U.S. Climate Policy Implementation: Effective Use of Carbon Markets for Cost Savings

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Public concern about the impacts of rising greenhouse gas (GHG) emissions continues to put pressure on state, federal, and international policymakers to adopt tougher emissions limits. Given the range of potential legislative and regulatory outcomes in the United States, industry faces challenges in planning, implementing, and financing appropriate GHG emission controls. If federal legislation falters in 2010, there is growing potential that a complex system of overlapping state programs and federal regulations could emerge over the next year. This system could even stay in effect until federal legislation is completed.

For covered entities, such a state-federal regulatory "patchwork" could be more costly than a single, integrated national model, particularly one that is linked efficiently with international carbon markets. This is prompting numerous companies—from the electric power generators in the Edison Electric Institute (EEI) to the corporate members of the U.S. Climate Action Partnership (USCAP)—to support comprehensive federal cap-and-trade legislation. These firms hope to avoid a cumbersome state-by-state approach, or worse yet, state programs combined with source-by-source regulation of GHGs by the U.S. Environmental Protection Agency (EPA) under the Clean Air Act (CAA).[1] Most industry support for cap-and-trade legislation is premised on the availability of cost-containment measures. These measures include ample use of domestic and international offsets (so-called where flexibilities, since they allow alternative compliance from reductions achieved at locations not covered by the legislation), as well as timing (or when) flexibilities, like banking and borrowing.

Interestingly, political support for where and when flexibilities comes not only from industry, but also from environmental groups like the Environmental Defense Fund, the Natural Resources Defense Council, and the World Resources Institute. These groups believe that the enhanced cost-effectiveness of the legislation will enable policymakers to reach for greater ambition in the level of reductions targeted. As a political matter, cost-containment policies are critical to the success of legislation, given that they can ease the impact on GHG-intensive sectors and those employed in them without sacrificing environmental progress.

This Article will review the current context of U.S. federal legislation and cost-containment mechanisms. Next, it will provide a brief discussion of the main policy elements related to carbon market formation. Finally, it will address the commercial role of cost-containment mechanisms, such as banking, borrowing, and offsets mechanisms, and how they contribute to policy goals.

I. Context and Overview: Emissions Trading in National, State/Regional, and International Policy

A. U.S. Federal Policy

In his first State of the Union Address on January 27, 2010, President Barack Obama urged the U.S. Congress to adopt "comprehensive energy and climate legislation with incentives that will finally make clean energy the profitable kind of energy in America."[2] Such legislation cleared two such hurdles in 2009:

- The U.S. House of Representatives passed the American Clean Energy and Security Act of 2009[3] (H.R. 2454 or Waxman-Markey) on June 16, 2009; and
- The U.S. Senate Environment and Public Works Committee passed the Clean Energy Jobs and American Power Act[4] (S. 1733 or Kerry-Boxer) on October 23, 2009.

1. 42 U.S.C. §§7401-7671q, ELR Stat. CAA §§101-618.

2. *See* President Barack Obama, Remarks by the President in State of the Union Address (Jan. 27, 2010) (transcript available at http://www.whitehouse.gov/the-press-office/remarks-president-state-union-address).

3. American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. (2009) (placed on the U.S. Senate calendar July 7, 2009).

4. Clean Energy Jobs and American Power Act of 2009, S. 1733, 111th Cong. (2009) (introduced Sept. 30, 2009).

Senate Majority Leader Harry Reid (D-Nev.) announced plans to bring a climate and energy package to the Senate floor in the spring of 2010.

Meanwhile, EPA appears to be moving forward with regulation of GHGs under the CAA, as prompted by a recent U.S. Supreme Court ruling. On April 2, 2007, in *Massachusetts v. EPA*,[5] the Supreme Court found that GHGs are air pollutants covered by the CAA. This decision set in motion a series of regulatory proceedings at EPA to determine whether GHG emissions pose a danger to human health, and if so, how they can be mitigated.

In one of the most significant of these regulatory proceedings, EPA announced on December 7, 2009, its finding that GHGs endanger public health under §202 (a) of the CAA.[6] Pursuant to this finding, EPA is expected to announce light-duty vehicle GHG standards and Corporate Average Fuel Economy (CAFE) standards in March 2010. Although these regulations would implement a settlement with U.S. automakers involving such standards, they would also trigger GHG considerations in permitting under Title V of the Act, as well as permitting under the prevention of significant deterioration (PSD) portion of new source review (NSR) provisions of the Act. Depending on the outcome of future rulemakings, these permitting programs could require best available control technologies to be applied to energy and industrial facilities throughout the nation. Predictably, litigation to challenge these EPA actions is underway, with suits filed by the states of Texas,[7] Virginia, Alabama, as well as the U.S. Chamber of Commerce and numerous business groups and think tanks.[8]

Congress is also poised to intervene to stop EPA's GHG regulations. On January 21, 2010, Sen. Lisa Murkowski (R-Alaska) and 39 cosponsors introduced a disapproval resolution (S.J. Res. 26)[9] to challenge EPA's endangerment finding[10] under the Congressional Review Act.[11] Similarly, Sen. Jay Rockefeller (D-W. Va.) introduced legislation to delay for two years EPA's regulatory proceedings under the Endangerment Finding.[12]

EPA has emphasized its intention to narrow the regulatory impact of the Endangerment Finding, so that Congress can complete comprehensive climate legislation. On September 30, 2009, EPA proposed a Tailoring Rule to focus the regulatory scope of the Title V operating permit requirements and PSD portion of the NSR requirements (on new and modified facilities) on those stationary sources emitting over 25,000 tons per year.[13] Subsequently, in testimony in the Senate Appropriations Committee, EPA Administrator Lisa Jackson further clarified the Agency's intention to narrow the initial impact of the permitting regulations to sources emitting over 75,000 tons per year.[14] EPA has also hinted that it is exploring the potential to use an emissions trading model for GHG regulations under the CAA, although it has made no formal plans for such a program.

Nonetheless, many companies are concerned that the Murkowski and Rockefeller provisions may fail, leaving EPA free to regulate under the CAA until preempted by comprehensive climate legislation. Further, they face risks of continued state and regional cap-and-trade programs.

B. State and Regional Policy Activity

Given the historic inaction on climate change by the federal government, numerous state governments and regional organizations have embarked on their own climate change programs:

- Ten northeastern and Mid-Atlantic states[15] launched the Regional Greenhouse Gas Initiative (RGGI), aimed at reducing emissions from power plants in the region by 10% below 2009 levels by 2018.[16]
- California adopted comprehensive climate legislation, known as the Global Warming Solutions Act of 2006, (Assembly Bill 32, or AB 32), which includes a cap-and-trade program for large sources of emissions.[17] In June 2008, the California Environmental Protection Agency's Air Resources Board (CARB) issued a draft implementation plan to guide further work on the program.[18] Subsequently, CARB issued a "Preliminary Draft Regulation for a California Cap and Trade Program"[19] on November 24, 2009, inviting public review and comment. The California EPA is expected to issue regulations to implement AB 32 by January 1, 2011.[20]

5. Massachusetts v. EPA, 549 U.S. 497, 37 ELR 20075 (2007).
6. U.S. EPA, Climate Change—Regulatory Initiatives: Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, http://www.epa.gov/climatechange/endangerment.html (last visited Mar. 18, 2010). The final findings were published in the *Federal Register* on Dec. 15, 2010, with the final rule taking effect Jan. 14, 2010. *Id.*
7. John McFarland, *Texas Challenging EPA's Greenhouse Gas Finding*, Associated Press, Feb. 16, 2010.
8. Robin Bravender, *16 "Endangerment" Lawsuits Filed Against EPA Before Deadline*, Greenwire, Feb. 17, 2010.
9. A Joint Resolution Disapproving a Rule Submitted by the Environmental Protection Agency Relating to the Endangerment Finding and the Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, S.J. Res. 26, 111th Cong. (2010) (introduced Jan. 21, 2010).
10. *See* Press Release, United States Senator Lisa Murkowski for the State of Alaska, Sen. Murkowski Offers Disapproval Resolution to Block EPA Endangerment of Economy (Jan. 21, 2010).
11. Congressional Review Act, 5 U.S.C. §§801 et seq. (2006).
12. *See* Press Release, Jay Rockefeller for West Virginia, Rockefeller Introduces Legislation to Suspend EPA Action and Protect Clean Coal State Economies (Mar. 4, 2010), *available at* http://rockefeller.senate.gov/press/record.cfm?id=322764.
13. U.S. EPA, New Source Review (NSR): Fact Sheet—Proposed Rule: Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, http://www.epa.gov/NSR/fs20090930action.html (last visited Mar. 18, 2010).
14. Ian Talley, *EPA: CO_2 Threshold at Least 75,000 Tons/Year Until 2013*, Dow Jones Newswires, Mar. 11, 2010, *available at* http://www.smartmoney.com/news/on/?story=ON-20100303-000634.
15. Participating states include Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont.
16. RGGI, http://www.rggi.org/home (last visited Mar. 18, 2010).
17. Cal. Health & Safety Code §§38500 et seq. (2006) (AB 32).
18. Cal. Air Res. Bd., Draft Scoping Plan: A Framework for Change, June 2008 Discussion Draft (2008), *available at* http://www.arb.ca.gov/cc/scopingplan/document/draftscopingplan.pdf.
19. Overview, Preliminary Draft Regulation for a California Cap-and-Trade Program—For Public Review and Comment (2009), *available at* http://www.arb.ca.gov/cc/capandtrade/meetings/121409/pdr.pdf.
20. *See* California Environmental Protection Agency Air Resources Board, Cap-and-Trade: Background, http://www.arb.ca.gov/cc/capandtrade/capandtrade.

- California and six other western states joined four Canadian provinces to form the Western Climate Initiative (WCI), aimed at launching a regional cap-and-trade program to reduce emissions by 15% below 2005 levels by 2020.[21] In addition, six more states, another Canadian province, and six Mexican states are Observers to the WCI. One state, Arizona, recently announced plans to withdraw from participation in the WCI, while other participants remain committed, thus far.[22]

C. International Policy

On the international scene, climate negotiators expected a banner year in 2009. Under the Bali Action Plan agreed to by the Bush Administration in December 2007, the international community was scheduled to complete an agreement on a post-2012 policy regime by the end of 2009. The Copenhagen Climate Summit was poised to build on nearly 20 years of international climate diplomacy, which began in December 1990 with the establishment of the Intergovernmental Negotiating Committee (INC) on a United Nations Framework Convention on Climate Change (UNFCCC). At the 1992 Earth Summit in Rio de Janeiro, nations agreed on the UNFCCC. This document contained scant references to "joint implementation" of commitments between nations, which became the policy forerunner to modern carbon markets. In 1997, negotiators produced the Kyoto Protocol, which established the fundamental market architecture for the 2008-2012 compliance period: the Clean Development Mechanism (CDM), the Joint Implementation (JI), and International Emissions Trading provisions, as well as timing flexibilities (multiyear compliance periods).

Although the United States did not ratify the Kyoto Protocol, the treaty entered into force in 2005 after ratification by Canada, the European Union (EU), Japan, Russia, and many developing nations. With the EU's efforts to comply with Kyoto Protocol obligations with its Emissions Trading Scheme (ETS), the international community began to form the world's first carbon market—with offsets generated under the CDM entering the EU compliance market at a significant scale. By 2008, the global carbon market had grown to $126 billion in size, led by $92 billion in EU allowance transactions, and with $6.5 billion in primary CDM transactions, $26 billion in secondary CDM transactions, and the remaining $1.5 billion in JI and U.S. voluntary transactions.[23]

The U.S. began to reengage forcefully in climate negotiations in 2009. In January 26, 2009, President Obama and Secretary of State Hillary Clinton appointed Todd Stern as Special Envoy for Climate Change. Stern and his team engaged in a long, difficult diplomatic process of multilateral negotiations in Bangkok and Bonn, as well as G-20 discussions in Pittsburgh. They complemented this multilateral work with bilateral consultations with China, India, and other major emitting countries.

In December 2009, the negotiations culminated in recognition of the Copenhagen Accords, which provide the basic elements of a policy structure to govern the post-2012 period. Important details are subject to further work, which is slated to begin at the 16th Conference of the Parties to the UNFCCC, scheduled for November 29 to December 10, 2010, in Cancun, Mexico.[24] Although the Copenhagen Accords provide little detail on specific measures to mobilize private finance, they set an overarching goal of stimulating an additional $100 billion per year in climate mitigation and adaptation funding by 2020 in a mix of public- and private-sector funding.[25] International carbon markets could mobilize a significant share of the needed financing from the private sector.

D. The Common Theme: The Economic Rationale for Federal, State, and International Policies on Carbon Trading

A common theme is evident at every major level of policy debate faced by American business today: the concept of emissions trading, with where and when flexibilities to bring down costs. This type of design is the centerpiece of the Waxman-Markey and Kerry-Boxer Bills in Congress, as well as the California, RGGI, and WCI programs. This thinking has permeated the international debate, having grown from a simple concept of "joint implementation" referenced in the UNFCCC to the fundamental architecture of the Kyoto Protocol's national targets, allowance markets, and CDM and JI offsets activities. Finally, prompted by the EU ETS, carbon markets have emerged as a major force in mobilizing private financing, and they will be critical to achieving the goals of the Copenhagen Accords. No other carbon policy in the world has mobilized a comparable level of financial activity aimed at reducing emissions.

The primary reason that policymakers have turned to the emissions trading model is that it provides companies, states, or nations with the flexible tools needed to achieve the desired emissions goals at the least cost. It does this by allowing corporations to have the "freedom of choice" to comply on-system or through a purchase of emissions reductions achieved elsewhere through a market for allowances and offsets. Similarly, it can offer timing flexibility to bank early reductions for use in a later year, or alternatively to borrow reductions from later years when technology will be deployed that enables deeper cuts than are possible in early years.

htm (last visited Mar. 18, 2010).

21. Western Climate Initiative, History, http://www.westernclimateinitiative.org/history (last visited Mar. 18, 2010).
22. *See* Cassandra Sweet, *Arizona Quits Western Cap-and-Trade Market, Utah Mulls Similar Move*, Dow Jones Newswires, Feb. 12 2010, *available at* http://www.foxbusiness.com/story/markets/industries/utilities/arizona-quits-western-cap-trade-market-utah-mulls-similar/.
23. The World Bank, State and Trends of the Carbon Market 2009 1-2 (2009), *available at* http://wbcarbonfinance.org/docs/State_Trends_of_the_Carbon_Market_2009-FINAL_26_May09.pdf.
24. *See* UNFCC, Calendar, http://unfccc.int/meetings/unfccc_calendar/items/2655.php?year=2010 (last visited Mar. 18, 2010).
25. Conference of the Parties, Copenhagen, Den., Dec. 7-18, 2009, *Draft Decision/CP.15 Proposal by the President: Copenhagen Accord*, FCCC/CP/2009/L.7, 3 ¶ 8 (Dec. 18, 2009), *available at* http://unfccc.int/resource/docs/2009/cop15/eng/l07.pdf.

Cost-containment is the key to garnering political support from business for U.S. legislation. For example, given its positive experience with the U.S. sulfur dioxide (SO_2) market under the acid rain control provisions of the CAA, EEI supported the Waxman-Markey legislation in the House. In the climate change arena, the international business community currently operates two main carbon trading markets: the allowance trading market prompted by the EU ETS, and the carbon offsets market stimulated by the CDM. These two markets are effectively linked through the use of U.N.-approved carbon offsets, since the EU ETS accepts CDM and JI offsets for compliance.[26] The other major source of demand for international offsets is Japan, where corporate emitters may use certified emissions reductions (CERs) for compliance with strict voluntary targets.

The EU ETS is meeting emissions goals at lower costs than many in business expected, thanks to the flexibility of emissions trading and offsets. Similarly, EPA estimates that offsets could reduce the cost of compliance with the Waxman-Markey Bill by 89%.[27] In more recent supplemental analysis of the Waxman-Markey Bill, prepared for Sen. George Voinovich (R-Ohio), the cost savings estimates ranged from 54% to 148%, depending on modeling assumptions.[28]

II. Exploring Cost-Containment Features of Legislation

The remainder of this Article will explore the set of cost-containment features under consideration in the U.S. debate. It will assess the following:

- How an effective carbon market can be created and maintained?
- What are the effects of borrowing, banking, offsets, etc. on obtaining scheduled reductions?
- Will the availability of two billion tons of offsets every year keep the legislation from achieving its reduction goals?

A. How an Effective Carbon Market Can Be Created and Maintained

Despite the political theater in Washington aiming to discredit cap and trade and other climate policies as overly complex, the fundamental policy elements needed to establish a carbon market are pretty simple. In both the Waxman-Markey and Kerry-Boxer Bills, a new title would be added to the CAA to establish the emissions limits and compliance options to form the supply and demand of the carbon market.

- The compliance requirement and deadline, and their applicability to certain sectors and sources, establish the *demand* in the market. The requirement is normally established as a percentage reduction in covered emissions from levels in a baseline year to a lower level over a target period.
- The flexibilities to trade allowances that are issued, and any offsets that are allowed, create the *supply* in the market. The ability to bank, borrow, or purchase from strategic government reserves provides additional tools to mitigate costs.

1. Provisions to Establish the Fundamental Demand in the Carbon Market

The Waxman-Markey Bill and the Kerry Boxer Bill phase in reduction requirements of seven major GHGs: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), sulfur hexafluoride (SF_6), and nitrogen tetraflouride (NF_3) from stationary sources emitting above 25,000 tons/year in the power-generation and industrial sectors. In addition, it requires transportation fuel refiners and importers and natural gas distributors to purchase allowances to compensate for the GHG emissions from fuels sold.

Both the House and Senate proposals would use 2005 as the baseline year and 2012 as the first compliance deadline for power generators and transportation fuel refiners and importers, with a phasein of industrial sources in 2014 and natural gas distributors in 2016.

The shortfall between each covered entity's emissions in a given year and the allowance or offsets it holds will create the fundamental pricing driver in the system. For example, an entity may receive a free allocation of some portion of the allowances that it needs to meet its compliance obligation, but it will need to purchase allowances or offsets from the market to close any shortfall in its registry account by the annual compliance deadline. Both the Waxman-Markey and Kerry-Boxer Bills provide large amounts of free allocations to power distributors and industrial firms, which gradually decline as auctions are introduced. However, transportation fuel refiners and importers would need to purchase 100% of the allowances attributed to the fuels they sell, creating a large amount of market demand from the outset of the program.

The demand drivers in these bills are buttressed by a strong penalty system. Both the Waxman-Markey and Kerry-Boxer Bills contain a financial penalty of twice the previous year's allowance price plus submission of sufficient allowances to cover any shortfall.

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26. Under the Kyoto Protocol, offsets from the CDM (Article 12) are termed certified emissions reductions (CERs), and offsets from JI (Article 6) are termed emission reduction units (ERUs). *See* Kyoto Protocol to the United Nations Framework Convention on Climate Change, *opened for signature* Mar. 16, 1998, 37 I.L.M. 22 (entered into force Feb. 16, 2005), *available at* http://unfccc.int/resource/docs/convkp/kpeng.pdf.
27. U.S. EPA Office of Atmospheric Programs, EPA Analysis of the American Clean Energy and Security Act of 2009: H.R. 2454 in the 111th Congress 12 (2009).
28. U.S. EPA Office of Atmospheric Programs, Supplemental EPA Analysis of the American Clean Energy and Security Act of 2009: H.R. 2454 in the 111th Congress 20 (2010), *available at* http://www.epa.gov/climatechange/economics/pdfs/HR2454_SupplementalAnalysis.pdf.

2. Provisions Creating the Fundamental Supply in the System

Both the Waxman-Markey and the Kerry-Boxer Bills create supply in the form of allowances that are allocated ex ante into the system, as well as offsets that can be issued in an ex post regulatory process.

The House and Senate proposals distribute emissions allowances to covered sectors in a mix of free allocations, auctions, and allocations to non-covered entities that are expected to sell them into the system. The supply of allowances gradually declines in both bills, with Waxman-Markey reducing emissions by 20% below 2005 levels by 2020, 42% below in 2030, and 83% below by 2050.

At the outset of the program, power and gas distributors, large industrials, and petroleum refineries receive varying degrees of allocations for free to cover direct emissions from sources in these sectors. These free allocations are phased out by 2026 in favor of public auctions. Indirect emissions from the burning of transportation fuels are to be covered by requirements on transportation fuel refiners and importers, who receive no free allocations for such emissions.

The largest amount of supply in the market appears as government auctions occur—and as sales occur from public entities. At the outset, a 15% share of allowances would be auctioned, and proceeds would be used for low-income consumer protection. Also, roughly 25% of allowance supplies are allocated for public purposes to agencies that would sell them to use proceeds for public purposes. Examples of such public purposes include 7.1% of allowances for State Renewable and Efficiency Programs, 3% for Investments in Clean Vehicle Technologies, 3% for Supplemental Reductions from Reduced Emissions From Deforestation and Forest Degradation (REDD) projects in developing countries, and 1.5% for Energy Research and Development.

The other large supply opportunity appears in the provisions to allow firms to comply with targets using a substantial amount of offsets from non-covered sectors or international offsets systems:

- The Waxman-Markey Bill would permit use of an overall total of two billion offsets to be used each year beginning in 2012 (one billion in domestic offsets, plus one billion in international offsets).
  - EPA would establish the process and substantive requirements for domestic offsets, taking into account recommendations from a new federal Offsets Integrity Advisory Board.
  - EPA would exchange internationally approved offsets for U.S. international offsets, provided that the host country for the project is one with which the United States has a bilateral or multilateral agreement regarding the offsets program operation.
  - The offsets provisions appear to allow EPA to recognize CERs from the CDM, provided that EPA finds the reductions are of sufficient quality and can be cancelled from further use under the Kyoto Protocol system.
  - The provisions would also allow offsets from REDD projects.
  - In the event that inadequate supplies of domestic offsets become available, the legislation would allow EPA to authorize up to 1.5 billion international offsets to be used. This could become important for U.S. emitters, since EPA models estimate that domestic supplies would not likely reach the one billion level. Given the uncertainties on offset supplies, the Waxman-Markey Bill authorizes the president to recommend to Congress that the amount of allowable offsets be increased or decreased.
  - The Waxman-Markey Bill requires that, beginning in 2018, companies must tender 1.25 international offsets to meet one ton of compliance obligation. Also, beginning in 2016, international offsets are no longer allowed for compliance in the United States, if they are produced by projects in sectors of major emitting countries that EPA deems capable of operating a sectoral crediting system. Importantly, the sectoral system would require "absolute" reductions from "absolute" baselines.
- The Kerry-Boxer Bill uses a similar structure to allow the same two billion offsets per year, but with a few important differences.
  - It divides the domestic/international split of offsets differently, with 1.5 billion domestic offsets and 0.5 billion in international offsets.
  - In the event that inadequate supplies of domestic offsets become available, the Kerry-Boxer Bill would allow EPA to authorize use of only 1.25 billion in international offsets.
  - Although it provides a similar cutoff of CDM offsets from projects that EPA, in consultation with the U.S. Department of State, deems appropriate for sectoral crediting, it does not appear to require absolute reductions from absolute baselines.
  - The Kerry-Boxer Bill adds further provisions to encourage integrity in offsets. It would establish an Office of Offsets Integrity at the U.S. Department of Justice, which would be empowered to investigate and enforce against civil violations of the offsets program.
  - Also, it would require that international agreements with potential host countries of offsets projects include provisions for international offset project developers be eligible to receive service of process in the United States. While this provision is intended to promote integrity in international offsets transactions, it could also have a chilling effect on the

ability of U.S. firms to gain access to many international projects.

3. *Energy-Related Factors in Carbon Pricing: The EU ETS Example*

While policy decisions determine the initial supply and demand balance, as the system begins to operate, other energy-related drivers will begin to influence demand for allowances and, consequently, carbon pricing. For example, in the EU ETS, a market has emerged that offers some interesting lessons about price formation. In the EU market, prices change daily, as market participants determine the impact on carbon pricing of other market factors.

- Power producers make daily plant-dispatch decisions to meet electricity demand with coal, gas, nuclear, or renewable energy, which changes regularly given fuel price differentials and carbon price movements. At a fundamental level, these price dynamics help energy producers decide whether to "make" or "buy" emissions reductions on any particular day, given the impacts of energy production decisions across their systems.
- Perhaps the biggest energy-related influences on pricing come with price movements in coal and natural gas markets. If coal prices rise and natural gas stays steady or declines, then European energy producers will burn less coal—and have more allowances to sell—which provides downward pressure on prices. Alternatively, if coal prices are low, while natural gas prices are high in comparison, then more coal is burned—creating upward pressure on allowance prices. At times, the close correlation of natural gas and oil prices means that oil price trends can also influence the carbon market.
- Weather trends also affect carbon pricing, such as when heat waves or cold snaps require more burning of fossil fuel, or when mild weather requires burning of less fossil fuel.
- Rainfall patterns also impact pricing: if rainfall is low and hydropower production is down, carbon prices can rise due to the need for use of more fossil fuel; but if rainfall is high and hydropower production is up, prices can decline due to less need for fossil fuel.
- Europe has also experienced periods when heat waves were severe enough in France to effect cooling waters at nuclear plants, forcing their temporary curtailment and replacement with fossil generation elsewhere.
- Demand from electricity customers—as well as demand for products from energy-intensive manufacturers—influences prices as well. As higher energy prices reflect carbon costs, some customers reduce their usage of electricity. Similarly, as the effects of the recession were felt across Europe in lower demand for cement, steel, and other commodities, producers reduced production—and needed fewer allowances to operate, which put downward pressure on carbon market prices.

B. *What Are the Effects of Borrowing, Banking, Offsets, Etc. on Obtaining Scheduled Reductions?*

Both the Waxman-Markey and the Kerry-Boxer Bills include banking and borrowing provisions as cost-containment measures. These timing flexibilities are considered appropriate due to the nature of the climate change problem itself. The risks of harmful impacts of climate change result from overall concentrations of GHGs that accumulate in the atmosphere over decades and centuries. The emissions of a given year are not as critical as the buildup of concentrations over time. Given this fact, the shifting of emissions reductions within a compliance period does not lessen the concentration level appreciably, but it can save money in certain situations. For example:

- One power company might find it valuable to make efficiency upgrades at its plants ahead of schedule, or to make deeper reductions than required, in order to bank the extra allowances for use in the future as the business grows.
- Another power company might find it economical to do just the opposite. If its fleet of power plants were newer and not yet economical to upgrade, it could borrow limited amounts from its future allocations to use in the near term; then it could make deeper emissions reductions later, when it is more cost-effective to do so, so long as it is able to true-up its borrowed emissions during the compliance period.

The Waxman-Markey and Kerry-Boxer Bills allow banking and borrowing as follows:

- First, they include a two-year rolling compliance period;
- They allow unlimited banking and unlimited borrowing from the following compliance year with no interest; and
- They allow borrowing of up to 15% of a compliance obligation from years two through five beyond the current calendar year at 8% annual interest.

As noted above, the Waxman-Markey and Kerry-Boxer Bills also allow the use of limited amounts of domestic and international offsets as a cost-containment measure. If first compliance deadlines hit quickly, covered entities do not have time to develop and install new technologies on their systems, so the use of offsets may be critical. For example, in the EU ETS, the first compliance deadline was only one year after the EU approved the ETS Directive. In the early years of the program, offsets were critical, because other options were not feasible for many entities. Many firms looked to offsets markets for relief while longer term on-system strategies were planned and implemented. Over time, announcements

of several large-scale renewable installations, carbon capture and storage (CCS) proposals, and new nuclear units came forward (though some are stalled due to recession). In the ETS, offsets are providing EU firms a bridge to a time when more advanced low-carbon technology deployment will be cost effective.

U.S. legislation also has an early compliance deadline: if enacted this year, companies would face the first compliance deadline (2012) in less than two years. One can expect that the "low hanging fruit" of fuel-switching, repowering, or other energy efficiency measures will be harvested quickly. But longer term strategies, like CCS, nuclear energy, or renewable energy investments, could take more time. During the period that major new investments are planned and implemented, offsets, banking, and borrowing will be major compliance options.

The Waxman-Markey and Kerry-Boxer Bills propose the use of a federal allowance reserve as a further tool for helping to assure stable market pricing. Known as a "Strategic Allowance Reserve" in Waxman-Markey, or a "Market Stability Reserve" in Kerry-Boxer, the federal government would form the reserve by taking a small percentage of allowances from future years. In Waxman-Markey, the allowances in the reserve would be auctioned periodically, with the initial minimum price level of $28 in 2012, rising at 5% plus inflation for 2013 and 2014. Beginning in 2015, the reserve auction trigger price would be 60% above the three-year rolling average of the market price of allowances. In Kerry-Boxer, a slightly modified auction structure is proposed. It would begin at $28 in 2012, rising 5% (plus inflation) per year through 2017, after which it would rise 7% (plus inflation) above the prior year auction price.

The ability to bank or borrow allowances, or to use offsets or a strategic allowance reserve, provides a protection against severe price fluctuations that can occur due to fuel price spikes, fuel supply disruptions, or other market anomalies. For example, in the EU ETS, natural gas prices rose dramatically in the summer of 2008 with the global rise in oil prices. While carbon markets reflected this volatility, the ability of firms in the ETS to use banked or borrowed allowances and offsets made carbon markets less volatile than oil and gas markets.[29]

C. *Will the Availability of Two Billion Tons of Offsets Every Year Keep the Legislation From Achieving Its Reduction Goals?*

The use of offsets does not impair the ability of legislation to achieve desired reductions. It simply shifts where the reductions occur. As discussed in the introduction to this Article, the potential to use domestic offsets can shift emissions reductions to non-covered sectors where cost-effective abatement opportunities may exist. Similarly, the ability to tap into an even wider range of low-cost abatement opportunities in the international arena can shift the reductions even more broadly without compromising the overall target—provided that robust rules of crediting offsets are established.

These forms of where flexibility are possible on the climate change problem, because the atmosphere benefits equally from reductions anywhere on earth, regardless of the precise location. But importantly, the differing costs of abatement can mean that costs of a program that allows where flexibilities will be dramatically lower than the costs of a purely localized system.

It is important to recognize that the ability to use offsets or to bank or borrow allowances does not mean that covered entities will delay controls on their own facilities forever. In fact, most companies are likely to adopt a range of technological changes in their own facilities as they gradually turn over capital stock. Since the Waxman-Markey and Kerry-Boxer Bills would apply emissions targets that steadily decline until 2050, one can expect U.S. industry to adopt major changes as new technologies become available. Given this dynamic, offsets, banking, and borrowing work together to provide a bridge to the time when each company determines that it is most cost effective to make changes to its own facilities.

III. Conclusion

Flexibility measures will lower the cost of climate legislation without compromising environmental integrity. The policy debates on the national, state/regional, and international levels consistently trend in favor of use of emission markets and timing flexibilities as cost-containment measures.

U.S. policy will establish the fundamental supply and demand drivers for a U.S. carbon market. As the system begins to operate, other factors related to energy markets will influence pricing.

The availability of carbon offsets, both international and domestic, can contribute major cost-containment benefits to U.S. businesses. Companies are likely to find that cost-containment features, like banking, borrowing, and offsets, will act as a near-term bridge to longer term on-system control strategies.

29. *Climate Industry Begins to Feel the Stimulus of Government Moves*, Greenwire, Apr. 9, 2009.