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How U.S. Federal Climate Policy Could Affect Chemicals' Credit Risk



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This article has been written by Standard & Poor's Ratings Services and the World Resources Institute (WRI), and brings together the independent perspectives of a rating agency and an environmental think tank. APG, which seeks to integrate environmental, social, and governance issues across all asset classes, including fixed income, provided funding for WRI's contributions to this report. Standard & Poor's did not receive funding from APG or any other party for its contributions. Standard & Poor's views and commentary in this article, though based on certain analysis and assumptions by WRI, have been arrived at independently.

Standard & Poor's and WRI have based their respective contributions on WRI's analysis of future policy determinants and the U.S. Energy Information Administration's policy forecasts, among other public data sources. As with any scenario-based exercise, this analysis uses several assumptions to examine a range of possible outcomes. Our respective findings are illustrative and do not represent WRI's or Standard & Poor's predictions of policies and related effects. An accompanying technical document which details WRI's analytical approach is available at <http://www.wri.org/publication/federal-climate-policy-and-us-chemicals-credit-risk>.

Credit Commentary

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Editor's Note: Standard & Poor's and WRI contributed to this article in an effort to examine how potential U.S. climate change policy scenarios could have credit implications for the U.S. chemicals manufacturing industry. In both Standard & Poor's and WRI's view, their respective findings indicate that environmental policy issues could play a role in the evaluation of credit quality.

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Any significant federal action to address climate change would likely be most relevant for subsectors of the U.S. chemicals industry that have significant greenhouse gas (GHG) emissions or a high dependence on natural gas- or oil-derived raw materials. Almost half of the 2007 value of shipments of the \$724 billion⁽ⁱ⁾ U.S. chemicals manufacturing industry—mostly commodity chemicals—fit this description.

These include the following 13 manufacturing subsectors, which comprised more than 90% of the U.S. chemicals industry's direct GHG emissions in 2006⁽ⁱⁱⁱ⁾:

- Alkalies and chlorine,
- Carbon black,
- Cyclic crude and intermediates,
- Ethyl alcohol,
- Industrial gas,
- Nitrogenous fertilizer,
- Noncellulosic organic fiber,
- Other basic inorganic,
- Other basic organic,
- Petrochemical,
- Phosphatic fertilizer,
- Plastic material and resin, and
- Synthetic rubber.

In the first part of the analysis, WRI describes scenarios under two types of potential federal climate policy—an economy-wide market-based system (specifically, cap-and-trade legislation) and Environmental Protection Agency (EPA) regulation of GHGs (see “U.S. Climate Policy Scenarios,” below). In the second part, WRI and, in certain discrete issues, Standard & Poor's look at how these policy scenarios could influence credit risk factors in 13 greenhouse gas-intensive⁽ⁱⁱⁱ⁾ chemicals subsectors (see “Subsector Analysis,” below). In the final, third part, Standard & Poor's applies these findings

with a view to assessing the potential credit impact on two hypothetical companies—one carbon black manufacturer and one industrial gas manufacturer (see “Company Case Studies,” below).

This analysis does not cover most U.S. specialty chemicals companies because they tend to be less GHG-intensive and have strong competitive positions. As a result, any future climate policy is less likely, in Standard & Poor’s view, to significantly affect their credit quality.

In Standard & Poor’s and WRI’s opinion, key indicators of credit impact under any U.S. policy to significantly reduce GHG emissions would likely include factors such as:

- Macroeconomic and energy-related factors including:
 - Industrial growth forecasts and the effects on demand for chemicals products;
 - Prices of fuel, feedstock, and electricity and their effects on input costs;
- Compliance-related factors, including:
 - Costs, or in some cases, revenues, related to climate policy provisions;
 - Capital expenditures or other spending to reduce/meet compliance obligations; and
- Competitive factors, including:
 - Effective management of the above factors, including the ability to pass along costs to customers, and/or in a few cases, to take advantage of new market opportunities.

The effects of these factors on creditworthiness would likely vary by policy design and implementation. To illustrate, rather than predict, WRI created scenarios based on two types of policy. The first type of policy envisions U.S. Congress using a market-based system—such as cap-and-trade policy—to reduce GHG emissions across the economy. Here, WRI uses the American Power Act (APA)—the most recently proposed economy-wide cap-and-trade bill in the Senate (May 2010)—as a proxy, since any future market-based policy would likely draw from APA. The second type of policy examines how the EPA would regulate chemicals-related GHGs using its existing authority under the Clean Air Act. As the EPA’s GHG regulatory form, timeline, and scope are currently unclear, WRI only examined which of the 13 subsectors are most likely to face GHG regulations rather than analytically examine credit impact on the 13 subsectors. While WRI and Standard & Poor’s considered these policy types separately in their respective analyses, they are not mutually exclusive because Congress and the EPA (as well as state governments and other federal agencies) could simultaneously establish policies to address climate change.

Standard & Poor’s and WRI decided to examine potential credit effects after an anticipated five-year phase-in period. We used 2016 as a proxy because it is the first year that the chemicals industry would have been required to hold permits under the APA, and, in WRI’s view, it is unlikely that future EPA regulation would cover GHGs from existing chemical facilities before 2016. Although not explicitly analyzed, chemicals companies could feel a credit impact before 2016—particularly those with older, less efficient facilities—as they expend capital to prepare for policy.

Standard & Poor’s and WRI also do not consider new market opportunities under a GHG-constrained economy as part of this analysis. These opportunities may be significant for some companies. For example, companies manufacturing products for use in industries like building insulation, electric vehicles, and agriculture could see greater demand for their products because of policy.

Key Findings

Credit impact under cap-and-trade scenarios

If passed, the APA would require companies to hold permits to emit GHGs for all emissions from facilities emitting more than 25,000 tons of carbon dioxide (CO₂) or equivalent greenhouse gas. Most large U.S. chemical facilities would meet this threshold.^(iv) By limiting the supply of these permits—

known as emissions allowances—in the market, the government would be able to cap economy-wide emissions. The APA also includes provisions that would rebate free emissions allowances to facilities in select subsectors. Eligibility for these free allowance rebates is at the subsector level, and depends on a subsector's energy intensity and trade exposure.^(v)

WRI has calculated that the APA provides enough free allowances to energy intensive, trade exposed manufacturing industries that any eligible subsector—as a whole—will receive enough free permits to cover all emissions in that subsector for 2016 and several years beyond (see WRI's accompanying technical document). However, the risk remains that the supply of free permits relative to demand may decline over time and at a faster rate than originally envisaged.

Predicting how the APA would affect the economy is challenging. For their analysis, Standard & Poor's and WRI have each relied on the U.S. Government's Energy Information Administration's (EIA) projections of APA's impact on GDP, energy prices, and GHG emissions permit prices.^(vi) As with any forecasting, these projections indicate what could happen, rather than what would happen.

Subsector-level evaluation

Standard & Poor's and WRI based their respective analyses on EIA projections using three GHG permit price scenarios—low, medium, and high—under the APA. Based on these projections, most of the chemicals subsectors we examined would only see modest energy and compliance effects in the first year of assumed compliance (2016).

The EIA projects only modest changes relative to no policy for most natural gas and oil-derived energy inputs in 2016 under the APA. Only well-head natural gas prices increase significantly—from 4% to 25% higher relative to no policy in the three scenarios Standard & Poor's and WRI considered—while petroleum and coal prices decrease modestly—from 1% to 9% lower relative to no policy. These projections are premised on the assumption that users across the economy will likely switch away from emissions-intensive fuel/feedstock sources (i.e., petroleum and coal) and demand lower emissions fuel/feedstock sources (including natural gas) because of the price signal cap-and-trade policy creates.

APA provisions require utilities to pass any free allowances they receive to industrial consumers, including chemicals manufacturers, in the form of lower electricity prices, which mutes electricity price changes.

WRI estimates that facilities in 10 of the 13 chemicals subsectors (as a whole) would be eligible to receive free allowance rebates under the APA. For these eligible subsectors, WRI expects no net compliance obligations—at the subsector level—in 2016 and through as far as 2033 (see WRI's accompanying technical document). WRI expects only facilities in three of the 13 subsectors examined—the industrial gas, ethyl alcohol, and phosphatic fertilizer—would not be eligible to receive free allowances since these subsectors don't meet the legislation's threshold for trade exposure and/or energy-intensity.

WRI compared the 13 GHG-intensive subsectors' relative policy-related energy and compliance costs (based on EIA projections in 2016) against Standard & Poor's ranking of relative competitive risks for each subsector (see *Figure 1*). WRI assumed that the ratio of these subsectors' emissions and their energy-related fuel/feedstock purchases to their size, as measured by value of shipments, is the same in 2016 as in 2006 (the most recent data available for emissions estimates). This comparison appears to indicate the following:

- While large energy-intensive commodity chemical subsectors (like the petrochemical, plastic material and resin, and other basic organic chemical subsectors) may have limited ability to pass along costs depending on market conditions, WRI doesn't expect these subsectors to face significant compliance costs because of their eligibility for free allowances. At the same time, these subsectors also depend

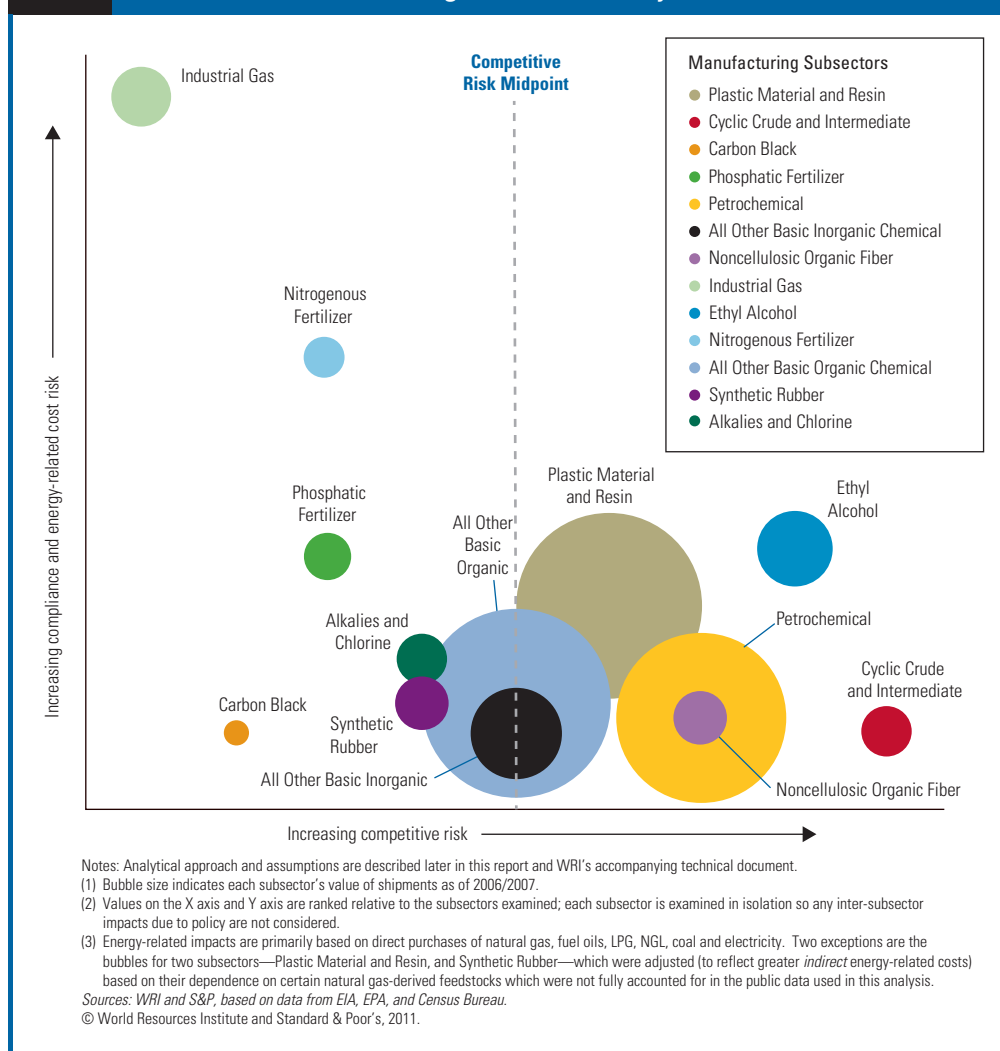
heavily on natural gas-derived feedstocks so they could face higher production costs. Standard & Poor's expects higher production costs could make some of these subsectors less competitive in their markets, lower their export opportunities, and ultimately weaken their credit metrics.

- The nitrogenous fertilizer subsector is likely to face moderate energy-related risks because of their natural gas purchases.
- The industrial gas subsector may have the greatest compliance costs relative to its size, but it should also be in the best competitive position to pass along these costs to customers.

Company-level evaluation

Under the APA, companies in eligible subsectors receive free allowances based on their market share (by output) in a subsector, multiplied by the whole subsectors' GHG emissions. As a result, companies with a lower ratio of GHG emissions to output than those of their peers would receive more free allowances than required to cover their facilities' compliance requirements. These companies can sell their extra free allowances for cash or bank them for future use. Companies with a higher ratio of

Figure 1 **Estimated Relative Impacts on Select Manufacturing Subsectors under the American Power Act—Average of Three EIA Projection Scenarios (2016)**



GHG emissions to output than their peers still receive free allowances, but these free allowances would only offset a portion of their compliance requirements and may put them at a cost disadvantage.

WRI and Standard & Poor's expect that the credit impact at a company-level would likely vary within each subsector based on the following:

- **Current and projected emissions and the ability to reduce emissions.** For companies eligible to receive free allowances, emissions data should be compared with the subsector average, since net compliance costs would depend on emissions intensity relative to the subsector average.
- **Current and projected fuel and feedstock mix.** Dependence on GHG-intensive fuels like petroleum products and coal (and to a lesser extent, natural gas) increase compliance costs because GHG emissions are released upon combustion. Natural gas dependence, whether through direct purchases or natural gas-derived feedstocks, may result in higher energy purchase costs.
- **Competitive position,** both domestic and international, including the ability to pass along costs.

Standard & Poor's examined the potential credit impact on two hypothetical companies in energy-intensive subsectors in 2016, using EIA projections of the APA and WRI's analysis of free allowances:

- Company A is a large carbon black producer with lower GHG emissions than most of its peers. WRI estimates that the value of free allowances Company A would receive under the APA would be greater than the costs of its compliance obligations, resulting in net revenue of \$0.01 to \$0.03 per dollar of U.S. sales in the first year of regulation—a negligible positive impact. Standard & Poor's also expects the implications of raw material costs to be manageable for Company A because it focuses its energy purchases on refined crude oil products, which are expected to decline in cost relative to the no-policy case. Even in the downside case, where its energy outlays increase more than what the EIA projects, energy costs appear manageable because of the company's geographic diversity and the expectation that Company A would retain sufficient pricing power due to the value-added-nature of its products and favorable industry structure. Thus, under the EIA projections, Standard & Poor's would not expect Company A's profitability and leverage metrics to deteriorate.
- Company B, as a large industrial gas producer, would not be eligible to receive compliance-related subsidies. As a result, WRI estimates Company B would face \$0.06 to \$0.17 in compliance costs per dollar of U.S. sales. The substantial costs of compliance could raise some uncertainty on future capital spending, and the EIA's projection for slightly lower economic growth could affect demand growth. But we expect Company B to be able to pass through some costs to downstream customers as a result of the strength of its business model and lack of lower-cost substitutes. Here, Standard & Poor's expects Company B's profitability and leverage metrics to deteriorate modestly under the EIA projections.

The subsectors that are most likely to face EPA regulation

WRI believes that 2016 is likely the earliest year that future EPA regulation would cover GHGs from existing chemical facilities. The form of regulation is unclear. Previously, the EPA has used both market-based and command-and-control regulation to limit pollutants.^(vii)

WRI believes that absolute emissions and emissions reduction potential are among the factors that the EPA will consider when regulating GHG emissions; other key criteria include cost feasibility and the remaining useful life of facilities (see Figure 2). Nitric acid and adipic acid production—part of the nitrogenous fertilizer and all other basic organic subsectors, and an input into fiber manufacturing—are also likely to come under regulation as a significant source of nitrous oxide (N₂O) emissions (a potent GHG). (Because of data limitations, Figure 2 does not reflect cost feasibility, the remaining useful life of facilities, and nitric acid and adipic acid production.)

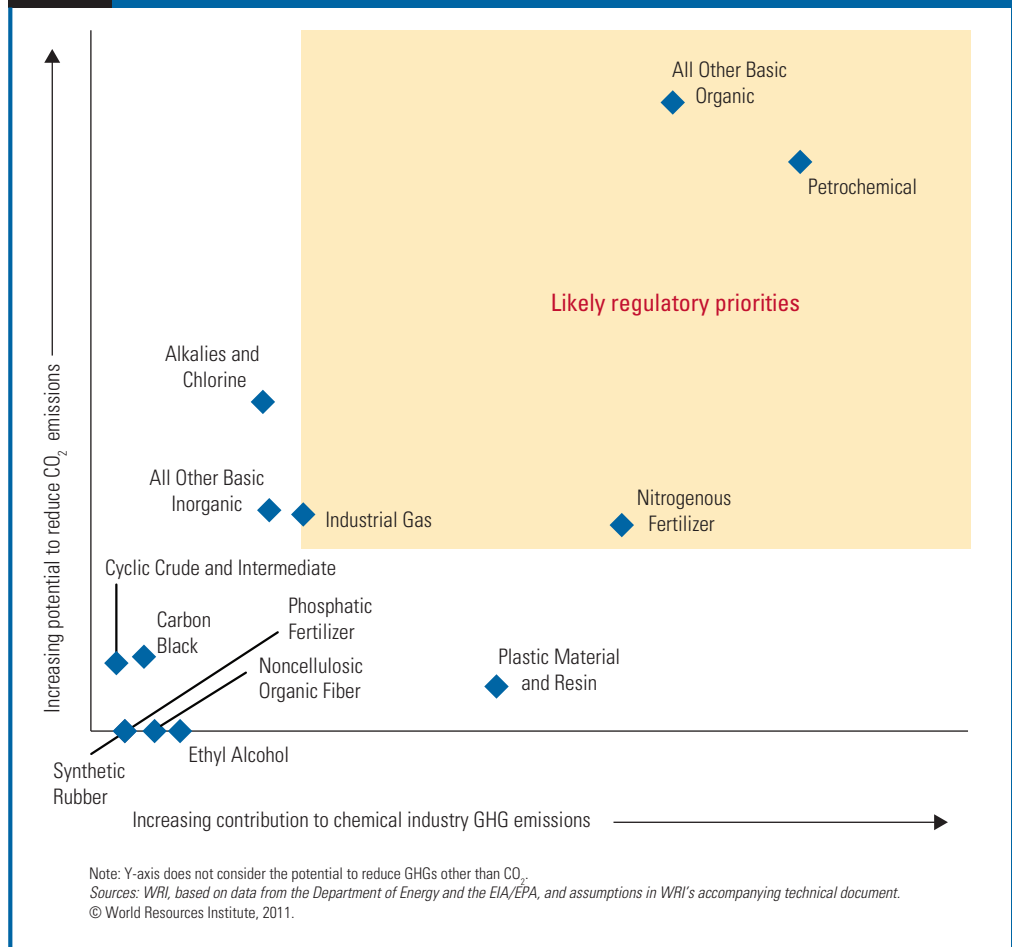
The credit differences between policy scenarios

Assuming the EPA does not use market-based mechanisms, WRI and Standard & Poor's believe the key credit-related differences between the cap-and-trade and EPA regulatory scenarios include:

- **Cash flow flexibility.** Cap-and-trade legislation provides companies with greater flexibility to choose between up-front capital expenditure and the purchase of emissions allowances, allowing companies to more easily manage cash flows in a given year.
- **Compliance-related revenue.** Under the APA, companies that are both eligible for rebates and emit less GHGs than their peers (per unit of output) would presumptively receive more free allowances than required, and could bank or sell these allowances for cash. A non-market-based EPA regulatory approach would not provide a similar opportunity to gain compliance-related revenue.
- **Management strategy.** Implementing an effective management strategy to comply with climate policy becomes more important in a cap-and-trade scenario. Benchmarking emissions reductions against peers and participating in GHG permit trading ("carbon") markets will likely be a complex undertaking for any company, requiring input and coordination from all business segments. In contrast, meeting EPA regulatory standards is likely to be easier to manage within existing company operations.

Figure 2

Relative Likelihood of Future EPA Regulation for Select Chemical Manufacturing Subsectors



As climate policy evolves, key policy variables to watch for include:

- **Stringency.** How aggressively do policies target greenhouse gas emissions reductions?
- **Coverage.** Which subsectors in the chemicals value chain do the regulations cover? And how and when do those regulations apply?
- **Transition provisions.** What provisions are available to ease the economy and companies into reducing GHG emissions and minimize competitive pressures (for example, free allowances)?

U.S. Climate Policy Scenarios

The chemicals industry accounted for a significant portion of the U.S. economy's greenhouse gas emissions in 2006, at 21 % of U.S. manufacturing GHG emissions and around 5 % of total U.S. emissions.^(viii) The cost base of many commodity chemicals producers depends on the price of oil or natural gas-related raw materials. Thus, any future U.S. government action to significantly limit GHG emissions is relevant for these companies' credit quality either directly because of compliance-related costs and revenues or indirectly through changes in fuel and feedstock costs. Here, WRI describes possible paths for U.S. federal climate policy as context for this article's analysis of credit impact.

U.S. climate policy: the current state of play

In 2009 and early 2010, an economy-wide cap-and-trade policy structure—where the U.S. government would sell a limited number of GHG emissions permits to companies—gained significant political traction. In June 2009, the U.S. House of Representatives passed a landmark economy-wide cap-and-trade bill, commonly called “Waxman-Markey.” And in May 2010, Senators Kerry and Lieberman followed by proposing a similar bill, the APA, in the Senate. But political winds changed by mid-2010; the Senate has not voted on the APA, and Congress has done little to address climate change.

Meanwhile, in 2009 and 2010, the EPA proposed and/or passed several rules designed to limit GHG emissions from sources such as passenger vehicles. In September 2010, President Obama stated that “passing an energy policy that begins to address all facets of [U.S.] over-reliance on fossil fuels” was one of his “top priorities” for 2011.^(ix) The EPA has indicated it plans to continue taking actions to regulate GHG emissions. The EPA's specific ambitions and its timeline are unclear, but it is likely that among non-transportation-related sectors, utilities would be the first to be regulated, followed by industrials. Depending on future political will, Congress could reconsider the APA cap-and-trade bill, or at least parts of it, sometime in the next five years. Finally, several states and regional state partnerships have pursued their own GHG emissions reduction targets (*see sidebar 1*).

State Action

Many states—Arizona, California, Connecticut, Florida, Hawaii, Illinois, Iowa, Kansas, Maine, Maryland, Massachusetts, Michigan, Minnesota, Montana, New Jersey, New Mexico, New York, Oregon, Utah, Washington, and Wisconsin—have already announced legislative and executive orders to reduce GHG emissions or are part of regional GHG reduction programs. There are varying emissions reduction targets and scopes for each of these states' programs. For example, some only consider the power sectors while others also consider industrial sources. See the 2010 WRI publication “Reducing Greenhouse Gas Emissions in the United States Using Existing Federal Authorities and State Action,” for additional information.