



## **CARBON FINANCE AND THE “CLEAN DEVELOPMENT MECHANISM”: PAST, PRESENT AND FUTURE**

### **Panel Discussion Presented by the Social Enterprise Club, Energy Club and Bernstein Student Leadership and Ethics Board**

Columbia Business School

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*Will a national “cap and trade” carbon market emerge in the United States? What can the volatile experience of the European carbon market teach us? Where are the future economic and environmental opportunities in carbon finance? On January 31, 2007, Columbia Business School’s Social Enterprise Club, Energy Club and Bernstein Student Leadership and Ethics Board held a panel discussion to address these and other compelling questions about carbon finance. The panel featured two executives from leading carbon trading firms, as well as a distinguished environmental scholar who discussed the opportunities and challenges in the carbon finance industry. This discussion was followed by a screening of An Inconvenient Truth, the Oscar-winning documentary about the dangers of global warming, which many hope carbon finance will help to mitigate.*

*The three panelists were*

- *Eron Bloomgarden, U.S. Country Director for EcoSecurities*
- *Satyajit Bose, Professor in the School of International and Public Affairs at Columbia University*
- *Neil Cohn, Managing Director at NatSource*

*Geoffrey Heal, the Paul Garrett Professor of Public Policy and Business Responsibility at Columbia Business School, moderated the panel and gave opening remarks.*

### **Cap-and-Trade System**

In 1997, the Kyoto Protocol was ratified by 160 countries in an effort to reverse the alarming trend of global warming through the reduction of “greenhouse gases,” such as carbon dioxide. With its participants accounting for 55 percent of worldwide greenhouse-gas emissions, the Kyoto Protocol targets a 5 percent reduction below 1990 greenhouse-gas emissions levels by 2012. The primary mechanism to achieve these targets is a “cap and trade” system.

Under this system, fixed emissions-reduction targets—also known as “caps”—are imposed on firms but enforced flexibly through the creation of tradable environmental certificates. An individual firm may choose to meet its target either by reducing its own emissions or by purchasing “carbon credits” from another firm that overcomplies with its target and generates excess emissions reduction. Firms that have a relatively low cost of abatement find it profitable to overcomply with their target, generate excess emissions reductions and sell their credits to other firms. Conversely, firms that have a relatively high cost of abatement find it profitable to purchase the emissions reductions generated by other firms, rather than to create those reductions themselves.

### **Credit Development Mechanism**

The Kyoto Protocol also includes a number of “flexibility mechanisms” for achieving its greenhouse gas targets, in addition to direct reductions of emissions. The most notable is the credit development mechanism (CDM), which enables firms in industrial countries to offset their carbon emissions by reducing emissions through specific projects in developing countries. For example, a UK utility might offset its carbon emissions in the European Union, not by directly reducing its emissions or purchasing carbon credits from another firm, but by planting a forest in Costa Rica. Such emissions-reduction projects take a wide variety of forms, including renewable energy (e.g., wind), industrial process improvements, energy efficiency, transportation (e.g., biofuels) and agriculture (e.g., methane capture).

The CDM aims not only to reduce emissions of greenhouse gases but also to contribute to the sustainable development of the host nation. It is proving successful in achieving both of its goals. Currently, there are approximately 1,500 emissions-reduction projects across 25 different project categories. These projects will offset 1.5 to 2.0 billion tons of greenhouse-gas emissions by 2012, which is equivalent to the total emissions of the United Kingdom. These projects are generating carbon credits that are valued at approximately \$5 billion to \$10 billion, while also resulting in a significant flow of capital to the developing world for sustainable-development projects. When firms in developed countries invest hard currency in projects that reduce emissions in developing countries, the firms receive the benefit of the subsequent emissions savings or reduction.

### **Carbon Markets**

The cap-and-trade system, as well as flexibility mechanisms such as CDM naturally give rise to a market on which carbon allowances can be traded. At this point, the largest and most liquid greenhouse gas market is the European Emissions Trading Scheme (E.U. ETS), which is a business-to-business market that facilitates the achievement of the E.U.’s targets under the Kyoto Protocol. E.U. firms are able to trade offsets with one another on this market, with

€14.6 billion in trades corresponding to 817 million tons of carbon dioxide traded in 2006. Trading volume in 2006 was three times the level recorded just one year earlier. The European Union, Japan and Canada are currently short by 700 million, 800 million and 1,500 million tons, respectively, in satisfying their emissions-reduction targets under the Kyoto Protocol. If the United States were to become involved in the Kyoto cap-and-trade scheme, demand would expand dramatically.

Two primary instruments are currently traded on the E.U. ETS. First, an assigned amount unit (AAU) is the entitlement to emit a ton of carbon dioxide or its equivalent in other greenhouse gases. Second, a certified emissions reduction (CER) is the unit generated by the CDM projects for supplementary reductions of carbon dioxide emissions mentioned previously. CERs typically sell at a discount to AAUs, since they involve performance risk. For example, in the case of a forest planted in Costa Rica by a UK utility, the forest might burn down and destroy the value of the CER to which it corresponds. Firms are limited in the degree to which they utilize credits from CDM projects or CERs to meet their carbon dioxide offset needs to 50 percent in total under the Kyoto Protocol. The balance must be achieved either through direct emissions reductions or the purchase of AAUs.

### **Volatile Pricing**

Like other experiments with environmental markets in the past, such as the UK allowance market, the Danish allowance market and the U.S. SO<sub>2</sub> market, the current market for carbon credits is proving to be highly volatile and illiquid. A number of factors simultaneously exert upward and downward pressure on prices. On one hand, Japan's aggressive buying and increasing demand from U.S. regional programs often drive prices up. On the other hand, an increasing registration of CER projects, the initiation of major non-carbon dioxide gas megaprojects and the fact that certain grandfathered corporations with surplus allocation have yet to enter the market, often drive prices down. Given these characteristics, panelist Neil Cohn told the audience, "These are markets where you are not trading a commodity that you can always use. You are trading a regulation. You are trading something that can be worth a lot today and nothing tomorrow. By the stroke of a pen, you are changing the pricing dramatically." As a result, he remarked, "These are not markets for the fainthearted."

### **The Future of Carbon Markets**

Currently, only firms in "energy intensive" sectors, such as utilities or oil and gas, are regulated by a cap-and-trade system and utilize the E.U. ETS market. Firms in other sectors are regulated through other measures, such as taxation. It is expected that in the coming

years E.U. governments will move to regulate all industries through the cap-and-trade system, leading to a likely increase in the trading volume on the E.U. ETS market.

There is also discussion about linking the E.U. ETS with other business-to-business markets, such as one that is being proposed by Governor Schwarzenegger in California and the Regional Greenhouse Gas Initiative that is being pursued by the nine northeastern states. This would leave the E.U. ETS as a hub of carbon-trading markets around the world.

In addition to such business-to-business markets as the E.U. ETS, the Kyoto Protocol envisages another market that will be a worldwide government-to-government market in which governments trade allowances with one another. This market is not yet functioning but will be established in 2008. At this time, it is not clear how these markets will be linked.

Finally, the parties to the Kyoto Protocol will vote at their December 2007 meeting in Bali, Indonesia, on the introduction of new asset classes, such as a certificate of reduced emissions from deforestation. This effort is being spearheaded by the Coalition of Rainforest Nations and managed from Columbia Business School by Professor Geoffrey Heal and a number of Business School alumni.

### **Relevance to the United States**

Greenhouse-gas emissions in the United States are 16 percent higher than their Kyoto target, equivalent to those of the United Kingdom, Brazil, Russia, India, South Korea and Canada combined. Although the United States has not yet ratified the Kyoto Protocol and the future of the American government position on climate change is not clear, carbon markets are nevertheless becoming increasingly relevant here. Interestingly, emissions trading started in the United States out of an interest in the business opportunity it presented. This activity was eclipsed shortly thereafter by trading in Europe, driven by the real demands of local firms for compliance with the Kyoto Protocol rather than the speculative demand of traders. However, there are still a number of initiatives under way in the United States to bring carbon trading back home.

Certain actions are being taken at the state level, such as the AB 32 program in California. This is a landmark bill recently signed by Governor Schwarzenegger that establishes a “first-in-the-world comprehensive program of regulatory and market mechanisms to achieve real, quantifiable, cost-effective reductions of greenhouse gases.” At the national level, a number of pieces of draft legislation involving a mandatory carbon program, such as the Lieberman-McCain bill, have won considerable support and are being considered by the U.S. Senate. Renewable energy has become a hot field; it is the third-highest target for venture capital

investment (after software and biotechnology) and the focus of numerous private equity funds, such as the Goldman Sachs \$2 billion renewable energy portfolio. Finally, 11 major U.S. corporations have established the Climate Action Partnership, which advocates a “mandatory, economy-wide, market-driven” greenhouse-gas reduction program.

### **Conclusion**

Panelist Eron Bloomgarden perhaps best captured the challenges and opportunities presented by carbon finance when he remarked, “The consequences of climate change are so dire . . . that it is becoming very clear that a carbon-constrained economy has arrived in Europe, has arrived around the rest of the world and is quickly arriving here in the U.S. It is very important to recognize that businesses that recognize this fact can basically prepare for the risks associated not only with climate change but with a carbon-constrained economy, and can also engage in some of the opportunities that it presents.”

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