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Viewpoint

Design issues in a mandatory greenhouse gas emissions registry for the United States

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ABSTRACT

On March 10, 2009, the US Environmental Protection Agency (EPA) proposed a new rule, Mandatory Reporting of Greenhouse Gases. When final, the rule would compel most large sources of greenhouse gases (GHGs) to report their emissions to EPA as well as fossil fuel suppliers and vehicle engine manufacturers to report their fuel sales and engine emissions rates, respectively. We suggest a number of improvements to the rule that would enhance compatibility with expected future climate legislation and enable a broader range of policies and analysis: (1) lower the threshold for reporting to a level more consistent with expected future legislation, (2) require reporting of electricity use along with direct emissions, (3) require reporting of emissions per unit output for a small number of selected sectors, (4) include a system of identifying corporate ownership of reporting facilities, and (5) identify a path toward coverage for sectors that were left out of the proposal due to underdeveloped reporting protocols.

1. Introduction

On March 10, 2009, the US Environmental Protection Agency (EPA) proposed the new rule, Mandatory Reporting of Greenhouse Gases (2009). This rule would compel facilities in various sectors above a certain size to report their greenhouse gas (GHG) emissions to the EPA. The public now has until June 9th, 2009 to comment on the proposal before the Agency revises and issues the final rule. In the ten short months it was given to write a proposal, EPA has completed a rule commendable for its scope, thoroughness, and practicality. The rule has some odd characteristics, however, owing to the difficult political situation the EPA has recently been in with respect to climate change. Having abandoned its finding that GHG's pose a threat to public health and welfare due to pressure by the Bush Administration (Shiffman and Sullivan, 2008), which would have started the EPA on a path to regulating them, the Agency proposed this rule only for informational, and not for regulatory purposes. Because of these unique circumstances, as EPA staff developed the rule they could neither calculate the benefits of various reporting options (although they are required to calculate the costs) nor strategically adapt the rule to any particular purpose.

In light of this challenge, EPA's proposal does a remarkably good job of gathering enough information to enable a range of future policies. Fossil fuel and industrial gas suppliers report production and sales "upstream" while major sources of direct emissions, most of them burning that same fuel or emitting those gases, report their emissions as well, "downstream". Such a system can support policies that act on the upstream suppliers, like a carbon tax or cap for fuels, as well as those which act on emitters, like a downstream cap on emissions. The Agency reasonably focuses emissions reporting on larger stationary sources like power plants and fuel suppliers or distributors, rather than small emitters like vehicles and small buildings, reducing overall costs while achieving a relatively high coverage, around 56% of direct emissions according to EPA estimates. Since fossil fuel sales are reported by fuel suppliers, however, much of the remaining emissions can be accounted for upstream, and adding upstream accounting for fuels, the total coverage goes up to 85% (EPA, 2009a).

Of course, this hybrid accounting leads to double counting of emissions from fuel suppliers (i.e., coal mines, petroleum refineries, etc) and large purchasers such as coal-fired power plants, stationary diesel generation, etc. There is similar reporting overlap with a unique provision for vehicle engine manufacturers to report GHG emissions from their vehicles on an emissions rate basis. Again, though, these different approaches support different types of policies: a CAFE-style standard for engine emissions on the one hand, and a restriction on overall fuel use on the other. Thus, this overlap is an advantage for future regulatory flexibility,

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which many argue should contain both a cap and trade component and specific sectoral arrangements where market forces from cap and trade alone may not be enough (CAP, 2009). The EPA should be commended for such foresight and for the majority of the rule in general.

However, there are several areas where the rule can be improved. Here, we discuss three primary areas: (1) modifying thresholds to accommodate leading climate bills in Congress and to better cover specific sectors, (2) expanding the data request to make the data useful for a wider range of policies, and (3) identifying a clear path forward for improvements in the coverage and scope of reporting.

2. Thresholds

Most emissions reporting schemes have a threshold such that facilities smaller than a certain size do not have to report, thus avoiding unnecessary burden to small businesses and easing administrative costs. Excluding such small emitters typically has little effect on the coverage of the rule. EPA considered economy-wide thresholds based on emissions and on "capacity", i.e. some measure of facility output, like tons of steel produced. This is not an important distinction from a broad policy perspective, however; both achieve the same goals and are referred to in tandem in this discussion.

Thresholds may be fixed economy-wide or vary sector-by-sector. The advantage of an economy-wide threshold is simplicity and perceived fairness. However, a well-formed policy should consider the costs and benefits of reporting, which vary greatly by sector. Emissions reported from sectors with low-cost mitigation options are more valuable for regulatory programs. Also, information that may have multiple uses, beyond a GHG regulatory system, is more valuable. On the other hand, reporting is much more costly for some sectors, where it involves installing expensive new monitoring equipment, than for others, where it is based on simple calculations using available data and methods. Due to competitiveness concerns, it is important that firms within a sector are either broadly excluded or included so that a large number of similar firms do not sit on opposite sides of the threshold.

Given the variation in burdens and benefits from sector to sector, a fixed, economy-wide threshold is not "fair" in any real sense, e.g., equitable burdens or similar cost-benefit balance among reporters. The only way it might be described as fair is in the sense of damage to the environment: "any facility damaging the environment more than X must report." However, facilities vary so greatly in size, number of employees, and value, it is a rather arbitrary designation on which to rest fairness.

Partly because EPA was prevented from quantifying the benefits of reporting, it did not use an objective measure for setting the reporting threshold, either economy-wide or on specific sectors. While it initially considered sector-specific thresholds, it would have been hard pressed to defend them, having no objective measures to justify particular choices. EPA thus proposed an economy-wide threshold, selecting 25,000 t of CO_2 equivalent emissions per year (t CO_2e/yr). This choice is described as balancing coverage with cost of the rule, and is supported by the observation that, for most sectors, the coverage is above 95%.

However, we have identified a number of sectors where the coverage is inadequate at the proposed threshold. Manure management systems have significant emissions (56 million t CO_2e in 2006) and only 2% coverage in the proposed rule (EPA, 2008, 2009b). Landfills are also a major source (126 million t CO_2e) with an estimated 82% of emissions covered (EPA, 2008, 2009a). Other sectors with incomplete coverage include food manufacturing (unknown), and SF_6 emissions from electricity distribution (81%) (EPA, 2009a).

In case of manure management systems, the rule would cover an estimated 44 out of the approximately 2,000,000 facilities (EPA, 2009b). This does not even provide enough data to do meaningful statistical analysis of the sector for future regulatory analysis. A lower threshold is clearly required to get a useful set of information or to capture a significant share of the sector's emissions. Further, the proposed reporting protocol for this sector is a very inexpensive, model-based method, which essentially involves entering some known factors into a web-based reporting system once per year. Thus, relative to facilities in other sectors, the burden of a lower threshold is very low.

Landfills also have a low cost of reporting, and the sector would have near-complete coverage at a lower but still reasonable threshold, such as 10,000 t CO_2e/yr (EPA, 2009a). Glass, on the other hand, is an example of a sector where a higher threshold might make sense, since there are many facilities clustered around the 25,000 t threshold, presenting competitiveness issues (and inevitably data suppression), and the impact of the sector overall is minor (1.6 million t CO_2e/yr) (EPA, 2009b).

Beyond adjusting the threshold on specific sectors where coverage is lacking, EPA should consider a lower threshold overall. Since EPA cannot officially anticipate legislation, it cannot cite pending climate bills in Congress as support for choices within the rule. However, many recent climate bills in Congress have used a threshold of 10,000 t CO_2e/yr (Lieberman-Warner Climate Security Act of 2008; Greenhouse Gas Accountability Act of 2007; National Greenhouse Gas Registry Act of 2007). The most recent and prominent proposal in the House, from Representatives Waxman and Markey, uses a reporting threshold of 10,000 t, although the threshold for the cap and trade system is 25,000, which highlights that the threshold for information collection can and should be lower than the threshold for the cap (American Clean Energy and Security Act of 2009). A 10,000 t threshold would also be consistent with the Connecticut and Washington state programs, and with the Department of Energy's voluntary 1605(b) program (EPA, 2009b).

The 25,000 t CO_2e/yr threshold is an obvious and serious limitation of the reporting rule to support future policies that use a lower threshold. Further, the average cost of reporting at the 10,000 t threshold is only slightly higher ($0.05/ton) than at the 25,000 t level ($0.04/ton) by EPA's calculations (EPA, 2009a). More to the point, although smaller entities may appear to have a higher reporting cost per ton emissions, they may not have a high cost per ton reduction. Many of the smaller entities are likely to be the least efficient, and may have a disproportionate share of low-cost, near term mitigation options. However, unless they report these opportunities may go unrecognized.

3. Scope

There are also several ways that the rule can be extended to support tools like life-cycle assessment and a broader range of policies such as sectoral agreements for energy-intensive industry, low-carbon fuel standards, and carbon portfolio standards for electricity systems. As part of this rule, EPA strongly considered requiring both direct emissions reporting from a facility as well as reporting of purchased electricity in energy terms, going so far as to develop a detailed reporting protocol for electricity use. This reporting would put EPA's mandatory reporting more in line with current voluntary reporting efforts around the world such as the GHG Protocol and the Carbon Disclosure Project (WBCSD and WRI, 2004; CDP, 2009) and California's mandatory system, all of which