Seeing Through the Fog

A Practical Guide for Dealing with Carbon

In San Francisco in the summer, fog rolls across the bay at certain hours of the afternoon, swiftly enveloping the city in a dense cover. In many ways, U.S. carbon rules are just like that blanket of fog: inevitable but of uncertain timing, all-encompassing, and with a sudden and large impact on life and the environment.¹

Carbon rules will have massive direct economic impacts on most industries, but particularly on emitters such as companies in the power, oil and gas, metals, cement, paper, and mining industries. These impacts will be pervasive for most emitting and nonemitting companies and will have implications for major functions and management processes, as well as for market structures and relative competitive positions. Investors and analysts are increasingly sensitive to carbon issues and are looking to management teams to craft a response, despite the uncertainty over the rules’ nature and timing.

Surprisingly, little of the relevant literature has addressed in a pragmatic manner what companies should do about carbon today. European companies have been dealing for several years with the implications of carbon rules owing to the EU Emissions Trading Scheme (ETS) and the Kyoto Protocol. But most recent literature deals with the emission reduction options that inform the raging policy debate (especially in the United States), the technology options (or lack thereof), or forecasted carbon prices. Little practical advice is available to a company’s board or CEO about what to do to prepare for or respond to current and looming regulations. This article aims to fill this gap and outlines a practical three-step process for companies to prepare for the coming carbon regulations.

Major Carbon Regulation Will Happen, but the Form and Timing Are Uncertain

The lack of consensus at the Copenhagen climate-change talks and the recent deferral of carbon legislation in the U.S. Senate have intensified the uncertainty around both the timing and the nature of the regulations that are ultimately implemented. The situation has done nothing to cool the fires of the policy debate (such as that between the developed world and the emerging markets, led by China, regarding their respective obligations vis-à-vis emissions reductions). Moreover, the U.S. Environmental Protection Agency (EPA) recently began actions to use the Clean Air Act to regulate carbon. This has been met with resistance by those claiming that the law was intended to regulate pollutants such as sulfur oxides (SO₂), nitrogen oxides (NOₓ), and mercury—which come from a limited number of large stationary sources—and not carbon, which is emitted by a plethora of sources large and small. The recent midterm elections further cloud the outcome of EPA’s intentions. At the regional level, carbon initiatives are either progressing (the Western Climate Initiative, for example) or have already been implemented (the Regional Greenhouse Gas Initiative, or RGGI, in nine states of the northeastern United States). Nongovernmental organizations are active and are increasingly pressuring companies regarding their emissions or their emissions disclosures.

And companies are starting to pursue different policy strategies. PG&E and Exelon, for example, left the U.S. Chamber of Commerce over divergent carbon-policy perspectives. Most U.S. states are establishing generally aggressive renewable-power-generation targets independent of federal action (Texas, for instance, now leads the nation in wind generation). Finally, even countries that are resisting global carbon targets, such as China, and countries that never signed the Kyoto Protocol, such as Morocco, are pursuing aggressive renewable-energy policies and developing local supply chains to support them.

¹ In this article, “carbon” refers to greenhouse gases, carbon dioxide, and all other forms of carbon and related greenhouse-gas emissions.
Thus, while it is increasingly clear that some form of global regulation—one that includes the United States—is inevitable, its specifics and timing remain quite uncertain.

**Carbon Regulation Will Have Significant Impacts**

The direct *economic impact* of carbon regulation will dwarf that of any previous environmental rules. The stakes are enormous, and not just for large emitters such as power generators. Under a reasonable range of price outlooks, the cost of carbon emissions will have economic impacts one to two orders of magnitude greater than those of SO₂, NOₓ, or mercury emissions. And in order for meaningful near-term reductions in carbon emissions to occur due to fuel switching (such as from coal to natural gas), carbon prices will need to be at least $30 to $50 per ton—two to five times the price envisioned by many politicians.²

These economic impacts are so large that they will affect companies not only directly through the cost of emissions, but also indirectly, through *industry and market structure changes*. For example, the mere prospect of higher carbon costs is causing U.S. utilities to ponder the implications (for revenues and rate design, for example) of likely regulatory mandates such as plug-in hybrid-electric vehicles, smart-grid technologies, demand-response and energy-efficiency programs in lieu of (or in addition to) new generation, and demand-neutral rate making. They are also thinking about market changes potentially resulting from carbon regulation, such as the impact of increased amounts of intermittent renewable power on the dispatch of fossil plants, on the reliability of the grid, and on transmission needs. The impact of carbon regulation will not just be economically large but pervasive as well.

How will higher carbon costs affect the structure, competitiveness, and cost curves of industries outside of power utilities? In petrochemicals, for example, as the carbon costs associated with the manufacture of PVC and polyester precursors increase, these commodities will lose their competitive advantage over less carbon-intensive materials, such as copper and cotton. In the aluminum industry, those smelters that are hydro-power-based will become far more competitive relative to fossil-powered plants, radically changing the industry cost curve. Moreover, it could become economical to shut down some hydro-powered smelters and resell their electricity on the new, higher-priced power markets.

Even companies whose businesses have no obvious connection with carbon issues could feel the effects of regulation. The potential cost impacts of carbon are so large that thin-margin businesses such as shoe manufacturing, textiles, and construction will need to understand them. Global industries need to be particularly wary, given the likelihood of differential carbon costs by country; already these have given rise to “leakage” issues in Europe under the ETS and are a major issue in the U.S. policy debate.

Carbon regulation is also likely to affect almost every aspect of a company’s *functions and core management processes*. For example, in a world of uncertain but potentially high carbon prices, using the appropriate carbon-price forecast when making capital decisions can be as important as selecting the right weighted average cost of capital.³ Annual budgets present a similar challenge. Integrating carbon into a company’s risk-management processes can be a significant task, both mechanically (because of the IT systems required to capture the requisite data, for example) and intellectually (because of the need to determine the “right” level of exposure to carbon prices).

Finally, *investors* are increasingly focused on carbon and are seeking from management not just its plans regarding a company’s exposure but also its plans for dealing with it. Industry reports have already appeared that estimate net carbon exposure by company and that also identify perceived “winners” and “losers”—and the resulting impacts on market valuations.

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2. These amounts vary significantly depending on the price of natural gas relative to coal.
3. In this article, we assume a cap-and-trade model for future regulation. “Price” denotes the cost of carbon, including the costs of externalities, resulting from regulation.
Cemex is a good example of a company that has been very proactive in preparing for a carbon-constrained world. It has developed internal Web-based collaboration platforms that enable innovation and best-practice sharing across its businesses. Several carbon-management initiatives, involving more than 1,000 experts across the company’s operations worldwide, continuously expand knowledge about carbon and its business implications and propose high-quality investment opportunities. In fact, in allocating capital expenditures, Cemex now includes CO$_2$ price forecasts in the economic analysis in order to assign value to avoided emissions.

Cemex has identified several levers within its production process that have significantly lowered its carbon footprint: reduction of clinker content in cement, greater use of lower-emission alternatives to traditional fossil fuels (usually from waste streams), increased energy efficiency, and greater use of renewable energy. Consequently, the company’s CO$_2$ emissions per ton of cementitious products have dropped by 21 percent since 1990. These efforts translated into more than 7 million tons of avoided CO$_2$ emissions in 2009. (See the exhibit below.)

It is worth noting that Cemex’s efforts go significantly beyond those installations that are covered by the EU’s ETS; rather, the company continually strives to improve the carbon footprint of all its operations and actively seeks low-carbon and renewable sources of electricity to reduce its indirect exposure to CO$_2$ via the power market. Some of its projects have been registered under the United Nations’ Clean Development Mechanism (CDM), and the credits they generate are recognized under the ETS. Cemex has so far registered three CDM projects, which are expected to reduce CO$_2$ emissions by more than 800,000 tons per year. Additional CDM projects are in the pipeline and are expected to be registered in the coming months.

Cemex is also actively engaged in exploring the technical and economical feasibility of carbon capture for both sequestration and recycling of CO$_2$. Moreover, because monitoring and reporting are cornerstones of any regulation, Cemex has, since 2006, tracked and audited its emissions in line with the Greenhouse Gas Protocol developed by the World Business Council for Sustainable Development (WBCSD) and the World Resources Institute, and has shared the results through the Carbon Disclosure Project.

On another track, Cemex has focused on meeting its customers’ needs for more sustainable building materials. Innovative products under development include high-strength concretes that reduce the amount of building material required; insulating concrete forms that help keep out heat in hot climates and retain it in cold weather; and self-compacting concrete, which reduces energy use during construction, improves the strength and durability of buildings, and reduces maintenance costs throughout the building lifetime. Cemex informs its customers of the life cycle CO$_2$ savings provided by its products.

Finally, Cemex is a pioneer in carbon labeling within the industry. It is the first cement company in the world to provide certified carbon labels for its cement, using the UK Carbon Trust’s Carbon Reduction Label, which highlights the CO$_2$ equivalents generated by cement from cradle to gate. Cemex is a core member of the Energy Efficiency in Buildings Initiative within the WBCSD, which aims at setting new standards for energy use in buildings, and a co-chair of the Urban Infrastructure Initiative.
Uncertainty Abounds

In carbon regulation, more perhaps than in most policy arenas, details matter a lot. And in the case of carbon regulation, there are many unresolved details that are creating significant uncertainty—which is hindering the ability of companies to agree on a response. The following is a partial list of open issues.

- How will India, China, and the other developing economies be handled given their understandable reluctance to put up obstacles in the way of their own economic development relative to developed economies such as the United States?
- Will energy-intensive export-oriented products produced in developed countries be “protected,” especially if India and China receive advantages? Will national politics really allow countries to shut down such industries locally while China’s growth continues unabated?
- Which industries will be covered?
- Will offsets be allowed or not? Will they be limited? If so, how? Who will administer them?
- Will regulation be based on a cap-and-trade model or taxes?
- Will there be global linkages among programs or not?
- In the United States, will federal programs preempt state or regional plans?
- Will credits be allocated or auctioned? If they are partially allocated, what will the formula be? What will happen to the auction revenue?
- Will the point of regulation be the burner tip, the point of fuel production, or someplace else?
- Will there be price caps? What will happen if the price cap is below the market price needed to meet reduction targets—as is likely?

Important details such as these explain why the U.S. Waxman-Markey Bill was 1,201 pages long.

What to Do?

Below we outline a three-step program that will allow companies to prepare for the impending carbon squeeze. It covers all aspects of an integrated carbon plan. We have found that most companies are taking some but not all of these actions. Few are dealing with carbon on an integrated basis.

1. Get smart. The first step is to become as educated as possible about carbon regulation and its likely range of impacts.

   - Educate the corporate and business leadership. This could start with a basic vocabulary lesson on the formidable array of acronyms and terms used and how they all tie together. It is also important to become informed about the policy debate and the key issues (such as auction versus allocation and separate targets for emerging versus developed markets) and the arguments on both sides. Understanding the various technologies and their economics is also important, especially for direct emitters such as power generators, cement plants, and paper mills. The board, the CEO, and the CEO’s corporate leadership team all need to be educated, as do the leaders of the various businesses, where the majority of the direct impacts will be felt.

   - Develop carbon market knowledge. This includes getting involved in an alphabet soup of stakeholders, associations, and forums. But mostly it means acquiring a fact-based microeconomic understanding of carbon markets, supply and demand levels, and the key drivers (beyond the emissions reduction target itself) that might lead to higher or lower prices. For example, at what point will sufficient offsets be
allowed to create an artificial price cap on carbon, even under tighter reduction scenarios? Given the considerable barriers to low-cost energy-efficiency investments, such as the agency risk of separating the decision maker (the landlord) and the beneficiary of the recurring savings (the tenant), it is not clear if such investments will be adequate to make a difference, even if the economics are nominally attractive.

Inventory your positions. Know what your emissions are across all three standard levels: tier one (direct emissions from your company’s smokestacks); tier two (direct emissions indirectly associated with your business, such as those related to its energy and fuel consumption); and tier three (other emissions, such as those related to your company’s supply chain and vehicle fleet). Learn not just what your emissions are but also which technologies are (and are not) acceptable for measuring them under current and prospective registry rules and under likely regulations.

But physical emissions are only part of the story. For many companies, a careful understanding of markets and contracts is also required. Do sales or long-term contracts allow for the pass-through of carbon costs under change-in-law clauses? Does it matter whether the new rules are cap-and-trade versus taxes (taxes are frequently handled differently under contracts)? How will the market price of your product change if carbon rules are imposed? Will the new price allow for full or partial recovery of your carbon costs? Will state or local agencies help in cost recovery, especially for regulated businesses? (In one case, we saw a company’s large gross physical exposure reduced, by more than 80 percent, to a net financial exposure thanks to such market effects and its own proactive contractual efforts.)

Develop different impact scenarios. Given the wide range of potential outcomes, it is imperative to look at the possible impacts on the enterprise across a range of scenarios. The factors considered should include both high and low carbon prices, regulation that goes into effect soon and regulation that goes into effect in the more distant future, and one or two other major differentiators of impact.4

Depending on the specific business, the scenarios should also include potential second-order impacts, such as the effects of regulation on market price, industry structure, or plant utilization/dispatch. For example, in power generation, if coal plants set local market prices because they emit two to three times the carbon that gas plants do, gas plants in the area will benefit from higher carbon prices even with a 100 percent auction of allowances. These scenarios may also take into account some of the regulatory details listed above and their interaction with cost recovery via contractual language.

Finally, the second-order effects need to include the implications of carbon regulation for suppliers and customers. Even if your own business is not significantly affected, other industries will be. For example, building contractors have a low carbon footprint but will see the relative cost of steel-framed versus concrete buildings shift because of the relative carbon intensity of steel versus concrete. Similarly, timberland owners, who have a negative carbon footprint, will see the relative economics of sawmills and pulp mills switch due to the relatively higher carbon costs of paper mills.

2. Get going. Having established a fact base and a basic understanding of the major drivers of carbon regulation’s potential economic impact, both direct and indirect, the company can now develop a portfolio of tangible actions to position itself across a range of scenarios. While some of these actions will likely be advocacy oriented and intended to shape prospective regulations, most will be a combination of “no-regrets” moves and building “options” that will be of value only under certain scenarios. For example, provided the actions are grandfathered under the eventual carbon regulations, reducing the carbon intensity of a product is likely to be a no-regrets move as long as it does not increase the product’s as-is costs. Acquiring rights to the production of certain offset projects at favorable prices might be an attractive option in a high-carbon price scenario.

A central senior task force should be charged with developing and overseeing implementation of the

4. The range of price expectations is enormous. For example, some see price caps keeping carbon in the $10 to $20 per ton range for the medium term. Others think prices will need to be more than $50 to $100 per ton (depending, in part, on gas prices) in the near to medium term to have any meaningful impact on emissions. A point of view on price range and whether one’s industry will get a favorable allocation is important in shaping a company’s actions.
company’s overall carbon strategy. This small team should drive the three-step program and revisit each step as events unfold. It needs to include representatives from corporate functions that have a major stake in the results (such as finance and legal), as well as those businesses that will be charged with implementation and whose P&Ls will be affected. The team should set up subteams to identify and analyze options across a range of levers, including the following:

- **Physical.** The list of options for reducing physical emissions is likely to be the longest and most varied. First, look at all the levers available, arraying them on a cost abatement curve from the cheapest to the most expensive. Many will likely be profitable investments or no-regrets moves, such as improving the energy efficiency of offices or the thermal efficiency of plants. Other options may not have such obvious benefits. For example, in coal-fired power plants, practically the only way to lower emissions in the near term—short of a shutdown—is to co-fire with biomass. This requires some modest capital and operational changes that would have marginal economic benefits at today’s relatively low coal and gas prices. However, given the likely impact of carbon regulation on coal-fired power plants, initiating a retrofit today could be a good option, since it takes one to two years to design, test, and complete such a plant. Moreover, getting first-mover access to the best local fuel supply can be a critical advantage given the transportation-intensive nature of biomass.

It is also important to ensure that the company does not merely reduce its baseline emission levels only to encounter a punitive resetting of the baseline in future targets to those lower levels, as we witnessed at one company in Europe. In the United States, companies must be careful not to make a physical change that inadvertently triggers a best-available-control-technology (BACT) requirement under hard-to-interpret New Source Review standards.

- **Contractual.** The list of contractual options will be shorter than the list of options for reducing physical emissions, but, in our experience, it will have an even greater economic upside. Regulated businesses should look into regulatory options for recovering their incremental carbon costs. Unregulated businesses should look at their markets and contracts. We know of one case in which the carbon costs pass-through language for several of a power generator’s long-term contracts covering 5,000 megawatts of capacity was not clear. If the plant operator had been required to pay those costs, the plant would have gone bankrupt within months of any new law’s taking effect. However, the off-taker would be able to recover those costs in the market. The at-risk producer was therefore able to bundle a renegotiation requested by the off-taker regarding unrelated terms with a clarification of the contract’s terms regarding carbon, thereby shedding its carbon risk. As a result, assets worth over $1 billion to the owner were protected from a potentially catastrophic risk.

- **Asset Management.** In many industries, the large economic impact of carbon regulation will have significant effects on relative asset values. Establishing a firm point of view on the likely winners and losers will enable transactions to be done—both buying and selling. In the utility industry, we have seen asset values move up and down by as much as 50 percent, depending on the company’s perspective on the effects of regulation and likely future carbon prices. The challenge here is to have enough confidence in one’s point of view to be able to transact with a company that has the opposite point of view.

However, the window of opportunity for such transactions may have closed, since the carbon price spread in most scenarios is not as wide as it was two years ago. For public companies, it is even more complex. We know of one power generator that considered selling more than one-third of its portfolio before any carbon discount had affected its asset values. However, because Wall Street did not share its pessimism about the impact that carbon regulation would have on its assets, the company decided not to sell, even though it was convinced there was a valuation mismatch. Later attempts to sell failed, because by then the valuation gap had closed, costing the company approximately $2 billion in lost opportunity value.

- **Risk Management.** Many companies will find that their carbon-risk exposure is as large or larger than their exposure to any traditional risks, such as interest rates or commodity prices. Building, understanding, and proactively managing the integrated corporate carbon-risk profile is therefore essential. Start with the inventory of emissions developed earlier. Then use classic corporate-finance theory to
determine whether there is an “optimal” risk profile to target. Given the high level of uncertainty, this will not be straightforward. But a review of the markets, physical and contractual options, and other levers (such as the emergent yet illiquid carbon markets) can help determine whether and how the company might be able to manage its net-risk profile.

◊ Business Development. Are there new market opportunities that are a natural fit for your company? These can be a hedge for emitters against high carbon prices—albeit a partial one. Even if the base business is hurt by higher prices, the new business may well be more successful. At AES Corporation, this was part of the rationale for the early creation of a carbon-offset development business leveraging the company’s unique geographic footprint across emerging markets. Banks are naturally suited to commercially oriented entry strategies. However, the execution risk of such new ventures is significant, especially for a business built on the shifting sands of global carbon regulations. Many carbon companies have found this out the hard way, including the carbon intermediary EcoSecurities, whose stock price plunged from more than £4 to less than 20p after U.N. regulations changed in 2007–2008.

◊ Policy. Companies need to develop their position regarding carbon, and most are already doing so. At a high level, this includes both the direct economic impacts of regulation and the ways in which the company’s position might affect its customers’ perceptions. Thus, PG&E Corporation can take an aggressive stance on carbon in part because it generates only limited fossil-fuel-based energy but has significant (zero-carbon-emitting) hydro and nuclear power. In addition, the company is located in environmentally sensitive California, so its customers will support such a position even if it causes rates to increase slightly. That said, there are many voices in the carbon debate, so it makes sense for a company to pick its fights carefully, attacking issues with a .22 instead of a shotgun. For example, one power company’s early advocacy work focused on issues unique to two of its plants. This allowed it to get support for these specific concerns from local congressional delegations while allowing industry trade groups, such as Edison Electric Institute, to work on the broader industry issues.

Once you have developed the list of possible levers, the senior team can analyze and prioritize them across different scenarios. A portfolio of actions can then be selected, responsibilities assigned, and execution plans developed. The scarcest resource is likely to be people rather than capital.

3. Get organized. While the steps outlined above are primarily externally focused, many internal changes will also be required. The good news is that most of them are likely to be applicable regardless of the specific details of carbon regulations; hence, they can be implemented immediately.

◊ Refine core management processes. Revisit all of the enterprise’s basic management processes, such as capital allocation and project evaluation, budgeting, risk management, and KPIs, to see where carbon needs to be included. For example:

- In capital decisions, what carbon price will be used to evaluate future decisions? Will one or several price scenarios be used? If a range is used, what happens if the project is a “no go” at the higher carbon price but a “go” at the lower one?

- How will management be held accountable for its budget targets given that carbon prices may cause near-term earnings to swing wildly? This is already a reality that companies have to live with in Europe and in those parts of the United States where the RGGI applies.

- How will carbon risk be managed? What will be a tolerable risk profile? Can that profile be managed, if at all, given cumbersome levers and illiquid markets? How?

- Will higher carbon prices impact the company’s KPI targets? Will energy efficiency measures be emphasized? Will other KPIs be less critical? Or does energy efficiency have a sufficiently small economic impact in overall operations that no changes are needed?

- Should the annual HR or people process look at the depth of current carbon skills? Are they adequate? How can the company develop them?
Make critical organizational decisions. Several thorny organizational decisions will arise:

- How will risk/commercialization decisions be made? Should risk be managed centrally by a corporate function with global perspective and visibility but with few good market options to manage the overall position? Or should it be managed by the businesses, which will have less relevant commercial skills and a more parochial perspective but access to more levers (physical and contractual) that could impact emissions and/or the company’s carbon position? How to coordinate?

- How will transfer prices and/or scorecards be impacted? Will the business units be able to have a net-carbon-risk profile that is separate from the overall corporate portfolio? If the position is set centrally, will the businesses have “relief” in evaluating budget performance?

- How will policy positions be made if conflicting perspectives arise? How will conflicting perspectives be reconciled? Many power companies increasingly have both large existing fossil businesses and small but growing renewable businesses with inherently competing interests. How can a company reconcile such structurally opposed perspectives and have a unified policy perspective?

- How will carbon issues be governed on an ongoing basis? What person or group will identify, prioritize, and decide carbon-related issues? What decisions are best made at this level rather than at the business unit level?

Carbon regulations will have implications for every major functional group. What are they? How do these implications intersect with each other at the corporate level?

- Finance. What is the impact on corporate cash flows and how does it vary across scenarios?

- Accounting. How will allocated and auctioned credits be accounted for? Are they given hedge accounting treatment or will they have mark-to-market treatment? Guidance on this technical issue is currently not as clear as most CFOs would like, raising the specter of future restatements.

- Tax. How are allocated versus auctioned credits treated for tax purposes? How will international tax planning for global companies be impacted?

- Credit. How will carbon regulations affect credit statistics under a range of likely scenarios? Can less attractive outcomes be mitigated?

- Treasury. In addition to the credit issues, will there be an impact on any upcoming refinancings? How? Under what scenarios might loan covenants be affected?

- Investor Relations. In addition to the required management discussion and analysis, what other disclosures are prudent given shareholder requests, customer preferences, or NGO pressures? What actions should be taken given pending new SEC requirements?

- Public Relations. These issues are similar to those regarding investor relations but relate more to non-governmental organizations and customer requests than to shareholders.

- Government Affairs. What are the issues to focus on? What issues should the company advocate itself and where should it tag along with trade groups? How should the company defend itself if a trade group to which it belongs takes a position different from that of another trade group? How much money should be spent given that any one company is not likely to have a dispositive impact on the debate?

- Strategy. Are carbon issues explicitly addressed in all business plans? How should the corporate strategy influence the policy decisions for public relations and investor relations regarding disclosures?

- Legal. Are there new creative torts to monitor or from which the company needs to be protected? What is the best way to manage document retention as well as the continued creation of new documents
that are consistent with the company’s established legal positions?

The process we are recommending may seem to entail a great deal of effort considering that the ultimate outcome of carbon regulation is so uncertain. However, given the potential magnitude of its impact on companies’ economics, industry dynamics and organization, and investors, we think it only prudent for companies to ask and answer these questions in a rigorous manner. Those that do will be able to see through the fog of impending carbon regulation and focus on the actions to take in the few areas that matter most before any rules are implemented.
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