGUs. Thus, the standards would be the same as those for new EGUs.

Modified Steam Generating Units

While EPA is not proposing to revise BSER for fossil fuel-fired steam generating EGUs that undertake a large modification[11], EPA is proposing to revise the maximum stringent standard—the level that is the most stringent that the standard could be. Thus, BSER for large modifications remains each modified unit's best one-year historical performance from 2002 to the time of modification with revised potential upper limits. In the 2015 Rule, EPA did not propose a standard for units undertaking small modifications.[12] Under the 2015 Rule, these units continued to be treated as existing sources.

While EPA is not proposing a change to this conclusion, EPA requests comment on the appropriate basis for a BSER and standards of performance for fossil fuel-fired steam EGUs that conduct small modifications.[13] EPA states that "it is conceivable that an owner or operator could make a small physical change…that results in an increase of hourly CO_2 emissions of less than 10 percent." EPA explains that if there is an applicable standard for such units, the unit would no longer be subject to 111(d). Thus, EPA is seeking comment on the types of changes that a unit could undertake that would result in small increases in hourly CO_2 emissions.[14]

Coal Refuse-Fired EGUs

EPA is proposing separate performance standards for new and reconstructed coal refuse-fired EGUs. EPA explains that it has conducted more recent analysis of the make-up of existing coal refuse-fired EGUs, which calls into question EPA's conclusion in 2015 that new coal refuse-fired EGUs would likely be designed at CHP units and would, therefore, not be subject to the standard for new coal-fired EGUs. EPA notes that there are multimedia environmental benefits of remediating coal refuse piles including remediation of acid seepage and leachate production, low soil fertility, and reclaiming land for productive use. EPA also states that existing coal refuse piles are "slowly combusting in place and the CO_2 will eventually be released to the atmosphere so net GHG emissions are lower than those measured at the stack."

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10 Comment C-8.

11 Large modification is one that results in an increase in regulated pollutants above the maximum hourly emission achievable at that unit during the five years prior to the modification.

12 Small modifications are defined as those that result in an increase in CO_2 emission of less than or equal to 10 percent.

13 Comment C-21.

14 Comment C-22.

Thus, EPA is proposing that BSER for coal refuse-fired EGUs is subcritical steam technology with a performance standard of 2,200 lb CO_2/MWh-gross.

Natural Gas-Fired Stationary Combustion Turbines

EPA is not proposing any changes to the standards of performance for new or reconstructed stationary combustion turbines. As background in the 2015 Rule:

- EPA finalized NGCC technology as BSER for base load natural gas-fired stationary combustion turbines and set the performance standard at 1,000 lb CO_2/MWh-gross.
- For non-base load natural gas-fired stationary combustion turbines, EPA finalized in 2015 that BSER was the use of clean fuels, particularly natural gas with an allotment for distillate oil. The standard is 120 lb CO_2/MMBtu.
- EPA also determined BSER for multi-fuel-fired combustion turbines to be use of clean fuel (natural gas, ethylene, propane, naptha, jet fuel kerosene, distillate oils 1 and 2, biodiesel, and landfill gas) with a standard at 120 to 160 lb CO_2/MMBtu.

Other Areas of Comment

EPA also requests comments on several additional issues, including, but not limited to the following.

Non-Base Load Combustion Turbines

As noted above, EPA is not proposing any changes to the performance standards for combustion turbines. However, the proposal notes that stakeholders have expressed concern about the rule's approach for distinguishing between load and non-base load turbines. The Proposed Rule states that "[s]takeholders have observed that in some regional electricity markets with large amounts of wind generation, some of the most efficiency new simple cycle turbines—aeroderivative turbines—could be called on to operate at capacity factors greater than their design efficiency; however, if they were to be operated at those higher capacity factors, they would become subject to the more stringent standard of performance for base load turbines, which they would not be able to meet." EPA notes that stakeholders have also stated that, as a result of this market dynamic such unit would need to curtail their generation and less efficient turbines would operate resulting in higher emissions.

EPA is seeking comment on this issue and on potential remedies.[15] Any changes to these provisions would be initiated through a subsequent rulemaking.

Subcategorization by Fuel Type

While the Proposed Rule does not include any additional subcategories except for coal refuse as noted above, EPA is seeking comment on that approach.[16] EPA explains that subcategorizing by fuel time can increase emissions and decrease compliance options. The "proposed fuel neutral standard is consistent with the emissions standards in the criterial pollutant NSPS and is achievable for all coal types. This approach both incentivizes the use of lower emitting fuels and allows the use of natural gas and/or integrated renewable generation as compliance options."

Low Duty Cycle Subcategory

EPA notes that due to low variable operating costs of highly efficient coal-fired EGUs, any affected coal-fired EGU would likely operate at high capacity factors. However, EPA states that "during periods of low demand,

[15] Comments C-56 through C-58.

[16] Comment C-30.

coal-fired EGUs may reduce load to approximately 45 percent as an alternative to shutting down completely." EPA explains that while efficiency is reduced at this load, it remains sufficiently high to maintain power generation, operate pollution control equipment, and allow the unit to ramp up relatively quickly if demand increases. EPA, therefore, is seeking comment on establishing separate emission standards for steam generating units operating at partial load.[17] Specifically, EPA requests comment on whether it would be appropriate to establish a subcategory for steam generating units during 12-month rolling average periods when the unit is not operated at high capacity factors.[18] For non-based load operation, EPA is seeking comment on a performance standard of:

- 2,100 lb CO_2/MWh-gross for sources with a nameplate heat input rating greater than 2,000 MMBtu/h
- 2,200 lb CO_2/MWh-gross for sources with a nameplate heat input rating of less than or equal to 2,000 MMBtu/h
- 2,400 lb CO_2/MWh-gross for coal refuse-fired steam generating units.[19]

EPA is also seeking comment on establishing a part load heat input-based standard as an alternative or in place of the low duty cycle output-based standard given that it would be a constant value and is "independent of efficiency and provides a clear compliance option regardless of the level of degradation of efficiency that results from operation at low loads."[20] To incorporate recognition of the environmental benefit of energy efficiency, EPA is proposing to "conclude that it is not appropriate to base a heat input standard on the emission rate of bituminous coal." Thus, EPA requests comment on "whether only a more stringent heat input-based standard would be appropriate" but notes that EPA is considering a heat input-based standard of 200 lb CO_2/MMBtu. EPA also notes that "due to the price of natural gas relative to coal, owner/operators of EGUs would have the financial incentive to operate their units efficiently as possible so they could comply with the full load standard with low an average duty cycle as possible without co-firing natural gas and/or fuel oil." EPA also lists areas for comment specifically focused on a low duty cycle standard including the cutoff point and the need for IGCC units to also have a low duty cycle subcategory.[21]

Commercial Demonstration Permit

The commercial demonstration permit provides a procedure for a slightly less stringent standard than would otherwise be required to encourage the development and implementation of innovative and emerging technologies. EPA requests comment on whether it should include a commercial demonstration permit provision in subpart TTTT to encourage the development of new technologies and compensate for problems that may arise when applied to commercial scale units.[22] The technologies EPA lists as considering includes: pressurized fluidized bed technology, alternative power cycle working fluid (e.g., supercritical CO_2), additional energy recovery using integrated thermo-electric materials, a supercritical CO_2 Brayton cycle, an integrated organic Rankine cycle, integrated hybrid photovoltaic-solar thermal, integrated novel energy storage technologies, and novel carbon capture technologies.

Applicability to Industrial EGUs

17 Comment C-31.
18 Comment C-32.
19 Comment C-33.
20 Comment C-34.
21 Comments C-37 through C-39
22 Comment C-40.

EPA requests comment on amendments to the applicability criteria for this rule as described above to address the concern that certain large processes of an industrial unit might be included as part of the EGU and meet the applicability criteria. One option EPA is considering is adding an industrial unit exemption that would apply to any EGU for which more than 50 percent of the heat input is derived from an industrial process that does not produce any electrical or mechanical output or useful thermal output that is used beyond the affected EGU.[23] EPA is also seeking comment on excluding fuels that are combusted to comply with another EPA regulation (e.g., control of HAP emissions) from being considered fossil fuel.[24] EPA also requests comments specifically related to the treatment of CHP units.[25]

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[23] Comments C-43 through C-44.
[24] Comment C-45.
[25] Comments C-46 through C-47.