Insight

Implications of Regulating Existing Greenhouse Gas Sources

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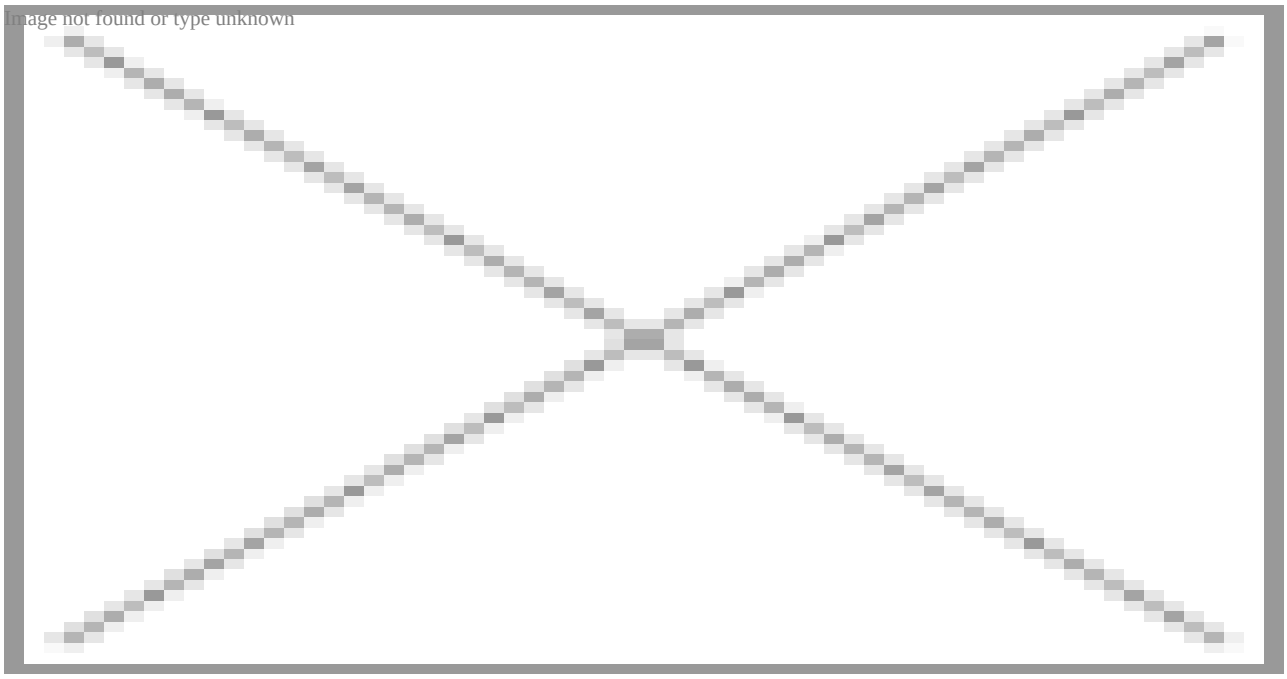
Today, President Obama will call for greenhouse gas (GHG) limits on existing stationary sources. Examining the largest sources in the U.S., the American Action Forum (AAF) estimates such a proposal will affect more than 37,000 employees and regulate a variety of industries. Natural gas generation, steel mills, refineries, and plastics manufacturing would all likely have to adjust to new regulation.

METHODOLOGY

The map below displays the largest GHG emitters in 2010 and 2011. In 2010, AAF tracked 100 facilities, labeled in blue, five of these plants will likely retire by 2020 (labeled in red), and eleven facilities moved into the top 100 in 2011 (labeled in green). AAF examined aggregate emissions, employment data, and the GHG rate (pounds of CO_2e per megawatt-hour) for each plant. This sample of 111 plants is approximately 7 percent of reporting facilities.



REGULATING IN THE DARK

This proposal from the President is a bit of surprise, considering several public statements from EPA officials.

Most recently, during her confirmation hearing last month to head EPA, Assistant Administrator Gina McCarthy stated, "EPA is not currently developing any existing source GHG [greenhouse gases] regulations for power plants." In March of 2012, when reporters raised the idea of regulating GHG from current sources, EPA Administrator Lisa Jackson was unequivocal, "We have no plans to address existing plants in the future; if we were to propose a standard, it would be informed by an extensive public process with all the stakeholders involved." The administration itself echoed these thoughts a month later. *Politico* reported the White House once considered regulating current plants, but abrogated during review of the proposal for future sources.

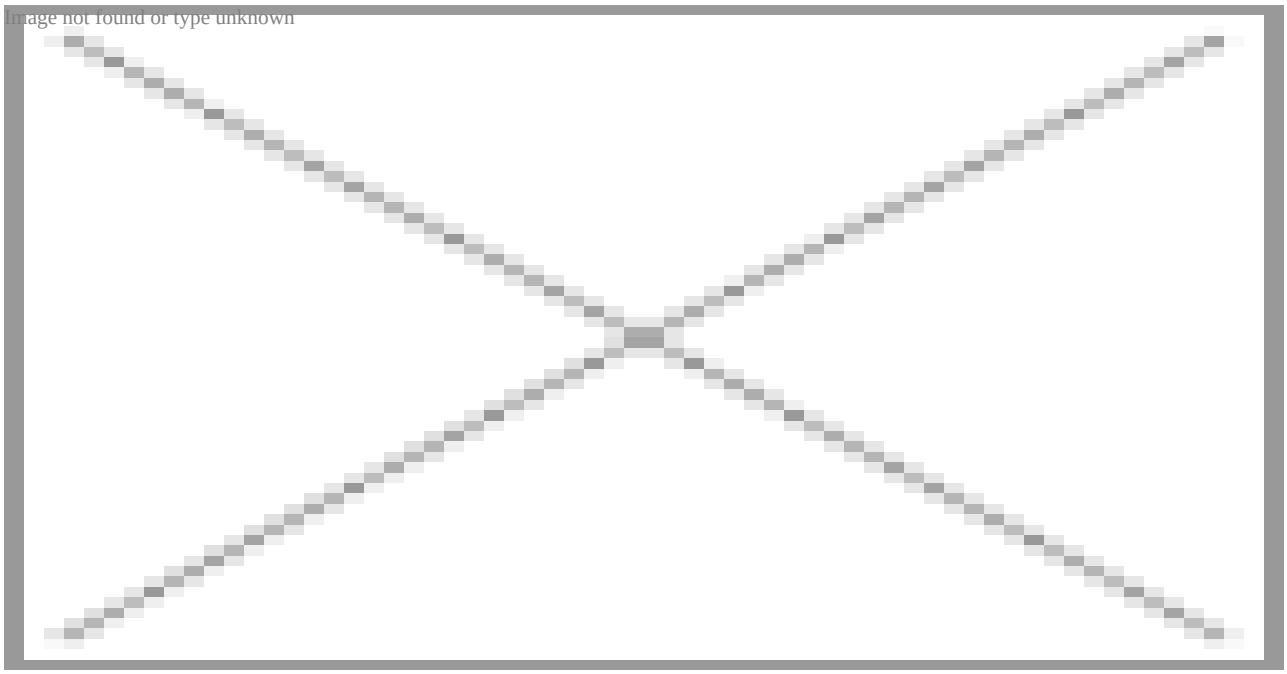
The previous proposed rule itself hinted at the regulation of current sources, but only speculated on timing. "The proposed rule will also serve as a necessary predicate for the regulation of existing sources within this source category."

It is even more puzzling that the President's proposal failed to appear in the "Unified Agenda" of federal regulations for 2013. EPA established plans to finalize its future source rule by March, but omitted even tentative plans for regulating current sources. With a proposal of this magnitude that seeks to fundamentally transform carbon pollution in the U.S., "an extensive public process" would probably have been a more appropriate procedural path than a political address.

PAST IS PROLOGUE FOR GHG REGULATION?

EPA was widely expected to finalize GHG standards for future stationary sources this past March. The regulation would limit new fossil-fuel fired power plants to no more than "1,000 pounds of CO_2 per megawatt-hour" (GHG rate).

The big question lingers on the details of the President's proposal. Currently, none of the coal plants in the sample could meet this threshold. The average facility emits 10.3 million tons of CO_2e, and combined they account for more than 1 billion tons of GHG pollution, or 51 percent of all power plant emissions. In addition, the average coal plant has a GHG rate of 2,114, more than double the proposed standard for new sources.



The devil will be in the details but it is clear EPA will not be able to apply the standard for future facilities to current facilities. Here are a few possible scenarios that EPA could explore.

REGULATORY SCENARIOS

The Clean Air Act provides EPA with several routes to take toward the regulation of greenhouse gases. Some options, like characterizing greenhouse gases as a hazardous air pollutant, would yield peculiar and inappropriate consequences. Others would be an odd fit, but remain possibilities. For instance, a National Ambient Air Quality Standard for carbon dioxide would force states to devise compliance programs to force down emissions. This option is difficult to conceptually defend, however, as the concentration of carbon dioxide is determined by global activity and cannot be modified with local activity. The EPA has indicated that they oppose using this provision for greenhouse gases, but it does remain on the table.

More than likely, the EPA will follow one of two routes that establish guidelines for state regulation of existing sources.

An electricity-output-based emissions limit akin to the standard for new facilities. Though the responsibility for enforcement lies with the states, the EPA could prescribe performance standards for existing facilities as a group or by fuel type. The proposed regulation for new facilities requires compliance with a 1,000 lb/MWh standard on average over 30 years. If the EPA establishes a performance standard for existing facilities, which likely would be higher than for new facilities, allowing averaging over a broad compliance window allows time for identifying low cost options and implementation. The standard would likely also involve some mechanism for trading, promoting more flexibility.

State-by-state emission rate standards. This plan, designed by the Natural Resources Defense Council, would establish emission rate targets in accordance with states' current electricity generation fuel mix. Over time, the emission rate targets will shrink, forcing the use of cleaner burning fuels, the installation of carbon capture

technology, or efficiency measures. This state-based averaging would force all states to reduce their emissions gradually without specifying compliance requirements for individual facilities, and would be functionally similar to cap-and-trade.

No matter the regulatory scenario that EPA elects to take, any limitations on carbon output will inevitably pull coal-based facilities off the grid. Unlike conventional pollutants, there is no "scrubber" for carbon dioxide. It's an inevitable byproduct of combustion, and off-the-shelf technologies can only cut about five percent of emissions from existing facilities. The results of regulation will either be the implementation of as-yet non-existent sequestration technology or some measure of fuel switching away from coal.

STATE IMPACTS

It should come as no surprise that the coal belt in the Midwest would be directly affected by new regulation of existing sources. Indiana, Ohio, and Pennsylvania account for 22 facilities, or 19.8 percent of the sample. Texas, however, has the plurality of likely affected plants:

- Texas: 13 facilities (11.7 percent)
- Indiana: 8 facilities (7.2 percent)
- Ohio: 7 facilities (6.3 percent)
- Pennsylvania : 7 facilities (6.3 percent)
- Florida: 7 facilities (6.3 percent)
- Kentucky: 6 facilities (5.4 percent)
- West Virginia: 6 facilities (5.4 percent)

With more than 37,000 employees at these facilities across the nation, a significant regulatory action could result in displaced workers. Since it is unlikely EPA would promulgate a rule that shuts down a major refinery or steel mill, coal plants are once again under the regulatory microscope.

The average coal plant in AAF's sample employs about 230 workers, with a high of 760 at the Crystal River facility in Florida. The plant has cut emissions by more than 1 million tons, but its GHG rate of 1,450 is largely unaffected.

Although there are some statutory provisions that prohibit EPA from considering compliance costs, 37,000 employees and a large slice of the U.S. generation mix would likely urge the agency to take a flexible approach to future GHG regulation. With carbon capture and storage technology still years away, a technology-specific standard should likely be off the table.

AFFECTED INDUSTRIES

If EPA elects to cover CO_2e, and not simply carbon dioxide, there is a strong chance regulations would force the manufacturing sector into compliance. From our dataset of the 111 largest emitters during the past two years, seven facilities do not burn coal:

1. Ascend Performance (FL): plastics manufacturing, 2,000 employees;

2. US Steel – Gary Works (IN): steel production, 5,700 employees;
3. ExxonMobil BT Site (TX): refinery, 270 employees;
4. Arcelormittal Burns Harbor (IN): steel production, 3,400 employees;
5. West County Energy (FL): natural gas power plant, 61 employees;
6. Mittal Steel (IN): steel production, 1,000 employees;
7. Texas City (TX): refinery, 480 employees.

If EPA established a GHG rate of 1,000 (pounds CO_2/MWh), it is likely all of those facilities would continue to meet the standard. The most "inefficient" facility, the West County natural gas plant, emits at 908; an efficient combined-cycle facility, it achieved this rate despite emitting more than 7.8 million tons of CO_2e.

However, all coal-fired power plants in AAF's dataset fail to achieve the proposed rate of 1,000 pounds CO_2 /MWh. One coal plant, Martin (in southern Florida) emits at a rate of 1,043 and has the possibility to meet a reasonable new threshold, but it all depends on what efficiencies plant operators can achieve.

PREVIOUS REGULATORY BURDENS

With hundreds of coal plants directly affected by the President's proposal, it is important to examine recent regulatory burdens, and their ability to comply with another round of significant regulation.

Based on AAF's database of all rulemakings during the last four years, EPA and the Department of Energy have published $290 billion in regulatory costs, more than the Gross Domestic Product of Norway. Rules like the Cross-State Air Pollution Rule (CSAPR), struck down by a federal court, and the Air Toxics rule may overlap for some coal facilities, but the combined impact of close to $300 billion in regulations has forced older facilities to close.

AAF has tracked 90 facilities, mostly in the Midwest, that plan to close because of the Air Toxics Rule and CSAPR. Combined, these plants employ more than 12,000 workers and produce roughly 41,000 megawatts of electricity.

Beyond the recent EPA rules affecting power plants in general, the administration has singled out several plants for Clean Air Act violations. Westar Energy in Kansas paid a $500 million settlement to EPA in 2010. As a result, Westar pledged to cut sulfur dioxide and nitrogen oxides 85 percent below 2007 levels. However, the plant's CO_2e levels actually increased from 2010 to 2011 by more than 196,000 pounds.

In addition, two power plants in the southwest, Four Corners and Navajo Nation, will pay more than $1.4 billion to increase visibility at parks in the area. The Four Corners plant could close because of recent settlements from EPA; although, the agency acknowledges, "It is not EPA's intention to cause [Four Corners] to shutdown."

Any new regulatory plan that EPA launches in 2013 to cover existing sources should acknowledge previous burdens imposed on electric generation facilities. However, even EPA will admit the previous regulatory steps have done little to curb CO_2e output, at least at the plants continuing to operate.

ENERGY IMPLICATIONS

Critically, regulating carbon emissions from existing facilities will require us to generate electricity – and produce things like steel, plastics, and oil products – in some other way.

There are some imperfect substitutes for the electricity side. Renewable power, though politically popular, continues to be excessively expensive and is by nature intermittent. Relying on renewables as a baseload power source will require both dramatic improvements in the cost of deployment and the development of reliable, sizeable storage technology solutions. Nuclear, though an established source of baseload power, is struggling to create a resurgence and is unlikely to play a major role in compensating for the loss of coal.

Natural gas is poised to compensate for nearly all generation losses. Indeed, as the price of natural gas has dropped, the United States is attaining its lowest levels of carbon emissions since 1994 through voluntary fuel switching at existing coal facilities. However, given the dramatically volatile price history of natural gas, and doubling of natural gas prices over the past twelve months, such single-fuel reliance poorly positions the U.S. to deal with an uncertain energy future.

Manufacturers, though unlikely to be captured in EPA's first round of existing source greenhouse gas regulation, face a much more difficult route to identifying appropriate substitutes and achieving serious reductions.

CONCLUSION

In pushing further greenhouse gas regulation, the president is singlehandedly putting the nation on an expensive path to a low carbon future. Appropriate Congressional action can clarify the intent of the Clean Air Act and prevent this from moving forward, though that seems unlikely in the current political environment.