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SUSTAINABLE DEVELOPMENT LAW & POLICY



EXPLORING HOW TODAY'S DEVELOPMENT AFFECTS FUTURE GENERATIONS AROUND THE GLOBE

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EDITORS' NOTE

The debate over climate change has evolved over the past several years; while it began as one about the need for action, it is now one of degrees. This debate has progressed from discussions regarding climate change to concrete actions by every industrialized country to reduce their CO₂ emissions, except the United States. However, at the state level, the United States has taken steps to reduce its carbon emissions and it appears that whoever Americans elect as their next president will commit the country to any post-Kyoto framework.

We are seeing the canaries in the coal mine with regard to climate change, including the dying of coral reefs, the melting of glaciers, and the increase in severe weather events. Every degree we allow Earth to warm we open Pandora's box wider. Many have already conceded a one-degree Celsius rise in global temperatures, at which we will increase the spread of severe droughts across the globe. A one-degree rise will force many species to migrate over 100 kilometers towards the poles or face extinction. A one-degree rise will raise sea levels, potentially placing many large coastal cities below sea level. A one-degree rise in global temperatures will cause many foreseeable and unknown consequences; however, this is not to discount the effects of a two- or even three-degree rise in global temperatures. As global temperatures increase the consequences increase exponentially. The economic, ecological, and human costs, devastation, and consequences are what makes the future fight over climate change one of degrees.

It is time for all countries, regardless of industrial status, economic, or population size, or even economic efficiency, to start addressing the carbon emission issue seriously and commit to binding reductions. The United States once led this effort with SO₂ reductions to prevent acid rain, and showed that phasing out emissions under a cap-and-trade scheme does not have to result in economic downturn, and may even boost an economy. It is time for the United States to start participating at the international level and show its leadership once more.

This is SDLP's fourth installment on climate law. From the beginning we have seen the issues evolve from whether to act transform to an issue of how to act. This issue includes a wide range of topics such as how state and federal climate change actions impact litigation, trade, and taxes; the developing domestic law in the United States and Australia; and encompasses the Clean Development Mechanism as well as successful efforts to combat climate change through the international ozone regime. We are proud to be one of the venues in the climate debate and

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we hope that this issue helps mold the debate into more action, because every degree counts.



Marcel De Armas
EDITOR-IN-CHIEF



Maria Vanko
EDITOR-IN-CHIEF

AN OVERVIEW OF THIS ISSUE:

FRAMEWORK FOR A POST-KYOTO CLIMATE CHANGE AGREEMENT¹

by Mohamed T. El-Ashry*

INTRODUCTION

Climate change is one of humanity's most pressing and difficult challenges. Without urgent and concerted action, climate change will seriously affect the way of life in all countries, damage fragile ecosystems and threaten global security through migratory pressures and resource conflicts. Since climate change is a long-term problem, it cannot be addressed successfully through short-term, country-based actions alone. Resolving the climate crisis will require international cooperation at all levels—from bilateral to regional to global.

Climate change, its causes, and its adverse impacts are closely linked to economic development, the alleviation of poverty, and energy security. While solutions will require harmonization of economic growth and poverty alleviation with

ambitious emissions reductions, they also present tremendous opportunities for innovation and technological development, especially in the energy field.

A future global agreement, negotiated under the auspices of the United Nations Framework Convention on Climate Change (“UNFCCC”) must have a long-term target to stabilize the “greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous interference with the climate system.”² Parties must agree on four pathways for negotiation that address mitigation, adaptation, technology, and finance. Any agreement must be comprehensive, including all countries, all sectors, all sources and sinks, and mitigation as well as adaptation. The cost of taking action now is small—about one percent of global gross domestic product, according to the Stern Review—and the benefits are large compared with the much heavier penalties of postponing action.³ The costs of both mitigation and adaptation will rise substantially with delay. A new agreement, however, will be successful only if it is perceived by all participating countries to be equitable.

MITIGATION

Mitigating emissions sufficiently to protect the Earth's climate will require vast international cooperation. A post-2012 agreement under the auspices of the UNFCCC should recognize the differentiated responsibilities underpinning the UNFCCC, specifically that “developed countries should take the lead in combating climate change.”⁴ However, “dangerous anthropogenic interference” cannot be avoided by developed countries acting alone. Even an eighty percent reduction of greenhouse gas (“GHG”) emissions in all developed countries by 2050 would not achieve this objective without emissions reductions by rapidly industrializing and developing countries. All countries should commit to reduce collectively global emissions by at least sixty percent below the 1990 level by 2050 to avoid the most serious impacts of climate change.

As a first step, developed countries should reduce their collective emissions by thirty percent by 2020. Rapidly industrializing countries on the other hand should commit to reduce their energy intensity by thirty percent by 2020, an average of four percent per year, and agree to emissions reduction targets afterwards. Other developing countries should commit to an energy

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* Mohamed T. El-Ashry is Senior Fellow with the UN Foundation and serves as Facilitator of the Global Leadership for Climate Action. Prior to that he was CEO and Chairman of the Global Environmental Facility. He also served as director for the Environment Department and as Senior Vice President of the World Resources Institute.

intensity target differentiated by their responsibilities and capabilities. The international community should develop a monitoring and review system and clear criteria for determining when and how various categories of countries should assume stronger climate commitments.

A comprehensive emissions-based agreement sends a clear signal to the market and offers countries flexibility to implement emissions reduction strategies that are most appropriate to their national circumstances. Smaller, targeted agreements, on the other hand, offer the potential of early action by countries that are not ready to accept emissions limits and could be incorporated into a comprehensive climate change agreement. The objective should be to make the comprehensive agreement and smaller targeted agreements mutually supportive and complementary.

Country-based agreements among the top-emitting countries in the world, or alternatively between smaller geographic groups, may offer a simpler negotiating process and the potential

to address a large fraction of the world's emissions. Sector-based targeted agreements should be encouraged; such agreements can avoid competitiveness concerns by setting emissions targets for particular industries—e.g., power, transportation, aluminum, steel, cement, appliances, buildings, and forestry—including those located in developing countries. Policy-based agreements could require harmonized carbon taxes or reductions in emissions intensity, for example, or support clean technology dissemination. Measures-based agreements could involve specific emission reduction strategies—e.g., energy efficiency, renewable energy, and land-use regulation.

Energy security and climate security are intertwined and should be addressed at the same time. Renewable energy and energy efficiency can contribute to such a strategy. Renewable energy is a win-win proposition for all countries as it (1) provides opportunities for poverty alleviation and for satisfying the energy needs in rural and remote areas; (2) helps generate employment and creates local economic opportunities; (3) helps curb climate change and contributes to the protection of human health caused by air pollution; and (4) enhances energy security through reliance on domestic energy sources. The technical and economic potentials of improving energy efficiency, including building efficiency, are also enormous and should be pursued as aggressively as new supply. In addition, technological innovations can cost-effectively reduce the risk of large-scale impacts of energy supply disruptions, especially in the electricity sector.

To reduce the emissions of carbon dioxide cost-effectively, a full range of interventions to create and maintain biological sinks of carbon should be included in a post-2012 climate change regime in order to capture the many co-benefits of sustainable

livelihoods, land management, forestry, and biodiversity conservation. Land-use changes, mainly deforestation, account for more than twenty percent of global emissions, a share greater than either the global transport or industrial sectors. With increasing emphasis on growing biofuels for transport, there will be increasing pressure to convert remaining forests to other uses. Both Article 3.3 of the Framework Convention and the history of Kyoto Protocol negotiations point to the need to include GHG sinks in any agreement. Difficulties in monitoring and verifying both above ground and below-ground stocks of carbon need to be overcome. Because not all forests are alike in their capacity to sequester carbon dioxide (“CO₂”), additional research is needed to account for their differences.

Because of the size of the forest resource, credits for avoided deforestation must be coupled with sharply reduced emissions targets or they could destabilize carbon markets. Reducing deforestation presents an opportunity to sequester CO₂ in the

atmosphere with additional benefits—the conservation of biodiversity, the provision of ecosystem goods and services, especially water resources, and the improvement of livelihoods for neighboring communities. In this regard, the carbon market offers an opportunity to change forest management and improve livelihoods in rural areas of developing countries.

Markets should be organized to have a reasonable

promise of achieving the policy goals of carbon reductions in an efficient manner. Most economists agree that to achieve the greatest climate benefits efficiently and effectively, a carbon price should be set through carbon taxes or trading. Carbon taxes are easier to implement than cap-and-trade schemes, are economically efficient, and would generate significant financial resources. A system of harmonized, universal carbon taxes should be agreed by the international community.

Recognizing that many in industry prefer a cap-and-trade system, there is a need for well functioning and financially linked carbon markets to be developed across the globe, incorporating various national and regional cap-and-trade programs. In general, emissions allowances should be auctioned, thus raising resources that can be allocated by national governments for other purposes, such as clean energy development and adaptation.

ADAPTATION

Adaptation is a key component of an effective strategy to address climate change. Adaptation is not simply a matter of designing projects or putting together lists of measures to reduce the impacts of climate change. A national policy response would increase resilience to climate vulnerability and change and should be anchored in a country's framework for economic growth and sustainable development and integrated in its poverty reduc-

*Dangerous
anthropogenic interference
cannot be avoided by
developed countries
acting alone.*

tion strategies. Responses to climate change need to encompass several levels including access to clean energy for vulnerable populations, crop and farm-level adaptations, national level agricultural and supporting policies and investments.

Businesses and international financial institutions also need to integrate climate change into their activities and make their investments less susceptible to climate change. International technical and financial assistance should be strengthened and made more coherent in order to respond at the requisite scale to the needs of least developed countries. The United Nations has a pivotal role to play in building institutional, public policy, and human capacity in support of effective programs of adaptation.

Because the costs of adaptation were thought to provide largely local benefits, were difficult to distinguish from “regular” development, were suspected to be large, and smacked of compensation awarded for damages, developed countries have been reluctant to agree to substantial amounts of funds for adaptation. Nevertheless, since climate change will impede development efforts, increase risks to public health, frustrate poverty alleviation programs, and exacerbate migrations from waterlogged, water-scarce or food-scarce regions, there is an important role for official development assistance in financing adaptation measures, including human and institutional capacity building, and in reducing vulnerability of agriculture, forests, and water resources. Effective adaptation will require broader planning capacity in all relevant departments and ministries in developing countries. Local scientists should be supported for monitoring and research on climate impacts on various sectors in their own countries. In addition, all countries should cooperate in identifying a package of reliable funding to help countries build resilience to climate risks. Such funding could include public and private finance and the carbon market. Development agencies should integrate climate change effects into their projects and programs.

TECHNOLOGY DEVELOPMENT AND COOPERATION

If the world continues on its current energy path, dominated by fossil fuels, energy-related CO₂ emissions in 2050 will be two-and-a-half times their current levels.⁵ According to the International Energy Agency, these emissions can be returned to their current levels by 2050 through a combination of the following actions undertaken in all countries: (1) strong energy efficiency gains in transport, industry and buildings sectors; (2) increasing decarbonization of the electric power generation sector through increased deployment of renewables, nuclear, natural gas, and coal with CO₂ capture and storage; and (3) increased use of bio-fuels for road transport. However, reducing global emissions by at least sixty percent at acceptable costs will require a science and technology revolution, at least as large as those in the space and telecommunication sectors, to make clean energy technolo-

gies more efficient and affordable. Unfortunately, investments in both public- and private-sector energy research and development programs have been declining for the last two decades. These declines need to be halted and reversed.

Market-based mechanisms are good at identifying the cheapest mitigation opportunities amongst existing options, and spurring innovations that have immediate cost reductions, but are less helpful in encouraging the development of new low-emission technologies. Innovation targets to bring new, more efficient, and less costly technologies to market could be very helpful. Incentives could be provided to countries (and businesses) that beat these targets in the form of credits against their future emission targets.

In addition, the formation of a Consultative Group on Clean Energy Research, as suggested by the International Task Force on Global Public Goods, could facilitate international col-

laboration on the development of low-cost, zero-carbon technologies and the exchange of information about clean energy technologies.

Sustainable development is not possible without making energy systems more sustainable. All developing countries, especially rapidly industrializing countries, should have access to clean energy technologies on preferential terms.

The barriers that hamper the dissemination of such technologies in developing countries, such as intellectual property rights and competitive rules, should be overcome.

FINANCE

Both public and private finance are essential for adaptation, for technology transfer to developing countries, and to implement successfully any comprehensive and long-term strategy to combat climate change. Climate-friendly investments need to be multiplied through national and international frameworks, and the current international carbon market needs to be enhanced in order to scale up private flows. However, external funding must be additional to national resources obtained through domestic savings and taxation. Governments have an obligation to establish a supportive framework for private investment. Local capital markets should facilitate long-term investments in adaptation measures. Carbon taxes or the auctioning of emissions allowances can also raise resources that can be used for this or other purposes.

The Clean Development Mechanism (“CDM”) was created under the Kyoto Protocol to support low-carbon investments in developing countries. For the developed countries, the purpose of the CDM is to lower the cost of emission reductions and provide an element of flexibility in carrying out their national obligations. From the developing countries’ perspective, the purpose of the CDM is to promote their sustainable development and contribute to the stabilization of GHGs in the atmosphere. The CDM has encountered administrative and technical hurdles.

*Renewable energy is a
win-win proposition for
all countries.*

Initial projects have been limited to a few countries and a few gases and have been plagued by bureaucratic procedures, and with little contribution to sustainable development.

The CDM should be reformed in order to deliver its full potential during the 2008–2012 commitment period, and in the post-2012 regime an additional market mechanism should support sectoral approaches capable of transforming whole sectors of rapidly industrializing countries at a speed commensurate with the challenge of taking emissions reductions to global scale. The CDM's weaknesses exist because it was created as a project-based instrument; however, the Executive Board recently approved the inclusion of "programmes of activities" in the CDM. In order to promote policy reform, underwrite technology development, and stimulate investment flows at a scale that is truly transformational, an additional market mechanism must take a sectoral approach. The fundamental distinction between the sectoral approach and the project-based or programmatic approach is that a developing country could set sector-wide baselines for carbon-intensive sectors at levels that coincide with its economic interest while meeting commitments to reduce the energy intensity of its growth.

Public finance also has an important role, especially in demonstrating new approaches for building human and institutional capacity and for mitigation and adaptation in developing countries. However, the existing funding sources for these purposes (for example, the Global Environment Facility ("GEF") and the multilateral development banks ("MDBs")) are too small for the scale of assistance required. They should be strengthened and their resources enhanced so that they can play a bigger role in leveraging private finance for mitigation and adaptation and in assisting developing countries to set appropriate framework conditions for private investment.

Finance is a critical element of any strategy to address climate change effectively. Funds will be required for increased assistance to developing countries for the adoption of energy efficiency and clean energy technologies, and for avoided deforestation. Funds will be required for greening power sectors, for adaptation, and for increased R&D and deployment in all coun-

tries, focusing especially on technologies that are technically viable but not yet financially competitive.

A climate fund of additional resources, starting at U.S. \$10 billion and growing to U.S. \$50 billion per year, should be established to support climate change activities in developing countries (adaptation, avoided deforestation, and clean energy development and deployment) and should include both public and private resources. It should have an innovative structure and governance that is transparent and inclusive. In addition, existing mechanisms, such as the GEF and the MDBs, should be strengthened and their resources enhanced to continue their important work in demonstrating new approaches, building human and institutional capacity, and leveraging private finance.

Finance is a critical element of any strategy to address climate change effectively.

CONCLUSION

With its limited time frame, participation, and inadequate provisions for monitoring, the Kyoto Protocol was never seen as a solution to the climate problem. It was meant to be a first step, preparing for the broader engagement that will be necessary and establishing the legal, technical and institutional groundwork for future regimes. As we embark upon a more comprehensive and inclusive agreement, we need to build on the experience gained from Kyoto, particularly in international emissions trading.

We also need to build on the experience of cities, states, communities, businesses, and individuals who have voluntarily undertaken important steps to address climate change. As they have shown, determined action presents substantial opportunities for economic growth and job creation, based on the development and deployment of clean energy technologies. In addition, public advocacy and information programs can play an important role in enhancing awareness of the impacts of personal behavior and lifestyle.

Above all, we need to build trust between North and South and establish an equitable basis and new modalities for genuine international cooperation to address the linked challenges of energy and climate security. For an issue this important to the future of the planet, there must be no more broken promises. 

Endnotes: Framework for a Post-Kyoto Climate Change Agreement

¹ This Article is based on GLOBAL LEADERSHIP FOR CLIMATE ACTION, FRAMEWORK FOR A POST-2012 AGREEMENT ON CLIMATE CHANGE (2007).

² Framework Convention on Climate Change, art. 2, May 9, 1992, 31 I.L.M. 849, available at <http://unfccc.int> (last visited Mar. 23, 2008) [hereinafter UNFCCC].

³ STERN REVIEW, THE ECONOMICS OF CLIMATE CHANGE, 212, available at http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/stern_review_report.cfm (last visited Mar. 14, 2008).

⁴ UNFCCC, *supra* note 2, art. 3 ¶1

⁵ INTERNATIONAL ENERGY AGENCY, ENERGY TECHNOLOGY PERSPECTIVES—SCENARIOS AND STRATEGIES TO 2050 (2006).

CLIMATE CHANGE AND THE STATES:

CONSTITUTIONAL ISSUES ARISING FROM STATE CLIMATE PROTECTION LEADERSHIP

by Robert K. Huffman & Jonathan M. Weisgall*

INTRODUCTION

As state, local, and federal legislators develop policies to address global climate change, the United States may soon face the difficult political and legal necessity of reconciling multiple—and potentially conflicting—state, local, regional, and federal climate change programs into a comprehensive national policy to reduce greenhouse gas emissions. This Article reviews some of these programs and explores several constitutional issues that may arise from state programs designed to combat climate change.

The causes of climate change are not completely understood, but there is now widespread agreement that humans are having an impact on the climate, primarily from carbon dioxide and other greenhouse gases (“GHG”) that are emitted from burning fossil fuels. As these gases accumulate in the atmosphere, they trap heat close to the earth’s surface, causing myriad effects on our delicate ecosystem.

Regulators and policymakers at the local, state, federal, and international levels are taking various actions to understand climate change and reduce GHG emissions. The first major action occurred in 1990, with the release of the first report by the Intergovernmental Panel on Climate Change (“IPCC”).¹ This was the first time that a detailed scientific endeavor was undertaken to study the climate change phenomenon. The IPCC’s first report led to international action, with the creation of the United Nations Framework Convention on Climate Change (“UNFCCC”). The UNFCCC is an international environmental treaty, adopted in 1992 at the United Nations Conference on Environment and Development in Brazil.² It created a UN Secretariat to oversee the Convention and substantively serves as a framework for further negotiations on detailed protocols aimed at reducing worldwide GHG emissions.

KYOTO PROTOCOL

Five years after the UNFCCC was created, at the Third Conference of the Parties in Kyoto, Japan, an agreement was reached to create binding emission reduction targets for industrialized nations. This 1997 agreement, known as the Kyoto Protocol, came into force on February 16, 2005, after being ratified

by the required number of parties that represent a specified minimum percentage of worldwide GHG emissions.³

The Kyoto Protocol is in effect only through 2012. Negotiations are currently underway to craft a successor agreement that would operate through at least 2020. This was the focus of the December 2007 Conference of the Parties 13 in Bali, Indonesia. These meetings resulted in an agreement, now known as the Bali Roadmap, to complete further negotiations over the coming two years.⁴

The United States, however, has not adopted the Kyoto Protocol, objecting to the inclusion of industrialized nations (Annex I Parties) but not the developing world. Seeing this as a competitive disadvantage that could cause significant harm to the U.S. economy, the government has refused to adopt the binding emissions limits called for in the Kyoto Protocol. Aside from the United States, every industrialized nation, including the European Union, has adopted the Kyoto Protocol.

The Kyoto Protocol provides three “flexibility mechanisms” that allow countries to reduce the costs of achieving their emissions reduction targets. These mechanisms are the Clean Development Mechanism (“CDM”), Joint Implementation (“JI”), and emissions trading. The CDM allows Annex I Parties to implement projects that reduce emissions in non-Annex I Parties, in return for Certified Emission Reduction (“CER”) credits.⁵ JI allows Annex I Parties to implement projects in other Annex I Parties that either reduce emissions or enhance carbon sinks, in return for Emission Reduction Units (“ERU”).⁶ CDM and JI projects are subject to a verification and certification process, in order to ensure the legitimacy of any CER or ERU credits that

Aside from the United States, every industrialized nation, including the European Union, has adopted the Kyoto Protocol.

* Robert Huffman is a partner at the law firm of Akin Gump Strauss Hauer & Feld LLP. Jonathan Weisgall is vice president for legislative and regulatory affairs at MidAmerican Energy Holdings Company. Both Mr. Huffman and Mr. Weisgall are Adjunct Professors at the Georgetown University Law Center, where together they teach the Law Center seminar on Climate Change and Energy Problems. Mr. Huffman and Mr. Weisgall wish to thank the following individuals for their contributions to this Article: Laurence H. Tribe, Thomas C. Goldstein, Kenneth J. Markowitz, and Jeremy A. Schiffer.

are generated by the projects. Emissions trading, the final mechanism, is a market-based strategy for reducing GHG emissions.

EMISSIONS TRADING SYSTEMS

Under the Kyoto Protocol, Annex I Parties may develop internal emissions trading markets or link together with other Annex I Parties to create larger trading markets. An emissions trading market contains a system-wide cap on emissions that decreases over time, thus ensuring that overall GHG emissions within the system decrease as well. The system-wide cap and market features give rise to the general term cap-and-trade to describe these emissions markets.

The emissions credits that can be traded are of a standard form, with each credit equal to one metric tonne of carbon dioxide equivalent emissions.⁷ This is the basic unit of currency in the emissions reduction world.⁸ In designing and operating carbon markets, the single most important issue is consistency and quality control in measuring emissions. If a tonne from one facility is not equal to a tonne from a neighboring facility, the market cannot operate properly. Therefore, without adequate monitoring, verification, and reporting procedures, emissions markets will fail to deliver actual emissions reductions.⁹

EUROPEAN UNION EMISSIONS TRADING SYSTEM

The most significant market developed under the Kyoto Protocol flexibility mechanisms is the European Union Emissions Trading System (“EU-ETS”).¹⁰ The EU-ETS, which began operation in 2005, is comprised of twenty-seven European member nations and sets a cap on the total emissions that can be generated from power stations, certain large industrial facilities, and oil refineries. Facilities covered by the EU-ETS must report their total emissions annually and surrender a number of allowances equal to their total GHG emissions. Some allowances are distributed to facilities for free, others are auctioned by governments, and others can be purchased on the market from traders, governments, or other entities that possess them (including allowances generated by credits in CDM or JI projects). If a facility has extra allowances after it surrenders those necessary to match its annual emissions output, it can sell them for profit. This provides an economic incentive to consistently reduce emissions at a facility. On the other hand, if a facility does not have enough allowances to cover its surrender requirement, it will have to purchase additional allowances to make up the shortfall. This serves as an incentive to reduce GHG emissions, particularly if the cost of the allowances in the market is greater than the cost of making modifications that lead to emissions reductions.

The current phase of the EU-ETS runs through 2012, to coincide with the timeframe of the operation of the Kyoto Protocol. Regardless of whether there is a global agreement to replace

the Kyoto Protocol, the EU-ETS will continue to operate, at least in a modified form. In January 2008, the European Commission released proposed rules for the next phase of the EU-ETS, which will run from 2013 to 2020.¹¹ The proposals will change several details in the operation of the market and include a provision that would allow the EU-ETS to link with trading systems in countries that have not ratified the Kyoto Protocol, something that is not permitted in the current phase. This is interpreted as a clear overture to the United States to link its future emissions market(s) to the EU-ETS.

U.S. FEDERAL GHG POLICY

The federal government has yet to pass legislation or issue regulations covering GHG emissions. In January 2007 a group of major corporations and prominent environmental groups formed the United States Climate Action Partnership (“US CAP”) and released a report entitled *A Call for Action*.¹² Its goal is to put pressure on Congress to adopt legislation regulating GHG emissions, including a comprehensive cap-and-trade program. While it may seem odd for a group of the

largest corporations in America to advocate for potentially costly regulation, they have come to realize that regulatory uncertainty and its concomitant risks may exact a greater long-term economic cost than comprehensive—but definite—legislation.

As of this writing, no comprehensive federal climate change legislation has been adopted. One major cap-and-trade bill, sponsored by Senators Lieberman and Warner,¹³ is considered the leading proposal on Capitol Hill, but there is only a small likelihood of final passage in 2008.

The Energy Independence and Security Act,¹⁴ signed into law in December 2007, contains several provisions that are intended to reduce GHG emissions, but it falls short of the comprehensive legislation advocated by US CAP and others. The Act includes the first increase in Corporate Average Fuel Economy (“CAFE”) standards for automobiles since they were enacted in 1975, requiring average fuel economy of thirty-five miles per gallon in 2020.¹⁵ It also includes provisions to improve energy efficiency in homes and buildings,¹⁶ a renewable fuel standard (mandating the production of at least thirty-six billion gallons of biofuels by 2020),¹⁷ and other provisions to meet President Bush’s “20 in 10” challenge for reducing gasoline usage by twenty percent in ten years.

A recent House Committee on Energy and Commerce white paper looked at the proper role of federal, state, and local governments in any comprehensive carbon regulation scheme.¹⁸ Working under the assumption that the federal government would eventually enact a cap-and-trade program like the Lieberman-Warner bill, the white paper revealed potential situations in which state and local leadership could lead to either increased emissions, increased overall costs, or both. It makes the argument that “climate change is a global, not local, problem, perhaps

No comprehensive federal climate change legislation has been adopted.

providing less need for allowing States to be more stringent.”¹⁹ As a result, “a more stringent State program may just shift the location of, rather than decrease, national emissions”²⁰ This would occur when regulated entities move their operations from states with higher (i.e., more expensive to comply with) standards to ones that follow the lower, federal standards.

The white paper does note, however, that state and local authorities do have a significant, complementary role to play in the effort to reduce GHG emissions. For example, building codes that mandate the use of better insulation in new homes would cause higher initial prices for consumers, but provide long-term savings as a result of lower energy bills. These measures “could capture . . . otherwise lost or uncovered emission reductions, and thereby decrease the societal cost of achieving greenhouse gas reductions.”²¹ The white paper also recognizes the importance of adequate and efficient monitoring, reporting, and verification of emissions. “It is probably more efficient to authorize State, Tribal, and/or local governments to inspect sources to determine compliance with national monitoring and record-keeping requirements than it would be to leave that exclusively to Federal inspectors.”²²

Many state leaders, frustrated at slow federal action to address climate change, are implementing both comprehensive and piece-meal programs at the state level to help reduce GHG emissions. The following section discusses the actions that states have taken on their own to reduce GHG emissions, focusing heavily on cap-and-trade programs. Next, this Article raises and analyzes the constitutional issues that may arise as a result of state responses to this pressing global problem, focusing heavily on the constitutional issues raised by attempts to link emissions trading systems among states and between states and foreign parties.

U.S. STATE-LEVEL ACTIONS

CAP-AND-TRADE PROGRAMS

Although the United States is not a signatory to the Kyoto Protocol, there are several efforts underway to establish state- or regional-level trading systems. These follow not only the model of the EU-ETS, but also other successful domestic cap-and-trade programs administered by the EPA, including the Acid Rain Program.²³

California is in the process of establishing its own cap-and-trade program. In September 2006, California adopted the Global Warming Solutions Act, also known as A.B. 32.²⁴ This law, in part, allows the state to establish a cap-and-trade program to help meet the goal of capping the state’s emissions at 1990 levels by 2020 and eventually reaching eighty percent below 1990 levels by 2050.²⁵ The program would be administered by the California Air Resources Board (“CARB”), which is in the process of adopting a scoping plan to identify California’s primary strategies for reducing GHG emissions under A.B. 32. The goal would be to have the cap-and-trade program operating by January 1, 2012.²⁶ Governor Arnold Schwarzenegger has openly expressed an interest in linking any cap-and-trade program, once it is open for business, with the EU-ETS market.²⁷

In addition to California’s intrastate efforts, three interstate groups are currently in the process of establishing carbon markets. One project, known as the Regional Greenhouse Gas Initiative (“RGGI”),²⁸ was initially formed in 2003 and is now made up of ten states in the Northeast and Mid-Atlantic: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, and Maryland. In addition, several eastern Canadian provinces have expressed interest in joining RGGI.

The consortium administering RGGI has published model rules for each of the states to adopt, and all ten states are in the process of adopting them in statutory or regulatory form. The goal is to have the market operating by January 2009. At this point, it appears likely that the market will be ready to open at that time, although all ten states may not be participating at the outset, as a few may have outstanding issues to resolve in the early stages of the program.

The second multi-state group, known as the Western Climate Initiative (“WCI”), consists of seven Western states and two Canadian provinces: Arizona, California, Montana, New Mexico, Oregon, Utah, Washington, British Columbia, and Manitoba. The WCI was established in February 2007, and as a result is not as far along in the process as RGGI. WCI is currently in the design phase, having completed basic design principles and established a year-long work-plan.²⁹ Its goal is to have the design of the market-based mechanism completed in August 2008. Based on this timeline, it is unlikely that the WCI will be able to establish a functioning market before 2011 or 2012.

A third group, consisting of nine Midwestern states and the Canadian province of Manitoba, signed the Midwestern Regional Greenhouse Gas Reduction Accord in November of 2007, which is designed to establish greenhouse gas reduction targets, a regional cap-and-trade protocol, and a regional system to track and manage greenhouse gas emissions.³⁰

RENEWABLE PORTFOLIO STANDARDS

A renewable portfolio standard (“RPS”) is a state-level mandate requiring electric utilities to obtain a certain percentage of their power from renewable resources. Twenty-four states and the District of Columbia currently have RPSs, while four other states have non-binding goals for adopting renewable energy.³¹

A typical RPS might call for having twenty percent of energy produced from renewable resources by 2020. Currently, Minnesota and Oregon have the highest standards calling for twenty-five percent renewable energy production by 2025.³² The renewable resources that qualify for state RPS programs generally include wind, solar (concentrated and photovoltaic), geothermal, and biomass. Nuclear power does not satisfy RPS requirements and cannot be used to meet the renewable standards.

AUTO EMISSIONS REGULATIONS

The Clean Air Act (“CAA”) prohibits states from issuing their own auto emissions regulations. There is one exception that applies only to California, as California was the only state regulating auto emissions prior to the enactment of the CAA in 1966.

Section 209(b) of the Act allows California to seek a waiver from the EPA, which shall be granted unless “the Administrator finds that—(A) the determination of the State is arbitrary and capricious, (B) such State does not need such State standards to meet compelling and extraordinary conditions, or (C) such State standards and accompanying enforcement procedures are not consistent with section 202(a)” of the CAA.³³ Other states then have the choice of adopting the federal rule or the California rule.

Citing the fact that automobile emissions account for roughly forty percent of GHG emissions in California, the California Greenhouse Gas Reduction Bill of 2002, known as A.B. 1493, requires CARB to adopt “regulations that achieve the maximum feasible reduction and cost-effective reduction of greenhouse gases from motor vehicles.”³⁴ The regulations are not fuel economy standards per se, but instead regulate the amount of GHG emissions that automobiles sold in the state may produce.

In 2004, CARB promulgated regulations pursuant to A.B. 1493 calling for a reduction in emissions by automobiles totaling over fifty million tonnes of carbon dioxide by 2030.³⁵ This equates to a twenty-seven percent reduction in automobile emissions by 2030. California formally sought a waiver from the EPA in December 2005.³⁶ Since California adopted its regulations, sixteen other states have followed its lead and passed laws requiring automobiles to meet the California standards.

After the April 2007 Supreme Court decision in *Massachusetts v. EPA*,³⁷ in which Massachusetts won a significant victory that formally establishes EPA’s authority to regulate GHG gases as pollutants, Governor Schwarzenegger met with EPA Administrator Stephen Johnson to encourage EPA to grant California’s waiver application. However, in December 2007, Administrator Johnson notified California that the waiver application would be denied, on the grounds that California’s situation does not meet the “compelling and extraordinary conditions” test.³⁸ Identifying global climate change as a worldwide problem and citing the Energy Independence and Security Act of 2007,³⁹ which increased CAFE standards, the EPA determined that California’s more strict GHG emissions reduction rule may not be enforced. This was the first time, after more than fifty successful applications, that a waiver request under Section 209(b) was denied by the EPA.⁴⁰

California and several other states have since sued the EPA, and the case is currently pending in federal court.⁴¹ For advocates of state action to slow the impacts of climate change, the waiver denial was both a significant blow to their efforts and a rallying

cry. Regardless of one’s views on the merits of the EPA decision, the decision underscores the importance of clarifying the role of the states, as this waiver decision is likely to be a major court battle lasting several years and costing millions of dollars.

GREENHOUSE GAS PERFORMANCE STANDARDS

In January 2007, California became the first state to adopt a greenhouse gas performance standard (“GGPS”).⁴² This is a facility-based emissions standard, affecting electric utilities, which requires that all new long-term baseload generation com-

mitments in California produce no more emissions than a combined gas cycle turbine plant.⁴³ It prohibits load-serving entities (investor-owned utilities, energy service providers, and community choice aggregators) from entering into long-term financial commitments (five years or more) for baseload generation with higher than proscribed emissions, regardless of the type of fuel used in the plant.⁴⁴

This means that no new coal-fired plants can be built in California, nor can existing plants make significant capital improvements that do not con-

form to the GGPS. In addition, it prohibits California utilities from contracting to import power from out of state that does not comply with the emissions requirements of the GGPS.⁴⁵

CONSTITUTIONAL ISSUES

The United States’ system of federalism allows the federal and state governments to share power in certain areas, while each maintains exclusive areas where the other may not regulate. The power of the federal government is constrained by the Constitution and does not include general police powers, which are reserved to the states.⁴⁶ State governments, however, may not regulate certain aspects of interstate and foreign commerce, foreign affairs, and other areas of reserved federal power.

When states take actions to regulate greenhouse gases, it raises questions about the extent of state authority to regulate the economy and the environment. Linking emissions trading programs or enacting auto emissions regulations brings states to the far end of their regulatory authority, given the transborder nature of emission trading and carbon dioxide emissions generally. This section explores the constitutional issues that can potentially arise from state actions to reduce GHG emissions.

COMMERCE CLAUSE

The Commerce Clause, Article I, § 8, cl. 3, gives the federal government the power “[t]o regulate Commerce with foreign Nations, and among the several States[.]”⁴⁷ The Supreme Court has long considered the Commerce Clause to be “an implicit

When states take actions to regulate greenhouse gases, it raises questions about the extent of state authority to regulate the economy and the environment.

restraint on state authority, even in the absence of a conflicting federal statute.”⁴⁸ This concept is known as the Dormant Commerce Clause—wherein the Constitution acts as a prohibition on certain types of state actions that affect interstate commerce, invalidating the state law by negative implication.⁴⁹

Although the Dormant Commerce Clause doctrine has gained widespread acceptance, at least two current Supreme Court justices (Justice Scalia and Justice Thomas) reject it altogether. Regardless of these two justices, it is highly unlikely that a majority of the Court would reject the Dormant Commerce Clause doctrine. Were the doctrine to be rejected by the Court, state actions would never be invalidated for conflicting with unexercised congressional power under the Commerce Clause, but would be subject to invalidation only for express or implied preemption by federal law.

The basic test for whether a state law violates the Commerce Clause is to look first at whether the law discriminates on its face against out-of-state entities or transactions.⁵⁰ If there is facial discrimination, which essentially means a protectionist measure that is written in a manner that singles out foreign entities or transactions for disadvantageous treatment when compared to their in-state counterparts, then the state law will be invalidated.⁵¹ If there is no facial discrimination, the state law can still run afoul of the Commerce Clause if it places unwarranted burdens on interstate commerce in a particular application or range of applications.⁵² “Where the statute regulates even-handedly to effectuate a legitimate local public interest, and its effects on interstate commerce are only incidental, it will be upheld unless the burden imposed on such commerce is clearly excessive in relation to the putative local benefits.”⁵³

A linked cap-and-trade program may raise questions of discrimination. One of the biggest issues with establishing regional cap-and-trade programs is “leakage,” which occurs when a regulated entity imports cheaper, higher-polluting power from an area outside the program to evade cap obligations. For example, if an electrical utility in a state covered by RGGI did not possess enough allowances for the current year, and it was more economical to purchase coal-fired electricity from the neighboring state than to buy allowances on the open market, the emissions produced by the neighboring utility company would “leak” into the regulated space of the cap-and-trade system when the electricity was purchased by the RGGI-covered company.

This leakage issue creates a serious problem for regulators. If the trading system allows or remains silent on importing power from states that leave GHG emissions unregulated, the credibility of the program as a whole will become suspect. At the same time, if the regional system were to attempt to ban the purchase of any power from non-member states, there would be at least a colorable argument of facial discrimination. In order to avoid these problems, the designers of regional cap-and-trade programs like RGGI will have to find innovative solutions that can protect the integrity of the emissions reduction mechanisms while at the same time avoiding potential constitutional pitfalls.

Linking a state or regional cap-and-trade program with a foreign trading system like the EU-ETS would raise unique con-

stitutional issues not present in a wholly domestic linkage situation. Emission trading linkages with foreign parties would create a whole host of problems, from verification and standardization of credits at an international level to accounting and securities disclosure laws and regulations. Credits created by European entities would require some sort of regulation under federal securities and/or commodities law. The federal government would have a good argument that states should not be involved in activities over which they do not have full control. Because a state cannot independently regulate securities and commodities markets, it may be impossible for a state or group of states to provide adequate oversight of a market linked to international participants.

In addition, the Dormant Commerce Clause can potentially affect attempts to institute greenhouse gas performance standards. This would not be a discrimination issue, as the performance standards are facially neutral. Rather, courts would have to look at whether the performance standards unduly burden interstate commerce. If California’s rules prohibit long term contracts for the in-state sale of energy from out-of-state coal-fired plants, out-of-state producers are likely to cry foul and sue over the lost business from California’s utilities. At that point, the courts would have to weigh the relative benefits of California’s standards against the burden they place on interstate commerce.

COMPACTS CLAUSE

The Compacts Clause, Article I, § 10, cl. 3, reads in part: “No state shall, without the consent of Congress, . . . enter into any Agreement or Compact with another State, or with a foreign power[.]”⁵⁴

In reviewing claims under the Compacts Clause, courts look generally to whether states are attempting to enhance their power at the expense of the federal government.

Where an agreement is not ‘directed to the formation of any combination tending to the increase of political power in the States, which may encroach upon or interfere with the just supremacy of the United States,’ it does not fall within the scope of the Clause and will not be invalidated for lack of congressional consent.⁵⁵

The first question that courts look at is whether a contractual arrangement, such as a cap-and-trade system, reaches the point of being a “compact” under the Compacts Clause. If it is a compact, then it generally must be approved by Congress or it will be invalid.⁵⁶ Once approved by Congress, it reaches the level of federal law. Thus, for an unapproved state-to-state or state-to-foreign-party relationship to be valid, it must not reach the formality of being a “compact” for these purposes.

To answer the first question, whether an arrangement is an agreement or compact, the courts look to the general indicia of a compact. The Supreme Court summarized the relevant factors in *Northeast Bancorp v. Federal Reserve*,⁵⁷ a decision involving an agreement by holding companies to purchase banks:

The . . . statutes . . . both require reciprocity and impose a regional limitation But several of the classic indicia of a compact are missing. No joint organization or body has been established to regulate regional banking

or for any other purpose. Neither statute is conditioned on action by the other State, and each State is free to modify or repeal its law unilaterally. Most importantly, neither statute requires a reciprocation of the regional limitation.⁵⁸

From the passage above, one can draw some general criteria for determining whether a contractual relationship is an agreement or compact. There should be some sort of joint organization or body to govern the agreement, if necessary. It should be binding; that is, no state can freely remove itself from the agreement. And it must require a reciprocity of the regional limitation, meaning that one party cannot agree to a nationwide program while another believes the agreement only covers a handful of states.

Regarding a regional cap-and-trade program, courts are unlikely to find that RGGI or a similar program is a compact, unless the agreement contains language that conditions actions (in one state) on actions by other states and is not freely revocable by participant states. It appears, based on *Northeast Bancorp*, that a voluntary union, which allows for a state to back out should it not want to participate, would not be considered a compact for the purposes of the Clause.

However, it is difficult to see how a linked international cap-and-trade framework could be crafted so as not to constitute a compact or even a treaty, which would be impermissible under Article I, § 10, cl. 1, regardless of the presence or absence of congressional approval. In order to have a properly functioning linkage between markets, there would need to be guarantees regarding enforceability and permanence. Without legally enforceable guarantees about the quality of the credits being traded, the markets are unlikely to succeed. There would be a serious problem, for example, if an offset project in California created credits that were purchased by a steel manufacturer in France, and California de-linked itself from the markets. The problem of how the French manufacturer would account for the credits in the absence of a monitoring or verification mechanism to account for what is happening in California is a significant one. The only way to ensure the integrity of the credits being traded in the marketplace is to create a framework that is robust enough to protect all of the parties involved. This would presumably include the inability to voluntarily leave the program and would be most easily accomplished with some sort of central emissions registry that aggregates and processes data from all participants. These components are almost certain to create a compact under the Compacts Clause, which would then require congressional approval in order to be valid.

SUPREMACY CLAUSE

The Supremacy Clause, Article VI, cl. 2, defines the Constitution and laws made “in Pursuance thereof” as “the supreme Law of the Land[.]”⁵⁹ This provision allows federal law to preempt state law in certain circumstances.

“Even without an express provision for preemption, we have found that state law must yield to a congressional Act in at least two circumstances,” the Supreme Court noted in *U.S. v. Locke*.⁶⁰ “When Congress intends federal law to ‘occupy the

field,’ state law in that area is preempted. And even if Congress has not occupied the field, state law is naturally preempted to the extent of any conflict with a federal statute.”⁶¹

A presumption of non-preemption arises in disputes involving the traditional police powers of the states; despite the presumption, even the police powers will yield when Congress clearly intends to supersede state law.⁶² In addition, when there is a history of significant federal presence in the area of regulation, there is no presumption of state law validity.⁶³

With a cap-and-trade system, the question is whether any federal law creates a conflict or if the federal government otherwise occupies the field. At this point, Congress has not passed any legislation that would present a direct conflict with a multi-state cap-and-trade system. Indeed, the federal government has been remarkably absent from the field of greenhouse gas regulation in general.

In the wake of *Massachusetts v. EPA*,⁶⁴ the federal government’s inaction becomes even more stark. The Court noted that “EPA has not identified any Congressional action that conflicts in any way with the regulation of greenhouse gases from new motor vehicles.”⁶⁵ Although issued in the context of federal regulations rather than state statutes, the point is the same: the federal government has not taken efforts to regulate GHG emissions. *Massachusetts v. EPA* held that EPA has the authority to regulate GHG emissions from automobiles because they fit within the statutory definition of “air pollutant” under § 202(a)(1).⁶⁶ The case was remanded to the EPA for the agency to either make a finding of endangerment and regulate auto emissions or provide a reasoned judgment as to why GHGs do not contribute to global warming and can thus escape regulation.⁶⁷

Even if the EPA decides to regulate GHG emissions from autos, that would not necessarily provide a conflict for a cap-and-trade program. Most proposals for cap-and-trade programs only regulate tailpipe emissions indirectly. If they capture the transportation sector, it is done upstream through regulating the fuel industry, rather than limiting actual vehicle emissions. As a result, it is unlikely that any forthcoming rule stemming from *Massachusetts v. EPA* would preempt state cap-and-trade initiatives.

The best case for federal preemption would arise if the federal government instituted a similar cap-and-trade system or other form of comprehensive carbon emissions regulation. Any program that created a nationwide price for carbon would likely be interpreted as directly conflicting with state programs; in the alternative, courts would probably hold that federal efforts occupy the field of GHG regulation. But lacking such a program, as is currently the case, it is difficult to see any way in which a state-organized cap-and-trade program could be preempted under the Supremacy Clause.

Some congressional leaders are advocating for express preemption in any future comprehensive cap-and-trade bill. The Dingell-Boucher white paper,⁶⁸ which discusses the role of federal, state, and local governments in efforts to reduce GHG emissions, makes the case for express preemption. “[O]nce a national, economy-wide cap-and-trade program is adopted, State

or regional cap-and-trade programs may interfere with the efficient functioning of the Federal cap-and-trade program[.]”⁶⁹ As a result, “Chairman Dingell has made it very clear that he believes that motor vehicle greenhouse gas standards should be set by the Federal Government, not by State governments[.]”⁷⁰ In addition, the analysis finds that compliance costs and overall system costs (including regulatory overhead) are likely to be higher in any duplicative system of federal and state/regional regulation.⁷¹ While the current version of the Lieberman-Warner bill actually encourages and provides incentives for states to take actions above and beyond the federal cap-and-trade program,⁷² there is a possibility that an express preemption clause could be part of any final bill.

The Supreme Court recently looked at the scope of express preemption of state laws, which may be relevant as applied to future GHG regulations.⁷³ In *Rowe v. New Hampshire Motor Transp. Ass’n*, several transport carrier associations sued Maine over regulations governing the conduct of carriers that deliver packages containing tobacco, as a way to help prevent youth from purchasing cigarettes through mail-order retailers. Federal motor carrier law expressly preempts any state from “enact[ing] or enforc[ing] a law . . . related to a price, route, or service of any motor carrier . . . with respect to the transportation of property.”⁷⁴ The state law, for example, required carriers to utilize a recipient-verification service, to ensure that the person who ordered the tobacco is also the recipient, and that the recipient is at least eighteen years old.⁷⁵

In holding that the state law was preempted, the court noted that “to interpret the federal law to permit these, and similar, state requirements could easily lead to a patchwork of state service-determining laws, rules, and regulations. That state regulatory patchwork is inconsistent with Congress’s major legislative effort to leave such decisions, where federally unregulated, to the competitive marketplace.”⁷⁶ This line of reasoning could be relevant, particularly for state efforts to regulate GHG emissions from automobiles.

Although there has not been affirmative congressional action to deregulate GHG emissions, as there was with the motor carrier industry, the threat of inconsistent state regulations is a significant tool for the federal government to yield. The threat of a patchwork of state laws was one of the major reasons EPA Administrator Johnson decided to reject California’s application for a waiver—even though there could never be more than just the federal standard and the California standard in that instance. The easiest way to prevent the threat of a patchwork of standards is to include in any federal legislation an express preemption clause that prohibits states from acting in a given area.⁷⁷ Should the federal government adopt comprehensive carbon legislation, it is likely to include some level of express preemption of state laws to ensure a consistent approach for the entire country. This will inevitably lead to legal battles that delay the implementation of any comprehensive carbon regulation program.

INTERFERENCE WITH FOREIGN AFFAIRS

The power to conduct foreign affairs is vested exclusively in the federal government. Aspects of the power are constitu-

tionally divided between the President in Article II (e.g., power to make treaties) and the Congress in Article I (e.g., power to raise an army, declare war). States do not play a role in foreign affairs, as it is important for the federal government to be able to speak with one voice on behalf of the national interest for matters involving foreign affairs.

Generally, the only cases where courts have struck down laws as interfering with foreign affairs power are “state or local laws purporting to set up their own authorities as mini-state-departments, with power to oversee and either approve or disapprove foreign regimes or the negotiation efforts of the U.S. Executive Branch[.]”⁷⁸

In *Zschernig v. Miller*,⁷⁹ the Supreme Court invalidated an Oregon law that prevented a nonresident alien from inheriting property unless certain conditions were met—primarily, a reciprocal right for Americans in the alien’s country and the assurance that any property received in Oregon would not be confiscated at home. Noting that states are the typical forum for probate matters, the Court still found the law problematic. “The several States, of course, have traditionally regulated the descent and distribution of estates. But those regulations must give way if they impair the effective exercise of the Nation’s foreign policy.”⁸⁰ *Zschernig* involved a citizen of East Germany, a country with which the United States had no treaties regarding inheritance. Regardless, “even in absence of a treaty, a State’s policy may disturb foreign relations.”⁸¹

*Crosby v. National Foreign Trade Council*⁸² is the first in a line of recent foreign affairs cases that focus on state attempts to limit contact with foreign countries. The *Crosby* court heard a challenge to a Massachusetts law that prohibited state entities from buying goods or services from companies doing business with Burma.⁸³ At the time the law was passed, there was no similar federal prohibition, although a federal law providing for sanctions on Burma was enacted a few months later. Although the Court spoke specifically of the Supremacy Clause, the decision’s rationale focused heavily on how the Massachusetts law tied the President’s hands and thus reduced his leverage against Burma.

We need not get into any general consideration of limits of state action affecting foreign affairs to realize that the President’s maximum power to persuade rests on his capacity to bargain for the benefits of access to the entire national economy without exception for enclaves fenced off willy-nilly by inconsistent political tactics.⁸⁴

The *Crosby* reasoning was followed recently in an Illinois case.⁸⁵ The district court there looked at an Illinois law that regulated contact with and investment in Sudan and determined that the state law was unconstitutional, based primarily on Supremacy Clause grounds. There was, however, extensive discussion of the foreign affairs powers in the decision. Understanding that the federal government has a unique and exclusive role in carrying out the country’s foreign policy, the court noted that “the degree of impact a state law has or might have on the national government’s conduct of foreign affairs is the relevant inquiry.”⁸⁶ In *National Foreign Trade Council v. Giannoulis*,

requiring pension funds to divest from Sudan, while potentially raising difficulties for the fund managers, did not interfere with the federal government's authority to conduct foreign affairs.⁸⁷

The *Giannoulias* ruling also contains dicta that is supportive of state efforts to reach non-discriminatory agreements with foreign entities: the court indicates that "it does not appear that state and local governments are prohibited from entering into 'sister state' agreements or other bilateral agreements with sub-national foreign governments or foreign trade associations."⁸⁸

Finally, in *American Insurance Ass'n v. Garamendi*,⁸⁹ the Supreme Court extended the ruling in *Crosby* to areas where there was no explicit federal statute, but merely executive agreements between the President and heads of foreign states. *Garamendi* involved a California law requiring any insurer in the state to disclose information about all policies sold in Europe between 1920 and 1945. This was seen as a way of ensuring that claims belonging to Holocaust victims were paid to any survivors and their heirs living in California.

President Clinton, however, had made executive agreements with Germany, Austria, and France so that all claims against German insurance companies relating to the Holocaust would be heard by an international commission established for that purpose.⁹⁰ The Court noted that the President has considerable authority in the area of foreign relations and can act independently of Congress. "While Congress holds express authority to regulate public and private dealings with other nations in its war and foreign commerce powers, in foreign affairs the President has a degree of independent authority to act."⁹¹ Thus, congressional silence does not undermine the executive agreements, which can, even without an explicit conflict, preempt state laws.

Garamendi was a 5-4 decision, with Justices Rehnquist and O'Connor in the majority. Justice Ginsburg's dissent, which was joined by Justices Stevens, Scalia, and Thomas, focused on whether there was an explicit conflict between the executive agreement and the state law. Without such a conflict the dissenting Justices would not allow an executive agreement to preempt a state law. Justice Ginsburg also noted that "the notion of 'dormant foreign affairs preemption' with which *Zschernig* is associated resonates most audibly when a state action 'reflects a state policy critical of foreign governments and involves 'sitting in judgment' on them."⁹²

Applying the case law above to a scenario in which states attempted to link to a foreign trading system, the lack of a coherent

ent federal policy on GHG regulation at this point strongly points to the constitutionality of such a linkage. The biggest potential problem would occur if there is federal legislation that makes mention of international linkages, or if the President makes clear statements concerning national priorities for GHG regulation that conflict with linking domestic trading systems with their international counterparts.

Perhaps just as important, any attempt to link to foreign emissions trading systems will be viewed very differently from the *Crosby* and *Giannoulias* cases. States attempting linkages will not be disparaging or otherwise passing negative judgment on foreign parties, as occurred in those cases involving state laws prohibiting or restricting commerce with rogue nations. Without that factor, it is difficult to imagine how courts could find any sort of interference with America's foreign policy prerogatives. Thus, cap-and-trade system linkages are likely permissible overtures to international partners, particularly if the federal government still has not undertaken a comprehensive scheme of carbon regulation.

CONCLUSION

State governments continue to demonstrate leadership in combating climate change—from adopting energy efficiency standards to enacting renewable portfolio standards to developing cap-and-trade programs aimed at reducing carbon dioxide emissions, often as part of regional compacts. At the same time, the Congress is in the process of developing national climate change legislation and agencies in the Executive Branch are defining their roles. As the federal and state governments begin regulating the same areas of the economy and the environment, the potential for conflicting programs arises.

State programs are potentially vulnerable to a variety of constitutional challenges, including through the Commerce, Compacts, Supremacy, and Foreign Affairs clauses. As the federal government solidifies its approach to global climate change over the next several years, the likelihood for preemption of state programs will become more evident. It is apparent now, however, that state programs are in serious jeopardy if the federal government actively seeks to restrict state authority. If the current or future President does not want states to play an active role in climate change regulation, he or she will have several constitutional tools at their disposal to handicap the states' abilities to create programs that reduce GHG emissions. 

Endnotes: Climate Change and the States

¹ INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, FIRST ASSESSMENT REPORT (1990), reprinted in *Climate Change: The IPCC Scientific Assessment* (J.T. Houghton, et al. eds., 1990).

² United Nations Framework Convention on Climate Change, May 9, 1992, 31 I.L.M. 849, available at <http://unfccc.int/resource/docs/convkp/conveng.pdf> (last visited Mar. 13, 2008) [hereinafter UNFCCC].

³ Kyoto Protocol to the United Nations Framework Convention on Climate Change, 1998, 37 I.L.M. 22, available at <http://unfccc.int/resource/docs/convkp/kpeng.pdf> (last visited Mar. 13, 2008) [hereinafter Kyoto Protocol].

⁴ See, e.g., UNFCCC, Decision -/CP.13 (2007); UNFCCC, Decision CMP.3 (2007).

⁵ Kyoto Protocol, *supra* note 3, art. 12.

⁶ Kyoto Protocol, *id.* art 6.

⁷ Kyoto Protocol, *id.* art 17.

CALIFORNIA SUES EPA AFTER ‘UNCONSCIONABLE’ WAIVER DENIAL

by Addie Haughey*

On January 2, 2008 the state of California filed a complaint in the 9th Circuit against the Environmental Protection Agency (“EPA”) for its December 2007 denial of a Clean Air Act waiver request made by California nearly two years before.¹

Under the Clean Air Act, California has the ability to enact its own air pollution laws due to unique and extreme impacts of pollution in the state.² In order to implement stricter regulations, California must acquire a waiver from EPA and the state has done this nearly fifty times over the last three decades.³ Previous waivers allowed California to create laws requiring catalytic converters, unleaded gasoline, and other major advancements in air pollution reduction, which are often implemented on the national level.⁴

A waiver seeking to impose stricter tail-pipe emission standards was originally requested by California on December 21, 2005.⁵ The waiver was based on policy developed by the California Air Resources Board (“CARB”) that was intended to phase in and ramp up greenhouse gas auto emission standards starting with the 2009 model year.⁶ According to CARB, global warming emissions would be cut by thirty percent by model year 2016, which is the equivalent to taking 6.5 million cars off California roads by 2020.⁷ The waiver request cited global warming impacts on California’s expansive coastline and the Sierra Mountain snowpack to justify the need to regulate greenhouse gasses.⁸

The Clean Air Act also allows other states to adopt California’s standards if they prefer them over the federal alternative.⁹ To date, sixteen states comprising forty-five percent of the US auto market have adopted or are in the process of adopting California standards, which increases the impact of the proposed standards, creating the effect of taking twenty-two million cars off America’s roads by 2020.¹⁰

After California’s waiver request in 2005, Governor Arnold Schwarzenegger made multiple efforts to force EPA to grant a decision on the waiver, including filing suit in 2007.¹¹ The EPA denied the waiver¹² on December 19, 2007 the same day that the U.S. Congress passed the Energy Independence and Security Act of 2007.¹³ The final Act was a stripped down version of what many environmentalists had hoped would be the largest advancement in energy policy in decades.¹⁴ Provisions that would have allowed tax incentives for renewable energy were left out, but the bill does create the first increase in corporate average fuel economy (“CAFE”) standards since the 1970s.¹⁵ According to the White House, new standards will reach thirty-five miles per gallon (“mpg”) by 2020.¹⁶

Some question whether the waiver denial coming the same day as the passage of the energy bill is a coincidence or an engineered political compromise. EPA staffers anonymously

revealed that Johnson made his decision against their unanimous recommendations to grant the waiver.¹⁷ One staffer went so far as to say “California met every criteria . . . on the merits. The same criteria we have used for the last 40 years on all the other waivers.”¹⁸ Johnson, on the other hand, said that his staff “presented [him] with a range of options with a lot of pros and cons” which he considered before deciding to deny the waiver.¹⁹

The Alliance of Automobile Manufacturers (“AAM”) adamantly denies a compromise, saying there are absolutely no linkages between the group’s decision to support the final version of the energy bill and EPA’s denial of the California waiver.²⁰ Critics point out the sudden reversal of AAM’s position after decades of vigorous opposition to the increase of emission standards.²¹

Regardless of whether the political conspiracy theories are correct, a bitter battle is brewing between the Schwarzenegger and Bush administrations. California began an immediate volley of sharp words, attacking the EPA assertion that California’s plan would not be as effective as the federal strategy. In his letter to Schwarzenegger, Johnson claimed that California’s plan would only reach a 33.5 mpg standard as opposed to the federal standard of 35 mpg.

Mary Nichols of CARB, who oversaw air regulations under the Clinton administration, said that Johnson’s decision shows “that this administration ignores the science and ignores the law to reach the politically convenient conclusion.”²² Governor Schwarzenegger called EPA’s decision “unconscionable” and said the EPA was “ignoring the will of millions of people who want their government to take action in the fight against global warming.”²³ California Attorney General Edmund G. Brown, Jr. said Johnson “must have consulted a Ouija board, I don’t know what else can explain his bizarre decision.”²⁴

The *Los Angeles Times* reported that EPA technical and legal staff predicted that if the waiver was denied, EPA would likely lose a legal challenge to its decision, but that if the waiver was granted and the EPA was sued by representatives of the auto industry, that EPA is almost certain to win.²⁵

In the last year several pro-state decisions have been handed down in support of regulation of greenhouse gasses, including *Massachusetts v. EPA* and *Green Mountain Chrysler v. Crombie*. These cases and others involving environmental organizations are likely to give support to California in the upcoming litigation. Despite any predictions, both sides appear ready for a fight.



Endnotes: California Sues EPA continued on page 82

*Addie Haughey is a J.D. candidate, May 2010, at American University, Washington College of Law.

IS THE CLEAN DEVELOPMENT MECHANISM SUSTAINABLE? SOME CRITICAL ASPECTS

by Dr. Christina Voigt*

INTRODUCTION

The Clean Development Mechanism (“CDM”) is rapidly developing as an important element in international climate policy by providing a cost-effective means of complying with the requirements of the Kyoto Protocol. Defined in Article 12 of the Kyoto Protocol, the CDM provides for Annex I Parties to implement project activities that reduce emissions of greenhouse gases (“GHGs”) in non-Annex I Parties, in return for certified emission reductions (“CERs”).¹ The CERs generated by such project activities can be used by Annex I Parties to help meet their emissions targets under the Kyoto Protocol and can be traded on the international emissions trading market. Article 12 also stresses that CDM projects should assist the developing country host Parties (non-Annex I Parties) in achieving sustainable development and in contributing to the ultimate objective of the United Nations Framework Convention on Climate Change (“UNFCCC”).²

There are currently more than 900 registered CDM projects in forty-nine developing countries, and about another 2,000 projects in the project registration pipeline. The registered projects have resulted in 117,394,796 issued CERs.³ The CDM is expected to generate more than 2.6 billion CERs, each equivalent to one tonne of carbon dioxide, by the time the first commitment period of the Kyoto Protocol ends in 2012.⁴

Therefore, the CDM is not only an innovative mechanism that builds a bridge over the ‘North/South’ gap in the Kyoto Scheme, but it also brings together private economic interests and public climate policy by helping to channel private sector investment toward climate-friendly projects that otherwise might not have taken place. A CDM project attracts substantial transfers in financial and technological services to developing countries while promoting climate protection and diminishing the extent of national climate change mitigation in developed countries.

Thus, it is crucial that a CDM project delivers real climate benefits without causing other environmental damages, and therefore upholds environmental integrity. Yet, how to ensure the CDM’s environmental integrity is a legal challenge that remains. Environmental impacts of the CDM have already led buyers of carbon credits to increasingly try to protect them-

selves from liability for environmental damage caused by GHG projects.⁵

LEGAL CHALLENGES

The CDM is unique among the flexibility mechanisms of the Kyoto Protocol in that it allows Annex I Parties to increase their accumulated caps by obtaining emission credits generated by investments in a CDM project in an uncapped, developing (non-Annex I) Party. Each CER is an additional carbon tonne which will entitle an Annex I, “investor,” Party to an equivalent increase in emissions from its territory, while remaining in compliance.⁶

However, the lack of quantitative mitigation commitments in CDM host countries and an interest in a maximal number of CERs resulting from a CDM project create incentives for both sides, CER-buyers/investors and host states, involved in a CDM project to inflate the amount of CERs claimed.⁷ Therefore, the more successful the CDM is at generating CERs, the more an

Annex I Party can use those CERs to increase its territorial emissions above its cap, and the more important it is that each CER corresponds to real, long-term, measurable emission reduction. Apparently, with increasing volumes of CERs, the environmental performance of the entire Kyoto System depends upon the environmental performance of the CDM. Environmental performance of the CDM depends on the demonstrated ability of the CDM system to support the objective of the UNFCCC: to stabilize greenhouse gas concentration in the atmosphere at safe levels.⁸ This ability of the CDM, coupled with avoiding other environmental damages is usually referred to as “environmental integrity.”⁹

The importance of environmental integrity has been made obvious by the 2005 Meeting of the Parties (“MOP”) 1 when adopting the Marrakech Accords (now titled *Kyoto Rule Book*). In decision 2/CMP.1, “Principles, nature and scope of the mech-

The long-term, significant reduction of GHGs is a necessary condition for sustainable development.

* Dr. Christina Voigt, LL.M., is a postdoctoral research fellow and lecturer in environmental law at the University of Oslo, Department of Public and International Law, Norway. Dr. Voigt would like to thank the members of the research group for natural resources law at the School of Law, University of Oslo, as well as Markus Gehring, Marie-Claire Cordonier Segger, Richard Ottinger, Gerd Winter, and Durwood Zaelke for helpful comments to this paper.

anisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol,” the Parties emphasize that “environmental integrity is to be achieved through sound modalities, rules and guidelines for the mechanisms, sound and strong principles and rules governing land use, land use change and forestry activities, and a strong compliance regime.”¹⁰

In this Article, I will try to explore what this passage implies for the CDM and attempt to highlight some aspects of the current design of the CDM that raise concerns about environmental integrity.

DEFINITION OF ENVIRONMENTAL INTEGRITY

Environmental integrity in general refers to the ability of an environmental measure to reach its objective and purpose. It therefore relates to the quality of the regime, its instruments, and its institutions. In the context of the climate regime, the extent to which the means are able to achieve the ultimate objective of the UNFCCC, as stated in Article 2, is essential in considering the environmental integrity of the entire regime.

With regard to the flexibility mechanisms, environmental integrity will depend on their capacity to ensure that the Parties included in Annex I do not exceed their assigned amounts. Emissions, reductions, and removals need, therefore, not only be quantifiable by using the same standard worldwide, but also real, complete, accurate, long-term, environmentally conservative, comparable, and verifiable.

Particularly in the climate regime, environmental integrity is a requirement for the promotion of sustainable development by a climate measure. The long-term, significant reduction of GHGs is a necessary condition for sustainable development. In other words, no development is sustainable if the issue of tackling climate change is left unsolved.

ENVIRONMENTAL INTEGRITY OF THE CDM

In the particular case of the CDM, environmental integrity can be defined in a wider and a narrower sense. In its narrower (or primary) sense, it is the demonstrated ability to approve projects and to certify emissions reductions that are real and additional, for example, reductions that would not have occurred in the absence of the project, and to support projects that contribute to long-term reductions in GHG concentrations in the atmosphere.¹¹ Environmental integrity in a wider (or secondary) sense means that other environmental concerns need to be taken into account and negative impact avoided. Special concerns in this respect relate to biological diversity protection connected to land use, land use change, and forestry projects.¹² In particular, these concerns exist where CO₂ sequestration projects (biomass or forest sinks) result in large-scale plantations of mono-cultural and/or non-indigenous tree species that could pose a threat to, or destroy local ecological systems.

SOME CRITICAL ASPECTS

ADDITIONALITY AND LEAKAGE

One of the key issues for the environmental integrity of CDM projects is the additionality of emission reductions or

removals.¹³ Article 12(5)(c) of the Kyoto Protocol provides that CERs shall be certified if based on reductions that are additional to any that would occur in the absence of the project.¹⁴ Additionality is a necessary requirement for making the CDM function as a mechanism to compensate for emissions that are not being reduced domestically by Annex I Parties.¹⁵ If CERs are created that represent emission reductions that would have happened anyway, then these “paper reductions” will undermine the integrity of the Kyoto Protocol.

Each project participant must demonstrate the additionality of the project in the project design document (“PDD”). Each project must describe the baseline scenario from which this additionality is measured. This baseline scenario represents the GHG emissions that would have occurred in the absence of the project. Problematic in this context is the counter-factuality of the baseline scenario: the project developer needs to investigate what would have happened if the project had not taken place. This scenario can lead to hypothetical assumptions, which help to inflate the amount of CERs.

To counter such incentives, the project must be based on a baseline and monitoring methodology applied to the project activity. The Executive Board (“EB”), which is assisted by the Panel on Guidelines for Methodologies for Baselines and Monitoring Plans (“Meth Panel”), are to approve the methodologies.¹⁶ However, the issue here is whether the EB and/or the Meth Panel are adequately equipped to carry out this task. Concerns have arisen with respect to the member’s capacity to carry this task and to the financial budget available for this kind of work.¹⁷

The PDD must further include the project boundary and any adjustments for leakage. This means that a project must calculate all GHG emissions under the control of the project participants that are significant and reasonably attributable to the project activity. These must then be adjusted for net changes of greenhouse gas emissions outside of the project boundary, which are measurable and contributable to the project activity.¹⁸

Additionality coupled with prevention of leakage helps to address concerns that investments in the CDM could displace, rather than replace, GHG-intensive activities. An example of such leakage would occur if a CDM project reduced fossil fuels where it meant to, but also resulted in increases elsewhere. The challenge, however, is how to define “project boundaries” and “emissions under the control of the project participant” in this context. “Leakage” might easily be detected if it happens in the same industrial sector or the same region, however, increases can also occur across country borders. These emissions might hardly be found to be under the control of the project developer, and thus not calculable in the baseline-scenario.

In order to survive an “environmental integrity check,” a CDM project would need to prove that its additionality does not lead to increased emissions elsewhere or slow climate change mitigation efforts. It is within the climate regime that a solution to this situation needs to be found. Therefore, the design of the CDM has to prevent projects that lead to a net increase in emissions, whether that is in the same sector, in other sectors, in other regions of the same country, or in other countries.

The additionality criterion in its present state, despite being crucial to the environmental integrity of the CDM, can create adverse policy incentives to climate change mitigation. The potential of CDM projects to generate much-needed investment flows into a host country has led some developing countries to back off from implementing more progressive energy or climate policies and the respective legislation needed. These policies and laws, if integrated into the baseline, would disqualify CDM projects that aim at meeting these new standards or thresholds because they no longer would be additional.¹⁹

In order to promote environmental integrity while encouraging progressive climate policies in these countries, a solution to, and safeguard against, this disturbing situation must be found within the climate regime.

CONTRIBUTION TO SUSTAINABLE DEVELOPMENT

The contribution of the CDM to sustainable development needs to be seen in terms of host country development, as expressed as one of the CDM goals mentioned above. Given the reference to the objective of the Convention and the role that climate change mitigation itself plays in sustainable development,²⁰ any assessment of the CDM's contribution must also recognize the wider role projects and the mechanism itself can play as catalysts for sustainable development of host States.²¹

CDM's contribution to sustainable development was subject to considerable debate during the negotiations of the Kyoto Protocol and the Marrakesh Accords and is under improvement still.²² In particular, host countries have been concerned about their sovereignty and largely unwilling to accept externally determined sustainable development priorities imposed on them.²³ This led to only marginal references to sustainable development in the Marrakesh Accords, which leave the meaning of "sustainable development" undefined. Rather, under the climate regime, it remains the host country's sovereign prerogative to determine whether a particular CDM project helps it achieve this goal.²⁴ Thus, relatively little is achieved in terms of affecting the growth pattern of developing countries.

A project is, in the absence of any alternative, considered to contribute to sustainable development if it is congruent with existing national development policies.²⁵ This "subjective" approach to sustainable development translates into curtailing and challenging the potential of the CDM. Though, there are a few concerns.

First, designing the CDM and meeting CDM project eligibility requirements present significant challenges because host countries have different economic conditions, natural resources, and development priorities. Thus, they have different perceptions about what is required to achieve sustainable development. Selecting sustainable development criteria and assessing the sustainable development impact can therefore differ significantly from one host country to another.

Despite several ideas about quality standards or indicators of sustainable development,²⁶ which provide some guidance on what should be taken into account, in the end, it is currently the host country's sovereign decision to ascertain whether a CDM project activity promotes its sustainable development targets.²⁷

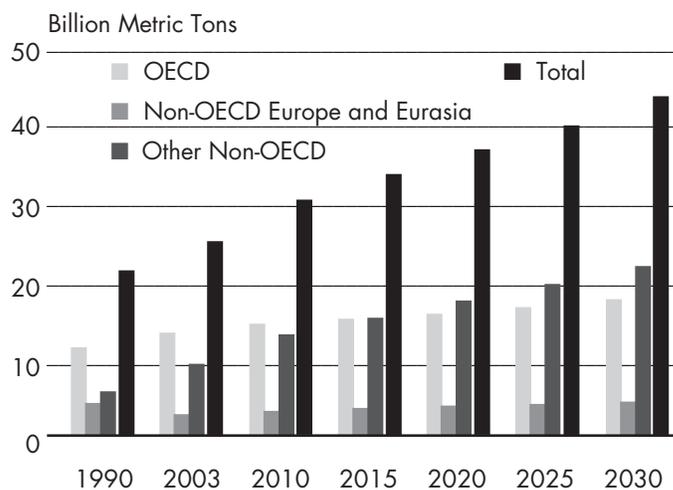
Therefore, the Designated National Authorities ("DNAs") in developing countries are tasked with issuing a Letter of Approval attesting to the project's contribution to their countries' sustainable development.²⁸ A CDM project can only be registered if such affirmation is provided to the CDM Executive Board. This leads to uncertainty and creates a disincentive for investment decisions.

Second, while there is, without a doubt, a strong potential for synergies between addressing environmental problems and national development goals,²⁹ there is also the danger that accepting congruency with existing development policies may not lead to a change of benefits to sustainable development since most existing national development policies lead to increasing GHG emissions.³⁰ Thus, the congruency requirement is not a high threshold, if any at all, in terms of sustainable development.³¹

Which Path to Follow?

From the point of sustainable development, a low energy path is, most likely, the optimal way.³² However, most development paths are likely to lead to increasing energy demands and depend on the availability of energy resources to meet these demands. It is unrealistic to assume that developing countries, or developed countries for that matter, will in the near future change to development strategies based on constant or declining levels of energy consumption. Energy is fundamental to advancing the economic and social dimensions of sustainable development.³³ However, sustainable development requires that, different from the scenario outlined in Figure 1, meeting increasing energy demand must not go along with increasing CO₂ emissions.

FIGURE 1: ENERGY-RELATED CO₂ EMISSIONS³⁴



In 1987, the World Commission of Environment and Development ("WCED") noted that it is essential that demands be met by energy sources that are dependable, safe, and environmentally sound.³⁵ In particular the latter, but arguably all three criteria for such "sustainable energy supply," require the decoupling of energy supply from increasing greenhouse gas emissions.

Achieving sustainable development in developing, and developed, countries, thus depends on more efficient energy use,

reduction of energy consumption, and, importantly, the decarbonisation of their economies. Unless the impact of the CDM spurs climate-friendly policies in developing countries, it will promote only one of the CDM's triple goals: the cost effective compliance of Annex I countries with their emission reduction commitments. However, it will not contribute to the ultimate objective of the UNFCCC, as it would not assist non-Annex I Parties in contributing to stabilizing GHG concentrations, nor contribute to the sustainable development of non-Annex I Parties in any meaningful way.

The question is whether developing countries should be accorded a privileged position when considering their sustainable development path. The WCED, in promoting the transition to a sustainable energy era, suggested that traditional fossil fuel use should be accepted in developing countries in order to realize their growth potential, while developed countries should seek to limit their uses of fossil fuel.³⁶ This recommendation is problematic. Sustainable development does not require increased fossil fuel consumption in developing countries. What it requires are equal development opportunities, however, these depend on the availability of energy resources in general, and not only fossil fuels. To grant developing countries a preferential "right" to use fossil fuels would also burden them with an obligation to reduce emissions. Rather, sustainable development requires avoiding such a burden from the outset.

Sustainable development in developing countries means enabling them to achieve higher levels of economic development with much reduced levels of greenhouse gas emissions and environmental damage. Copying the negative example of industrialized nations is certainly not sustainable.

Former UN Secretary-General Kofi Annan pointed out the inconvenient truth that, "energy security cannot be achieved without recognition of the environmental consequences of energy consumption, 'especially our currently overwhelming and deeply entrenched reliance on fossil fuels.'"³⁷ He said "the need to increase energy supplies in order to fight poverty could entail a vicious circle but added that this does not need to happen" because energy supplies do not depend on fossil fuels only.³⁸

In order to move toward sustainable development, developing countries also must systematically decrease the carbon intensity of their economic development through renewable energy systems, enhanced energy efficiency, and introduction of clean technologies, with the financial and technological assistance of industrialized countries. Thus, with respect to developing countries, the purpose of the CDM can be understood as assisting in the transformation of their economies. Therefore, the CDM is a crucially important global financial vehicle to catalyze national transitions toward sustainable development in host countries

by increasing "green investment" flows into energy supplies, transportation, and other industrial sectors.³⁹ In this sense, it is evident, as the acting head of the UN Climate Change Secretariat stated, "that the Kyoto Protocol is making a significant contribution towards sustainable development of developing countries."⁴⁰

Reality

The reality of CDM projects has so far been quite different from their initial conception.⁴¹ As has been noted, almost all proposed and approved projects to date have primarily focused on maximizing the generation of CERs instead of focusing on sustainable development.⁴² Thus, three contentious issues related to carbon dioxide capture and storage ("CCS"), HFC-23 projects, and forest conservation, arose.⁴³

First, including CCS projects aimed at capturing CO₂ emissions from industrial sources and subsequently storing the gas underground or in the sub-seabed of the oceans in the scope of the CDM raises not only complicated technological questions with regard to ensuring permanence and monitoring, but also legal questions as to whether the injection of CO₂

in geological formations should count as a non-emission, emission reduction, or carbon sequestration.⁴⁴ It also raises more fundamental points as to the contribution to sustainable development of such projects. Critics allege that this kind of technological advance channels substantial research and development into end-of-pipe technological fixes without contributing to long-term benefits to low-carbon intensive technological development. Though in fact, it might actually delay the transition from fossil fuels to more sustainable energy systems.⁴⁵ The Member States of the Kyoto Protocol confirmed that

carbon dioxide capture and storage in geological formations should lead to the transfer of environmentally safe and sound technology and know-how, Noting that the Intergovernmental Panel on Climate Change special report on carbon dioxide capture and storage provides a comprehensive assessment of the scientific, technical, environmental, economic and social aspects of carbon dioxide capture and storage technologies as mitigation options.⁴⁶

However, it was also recognized that "there remain a number of unresolved technical, methodological, legal and policy issues relating to carbon dioxide capture and storage activities under the clean development mechanism" and "that there is a need for capacity-building on carbon dioxide capture and storage technologies and their applications."⁴⁷ It is therefore timely and necessary to place a wider assessment of CCS and sustainable development on the research agendas.

Second, another challenge to the promotion of sustainable development by the CDM concerns the proposed inclusion of

The reality of CDM projects has so far been quite different from their initial conception.

HFC-23 projects. HFC-23, a greenhouse gas listed in Annex A of the Kyoto Protocol, is a by-product in the production of Hydrochlorofluorocarbons (HCFC-22), an ozone-depleting gas regulated under the Montreal Protocol. Incineration of HFC-23 at existing production sites is already an accepted and practiced CDM project, generating low cost CERs (\$0.50 per tonne of CO₂ equiv.). Expanding the scope of CDM projects to new incineration sites could create the perverse incentive to increase the production of HCFC-22 to generate larger amounts of HFC-23. Sustainable development is further undermined by the fact that HFC-23 projects provide no technology transfer to developing countries and the low cost CERs from these projects could actually lead to outpacing other high-quality projects. Again, no final decision has been taken on this issue and the MOP1 asked the Subsidiary Body for Scientific and Technological Advice (“SBSTA”) for further elaborations.⁴⁸ Also, it is recommended that the discussions around this issue seriously consider the impacts on sustainable development due to the extension of such projects.

Third, one of the major omissions of the current design of the climate regime is a plan for reducing emissions from deforestation in developing countries and accounting for forest conservation activities. A proposal by Papua New Guinea and Costa Rica submitted to the 11th Conference of Parties (“COP”)/MOP1 in 2005 seeks to include forest conservation activities under the CDM or, alternatively, suggests elaborating an optional Protocol to the Climate Convention. Yet, at COP13/MOP3 held in Bali, there was still no final decision made regarding the role for avoided deforestation in the CDM. Thus, forest conservation, avoided deforestation, and accounting for both will be dealt with as part of the post-2012 package. Still, the inclusion of forest conservation projects could bring about the win-win situation envisaged by sustainable development, where economic value is attached to the protection of ecological assets. For developing countries, CDM benefits from “avoided deforestation” could bring about social and economic improvements via the transfer of environmentally sound technologies, in this case ones not directly linked to the project, as well as wider environmental benefits, such as biodiversity protection.

Safeguards

Sustainable development must be clearly defined, and seriously and actively pursued through the CDM. Ensuring the integrity of the CDM with regard to the sustainable development paths of host countries, demands strong safeguards. However, no such safeguards exist for ensuring sustainable development. Despite the above-proposed relatively straightforward definition of sustainable development in a climate context, for example, where economic growth is decoupled from GHG emission growth, the climate regime has yet to embrace this understanding.

To meet the requirements of sustainability, a CDM project with adverse trade ramifications will need to demonstrate an ability to overcome the still existing obstacles and shortcomings of the Kyoto/Marrakech system.

The legal review of CDM projects, whether it takes place under the compliance system of the Kyoto Protocol,⁴⁹ an international arbitral tribunal,⁵⁰ or the WTO Dispute System, will supposedly establish a definition of sustainable development requirements under the CDM. Regardless, it is important that climate law and practice construe a coherent understanding of sustainable development. While searching for the conceptualization and definition of sustainable development as an external tributary into international climate law, the converse normative flow might be at least as valid and probable, and perhaps more significant in the long run.⁵¹

If sustainable development is to be seriously pursued, CDM projects will need to go beyond more immediate impacts and provide “long-term benefits” as required by Article 12(5) of the Kyoto Protocol. However, those immediate benefits are equally necessary. No long-term benefits can be attributed to the CDM if it does not lead to real, measurable, and additional emission reductions.⁵²

The benefits generated by CDM projects may lessen reliance on carbon-intensive development. An analysis of sustainable development benefits accruing from CDM projects has identified the following advantageous impacts: direct financial incentives for proving the competitiveness of new technologies for energy reduction, renewable energy generation, and increase of energy efficiency, such as sustainable energy technologies; development of supporting policy initiatives; increased understanding and acceptance of the importance and application of sustainable energy technologies; dissemination of best-practice techniques; strengthening of local institutional, financial and technological capacity; increased and sustainable foreign investment; and increased access to sustainable energy services.⁵³

Arguably, the most sophisticated analytical methodology for identifying sustainable CDM projects is the proposed Gold Standard, though other approaches exist.⁵⁴ The Gold Standard aims to ensure that CDM projects deliver real emissions reductions and clear contributions to sustainable development. The criteria established are divided into three screens: the project type, additionality and baselines, and sustainable development. In regards to the latter particularly, the Gold Standard creates a sustainability matrix, in addition to an environmental impact assessment and stakeholder consultation. The matrix aims at assessing a project’s contribution to sustainable development based on its environmental, social, and economic impacts.⁵⁵ The key variables are assessed on the basis of on-site measurement, existing data, and stakeholder consultation, and can score nega-

*The benefits generated
by CDM projects may
lessen reliance on carbon-
intensive development.*

tive or positive. If the overall contribution is positive and non-negative in all key components, then a project is considered as contributing to sustainable development.

While the Gold Standard certainly is laudable, its success will depend on its acceptance by project developers, host and investor countries, and the multilateral climate regime, particularly the Executive Board. So far, it has acquired a closer and more specific understanding of sustainable development. The Gold Standard, together with other approaches to identifying “sustainable” CDM projects,⁵⁶ helps to clarify the substance of sustainable development not only in the particular context of CDM projects, but also beyond this mechanism. The identified criteria and components, if they are accepted and used to guide further project development, would reflect the understanding of the international community, both North and South, of sustainable development. This understanding could be decisive if compliance with WTO norms were at stake.

PROCEDURALS

Additionally, procedural safeguards of direct contribution of CDM projects to sustainable development in developing countries, more specific requirements on sustainable impact assessment, public consultation and participation, and benefit sharing⁵⁷ have yet to be included in the CDM regime.⁵⁸

Impact Assessment

As with the response to sustainable development indicators, the idea of a mandatory environmental and sustainable impact assessment for all CDM projects was seen as an infringement on the sovereignty of potential host States. As a result, the final language of the agreement is weak, requiring nothing more than an analysis of environmental impacts only if the host country makes it mandatory for the project to be approved.⁵⁹ The CDM Modalities and Procedures do not provide for a situation where the host country does not have any laws on environmental impact assessment. However, if stakeholders have concerns about the local environment or the social impact of a CDM project, then the project should be evaluated under the highest international environmental and social assessment procedures and standards.⁶⁰

However, the more stringent the rules on environmental and sustainable impact assessment are, the more costly CDM projects might become. Since a host country benefits from a CDM project, the absence of harmonized international rules may create an incentive for the host country to refrain from insisting on a thorough impact assessment, in order to make its own market attractive for CDM projects. “The CDM’s geographical flexibility,” warn Meijer and Werksman, “should not become a means of channelling projects to host countries with the lowest environmental standard.”⁶¹

Internationally harmonized rules on environmental and sustainable impact assessment of a CDM project would counter such a perverse incentive. In order for a CDM project to pass a sustainability test, they might, indeed, be necessary. Still, such a test would evaluate the circumstances of a particular CDM project. In this case, it needs to be shown that the environmental and sustainable impacts were thoroughly assessed.

Public Participation

Involvement of stakeholders, defined as “the public, including individuals, groups or communities affected or likely to be affected” by the CDM project,⁶² gives an opportunity to a wider circle to comment on CDM projects at various stages of the project cycle. The modalities of the CDM require certain types of information to be made public. Public participation could lead to benefits in regards to environmental integrity and sustainable development. Local communities and NGOs could influence project design as their knowledge of local conditions might be of particular value, thus making it easier for project developers to recognize community needs and gain public support, and to avoid delays, financial risks, local unrest, or legal action.

So far, stakeholder involvement requirements are only of a procedural character. Comments from the public must be invited and compiled and form an official input as part of the validation and registration process of a project. However, the concerns of stakeholders are not required to be substantially reflected in the project development. Again, these restrictions on direct public involvement resulted from the unwillingness of countries with different approaches to public participation to agree on harmonized standards.⁶³

However, the requirements of environmental integrity and sustainable development may demand a stronger commitment to stricter and harmonized standards for and more direct influence of public involvement.⁶⁴ The reference to international standards for public participation would prevent a “race to the bottom” toward countries with low or no regulation on public involvement.

IN SUM

Despite the fact that it is the stated goal of the CDM to achieve the ultimate objective of the UNFCCC and to assist non-Annex I countries in developing sustainability, the present regulatory framework remains somewhat rudimentary in setting up and standardizing essential substantial and procedural requirements for meeting these goals. Therefore, the rather pragmatic and fragmented approach taken so far to ensure the CDM’s environmental and sustainable integrity will need to be replaced by a stronger, harmonized regulatory framework.

CONCLUSION

Whether the CDM will provide a basis for future multilateral climate policy depends on the willingness of nations to commit themselves to the deeper emission cuts that, as scientific evidence suggests, are necessary.⁶⁵ Discussions about the CDM during the negotiations of COP13/MOP3 in Bali in December 2007 signified the considerable potential of the CDM to bring about consensus on the terms of global climate policy at some point in the future.

UNFCCC Executive Secretary, Yvo de Boer, noted at this event:

The CDM has been the focus of intense scrutiny, and rightly so, by those who wish to ensure the mechanism’s environmental integrity and contribution to sustainable development, as well by those who want

to ensure cost effectiveness. The conclusion that we can draw, looking back from this milestone, is that the CDM is delivering what it was meant to deliver—emission reductions and development. What’s more, it has shown that it can evolve, adapt and improve.⁶⁶

This positive conclusion will also be subject to scrutiny and criticism in the future. Despite the achievements, much still needs to be done in order to secure sound environmental outcomes of the CDM.

Whether the CDM is going to play an important role in any post-2012 agreement will depend on the CDM’s ability to meet its triple goals: to assist non-Annex I Parties in achieving sustainable development, to contribute to the ultimate objective of the Convention, and to help Parties included in Annex I achieve compliance with their quantified emission limitation and reduction commitments.⁶⁷

Still, the increasing interest in the CDM has spread to non-Kyoto countries as well. The Regional Greenhouse Gas Initiative of seven U.S. states, for example, envisages a cap-and-trade system to be in place by 2009. The plants covered by the scheme will presumably be allowed to use “offset credits,” emissions reductions achieved outside the electricity sector. Such credits could be “born in the USA” following similar rules as those from projects generating emissions reduction under the CDM. However, the plan envisages that under certain conditions, they may also stem directly from CDM projects.

The implications for the environmental integrity of the CDM should non-Kyoto Parties be allowed to receive CERs are yet to be assessed. While the interest in the CDM is steadily increasing, so are the challenges to ensuring its environmental integrity and its contribution to sustainable development.



Endnotes: Is the Clean Development Mechanism Sustainable?

¹ Kyoto Protocol to the United Nations Framework Convention on Climate Change art.12, Dec. 11, 1997, 37 I.L.M. 22 [hereinafter Kyoto Protocol].

² Kyoto Protocol, *id.*

³ CDM Statistics—Issuance, United Nations Framework Convention on Climate Change website, <http://cdm.unfccc.int/Statistics/Issuance/CERsRequestedIssuedBarChart.html> (last visited Feb. 16, 2008).

⁴ CDM Statistics, United Nations Framework Convention on Climate Change, <http://cdm.unfccc.int/Statistics/index.html> [hereinafter CDM Statistics] (last visited Feb. 16, 2008).

⁵ Press Release, Point Carbon, Buyers seek to insure against CDM project liability (Jan. 17, 2008), available at www.pointcarbon.com (access restricted to paying subscribers).

⁶ Erstein Meijer & Jacob Werksman, *Keeping it Clean—Safeguarding the Environmental Integrity of the CDM*, in LEGAL ASPECTS OF IMPLEMENTING THE KYOTO PROTOCOL MECHANISMS MAKING KYOTO WORK 192 (David Freestone & Charlotte Streck eds. 2005).

⁷ Axel Michaelowa, *Creating the Foundations for Host Country Participation in the CDM: Experiences and Challenges in CDM Capacity Building*, in CLIMATE CHANGE AND CARBON MARKETS: A HANDBOOK OF EMISSION REDUCTION MECHANISMS 305 (Farhana Yamin ed., Earthscan 2005), available at http://www.hm-treasury.gov.uk/media/C/A/Michaelowa_Creating_the_foundations.pdf (last visited Feb. 25, 2008).

⁸ United Nations Framework Convention on Climate Change art. 2, May 9, 1992, 1771 U.N.T.S. 107 [hereinafter UNFCCC].

⁹ This applies to the CDM as well as to the other flexibility mechanisms: international emissions trading and joint implementation.

¹⁰ UNFCCC, *Report of the Conference of the Parties serving as the meeting of the parties to the Kyoto Protocol on its first session, held at Montreal from 28 November to 10 December 2005* [Montreal COP 2005], *Principle, Nature, and Scope of the Mechanisms Pursuant to Article 6, 12, and 17 of the Kyoto Protocol*, FCCC/KP/CMP/2005/8/Add.1, 4 (Mar. 30, 2006), available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a01.pdf> (last visited Feb. 18, 2008) [hereinafter UNFCCC Montreal COP 2005].

¹¹ Kyoto Protocol, *supra* note 1, art. 12(2).

¹² Carbon Sequestration, CDM Investment Newsletter (BEA International & the Climate Business Network), Nr.3/2004, available at http://www.joanneum.at/encofor/publication/CBNet_newsletter_3_04_with_ENCOFOR_policy_brief.pdf (last visited Feb. 18, 2008).

¹³ See Meijer & Werksman, *supra* note 6, at 197-203 (explaining that other “safeguards” for environmental integrity are the determination of baselines,

their methodology and modalities to avoid “leakage,” the increase of GHG emissions elsewhere).

¹⁴ Kyoto Protocol, *supra* note 1, art. 12(5)(c).

¹⁵ Mark Kenber, *The Clean Development Mechanism: A Tool for Promoting Long-Term Climate Protection and Sustainable Development?*, in CLIMATE CHANGE AND CARBON MARKETS: A HANDBOOK OF EMISSION REDUCTION MECHANISMS 263, 269 (Farhana Yamin ed., Earthscan 2005).

¹⁶ UNFCCC, Montreal COP 2005, Implementation of Article 6 of the Kyoto Protocol, FCCC/KP/CMP/2005/8/Add.2, para. 4(a) (Mar. 30, 2006), available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf> (last visited Feb. 25, 2008).

¹⁷ See, e.g., Axel Michaelowa, *Untergräbt der Clean Development Mechanism den internationalen Klimaschutz?*, Die Volkswirtschaft. Das Magazin für Wirtschaftspolitik (Aug. 2007).

¹⁸ UNFCCC, *Report of the Conference of the Parties on its Seventh Session, Held at Marrakesh from 29 October to November 2001* [Marrakesh Accords], *Modalities and procedures for a clean development mechanism as defined in Article 12 of the Kyoto Protocol*, Decision 17/CP.7, annex, paras. 51, 52 (Jan. 21, 2002), available at <http://unfccc.int/resource/docs/cop7/13a02.pdf> (last visited Feb. 18, 2008) [hereinafter UNFCCC Decision 17/CP.7].

¹⁹ See, e.g., Christina Figueres, *Sectoral CDM: Opening the CDM to the Yet Unrealized Goal of Sustainable Development*, 2 MCGILL INT’L J. OF SUSTAINABLE DEV. L. & POL’Y 1, 5-26 (2006). One should, however, bear in mind that such safeguards might increase the cost of CDM projects. In this context, it has to be remembered that CDM was included to provide Annex I countries with a cost-effective means of complying with their obligations. If the cost of reducing GHG emission in developing countries grows, the incentive to ‘cheaply mitigate abroad,’ which was criticized by a significant number of Member States, might sharply diminish. While domestic emissions reductions by Annex I Parties are surely positive, the fading financial stream into developing countries reduces their capacity to meet their own proactive policies and laws. Increasing emissions reduction costs in developing countries brings CDM into disrepute, thus additional measures must be introduced to help developing countries with their financial and technical needs.

²⁰ Intergovernmental Panel on Climate Change, *Fourth Assessment Report, Climate Change 2007: Mitigation of Climate Change*, ch. 12, Sustainable Development and Mitigation (2007), available at <http://www.ipcc.ch/ipccreports/ar4-wg3.htm> (last visited Feb. 18, 2008).

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INTERNATIONAL TRADE LAW AND THE “CARBON LEAKAGE” PROBLEM:

ARE UNILATERAL U.S. IMPORT RESTRICTIONS THE SOLUTION?

by Bernd G. Janzen*

INTRODUCTION

At the December 2007 United Nations Climate Change Conference in Bali, Indonesia, negotiators overcame tremendous differences to agree on a “Bali Roadmap” process intended to determine a successor to the Kyoto Protocol to the United Nations Framework Convention on Climate Change (“UNFCCC”),¹ whose current commitments to reduce global greenhouse gas (“GHG”) emissions expire in 2012.² While the United States rejected the Kyoto Protocol,³ there appear to be decent prospects that it will join its post-2012 successor.⁴

Among other ambitious goals, the Bali Roadmap process, through the “Bali Action Plan” agreement, calls for the development of both national and international measures to mitigate climate change, based on a “shared vision for long-term cooperative action.”⁵ However, reflecting a deep rift between developed and developing countries, the Bali Action Plan prescribes “common but differentiated responsibilities”⁶ in which developed countries commit to quantified and verifiable GHG emission reductions, but developing countries are only required to contribute “appropriate mitigation actions . . . in the context of sustainable development.”⁷ In short, under the Bali Roadmap, only developed countries must actually reduce GHG emissions.

This core doctrine of “common but differentiated responsibilities” in the Bali Roadmap may have been politically indispensable to reaching agreement in Bali, but it has substantial complicating implications for international trade in goods and the competitiveness of U.S. industries. The problem, in a phrase, is “carbon leakage.”⁸ If developed economies like the United States and EU impose higher costs on carbon dioxide (“CO₂”) and other GHG emissions (the economic consequence of setting and tightening caps on such emissions) than do developing countries, one result will be an incentive to shift GHG-intensive

manufacturing from the former to the latter. This could lead to the reduction of such production in developed countries and an increase in exports of GHG-intensive goods from developing to developed countries.⁹ In the context of China’s massive and growing trade surpluses and its emergence as the world’s largest emitter of CO₂,¹⁰ lawmakers in the United States and other developed countries face a tricky challenge—how to proceed

with the urgent task of imposing meaningful national curbs on GHG emissions while ensuring that domestic industries are not disadvantaged by imports produced pursuant to less onerous emissions requirements.

In the United States, unilateral trade restrictions appear to be emerging as a mechanism of choice as Congress evaluates its options for legislating a solution to the carbon leakage problem. However, it is far from clear if the trade restrictions under consideration comply or conflict with current global trading rules under the World Trade Organization (“WTO”). Such restrictions also do not appear to mesh well with U.S. trade policy, which generally favors trade liberalization. Uni-

laterally imposed national trade restrictions would also, at first blush, appear inconsistent with the goal established in the Bali Action Plan of a globally coordinated approach to the reduction of greenhouse gas emissions. This Article examines the most visible proposed legislative solution to carbon leakage currently under consideration in the United States in light of WTO rules, U.S. trade policy, and the multilateral goals espoused in the Bali Action Plan. This Article also proposes that current U.S. trade remedy laws provide a useful analogy for understanding and addressing the concerns of domestic manufacturing industries as they grapple with the carbon leakage problem.

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* Bernd G. Janzen is Counsel in the International Trade Group at Akin Gump Strauss Hauer & Feld LLP in Washington, D.C.

REGULATING U.S. IMPORTS TO ENSURE FAIR COMPETITION

Of the various recent legislative proposals that would reduce U.S. emissions of GHGs, the most prominent is the America's Climate Security Act of 2007 ("ACSA"), introduced by Senators Joe Lieberman (D-CT) and John Warner (R-VA) on October 18, 2007.¹¹ ACSA would establish a national emissions cap on six GHGs, including CO₂, which would decline from 2012 through 2050,¹² and would institute mechanisms to allocate emissions allowances to a range of covered U.S. GHG-emitting industries.¹³ Senators Lieberman and Warner introduced ACSA in the Senate two months prior to the release of the Bali Action Plan, and the ACSA is not expressly tied to that multilateral process. However, both measures are a clear reflection of the strong political will in the United States and in many other countries to move quickly and in a globally coordinated fashion to reduce GHG emissions and stave off the worst expected effects of climate change.

Recognizing the adverse competitive effects that could result to U.S. manufacturing industries competing against foreign industries not subject to such measures—i.e., the carbon leakage problem—ACSA would require the Administration to urge other countries to adopt comparable measures to reduce GHG emissions.¹⁴ Otherwise, U.S. industries would have systemically higher compliance costs than their foreign competitors—and such an imbalance would only increase over time as U.S. emissions

caps decline. But also recognizing that a globally coordinated approach to reducing GHG emissions may or may not occur, ACSA would, as of 2020, require importers of GHG-intensive products to declare to U.S. Customs and Border Protection ("CBP") either that: (1) the imported goods are covered by special international allowances created under ACSA,¹⁵ or (2) the exporting country is one deemed under ACSA to have taken measures to reduce GHG emissions comparable to those taken by the United States.¹⁶ The import provisions expressly cover GHG-intensive manufactured goods such as iron, steel, aluminum, cement, bulk glass, and paper, and would extend to any manufacturing production process that generates GHG emissions "comparable" to the expressly covered products.¹⁷ Thus, ACSA has the obvious potential to impose very substantial compliance costs on U.S. importers of a wide range of manufactured goods, and seems certain to alter the competitive balance between U.S. and foreign firms supplying ACSA-covered goods

to the U.S. market. While these added import compliance costs (in essence, constituting a trade restriction) would be justified from the U.S. perspective as attempting to restore the competitive balance of U.S. industries harmed by imports from countries with less stringent emissions restrictions, it seems unlikely that U.S. trading partners would willingly accept such unilateral import restrictions.

ACSA's import restrictions are not the only type of mechanism under consideration as the U.S. Congress examines how to address competitive disadvantages to U.S. industries resulting from the carbon leakage problem. The U.S. House of Representatives Committee on Energy and Commerce identified two other possible mechanisms to address the competitiveness concerns for U.S. industry associated with carbon leakage in a

widely cited January 2008 White Paper.¹⁸ One is the adoption of carbon intensity standards for energy-intensive products, which would apply to all such products sold in the United States regardless of their origin.¹⁹ Fees would presumably be imposed on products that do not meet those carbon intensity standards, to compel the sale in the United States of only those products that do meet those standards.²⁰ The American Iron and Steel Institute and the Steel Manufacturers Association are major proponents of carbon intensity standards, and have criticized the proposed ACSA import mechanism for, among other things, encouraging foreign governments to provide subsidies to their exporters to the United States of greenhouse gas-intensive goods.²¹

The third possible option for addressing carbon leakage identified in the White Paper would make foreign countries' access to U.S. carbon markets contingent on their imposition of GHG emissions restrictions comparable to those adopted in the United States.²² Such incentives could take several forms, such as more generous terms of access for countries that agree more quickly to emissions caps comparable to those imposed in the United States.²³ However, import restrictions along the lines of those proposed by ACSA, while contentious, are generally seen at this point as having the best chances of passage in the U.S. Congress.

The EU is also contemplating unilateral trade measures that could restrict imports as part of its ambitious drive to reduce carbon emissions across a wide range of industries by twenty percent by 2020.²⁴ While no such import measure is currently in effect, EU leaders such as French President Nicolas Sarkozy and European Commission President Jose Manuel Barroso have

The EU is also contemplating unilateral trade measures that could restrict imports as part of its ambitious drive to reduce carbon emissions across a wide range of industries by twenty percent by 2020.

repeatedly referred to the possibility of imposing a carbon tax or allowance requirement (similar to the scheme contemplated by ACSA) on imports from countries not in compliance with Kyoto Protocol emission reduction requirements (i.e., the United States).²⁵ These suggestions have drawn strong criticism from U.S. trade officials, who warn that such proposals could facilitate WTO-inconsistent trade protectionism under the guise of environmental protection.²⁶

Notably, the recent proposed directives of the European Commission that form the centerpiece of the ambitious EU climate change package do not, with certain limited exceptions, impose restrictions on imports.²⁷ However, the economic burden of the carbon leakage problem is potentially just as acute for EU industries as it is for U.S. industries. It therefore seems inevitable that the EU will eventually need to contemplate some scheme akin to the ACSA import restrictions to address the competitiveness concerns of its carbon-intensive industries as emissions restrictions begin to increase production costs. Indeed, European steelmakers recently threatened to delay expansion plans in Europe pending EU adoption of appropriate measures to account for the competitive impact of carbon-intensive imports.²⁸

TESTING ACSA'S IMPORT PROVISIONS UNDER THE WTO AND U.S. TRADE POLICY

The trade provisions of ACSA clearly raise the question of U.S. compliance with obligations under the WTO. The question of WTO compliance has been at the forefront of Congress' consideration of ACSA's import measures.²⁹ The debate potentially implicates many aspects of the WTO Agreements, but centers around two core concepts: (1) the "national treatment" principle of Article III of the General Agreement on Tariffs and Trade ("GATT"), which, in essence, obligates WTO Members to ensure that imported goods are subjected to regulatory and tax treatment no more burdensome than the treatment to which the same goods, produced domestically, are subjected;³⁰ and (2) the GATT Article XX defense, which allows WTO Members to take discriminatory action against imports where "necessary to protect human, animal or plant life or health"—but *only* where such action does not constitute "arbitrary or unjustifiable discrimination"³¹ or represent a disguised trade restriction.³² GATT Article XX, the plain language of which does not seem to perfectly capture the concerns surrounding GHG emissions, is as close as the WTO Agreements come to permitting trade restrictions based on climate change mitigation.³³ It remains unclear—and the source of considerable concern—whether U.S. laws such as ACSA would be vulnerable to attack from WTO Members alleging that ACSA discriminates against their exports to the United States, but that it does not meet the narrow GATT Article XX tests permitting such trade discrimination.³⁴

In the most recent relevant case, involving a Brazilian ban on imports of retreaded tires, the WTO Appellate Body found that, while Brazil's import ban constituted a permissible means of protecting human health, the fact that Brazil also permitted imports of retreaded tires from neighboring MERCOSUR countries resulted in trade discrimination not rationally connected to the human health objective of the import ban.³⁵ Because of this

absence of a rational connection between the objective of the import ban and the manner in which it was applied, the import ban did not satisfy the narrow GATT Article XX test. This most recent WTO decision—in particular the rational connection test applied by the WTO Appellate Body—provides an important roadmap for U.S. lawmakers crafting climate change legislation, but by no means answers whether ACSA or other such legislation, once implemented, would pass the GATT Article XX test if challenged. As noted in the congressional White Paper discussed above, "while Congress has control over which trade-related measure to include in a climate bill, the determination of such a provision's legitimacy under WTO rules is out of U.S. hands."³⁶

The retaliation issue matters, because a loss at the WTO could mean the conferral on U.S. trading partners of substantial retaliation rights. Previously stung by WTO losses providing substantial retaliation rights to the complaining WTO Members,³⁷ U.S. law- and policy-makers are justifiably nervous about the possible outcome of a WTO challenge to ACSA's import provisions.

ACSA's import measures also are likely to re-activate the longstanding debate about whether the WTO Agreements prohibit or allow trade regulation based on so-called processes and production methods ("PPMs"). The basic terms of the debate can be summarized in the following question: May WTO Members regulate imports based on the way a good is made (i.e., PPMs), or must WTO Members base such regulation on the physical attributes of the good in the condition as imported? It is easy to see why some might characterize ACSA's import provisions as PPMs, as their application arguably hinges on the "emissions footprint" of the imported good, rather than its physical characteristics at the time the good crosses the border.

The WTO jurisprudence to date does not provide a definitive answer on the WTO-consistency of PPMs, and WTO experts are divided on the question. One recent commentator assembled a long list of statements supporting the view that PPMs can never (or almost never) be justified under WTO rules, and then proceeded to "debunk the myth of illegality."³⁸ The most commonly cited standards in WTO case law for analyzing PPMs are in the multiple decisions in the *Shrimp-Turtle Case*, in which India, Malaysia, Pakistan, and Thailand challenged a U.S. ban on the importation of shrimp caught in a manner that adversely affected threatened sea turtles. These complaining WTO Members alleged, *inter alia*, that the ban violated the U.S. obligation under the WTO to ensure non-discriminatory treatment of imports from these countries.³⁹ The U.S. defense turned on the application of GATT Article XX, described above.

One aspect of the WTO Appellate Body's ultimate decision in the *Shrimp-Turtle Case* could be central to any future case challenging ACSA's import provisions as WTO-inconsistent PPMs. In upholding a modified version of the U.S. import ban as consistent with GATT Article XX, the WTO Appellate Body concluded that a WTO Member can show that an import restriction does not constitute "arbitrary or unjustifiable discrimination" for purposes of GATT Article XX if that WTO Member

attempts to negotiate an international agreement ensuring equal treatment of all affected trading partners. As the WTO Appellate Body explained, the key is not whether such an agreement is actually reached, but whether the WTO Member asserting a GATT Article XX defense has made a “serious, good faith effort” to reach such agreement.⁴⁰

Given the ongoing interplay of U.S. legislative efforts to impose a national scheme to limit GHG emissions and the international UNFCCC process, it is too soon to say if the United States would be able to rely on the “international negotiation” defense of the *Shrimp-Turtle Case*. Notably, ACSA section 6003 would require the United States to engage in international negotiations with the objective of coordinating global GHG emissions reductions in a manner consistent with the goals of ACSA. However, at this point we can only speculate if ACSA will even be enacted into law.

The Bush Administration also expressed concern that import restrictions like those proposed in ACSA pose trade policy problems beyond possible inconsistency with U.S. WTO obligations. As recently expressed by U.S. Trade Representative Susan C. Schwab, unilateral U.S. trade restrictions designed to compel reductions in foreign emissions of GHGs are “a blunt and imprecise instrument of fear” that could poison commercial relations and trigger retaliatory measures by U.S. trading partners.⁴¹ Such mirror actions could quickly harm U.S. exports, and could take years to resolve if challenged at the WTO.⁴²

Rather, the consistent message from U.S. Trade Representative Schwab has been that, instead of crafting import restrictions that will somehow ensure a competitive, level playing field as countries commit to GHG reductions, the priority of the United States should be to harness trade liberalization to enhance the global distribution of goods and services that contribute to climate change mitigation. At the core of this effort are the ongoing WTO negotiations toward an Agreement on Trade in Environmental Goods and Services (“EGSA”).⁴³ The mandate for these negotiations, set out in the 2001 WTO Doha Declaration,⁴⁴ is the “reduction or, as appropriate, elimination of tariff and non-tariff barriers to environmental goods and services.”⁴⁵ When originally conceived, this mandate did not expressly include climate change. Nor did the mandate provide any guidance on what goods and services should be deemed “environmental.” But the United States and many other WTO Members now view a multilateral EGSA as an important tool in combating climate change, and state that this effort complements the UNFCCC process. As recently explained by U.S. Trade Representative Schwab, the current framework for such an agreement, as jointly proposed by the United States and the EU, would increase global trade in climate-friendly technologies (such as wind turbines and photovoltaic solar panels) by as much as fourteen percent, thereby contributing significantly to global reductions in greenhouse gas emissions.⁴⁶

As of this writing, the Administration and Congress appear to be headed for a show-down this year on ACSA’s import provisions. As a practical matter, the debate seems likely to carry forward into a new Congress and Administration in 2009.

Notwithstanding the possibility of claims that ACSA’s carbon leakage provisions may violate U.S. WTO obligations and send signals to U.S. trading partners inconsistent with current U.S. trade policy, the carbon leakage provisions may also be viewed as consistent in spirit with long-accepted norms under U.S. trade remedy laws.

Like many WTO Members, the United States maintains antidumping and countervailing duty laws that permit domestic industries to petition the government (or allow the government on its own initiative) to impose import duties to redress injurious import practices. Under the U.S. antidumping law, the U.S. Department of Commerce (“DOC”) may order CBP to impose on imports antidumping duties in an amount equivalent to the difference between the actual import values, as adjusted under the statute, and their deemed “fair value.”⁴⁷ Similarly, under the U.S. countervailing duty law, DOC may impose duties to offset subsidies provided by foreign governments to the extent they confer an unfair benefit on imports and certain other conditions are satisfied.⁴⁸ These laws are expressly permitted by WTO rules,⁴⁹ and are widely seen as a necessary escape clause from the presumption of trade liberalization that permitted the WTO Agreements to be reached in the first place.⁵⁰

The trade-restrictive provisions of ACSA may be seen as expanding the universe of import practices that should be deemed “unfair” under U.S. law. As noted, international trade law, as reflected in both U.S. domestic law and the WTO system, recognizes that import pricing below certain levels (whether due to “dumping” by foreign exporters or subsidies provided by foreign governments) is a form of unfair trade that, when causing harm to domestic industries, may be redressed through import duties. This notion of unfair trade is based purely on how an imported product is *priced*. ACSA would arguably expand this accepted notion of unfair trade to take into account how imported products are *made*—specifically, the volume and nature of the GHGs associated with their manufacture. ACSA would, in essence, dictate that the price of U.S. imports reflects the externalized environmental costs of GHG emissions. Just as the U.S. antidumping law provides a remedy to domestic manufacturers that must compete against unfairly low-priced, or “dumped,” imports, ACSA would provide a remedy to domestic manufacturers that must compete against imports that were manufactured under less stringent GHG emissions standards—in other words, a remedy against a newly recognized form of environmental dumping.

However, unlike the U.S. antidumping and countervailing duty laws—which cover approximately one percent of the total value of U.S. imports—ACSA could potentially apply to a very substantial percentage of U.S. imports. As explained above, “covered goods” under ACSA include iron, steel, aluminum, cement, bulk glass, and paper, as well as many other unspecified manufactured goods accounting for “comparable” levels of greenhouse gas emissions.⁵¹ Thus, ACSA (or any comparable legislation to equalize the climate change impact of imports with domestically produced goods) could represent a major expan-

sion of the concept of “unfair trade.” Still, the core concept of ACSA’s trade provisions are analogous to U.S. trade remedy law in that their purpose is to equalize the competitive impact of imports with the same types of goods produced domestically through recognition of an “unfair” advantage conferred on the imports.

CONCLUSION

The political will to sharply reduce GHG emissions—at least in the United States and the EU—seems to be strong and intensifying. The major U.S. presidential candidates all support the implementation of a national cap-and-trade system to reduce greenhouse gases, and all support U.S. participation in the UNFCCC process. Senator Baucus has spoken of “the moral imperative to deal with climate change.”⁵² Further, the introduction of ACSA by Senators Lieberman and Warner signals a bipartisan consensus for ambitious action on climate change.

However, the “carbon leakage” problem that ACSA’s trade provisions attempt to address—a critical component of the bill from the perspective of U.S. GHG-emitting manufacturing industries—may also constitute a major hurdle to ACSA’s enactment into law. For one, there seems to be significant risk that ACSA’s trade provisions, if enacted, could trigger WTO complaints against the United States and, potentially, retaliatory action to the detriment of U.S. exporters. This risk is one reason the current Administration is wary of proposals to penalize importers of GHG-intensive goods, and is instead promoting other mechanisms, such as a multilateral EGSA, that would rely upon trade liberalization, rather than trade restriction, to combat climate change. However, these objections to ACSA’s trade provisions cannot be expected to lessen the concerns of U.S. GHG-intensive manufacturing industries which, absent such provisions, would likely face declining competitiveness vis-à-vis their foreign rivals not subject to GHG emissions restrictions of the same magnitude as imposed in the United States. These U.S. industries can be expected to press for equalizing measures,

akin to the trade remedy laws, to ensure “fair” competition with imported goods manufactured under less stringent GHG emissions standards.

The controversy surrounding ACSA’s trade provisions also underscores the imbalance between U.S. domestic and multilateral efforts to reduce GHG emissions. GHG emissions and climate change are a problem of the “global commons,” and therefore require a globally coordinated approach as embodied in the UNFCCC process and Bali Roadmap. Yet, as explained above, the Bali Action Plan does not expressly commit developing countries to undertake reduction in GHG emissions. In the face of this asymmetry of commitments between developed and developing countries, it is reasonable to expect the United States (and the EU) to explore domestic laws and other mechanisms that would unilaterally attempt to compel countries with less stringent GHG emissions standards to tighten them. That is what ACSA seeks to do—first through a mandate for the Executive Branch to negotiate a global agreement to reduce GHG emissions in a coordinated fashion, and second, through import requirements that would redress any competitive imbalance experienced by foreign manufacturing industries exporting to the United States.

It remains unclear how much of the burden developing countries will accept as the Bali Roadmap process produces a successor to the Kyoto Protocol (if it does). But it is clear that, the less they do, the greater will be the pressure on U.S. and EU lawmakers to ensure, through unilateral trade measures like ACSA’s import provisions, that their industries are protected from imports produced under less costly emissions standards. Political realism suggests that trade mechanisms will be tools of choice in this effort—whether or not they are found to comply with current WTO rules, the Administration’s trade policy preferences, or the “shared vision” principles espoused in the Bali Action Plan. 

Endnotes: International Trade Law

¹ As set forth in Article 2 of the UNFCCC, its purpose is:

[S]tabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.

United Nations Framework Convention on Climate Change art. 2, Mar. 21, 1994, available at <http://unfccc.int/resource/docs/convkp/conveng.pdf> (last visited Mar. 11, 2008). The United States signed the UNFCCC on June 12, 1992, and ratified it on October 15, 1992. United Nations, United Nations Framework Convention on Climate Change Status of Ratification website, http://unfccc.int/files/essential_background/convention/status_of_ratification/application/pdf/unfccc_conv_rat.pdf (last visited Mar. 11, 2008). The UNFCCC entered into force with respect to the United States on March 21, 1994, and currently has 192 signatories. *Id.*

The 1997 Kyoto Protocol expanded on the UNFCCC by obligating developed country signatories to stabilize greenhouse gas emissions, and entered into force on February 16, 2005. See United Nations, Kyoto Protocol website, http://unfccc.int/kyoto_protocol/items/2830.php (last visited Mar. 14, 2008).

² The principal document memorializing the “Bali Roadmap” process is the Bali Action Plan. United Nations, Bali Action Plan (Decision -/CP.13), http://unfccc.int/meetings/cop_13/items/4049.php (last visited Mar. 1, 2008).

³ The United States signed the Kyoto Protocol, but never ratified it for domestic political reasons—in large part because the Kyoto Protocol exempted developing countries from the same emissions reduction obligations as developing countries. See SUSAN R. FLETCHER & LARRY PARKER, CONG. RESEARCH SERV., CRS REPORT: CLIMATE CHANGE: THE KYOTO PROTOCOL AND INTERNATIONAL ACTIONS AT CRS-2 (Updated June 8, 2007), available at <http://www.nationalaglawcenter.org/assets/crs/RL33826.pdf> (last visited Mar. 11, 2008).

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CONSERVATION EASEMENTS AND CLIMATE CHANGE

by Daniel L. Aaronson & Michael B. Manuel*

INTRODUCTION

Governments at all levels are increasingly engaging the challenges posed by global climate change. Conservation easements have provided income tax deductions to their grantors for decades in recognition of certain special benefits afforded by the conservation of land subject to the easement.¹ As policy makers search for effective means to address climate change issues, conservation easements may well be recognized as an important tool. However, the current law of conservation easements does not recognize the full potential for carbon capture resulting from land conservation, in part because the tax code limits the types of land that may benefit from such easements. Current laws will need to be revised and expanded to better recognize the climate change benefits that could be achieved from placing land under conservation easements.

CONSERVATION EASEMENTS

A conservation easement is a legal agreement, made between a landowner and an eligible organization, that serves to restrict the activities that may take place on the landowner's property.² The restrictions embodied in a conservation easement apply to all future owners of the burdened land and may be enforced by the easement holder or in some cases by the state attorney general.³ A conservation easement can cover all or part of the property, and can restrict the uses of various parts of the property differently.⁴ Conservation easements are individually negotiated and the restrictions that a conservation easement imposes on the landowner will thus vary from one conservation easement to another.⁵

Ownership of land has often been likened to a bundle of sticks, where each stick represents a particular right associated with the land.⁶ Landowners may elect to sell or donate individual "sticks," such as the right to construct buildings, or the right to harvest timber, while preserving other rights associated with the land.⁷ A landowner who grants a conservation easement gives up only those rights that are spelled out in the conservation easement, retaining all others. The conservation easement has thus emerged as one of the most popular land conservation tools in the United States because it allows its holder, typically a land trust, to protect land without the necessity of owning and managing the property.

TAX DEDUCTIONS FOR DONATED CONSERVATION EASEMENTS

While taxpayers are generally not permitted to take charitable deductions for contributions of less than the taxpayer's full interest in property, the Internal Revenue Service makes an exception to this rule in the case of deductions for "qualified conservation contributions."⁸

As a general rule, the available income tax deduction for a qualified conservation contribution is equal to the fair market value of the subject property before the conservation easement was put in place, minus the fair market value of the property after it has been encumbered by the conservation easement.⁹ This formula is intended to compensate the grantor of a conservation ease-

ment for the lost development potential that results from the conservation easement's imposition of development restrictions.¹⁰

Another potential tax benefit of a validly created conservation easement is that the easement may serve to lower the assessed value of the property on which it is placed. Put simply, property taxes are based on two things: the assessed value of the parcel, and the local tax rate.¹¹ In many taxing jurisdictions, the assessed value of a parcel is determined based on the property's highest and best use, which often assumes the maximum level of development allowable under applicable zoning regulations.¹² Many states allow for—or even expressly mandate—the reassessment of land upon which a conservation easement is created, requiring the assessor to take into account the conservation easement's development restrictions in determining the property's value.

COMMON LAW IMPEDIMENTS TO THE ENFORCEABILITY OF CONSERVATION EASEMENTS

In today's practice, conservation easements are exclusively creatures of statute.¹³ This is because under the common law, the perpetual enforceability of conservation easements is doubtful.¹⁴

The current law of conservation easements does not recognize the full potential for carbon capture.

* Daniel L. Aaronson is an Associate in Goldberg Kohn's Climate Change & Resource Conservation Group and the firm's Real Estate Group. Michael B. Manuel is a Principal in Goldberg Kohn's Real Estate Group and is the Chair of the firm's Climate Change & Resource Conservation Group.

In order to be enforceable under the common law, the property interest created by a conservation easement must be classifiable as one of three types of servitudes: (1) an easement, (2) a real covenant, or (3) an equitable servitude. For all three classes of servitudes, troublesome common law doctrines serve as obstacles to perpetual enforceability.¹⁵ Despite its nomenclature, a conservation easement is not enforceable under the common law as an easement because it does not fall within one of the four recognized types of negative easements, which are defined as easements granting the right to restrict the types of activities that can be performed on a parcel of land.¹⁶ Conservation easements are not enforceable in perpetuity as equitable servitudes because they run afoul of what is known as the “touch and concern” doctrine.¹⁷ Courts also have generally held that a real covenant held “in gross”—one which benefits a specific individual rather than a specific parcel of land—cannot be binding on successive landowners due to its failure to satisfy the “touch and concern” test.¹⁸

In light of the aforementioned impediments to the enforceability of conservation easements—and recognizing the fact that, from a land preservation standpoint, the permanence of a conservation easement is its most critical aspect—states began to enact conservation easement legislation in the 1980s.¹⁹

STATUTORY CONSERVATION EASEMENTS

In the early 1980s, the National Conference of Commissioners on Uniform State Laws proposed model state legislation intended to strengthen the reliability of conservation easements as a land preservation tool by exempting them from the common law doctrines that would otherwise impede their enforcement.²⁰ This model legislation, titled the Uniform Conservation Easement Act (“UCEA”), has since been adopted in twenty states, while most others have enacted functionally equivalent legislation modeled after the UCEA.²¹ Conservation easements that satisfy the requirements of the local state conservation easement statute are often referred to as statutory conservation easements.

Statutory conservation easements are sheltered from the impediments to enforceability that would otherwise plague them under the common law. The UCEA and the various state conservation easement statutes place conservation easements beyond the reach of the “touch and concern” doctrine by providing that a conservation easement is valid even though its benefit does not touch and concern real property.²² The other primary obstacle to enforcement of conservation easements under the common law—that a negative easement may serve only a limited number of recognized purposes—is also expressly eliminated by statute.²³

Statutory conservation easements must be granted in favor of a non-profit land trust or a governmental agency.²⁴ Private foundations or other for-profit entities are ineligible grantees of conservation easements.²⁵ State conservation easement statutes

typically also impose a conservation purpose requirement that in many instances mirrors that of the Internal Revenue Code (“IRC”). A conservation easement that is granted to an eligible donee and satisfies the requirements of both the applicable state conservation easement statute and the IRC will yield an income tax deduction for its grantor and will be enforceable in perpetuity.

“CONSERVATION PURPOSES” AND CARBON SINKS

Not every parcel of land is eligible for preservation by way of a conservation easement. The IRC and the various state conservation easement statutes provide that the property to be protected by a conservation easement must possess significant conservation or historic preservation values.²⁶ Determining whether a particular parcel of land exhibits such conservation values is an inexact science.

The tax code recognizes only four legitimate conservation purposes: (1) preservation of land areas for outdoor recreation by, or the education of, the general public; (2) protection of a significant wildlife habitat

or plant community; (3) preservation of open space (including farmland and forestland) for the scenic enjoyment of the general public or pursuant to government policy; and (4) preservation of a historically important land area or a certified historic structure.²⁷ As a general rule, a conservation easement that satisfies one of the conservation purposes recognized by the tax code will also be deemed to satisfy the conservation purpose requirement of the applicable state conservation easement statute. A conservation easement cannot yield tax benefits to its grantor, nor will it likely be perpetually enforceable under state law, if it does not fit into one of the four recognized conservation purposes.

In the case of undeveloped land that a landowner does not intend to open to the general public, a conservation easement will most likely be appropriate if the land is home to an “ecologically significant” habitat of flora or fauna²⁸ or if there is sufficient public road frontage for the easement area to provide a scenic view to passersby.²⁹ IRS regulations and recent jurisprudence have shown both of these conservation purposes to be unduly difficult to satisfy. Land to be protected by a conservation easement will not be deemed ecologically significant if it does not contain endangered or threatened species or adjoin a designated conservation area such as a state or national park. Meanwhile, the open space conservation purpose is notorious for its ambiguity. One thing IRS regulations have made clear, however, is that the preservation of “ordinary” tracts of land would not be deemed to yield the significant public benefit requisite for purposes of satisfying the conservation purpose test.³⁰

The current law of conservation easements does not recognize the potential for carbon capture resulting from land conservation. Otherwise “ordinary” tracts of land can produce

*Not every parcel of land
is eligible for preservation
by way of a
conservation easement.*

a significant social benefit by acting as carbon sinks, as growing vegetation absorbs carbon dioxide from the atmosphere.³¹ Young forests comprised of still-growing trees are especially effective at absorbing carbon dioxide,³² but even the conservation of mature forests can result in emissions reductions by preserving existing carbon stocks where development—which releases carbon—might otherwise occur.

CONCLUSION

The defining characteristic of a conservation easement is the yielding of a public or social benefit from preserving land in its natural state. But present laws do not recognize carbon capture as a legitimate social benefit. If the law could develop so that carbon attributes are recognized as valid conservation purposes, the conservation easement could become a meaningful component of the overall climate change solution.



Endnotes: Conservation Easements and Climate Change

¹ C. Timothy Lindstrom, *The Tax Benefits of Conservation Easements*, 79 MICH. B.J. 690, 691 (2000).

² Alexander R. Arpad, *Private Transactions, Public Benefits, and Perpetual Control Over the Use of Real Property: Interpreting Conservation Easements As Charitable Trusts*, 37 REAL PROP. PROB. & TR. J. 91, 100 (2002).

³ The Nature Conservancy, *Conservation Easements*, <http://www.nature.org/aboutus/howwework/conservationmethods/privatelands/> (follow “Conservation Easements” hyperlink; then follow “About” hyperlink) (last visited Mar. 9, 2008).

⁴ See *Glass v. C.I.R.*, 124 T.C. 258 (T.C. 2005).

⁵ Federico Cheever, *Public Good and Private Magic in the Law of Land Trusts and Conservation Easements: A Happy Present and a Troubled Future*, 73 DENV. U.L. REV. 1077, 1078 (1996).

⁶ Myrl L. Duncan, Essay, *Reconceiving the Bundle of Sticks: Land as a Community-Based Resource*, 32 ENVTL. L. 773 (2002).

⁷ Duncan, *id.*

⁸ Francine J. Lipman, *No More Parking Lots: How the Tax Code Keeps Trees Out of a Tree Museum and Paradise Unpaved*, 27 HARV. ENVTL. L. REV. 471, 494-95 (2003); see also Maureen Rudolph & Adrian Gosch, *A Practitioner’s Guide to Drafting Conservation Easements and the Tax Implications*, 4 GREAT PLAINS NAT. RESOURCES J. 143, 162 (2000).

⁹ Rudolph & Gosch, *supra* note 8, at 171-73.

¹⁰ Rudolph & Gosch, *id.* at 173-75.

¹¹ Katherine S. Anderson & Marybeth K. Jones, Comment, *Conservation Easements: An Essential Tool in the Practitioner’s Estate Planning Toolbox*, 35 LAND & WATER L. REV. 183, 199-200 (2000).

¹² Rudolph & Gosch, *supra* note 8, at 173-75.

¹³ Sean P. Ociepa, Casenote, *Protecting the Public Benefit: Crafting Precedent for Citizen Enforcement of Conservation Easements*, 58 ME. L. REV. 225, 228-30 (2006).

¹⁴ Gerald Korngold, *Privately Held Conservation Servitudes: A Policy Analysis in the Context of In Gross Real Covenants and Easements*, 63 TEX. L. REV. 433, 479-80 (1984).

¹⁵ Korngold, *id.* at 479-80.

¹⁶ Korngold, *id.* at 437.

¹⁷ Peter M. Morrisette, *Conservation Easements and the Public Good: Preserving the Environment on Private Lands*, 41 NAT. RESOURCES J. 373, 383 (2001) (“The rationale behind this bias derives from the general prohibition in the common law against dead-hand controls on property that restrain alienability.”).

¹⁸ Morrisette, *id.* at 383.

¹⁹ Alexandra B. Klass, *Adverse Possession and Conservation: Expanding Traditional Notions of Use and Possession*, 77 U. COLO. L. REV. 283, 297-304 (2006).

²⁰ Klass, *id.* at 302-06.

²¹ Klass, *id.* at 303 (“Currently, the District of Columbia and all the states except North Dakota have specific statutes facilitating the creation of conservation easements.”).

²² Morrisette, *supra* note 17, at 384.

²³ Morrisette, *supra* note 17, at 383-84.

²⁴ Dominic P. Parker, *Land Trusts and the Choice to Conserve Land With Full Ownership or Conservation Easements*, 44 NAT. RESOURCES J. 483 (2004).

²⁵ Lindstrom, *supra* note 1, at 691 (The key is that the organization be a charitable organization qualified under [I.R.C. § 501(c)(3)]; have the ability to enforce the easements it holds over time; and be organized, at least in part, for the conservation of the property subject to easements it holds.).

²⁶ Lawrence R. Kueter & Christopher S. Jensen, *Conservation Easements: An Underdeveloped Tool to Protect Cultural Resources*, 83 DENV. U.L. REV. 1057, 1059-60 (2006).

²⁷ I.R.C. § 170(h)(4)(A) (2006).

²⁸ A conservation easement meets the conservation purpose standard if it protects “a relatively natural habitat of fish, wildlife, or plants, or similar ecosystem.” I.R.C. § 170(h)(4)(A)(ii) (2006). Courts have found compliance with this prong of the conservation purpose standard in only two general situations: (1) where an endangered or threatened species is present on the property, or (2) where the property is deemed to play a role in the ecological viability of a public park or wildlife refuge. See Nicholas Agopian, *Conservation Easements – Preserving Privately Owned Natural Habitats*, 6 WYO. L. REV. 447, 463 (2006).

²⁹ I.R.C. § 170(h)(4)(A)(iii) (providing that a conservation easement meets the conservation purpose standard if it preserves open space either “for the scenic enjoyment of the general public” or pursuant to a “clearly delineated” governmental conservation policy and also yields a “significant public benefit.”); see Treas. Reg. § 1.170A-14(d)(4)(i) (clarifying that the “significant public benefit” requirement applies to any conservation easement evaluated under the open space prong of the conservation purpose standard).

³⁰ 5 RATHKOPF’S THE LAW OF ZONING AND PLANNING § 82:22 (4th ed.) (citing 26 C.F.R. § 1.170A-14(d)(iv)(B), Significant public benefit can probably best be shown by demonstrating that the land in question has some characteristic that distinguishes it from what might be called ordinary land.).

³¹ Klaus S. Lackner, *A Guide to CO₂ Sequestration*, 300 SCI. 1677, 1678 (2003) (stating that photosynthesis is currently the only practical form of air capture of carbon dioxide).

³² Richard Birdsey, Kurt Pregitzer & Alan Lucier, *Forest Carbon Management in the United States: 1600-2100*, 35 J. ENVTL. QUALITY 1461, 1466 (2006) (“The rate of carbon sequestration, as indicated by either net primary productivity (NPP) or net ecosystem productivity (NEP), increases after disturbance to a variable point in time, and then declines as forests mature.”).

SECURING RIGHTS TO CARBON SEQUESTRATION:

THE WESTERN AUSTRALIAN EXPERIENCE

by Sandra Eckert & Richard McKellar*

INTRODUCTION

Organic carbon sequestration through vegetation growth is the only realistic means of removing carbon dioxide from the atmosphere. Increasing vegetation and biomass stocks can therefore be a valuable means to limit atmospheric carbon dioxide concentrations until energy efficiency, low greenhouse gas emitting energy and agricultural options, and other emission reduction initiatives can be implemented at a scale required to limit the growth, and ultimately reduce, the amount of global greenhouse gas emissions.

For over ten years commercially-oriented tree plantation interests in Australia have recognised the potential for carbon sequestration offset credits to augment the income from other plantation products. Income from the sale of offset credits could expand the geographic area over which tree and mixed species plantations could be a viable land use, contributing to the growth of the domestic plantation industry.

In addition, revegetation through plantation establishment and other means provide further environmental and social benefits in Western Australia ("WA"), such as groundwater salinity reduction, surface water production, erosion control, biodiversity protection, and regional economic diversity. Encouraging revegetation is therefore a matter of keen interest to the State Government for sustainability objectives.

While the scientific notion that increasing biomass will remove carbon dioxide from the atmosphere is conceptually simple, there are significant challenges in converting those carbon dioxide removals into commercially tradeable commodities, even with the clear recognition of Emission Reduction Units under rules established pursuant to the Kyoto Protocol.

Any emission accounting or trading program which seeks to include carbon offset credits resulting from organic sequestration must address several key issues, of which additionality, permanence, quantum, and ownership are the most fundamental.

Ownership raises some of the most complex issues associated with the creation and trading of organic carbon sequestration rights, especially where other benefits, such as harvestable timber, improved ground water quality, erosion control, or biodiversity enhancement, are created by the same actions.

This paper addresses the approach taken in WA to overcome barriers associated with ownership of carbon sequestration offset credits generated by the establishment of forest plantations (Kyoto Article 3.3), followed by a brief summary of the position in the other Australian States.

CARBON SEQUESTRATION RIGHTS: A NEW RIGHT IN PROPERTY

Where all rights associated with the establishment of plantations are held by the same party, carbon sequestration rights are coincident with rights to other plantation products. Where carbon sequestration rights are separated from other rights, however, several issues need to be addressed. For example, how does ownership of carbon sequestration differ from ownership of sequestered carbon? What legislative guidance is required to support the commercial interests of both parties? How can carbon sequestration rights be protected from loss or injury from negligence, natural risks, or other commercial imperatives (e.g. harvesting of plantation products)?

An example will illustrate these challenges. Farmer A leases part of his farm to Corporation B for thirty years for plantation establishment. Corporation B holds all rights to the plantation, including carbon sequestration rights, and agrees to pay an annual land rent to Farmer A. Corporation B sells rights to the lease and the timber to Corporation C and rights to the benefits and risks arising from carbon sequestration to Corporation D.

Since the mid-1990s, most contractual arrangements relating to tree plantations in WA have included provisions identifying the ownership of benefits arising from carbon sequestration by the plantations. The complexity and cost of contracts for carbon sequestration rights has led all Australian State governments to legislatively create a separate carbon sequestration right. This approach, apparently unique to Australia, has increased certainty and reduced costs to land holders and traders in carbon sequestration rights.

WESTERN AUSTRALIA'S CARBON SEQUESTRATION LEGISLATION

The approach taken in WA has been the broadest of the Australian jurisdictions. The forms of carbon sequestration that can give rise to carbon rights are not limited in any way, and do not require a direct link to a silvicultural project or any form of forest management. The approach reflects several important

* Sandra Eckert B. Juris LIB (Hons) Grad Dip Prop has twenty years experience as a property lawyer in Western Australia, both in private legal practice and in the State public service providing advice to the Government on the administration of Crown land. She was instructing officer on the property aspects in the drafting of the Western Australian Carbon Rights Act 2003. Richard McKellar BSc, MSc LIB has worked on many aspects of climate change science and policy for twenty years in Western Australia. He was a member of the Western Australian Carbon Rights Task Force, which developed the conceptual basis for the Western Australian Carbon Rights Act 2003.

considerations. First, a broad enabling legislative framework was considered most appropriate to support activities that might be accountable and tradeable under international and national rules that are still emerging and are likely to be further altered over coming decades. Second, market-based instruments established by the Kyoto Protocol will be able to distinguish between differing types of carbon sequestration products. Finally, revegetation could reverse past damage to Western Australia's land and ecosystems resulting from clearing for agriculture, urban use, infrastructure, or by vegetation destruction through range-land activities such as grazing.

Western Australia has an area of approximately 2,527,620 square kilometres. Approximately ninety-three percent of this area is held as Crown land, and the remaining seven percent is held as freehold land.¹ There are two types of freehold land in Western Australia. The dominant system is Torrens title land, which comprises almost all of the freehold land in WA. The Torrens system is a system of title by registration of dealings in land in the Register held at the land registry office. The system is established under the *Transfer of Land Act 1893 (WA)* ("TLA"). One of the fundamental principles underlying the Torrens system is the concept of indefeasibility of title. Essentially, the registered proprietor's title is paramount (except in the case of fraud) and held only subject to the interests registered in the Register and certain specified exceptions.² The State in effect guarantees the title to land, and interests registered in respect of the land, by providing for a right to claim against the State if a person is deprived of his or her land due to a number of circumstances.³

The other type of freehold land is old system title land, which comprises 0.1 percent of the seven percent of freehold land in Western Australia. This system of title relates to Crown grants of freehold that were made prior to the introduction of the Torrens system of title,⁴ and which have not since been converted to Torrens system land.⁵ Under this system, title to land is established by an unbroken documentary chain of title for at least thirty years prior to the agreement to sell.⁶

The administration of Crown land in WA is governed by the *Land Administration Act 1997 (WA)* ("LAA"). "Crown land" is all land that is not freehold land.⁷ It is land held by the Crown, or the State.

However, all dealings in Crown land are registered under the single registration system provided for in the TLA.⁸ Consequently, the holder of an interest registered in respect of Crown land has the same indefeasible title as a freehold land owner, subject to the exceptions contained in section 68 TLA and certain other exceptions arising from its nature as Crown land as set out in section 81T of TLA.

CARBON RIGHTS ACT 2003 (WA)

The Western Australian *Carbon Rights Act 2003* ("CRA") establishes a new, separate interest in land known as a "carbon right."

A carbon right comes into existence once it is registered on the title to the land.⁹ The person registered as the proprietor, or owner, of the carbon right on the title to the land has security of

title to the carbon right, via the benefits of the indefeasibility and other provisions under the TLA. A carbon right can be registered in respect of any Torrens title freehold land and any Crown land.¹⁰ The only land in Western Australia in respect of which a carbon right cannot be registered, and therefore cannot be created, is old system title land. Generally, it can be dealt with in the same way as any other interest in land.¹¹

The intention of the CRA is to establish the legal certainty and security of a carbon right as an interest in respect of certain identified land. A carbon right gives the owner "the legal and commercial benefits and risks arising from changes to the atmosphere that are caused by carbon sequestration and carbon release occurring in or on land in respect of which the carbon right is registered."¹²

The CRA does not operate to determine or set the value of the carbon right. Its commercial value, and therefore tradability, is left to the market to determine, in the same way that the value and tradability of any other interest in land is determined by the market. This is evident from the Second Reading Speech for the CRA when it was introduced into the Legislative Assembly by the Honourable Francis Logan MLA when he said:

The Carbon Rights Bill will provide security for the owner of the carbon right in land by enabling a carbon right to be registered on the land title . . . Issues such as measuring the carbon that has been sequestered and stays there, provisions for disease and fire protection and whether a particular type of sequestered carbon can be traded and so on are left to the market to determine.¹³

This intention was reiterated later in the Second Reading Speech in the following terms: "Registration will clarify the ownership of the right . . . but it gives no guarantee as to how much carbon is there, whether it will remain there or what value it may have."¹⁴

The owner of the carbon right does not need to be the same person who is the owner of the land to which it relates. However, if they are not the same person, the carbon right can only be created with the land owner's consent.¹⁵

The definitions of "carbon sequestration" and "carbon release" in section 3 of the CRA make it clear that the changes relate to anything stored in or on the land. Consequently, it relates to changes in carbon storage in any form—in the soil of the land, or in the trees or other forms of vegetation on the land.

The owner of the carbon right, however, does not own the carbon itself stored in or on the land. That interest remains with whoever owns the matter in which it is stored—for example the land owner, or the holder of a plantation interest under section 7(1) of the *Tree Plantation Agreements Act 2003 (WA)* ("TPA"). A plantation interest is a separate interest in land (again registered on the title to the land under the TLA), in which the ownership of trees on the land is separated from ownership of the land itself (contrary to normal common law principles).

As a consequence of the separation of the ownership of the carbon right from the carbon itself, the owner of the carbon right must have a mechanism by which carbon changes in or

on the relevant land can be controlled, in order for the carbon right to have some continuing certainty of its commercial value. This is done, in a legal sense, by providing for the creation of a concomitant, separate interest in land known as a “carbon covenant.” The carbon covenant is also registered on the title to the land,¹⁶ allowing the land owner, or others with an interest in the same or other land, to agree with the owner of the carbon right (who must also be the owner of the carbon covenant)¹⁷ to do, or not to do, certain things on the land. This will have the effect of encouraging carbon sequestration on the land, and mitigating carbon release from the land, as much as possible.

For example, the carbon covenant may include provisions as to how the land will be used or managed to decrease the risk of fire or pests, thereby reducing the risk of carbon release and increasing carbon sequestration in the trees or vegetation on the land. Similarly, altered grazing patterns of livestock may increase the chance of carbon sequestration.

The carbon covenant runs with, and binds, the land so that future owners of the land will be bound to comply with them, and any future owner of the carbon right (and therefore the carbon covenant) will have the benefit of the covenants.¹⁸

The carbon covenants are enforceable through legal proceedings in the same way that any other interest in land is enforced at common law. Any failure to comply with the carbon covenant is a civil matter between the relevant parties, which will be adjudicated by the courts.

UPTAKE OF CARBON RIGHTS

The development of the CRA was a government initiative to promote the development of the forest plantation industry to expand regional economic opportunities, provide domestic wood products, support woodchip exports, replace logging of old growth forest, and gain the broader environmental benefits of revegetation, by reducing transaction costs and increasing certainty associated with establishing and trading carbon sequestration rights.

Australia’s plantation and timber industries have included carbon rights considerations in their contractual arrangements for at least fifteen years and Australia’s financial industry developed emission trading frameworks during the mid-1990s. Yet, because Australia’s national government until recently refused to ratify the Kyoto Protocol and has not established domestic sectoral or other emission limits or taxes, there exists no basis for either international or domestic commercial trading of carbon sequestration or any other emission reduction units. Therefore, there has been virtually no incentive for parties to undertake the costs of establishing carbon sequestration right ownership through registration under the CRA, and consequently, the uptake on registering carbon rights has been relatively slow.

As of October 2007, only twenty-four carbon rights had been registered since the CRA’s proclamation on March 24, 2004.¹⁹ Of these, only ten have had accompanying carbon covenants registered. There are only three instances where a carbon right, a carbon covenant and a plantation interest under the TPA have been registered. Four plantation interests have been registered without an accompanying carbon right.

The number of dealings registered does not provide an indication as to the size or number of properties involved, however, as one dealing may affect more than one area of land, if the same person owns more than one property.

Similarly, it is not possible to draw any conclusion as to the relationship between the uptake of carbon rights and the forest plantation industry. This is because tree plantation companies have in the past secured their interests in the land by a variety of means including timber share-farming agreements under section 34B of the *Conservation and Land Management Act 1984 (WA)*²⁰ or a lease, and these remain available along with the more recently enacted plantation interest. One of the reasons for the slow uptake of registration of carbon rights is the number of requirements that need to be met before they can be registered.

The area of the land over which the carbon right is being registered must be clearly identifiable.²¹ If the carbon right is over the whole of the land in a property, then the description is simply the same as the current land description for the property. If the carbon right is only over part of the land in the property, then a suitable diagram needs to be prepared with co-ordinates. If the area over which the carbon rights are to be registered has not already been surveyed for other purposes (such as the registration of a plantation interest), a considerable cost burden is imposed. In most cases this would be borne by the carbon right holder.

The carbon rights are required to be registered separately on the title to each property. Any dealings with the carbon right will require the consent of any person having an interest in the carbon right itself and in many cases, the owner of the underlying land and any person having an interest in that land. This is likely to act as a disincentive to the development of a trading market in carbon rights per se, as the conveyancing costs and other administrative requirements will be too costly, intensive, and time consuming. However, it may lead to the development of a wholesale market, where brokers accumulate and hold the individual carbon rights from land owners and aggregate them for on-sale to industrial or other companies seeking credits in a carbon trading system.

CARBON SEQUESTRATION RIGHTS IN OTHER AUSTRALIAN STATES

The following table sets out a comparison of the forms of legal recognition of carbon sequestration rights, and the limits on that recognition, that have been enacted in legislation in the other Australian States.

Almost all of the other Australian State jurisdictions have limited their recognition of carbon rights to carbon sequestration in trees or forest vegetation. New South Wales is most restrictive in that it is limited to trees or forest on the land after 1990.²² However, the approach in Queensland is more liberal as the carbon sequestration right is one of several potential forest products and can also relate to vegetation more generally.²³

All jurisdictions allow for ownership or the benefits of a carbon right to be separated from the ownership or benefits of the trees or vegetation. In addition, the rights can run with, and bind the future owners of, the land over which the rights exist.

TABLE: SUMMARY OF CARBON SEQUESTRATION LEGISLATION IN AUSTRALIA, OTHER THAN WESTERN AUSTRALIA

Jurisdiction	Definition of the Right	Nature of the Right	Limitations on the Right
VICTORIA <i>Forestry Rights Act 1996</i>	“Carbon sequestration right” means a right to commercially exploit carbon sequestered by trees (§3) Created under a “carbon rights agreement” (§12)	Deemed not to be an interest in land (§14(2))	Limited to carbon sequestered by trees (§3) Can be separated from ownership of trees (§12) Applies to freehold land only (§4)
NEW SOUTH WALES <i>Conveyancing Act 1919</i>	“Carbon sequestration right” means a right conferred on a person by agreement or otherwise to the legal, commercial, or other benefit (whether present or future) of carbon sequestration by any existing or future tree or forest on the land after 1990 (§87A) Carbon sequestration right included in a “forestry right” (§87A)	Forestry right deemed a profit a prendre (§88AB) Forestry covenant is an interest in land (§88EA(5))	Limited to carbon sequestered by trees on land after 1990 (§87A) Can be granted separately from forestry right in respect of crop of trees on land (§87A)
SOUTH AUSTRALIA <i>Forest Property Act 2000</i>	“Carbon right” is the capacity of forest vegetation to absorb carbon from the atmosphere (§3A(1)) Created under “forest property (carbon rights) agreement” (§5(3))	Form of property, in the nature of a chose in action (§3A(1)) Attaches to the forest vegetation to which it relates (§3A(2))	Limited to absorption of carbon in “forest vegetation” (trees or other forms of forest vegetation) (§§3 & 3 A) Can be separated from ownership of forest vegetation (§3A(2))
QUEENSLAND <i>Forestry Act 1959</i>	“Natural resource product” includes carbon stored in a tree or vegetation and carbon sequestration by a tree or vegetation (Schedule 3) Owner of land may enter into an agreement about a natural resource product on the land (§61J(1))	Does not create an interest in land (§61J(4)) Rights are a profit a prendre (§61J(5))	Limited to absorption of carbon by, or storage of carbon in, trees or vegetation (Schedule 3) Agreement can be limited to these natural resource products relating to carbon sequestration and/or storage of carbon (§61J(3) & Schedule 3) Note the effect of these provisions is that ownership of carbon stored in trees or vegetation, and the ownership of the carbon sequestration right in respect of them, can also be separated
TASMANIA <i>Forestry Rights Registration Act 1990</i>	“Carbon sequestration right” means a right conferred on a person (by agreement or otherwise) to the legal, commercial or other benefit (whether present or future) of carbon sequestration by any existing or future tree or forest on the land (§3) Carbon sequestration right included in a forestry right (§3)	Deemed to be a profit a prendre (§5(1))	Limited to carbon sequestration by a tree or forest (§3) Can be separated from ownership of trees (§3)

Neither the Northern Territory nor the Australian Capital Territory have enacted any legislation, so any relevant common law principles apply in these jurisdictions.

CONCLUSION

The new Australian government elected on November 24, 2007 has ratified the Kyoto Protocol, potentially leading to the capacity to export carbon sequestration rights (using the Joint Initiative mechanism) and to a domestic emissions market. Internationally, a greenhouse gas limitation regime is being negotiated for the period following the first Kyoto Protocol reporting period.

As the CRA covers all types of carbon sequestration on all but less than 0.1 percent of land in Western Australia and focuses on creating certainty of ownership, the Western Australian Carbon Rights Act will be able to support initiatives under any future national or international emission regime that includes organic carbon sequestration as an option to generate offset credits.



Endnotes: Securing Rights to Carbon Sequestration
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IT'S NOT EASY BEING GREEN:

REFLECTIONS ON THE AMERICAN CARBON OFFSET MARKET

by Laurie A. Ristino*

INTRODUCTION

Over the past few years, the U.S. carbon offset market has experienced tremendous growth.¹ This expansion can be attributed to several factors, including the creation of regional greenhouse gas (“GHG”) initiatives, the anticipation of federal regulation, and growing public concern regarding climate change. In the absence of a national system of carbon offset standards, a confusing myriad of methodologies governs the creation of offsets. The media has repeatedly questioned the credibility of carbon offsets, likening them to papal indulgences for environmental sins committed.² Indeed, the emphasis on offsets to mitigate climate change has distorted their appropriate role in any future national framework to address climate change and may distract from the more fundamental changes needed to address climate change. Likewise, the ease at which some offsets are acquired to reduce emissions serves to oversimplify the comprehensive, national response that is necessary to address climate change.

On the other hand, high quality offset projects can play a role in the near term to mitigate climate change by reducing net carbon emissions in a cost-effective manner.³ Additionally, the growth of the carbon market reflects, in part, American society’s genuine desire to address climate change, and this impetus should be preserved and encouraged. Assuming the enactment of a federal cap-and-trade system, rigorous requirements for the creation and maintenance of carbon offsets will be needed to ensure market certainty and emissions reductions.

AN OVERVIEW: CARBON OFFSETS

Under a cap-and-trade regime, a limited percentage of a regulated industry’s emission reduction requirement may be met with the purchase of carbon offsets. Offsets are different from on-site reductions because they mitigate regulated source emissions by reducing emissions through an unregulated sector GHG reduction project. Some offset projects remove GHGs from the atmosphere; other projects are designed to reduce future emissions. Offset projects include terrestrial carbon sequestration, such as afforestation or reforestation, improved range management, no-till practices on agricultural lands, as well as projects that invest in renewable energy, methane capture, and energy conservation.

ADDITIONALITY

The reduction in emissions achieved with offsets is called “additionality.” Additionally is defined as emission reductions that occur solely as the result of voluntary or regulatory GHG market incentives, not reductions that would have occurred anyway.⁴ A deceptively simple concept, additionality in practice can be difficult to assess, but it is critical to viable carbon credit creation. Achieving additionality requires policy clarity, rigor, and transparency.

REGULATORY & VOLUNTARY OFFSETS

There are two general categories of offsets: regulatory and voluntary. The former are regulated by emerging state and regional cap and trade frameworks like the Regional Greenhouse Gas Initiative (“RGGI”) or mandated by law such as Oregon’s requirement that all new power plants in that state offset part of their carbon dioxide emissions.⁵ The latter include offsets that are purchased by individuals, organizations, government, and corporations voluntarily seeking to reduce

their carbon footprint. Voluntary offsets are purchased either through the Chicago Climate Exchange (“CCX”), America’s only legally binding commodities market for emissions trading and offsets, or through over-the-counter (“OTC”) transactions. Since both categories of offset projects purport to result in emissions reductions, similar standards for verifying and monitoring should apply.

Each trading system establishes its own standards for offset project creation, including verification, monitoring, baseline determination, and permanence, resulting in an inconsistent array of methodologies. For example, under RGGI, which is comprised of 10 Northeast and Mid-Atlantic states, only afforestation projects on land that has not been forested for ten years are eligible forest offset projects, and the carbon sequestered must be protected through a permanent conservation easement.⁶ In contrast, under CCX, afforestation projects undertaken on sites

High quality offset projects can play a role in the near term to mitigate climate change.

* Laurie A. Ristino is an attorney with the Office of the General Counsel, United States Department of Agriculture in Washington, DC. The views expressed in this article are solely of the author and do not necessarily represent the position of the United States Department of Agriculture. Ms. Ristino can be reached at LRistino@netscape.net.

unforested as of January 1, 1990 are eligible.⁷ Instead of a conservation easement to ensure project permanence, CCX holds in reserve twenty percent of all CCX afforestation offsets to insure against catastrophic losses. Landowners must indicate in writing their intent to maintain forest for at least fifteen years.⁸ As is generally the case in the voluntary market, CCX has a broader array of eligible offset project types, such as agricultural soil carbon sequestration, when compared to RGGI. Regulated markets tend to be more restrictive to ensure a greater confidence level in offset credibility.

In contrast, OTC offsets are not governed by any regulatory or legally binding regime. The public is generally more familiar with OTC offsets, which include many of the popular retail-type offsets offered by both for profit and non-profit entities. For example, Expedia, Orbitz, and Travelocity offer individuals the opportunity to offset their travel emissions by adding the cost of offsets to the travel bill. These offsets are provided by different partners, e.g., Carbonfund, Terapass, and The Conservation Fund, each with different offset prices and policies.⁹

The quality of retail offsets is uneven, and there is no standard certification of offsets upon which consumers can rely. To address this information gap, Clean Air-Cool Planet commissioned a 2006 report as an effort to evaluate carbon offset providers to the retail market. The report ranked, on a scale from 1-10, thirty retail offset providers based upon several criteria and found that only eight of the thirty providers had a score of five or more.¹⁰ In addition, there have been voluntary efforts to develop offset standards such as the Voluntary Carbon Standard. Recently, the Federal Trade Commission (“FTC”) has been reassessing its consumer protection guides related to environmental marketing claims (carbon credits and renewable energy certificates) to help prevent false or misleading claims to the public. However, FTC’s review focuses on its consumer protection role, not on establishing environmental performance standards.¹¹

OFFSETS: SOMETHING FOR EVERYONE?

The U.S. carbon offset market has been marked by an exuberant entrepreneurialism informed, in part, by a desire to do environmental good on the one hand and, on the other, tap into a significant revenue and funding stream.

Businesses are participating in the offset market for a variety of reasons, including demonstrating corporate responsibility, hedging against future regulation, and gaining market experience. Companies are both purchasing offsets to reduce their carbon footprint and acting as offset project proponents. As is the case with individuals purchasing offsets, the media has questioned the environmental efficacy of these offsets.¹² In anticipation of GHG emissions regulation, businesses, especially power companies, have established offset projects. For example, twenty-five power companies established Powertree Carbon Company (“Powertree”) to invest in carbon offset projects in the Southeast with various partners, including the federal govern-

ment, The Nature Conservancy, and Ducks Unlimited. Powertree retains the rights to emission reductions associated with the project and distributes the credits to its member companies. In addition, there is an emerging industry associated with carbon offsets, including credit brokers, aggregators, providers, and verifiers.

The agricultural sector has embraced offsetting.

The agricultural sector has embraced offsetting for its potential to generate \$8 billion in revenue.¹³ The American Farm Bureau Federation has stated that agriculture and forestry should have unlimited access to the offset market.¹⁴

In 2007, Iowa Farm Bureau launched a wholly owned subsidiary, AgraGate Climate Credits Corporation, to expand its existing offset aggregating business. AgraGate pools together carbon offset credits produced from offset projects on farms, ranches, and forests and then offers the credits for sale on the CCX. To date, the company has enrolled more than a million acres of land.¹⁵

Non-profits are using carbon offsets projects to fund conservation. Ducks Unlimited, for example, is currently offering to purchase carbon credits from landowners in the prairie pothole region (the Dakotas, Iowa, Minnesota, and Montana) who place U.S. Fish and Wildlife Service (“FWS”) grassland easements on their property.¹⁶ The carbon credit payment is in addition to the easement payment. Ducks Unlimited transfers the credits to an environmental asset manager, which sells the credits to investors. The organization’s website does not explain how paying for the carbon credits in addition to the payment for the conservation easement, which protects the land from conversion, meets the test of additionality. Ducks Unlimited uses the revenues from the credits sold to purchase more easements.

Likewise, the federal government has experimented with the carbon offset market as a funding stream. Federal land management agencies’ budgets have increasingly been directed toward firefighting¹⁷ with the budget in other programs areas reduced.¹⁸ Partnerships with non-profit organizations have provided much needed funding to restore areas previously burned by catastrophic wildfire. In 2007, the Forest Service signed an agreement with the National Forest Foundation (“Foundation”),¹⁹ under which the Forest Service identifies and makes available appropriate National Forest System lands for reforestation projects, and other lands within National Forest Systems for acquisition and afforestation. In return, the Foundation collects and provides funds to carry out reforestation, afforestation, and acquisition. No carbon credits are created or traded. The Foundation established the Carbon Capital Fund through which individuals and organizations wishing to offset their emissions may donate funds to support these reforestation efforts.

Some of the funding generated by the Forest Service’s partnership with the Foundation was used to reforest acreage burned by fires and damaged by tornados on national forests in Idaho and Montana. Forest Service Chief Gail Kimbell has stated that

these reforestation efforts are not necessarily intended to replace all the carbon released by wildfire but to have those sites begin storing carbon at a good rate as soon as possible.²⁰

For several years now, the Department of Interior has been using the funding that carbon offset projects generate to restore existing public lands and acquire new lands. In August of 2002, the FWS, which administers the National Wildlife Refuge System, dedicated the Red River National Refuge. FWS was able to do so with the financial assistance of Entergy Corporation and The Conservation Fund.²¹ Entergy is a major global energy company that, among other things, delivers electricity to over two million customers in the Southeast. The company had planted more than 180,000 trees to restore native bottomland and sequester carbon.

OFFSETS IN PERSPECTIVE

This enthusiastic participation in, and promotion of, the burgeoning offset market has, arguably, inflated the appropriate role of offsets in any national strategy to address climate change. Similarly, the focus on offsets as an environmental panacea has distracted from the comprehensive approach that is necessary to begin mitigating climate change. The reality is that addressing climate change requires fundamental changes to American infrastructure and assertive public policy to support such changes, of which carbon offsets will play a limited role.²²

In a cap-and-trade system, offsets are only a part of the equation. Under the RGGI Model Rule, for example, initially only 3.3 percent of a source's compliance obligation may be met by offsets.²³ This ensures that bona fide emissions reductions are achieved by the regulated entity. The use of carbon offsets represents a policy choice to use regulated industries to fund GHG reductions for unregulated activities, in lieu of public incentives and standards to achieve such reductions. Given the challenges of creating credible offsets as well as other public policy concerns, an initial inquiry should be made whether an offset approach is best to effectuate reductions in a particular sector of emissions sources.

One instance where using an offset mechanism to address emissions may not be optimal, at least in the United States, are those projects seeking to prevent future occurrences resulting in GHG emissions, such as deforestation. In these cases, the regulated industry is essentially meeting its current emission reduction requirement by helping prevent additional emissions from another source sometime in the future. There are technical hurdles associated with avoidance of deforestation projects, including determining a baseline from which additionality is then measured. This is because project proponents have to essentially estimate when such forests *might* be deforested.

That is not to say that such projects should not be part of a climate change mitigation strategy. In a 2007 report, the Global Canopy Programme described the immense contribution of GHG emissions from deforestation. According to the report,

deforestation accounts for eighteen to twenty-five percent of global emissions, mainly from developing countries.²⁴ Under-scoring the complexity of climate change mitigation, there is some evidence that all avoided deforestation and reforestation projects do not provide equivalent mitigation benefits. In particular, preservation in the tropics may be more beneficial than

in snowy climes because forests dampen the reflectivity of the snow, known as the albedo effect, and trap heat.²⁵

In the United States, the use of public funds, including existing easement acquisition programs, to protect private forested lands meeting specific

carbon sequestration criteria and management goals may be a more rational public policy response to prevent emissions from forest degradation. Public incentives provide greater transparency regarding what is really being paid for: ecosystem services. This approach would reflect society's determination that the continued ecosystem services these lands provide, such as clean water, wildlife habitat, and carbon sequestration, are vital public goods, and society will pay for them.

There are other categories of non-regulated emissions sources that may not result in robust or efficient offsets, and therefore, alternative strategies may be considered to address those sectors. For example, carbon offsets from sectors that already receive government financial assistance so that receiving payment for offsets results in "double-dipping;" projects for which extant public programs already provide a mechanism to require GHG reduction practices; offsets from categories of projects that are difficult or expensive to verify and/or quantify; and offset projects involving resources where there is a legal requirement to manage those resources sustainably.

Along the lines of using existing infrastructure to maximize carbon sequestration, a Pew Center for Climate Change report addressing agricultural and forest lands carbon sequestration concluded that agricultural and forest lands can play a key part in climate change mitigation and that much of the infrastructure needed to increase carbon sequestration on those lands is already in place, mainly in the form of conservation programs authorized by the 2002 farm bill.²⁶ The report proposed that a variety of tools can be used by the Federal government to increase sequestration, including education, incentives, and results-based system of payments that encourages local innovation.²⁷

Another example of using public programs to incentivize emissions reductions is in the federal grants context. Recently, the U.S. House of Representatives passed "The College Opportunity and Affordability Act," H.R. 4137, which reauthorizes loans, grants and assistance programs to make education more accessible to students. The bill also ties several of the grants to how much universities reduce their carbon footprint and requires new campus buildings to meet or exceed certain energy efficiency standards.²⁸

The quality of retail offsets is uneven.

CONCLUSION

Addressing climate change requires a robust, national response, including making fundamental changes to American infrastructure, incentivizing the use of existing renewable and clean technologies, fostering technology development and deployment, and reducing consumption in order to create a more sustainable America. Climate change can be a tremendous driver for innovation, and progressive public policy can facilitate this process.

Carbon offsets have the potential to play an effective, interim role as part of an overall comprehensive federal framework that uses multiple strategies to address climate change. However, a national regulatory framework that takes a disciplined approach to offset creation is needed to ensure high quality offsets resulting in real climate mitigation. Such an approach will also help provide needed credibility to the offset market and more effectively harness for the good of the environment the significant investments being made in the offset market.²⁹



Endnotes: It's Not Easy Being Green

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⁵ See H.B. 3283, 1997 Leg. (Or. 1997).

⁶ See REGIONAL GREENHOUSE GAS INITIATIVE MODEL RULE, § XX-10.5 (c)(1)(i)-(2) (iii) (Final with Corrections 2007), available at www.rggi.org/modelrule.htm (last visited Mar. 3 2008) [hereinafter RGGI FINAL MODEL RULE].

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¹⁷ See, e.g., *To Consider Scientific Assessments of the Impacts of Global Climate Change on Wildfire Activity in the United States*, Hearing Before S. Comm. on Energy & Natural Resources, 110th Cong. 5 (2007) (statement of Ann Bartuska, Deputy Chief Research & Development, Forest Service), available at http://energy.senate.gov/public_new/index.cfm?FuseAction=Hearings.Testimony&Hearing_ID=9a58bd66-3950-4e57-ae63-509ce6bf1337&Witness_ID=0058453b-4eba-44c8-bca2-5c6112aea795 (last visited Mar. 1, 2008) (stating that global warming is resulting in an increase in the intensity and scope of fires on public lands).

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¹⁹ See 16 U.S.C. § 583j (2000) (authorizing the Foundation as a non-profit organization to serve as fundraising source for the benefit of the Forest Service in carrying-out its programs).

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²⁹ See, e.g., Editorial, *Junk the Term 'offsets' for carbon credits*, THE SACRAMENTO BEE, Nov. 29, 2007, available at <http://www.sacbee.com/110/story/528597.html> (last visited Mar. 1, 2008) (providing a rebuttal to The Washington Post's criticisms of Congress's purchase last year of offsets to neutralize its omissions and outlined a strategy to avoid squandering the opportunities presented by voluntary investments being made in offsets).

THE FUTURE OF THE EU EMISSIONS TRADING SYSTEM

by Erika Lennon*

Slightly more than a year after ratifying the Kyoto Protocol in October 2003, the European Commission established the European Union Emissions Trading System (“EU-ETS”), a cap-and-trade system, to help implement its goals under the Kyoto Protocol.¹ Now, as the reporting period for the Kyoto Protocol begins, the European Union (“EU”) is looking beyond 2012 and creating plans for the future.

The EU-ETS has completed its first phase (2005–2007) and is currently beginning its second phase (2008–2012). In these first two phases, the EU-ETS was limited to installations in certain industries, namely energy activities, production and processing of ferrous metals, activities involving pulp and paper production, and carbon dioxide emissions.² Additionally, the structure of the EU-ETS centered on allocations through National Allocation Plans (“NAPs”)³ and the predominantly free distribution of allowances.⁴ Each country submitted a NAP laying out its number of allowances and its allocation plan, then at the end of the year each country reported its emissions and could sell any leftover allowances.⁵ Thus, these initial EU-ETS phases establish the system, but are limited in scope.

As the “cornerstone for the EU’s strategy for fighting climate change,” the EU-ETS must be continued and strengthened.⁶ To establish a proposal for phase three, the Commission used three guiding objectives: to fully exploit the potential of the EU-ETS to the EU’s overall greenhouse gas reduction commitments; to refine and improve the EU-ETS based on experience; and to contribute to the transformation of Europe into a “low greenhouse-gas-emitting economy” and to create incentives for low carbon investment decisions by “reinforcing a clear . . . and long term carbon price signal.”⁷

The Commission issued a draft proposal on January 23, 2008 that included an overview of the provisions and specific language to amend the EU-ETS directive.⁸ This draft proposal acknowledges the EU commitment to reduce greenhouse gas emissions by at least twenty percent below 1990 levels by 2020.⁹ The new proposal tries to create a more harmonized system to exploit the benefits of emissions trading and facilitate linking the EU-ETS with other emissions trading systems that may emerge while avoiding distortions in the market.¹⁰ In addition to increased harmonization, the proposal includes new industry sectors and new gases, which will allow for new investments and new abatement opportunities, hopefully leading to increased efficiency.¹¹ The expansion of the EU-ETS to include more industries and gases other than carbon dioxide is a key provision in the fight against climate change.¹² It is estimated that there will be six percent increase in coverage—about 120 to 130 million tonnes of CO₂-equivalent when compared to phase two and will cover almost half of Europe’s emissions.¹³

Another key part of the proposal is the shift from individual country NAPs to a Community-wide quantity of allowances.¹⁴ The initial Community-wide cap will base the number of allowances on the average total number of allowances issued by Member States during phase two.¹⁵ Additionally, it will create greater harmonization across countries by standardizing allocation rules, which will help prevent countries from having NAPs that favor certain industries.¹⁶ Further, the draft proposal calls for a decrease in allowances yearly from 2013 to 2020 so as to reduce overall emissions in a cost-effective way.¹⁷ Reducing allowances yearly will not only help the EU meet its emissions reduction goals, but do so in a way that avoids instability and uncertainty.

The new draft proposal calls for the auctioning of allowances, which is distinguishable from the initial phases of the EU-ETS, when most of the allowances were given away for free.¹⁸ The draft calls for the full auctioning of allowances in the power sector, but for the free allocation of allowances in other sectors of industry initially, with a program to eliminate all free allocations by 2020.¹⁹ It is proposed that the power sector, due to its inclusion in the current EU-ETS scheme, have auctioned allocations, whereas other industries are given some free allowances to help adjust to the emissions trading system. Moreover, the draft proposal recognizes that some industries could suffer from “carbon leakage” due to international competition, thus it allows consideration of this factor in assessing whether to auction off or freely distribute allowances.²⁰ Further, a portion of the proceeds from the auctioned allowances will go to programs designed to fight climate change and to adapt to its inevitable effects.²¹

As the international community works towards a post-Kyoto agreement, the EU has put forth a new plan to fight climate change with a focus on expanding and refining the EU-ETS. The proposed changes in the EU-ETS show the steps the EU is taking to fight climate change in the upcoming decade. By expanding and harmonizing the EU-ETS, the proposal looks to the post-Kyoto world and the changes to come. 

Endnotes:

¹ Council Directive 2003/87/EC, preamble, para. 4, art. 1, 2003 O.J. (L 275) (EC), available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32003L0087:EN:HTML> (last visited Feb. 15, 2008) [hereinafter EU-ETS Directive].

Endnotes: The Future of the EU Emissions Trading System
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* Erika Lennon is a J.D. candidate, May 2008, at American University, Washington College of Law.

RECENT DEVELOPMENTS IN AUSTRALIAN CLIMATE CHANGE LITIGATION: FORWARD MOMENTUM FROM DOWN UNDER

by Tracy Bach & Justin Brown*

INTRODUCTION

Studies indicate that Australia has one of the worst environmental records of any developed country.¹ Particularly striking is its role in the climate change debate: despite being the current leading emitter of greenhouse gases in the world on a per capita basis, Australia originally joined the United States in refusing to sign the Kyoto Protocol.² These disparate climate change positions have a common denominator: coal.³ Australia is the world's fourth largest coal producer and largest coal exporter, sending out approximately sixty percent of its annual production, which accounts for almost thirty percent of global coal exports.⁴ Not only is the country's trade economy reliant on coal,⁵ so too is its electricity production: over seventy-five percent of Australia's electricity comes from burning coal.⁶

Fuels for Electricity

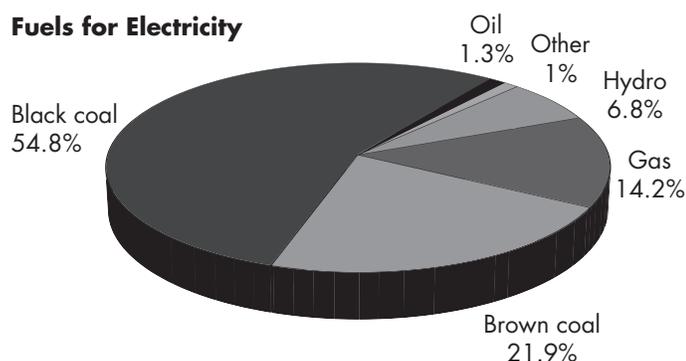


FIGURE 1⁷

As Dr. Mark Diesendorf, Director of the Sustainability Centre at Sydney's University of Technology, pointed out, "[t]he greenhouse pollution produced by these [coal fired] power stations is equivalent to the annual emissions from about forty million cars, four times Australia's actual car fleet."⁸

But today, the business as usual mentality and relative environmental indifference is quickly becoming a thing of the past. Ubiquitous climate change headlines both popularize the issue and arguably educate the public.⁹ The Intergovernmental Panel on Climate Change's ("IPCC") Fourth Assessment Report unequivocally documents the scientific consensus on climate change's anthropogenic sources.¹⁰ Closer to home, record drought in Australia and its toll on the agricultural sector—particularly cotton exports—has raised awareness and concern over global warming.¹¹ Such a massive turn in public perception has led to a political reevaluation of Australia's climate change position. On November 24, 2007, Labor Party candidate Kevin Rudd was elected Prime Minister in the world's first climate change

election.¹² Promising to make the issue a priority, Rudd immediately signed the Kyoto Protocol and played an active role in the United Nations' climate summit in Bali.¹³

The growing scientific consensus about climate change and Australians' fears about irreversible ecological impacts have led to a search for more proactive domestic regulation via environmental impact assessments ("EIAs"). During the past five years, Australian conservation foundations have spearheaded a grassroots movement to use the courts as a tool for climate change reform. In so doing, these environmental advocates have pushed the judiciary to interpret and apply the Environment Protection and Biodiversity Conservation Act of 1999 ("EPBC Act") to climate change. Through a series of cases,¹⁴ courts decided that EIAs required under the EPBC Act and relevant state environmental planning statutes¹⁵ must consider climate change and its intergenerational effects. Reaching this conclusion required case-by-case analysis of the EPBC Act's terms in light of its overall purpose. It also required a measure of courage, for, by taking a general environmental protection statute and applying it progressively to the home-grown causes of global climate change, Australian judges have stepped into a breach that legislators and executive branch agencies have typically avoided.¹⁶

This Article seeks to explain how Australian jurisprudence came to take this position on climate change. In Part I, we briefly describe the EPBC Act, its key principles and provisions, and how these ideas made their way into national legislation. In Part II, we explore the recent climate change decisions of various federal and state trial and appellate courts. We specifically analyze how key EPBC Act provisions have been interpreted to require recognition of global and intergenerational accountability for Australia's coal industry. Finally, in our conclusion we discuss how the EPBC Act and Australian courts contribute to the broader narrative of climate change litigation currently occurring around the world.¹⁷

PART I:

ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT OF 1999

The EPBC Act established a schema of EIA requirements and guidelines. Although a federal statute, individual Australian states and territories look to its principles and structure when

* Tracy Bach is a professor of law at Vermont Law School ("VLS"). Justin Brown is a J.D. candidate, May 2009, at VLS. Professor Bach and Justin Brown have conducted this research for the Climate Legacy Initiative ("CLI"), a scholarly collaborative of VLS and the University of Iowa College of Law. For more information about the CLI, visit http://www.vermontlaw.edu/cli/index.cfm?doc_id=1403.

formulating their own environmental regulations. Along with the general objectives of protecting the environment and conserving biodiversity, the EPBC Act takes a strong stand on sustainable development and intergenerational equity.¹⁸

PRECURSOR PRINCIPLES

After signing many international environmental treaties and protocols beginning in the 1980s, the Commonwealth, states, and territories of Australia adopted the National Strategy for Ecologically Sustainable Development (“NSED”) and the Intergovernmental Agreement on the Environment (“IGAE”) in 1992. These two agreements established ecologically sustainable development as an accepted principle of environmental policy across all levels of government.¹⁹ The NSED provides a framework for policy and decision-making. Its adoption came largely in response to the 1987 release of *Our Common Future* by the World Commission on Environment and Development (commonly referred to as the Brundtland Commission).²⁰ The NSED thus lays out a cooperative approach to ecologically sustainable development that emphasizes long-term benefits over short-term gains. Taking into account Australia’s unique natural environment, the values of the Australian people, and the prevailing patterns of economic production and consumption, the NSED defined ecologically sustainable development as “using, conserving and enhancing the community’s resources so that ecological processes, on which life depends, are maintained and quality of life for both present and future generations is increased.”²¹ The NSED’s five principles, announced after consultation with Australia’s manufacturing, mining, agriculture, and fisheries sectors, include:

1. integrating economic and environmental goals in policies and activities;
2. ensuring that environmental assets are properly valued;
3. providing for equity within and between generations;
4. dealing cautiously with risk and irreversibility; and
5. recognizing the global dimension.²²

Although each level of government adopted these principles, they implemented them according to their own needs and priorities.²³

Most Australian governments signed off on the IGAE one month before the UN Conference on the Environment and Development in 1992 in Rio, as a direct reflection of Australia’s commitment to the environment. In it, the parties acknowledged that environmental concerns and impacts respect neither physical nor political boundaries and thus have inter-jurisdictional, international, and global impacts.²⁴ Similar to the NSED, the IGAE declares that “ecologically sustainable development . . . provides potential for the integration of environmental and economic considerations in decision making and for balancing the interests

of current and future generations.”²⁵ Government parties also agreed that environmental decisions need to take into account the precautionary principle, intergenerational equity, conservation of biological diversity and ecological integrity, and improved

valuation, pricing, and incentive mechanisms.²⁶ Importantly, the IGAE sought to harmonize Commonwealth and State approval processes, to promote efficiency and limit duplication. The IGAE report concluded by pointing out the potentially significant impact of greenhouse gas-enhanced climate change on Australia’s natural, social, and working environments, as well as on the global community.²⁷

Ubiquitous climate change headlines both popularize the issue and arguably educate the public.

THE EPBC ACT’S TERMS

When enacted in 1999, the EPBC Act set out eight “Objects of Act:”

1. protecting the environment, especially “matters of national environmental significance;”
2. promoting ecologically sustainable development through conservation and sustainable use;
3. conserving biodiversity;
4. protecting and conserving heritage;
5. promoting cooperation among governments, community, landholders, and indigenous peoples;
6. implementing cooperatively Australia’s international environmental responsibilities;
7. recognizing the role of indigenous people; and
8. promoting the use of indigenous peoples’ knowledge.²⁸

To achieve these objects, the EPBC Act very practically committed to “strengthen[ing] intergovernmental co-operation, and minimi[z]ing duplication through bilateral agreements,”²⁹ “adopt[ing] an efficient and timely Commonwealth environmental assessment and approval process that will ensure activities that are likely to have significant impacts on the environment are properly assessed,”³⁰ and “promot[ing] a partnership approach to environmental protection” with states and territories, landholders, and indigenous people.³¹

Given the EPBC Act’s grounding in the NSED and IGAE, the Act includes a separate section explicitly stating the five principles of ecologically sustainable development:

1. decision-making processes should effectively integrate both long-term and short-term economic, environmental, social, and equitable considerations;
2. if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation;
3. the principle of intergenerational equity—that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations;

4. the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making; and
5. improved valuation, pricing, and incentive mechanisms should be promoted.³²

EPBC Act assessment and approval is required for actions that are likely to have a significant impact on: (1) a matter of national environmental significance; (2) the environment of Commonwealth land (even if taken outside Commonwealth land); and (3) the environment anywhere in the world (if the action is undertaken by the Commonwealth).³³ The EPBC Act characterizes “action” broadly to include a project, development, undertaking, activity, or series of activities.³⁴ When a person or Commonwealth agency proposes to take an action it believes may be “controlled”

under the EPBC Act, it must refer the proposal to the Commonwealth Minister for the Environment and Water Resources.³⁵ To make this determination, the Minister “must consider all adverse impacts (if any) the action “(i) has or will have; or (ii) is likely to have.”³⁶ To apply this language, policy guidelines instruct that:

1. a “significant impact” is an impact which is important, notable, or of consequence, having regard to its context or intensity;
2. whether or not an action is likely to have a significant impact depends on the sensitivity, value, and quality of the environment which is impacted, and on the intensity, duration, magnitude, and geographic extent of the impacts; and
3. the significant impact does not need to have a greater than fifty percent chance of happening. Rather, all that is required is that it has a real and not a simply remote chance or possibility. If there is scientific uncertainty about the impacts of an action but the potential impacts are serious or irreversible, the precautionary principle is applicable.³⁷

PART II: CLIMATE CHANGE AND INTERGENERATIONAL RIGHTS CASE LAW

Australian courts have taken the lead in connecting global climate change to domestic environmental planning and economic development. Using the EPBC Act and its core principle of intergenerational equity, courts have asserted the government’s responsibility to assess even the indirect impacts of coal industry expansion, in light of its greenhouse gas (“GHG”) emissions and their contribution to global climate change.

REACHING THE INDIRECT EFFECTS OF DEVELOPMENT

To understand the recent flurry in climate change litigation, one has to first understand the *Nathan Dam (Minister for the*

Environment & Heritage v. Queensland Conservation Council) precedent,³⁸ for it established the test used to determine the scope of a controlled action under section 75 of the EPBC Act. In this case, a developer applied to the Commonwealth Environmental Minister for EPBC Act approval of a dam construction project in Central Queensland. The dam’s principal purpose was to supply water to irrigate cotton farms. If constructed, the dam would have significantly affected river flow traveling into the Great Barrier Reef World Heritage Area (“GBRWHA”).

Because the dam would directly impact certain threatened species, the Minister found the construction of the dam to be a controlled action only in that regard. The dam’s indirect impacts on migratory species, for example, and on the GBRWHA, through agricultural runoff, were deemed not controlled actions under this direct effects test.

In response, the Queensland Conservation Council (“QCC”)

challenged the direct effects test, asking the Minister to do environmental impact assessments for the indirect impacts the dam would have on the downstream Great Barrier Reef and Dawson floodplain.³⁹ The federal trial court held that the Minister had erred by refusing to consider the impacts of associated agricultural development and the reviewing court affirmed, concluding that the Minister had wrongfully construed the “all adverse impacts” language.⁴⁰ The Court of Appeals determined that these statutory words include “each consequence which can reasonably be imputed as within the contemplation of the proponent of the action, whether those consequences are within the control of the proponent or not.”⁴¹ Furthermore, “impact” means the influence or effect of an action, which may readily include the indirect consequence of an action—even possibly the results of acts done by persons other than the principal actor.⁴² The court did put limits on these indirect effects, however: they must be “sufficiently close to the action to allow it to be said, without straining the language, that they are, or would be, the consequences of the action on the protected matter.”⁴³ Thus, as long as potential impacts do not lie in the “realm of speculation,” they are controlled actions.⁴⁴

REGULATING COAL MINING AND ITS INDIRECT EFFECTS ON CLIMATE CHANGE

The decision in *Australian Conservation Foundation & Ors v. Minister for Planning* stands as one of the world’s first climate change lawsuits resolved in favor of environmentalists.⁴⁵ In this case, the Hazelwood Mine and Power Station and its owner, International Power Hazelwood (“IPH”), sought to develop an additional coal field to ensure a supply until at least 2031.⁴⁶ Although IPH created an environmental effects statement,⁴⁷ it only addressed the release of GHG during coal extraction and not from its subsequent burning in IPH’s power station.⁴⁸ On July 12, 2004, the Australian Conservation Foundation (“ACF”) petitioned to have the future release of GHGs from the power

station considered. The panel rejected the petition and the ACF referred the matter to the Victorian Civil and Administrative Tribunal (“VCAT”).

The VCAT concluded that GHGs released from power station operation constitute a relevant planning concern when determining whether a coal mine field should expand. Although it looked to several sections of the Victoria’s Environment Protection Act when construing the relevancy of panel submissions,⁴⁹ notably section 21(1)’s relatively simple requirement that the submission be “about an amendment,” it is the Tribunal’s adoption of the indirect test from *Nathan Dam*’s EPBC Act interpretation that stands out. To find a sufficient nexus between the amendment and the effect, the VCAT reasoned that

the approval of [the] Amendment will make it more probable that the Hazelwood Power Station will continue to operate beyond 2009; which, in turn, may make it more likely that the atmosphere will receive greater greenhouse gas emissions than would otherwise be the case; which may be an environmental effect of significance.⁵⁰

Thus, the GHG submission is “about” the planning amendment because an indirect effect of expanding coal mine operations is an eventual increase in GHG emissions.⁵¹

Although complicated procedurally, this VCAT decision is vitally important climate change jurisprudence in Australia. By deciding that applications for permits or amendments to planning schemes must consider all relevant environmental impacts, both direct and indirect, it paved the way for greenhouse gas emissions produced through future burning of the coal to constitute relevant considerations in the present.

Two years later, another coal mine expansion challenge shifted the judicial discussion to the burden of proving when a project’s local GHG emissions have a significant impact. In *Wildlife Preservation Society of Queensland Proserpine/Whitsunday Branch Inc. v. Minister for Environment & Heritage*, the preservation society argued that two proposed coal mine projects fell under the EPBC Act’s “controlled action” provision because burning coal from these mines would produce massive amounts of GHGs, which in turn would lead to increased global warming.⁵² But in this case, the Minister’s environmental impact assessment had already considered the possibility that GHGs might cause climate change and that it, in turn, could adversely affect protected areas. When reviewing this data to determine whether the project amounted to a controlled action, requiring the next level of scrutiny in an environmental impact statement, the Minister saw such future impacts as too speculative. He found no strong evidence suggesting the project would increase overall GHG emissions: if the coal did not come from these mines, he reasoned, other mines would feed the power plants.

The Court agreed with the Minister’s reasoning, finding that GHGs generated in the extraction, transportation, and burning of coal were unlikely to have a “significant impact” on a matter of national environmental significance.⁵³ The Court rejected Whitsunday’s interpretation that “likely,” under section 75 of

the EPBC Act, meant “possible.”⁵⁴ It consequently concluded that the Minister had lived up to the *Australian Conservation Foundation*’s baseline of taking GHGs into account in the environmental assessment phase; having done so procedurally, it could now conclude substantively that the burning of coal was not likely to have a significant impact on a protected area or species. In this manner, *Whitsunday Branch* established a new focus on the “likely” requirement and on the amount and kind of information needed to prove it.

With the courts having established both a GHG accounting baseline and a tighter nexus between these emissions and their specific impact on the Australian environment, a third case decided in neighboring New South Wales (“NSW”) staked out new territory by bringing ESD principles to the fore. In *Gray v. The Minister for Planning*,⁵⁵ Centennial Hunter Party Limited applied for approval to construct and operate a large, open cut, coal mine at Anvil Hill under the New South Wales Environment Planning and Assessment Act of 1979 (“EPA Act”). The mine would have an estimated production capacity of 105 million tons of coal per year and an estimated twenty-one-year life span. Gray, a law student, challenged the Director-General of the Department of Planning’s acceptance of the company’s proposed environmental assessment because it ignored the indirect effects of GHG emissions released from burning Anvil Hill coal at power stations.

The *Gray* Court began with the principle that EIAs extend to the “whole, cumulated and continuing effect” of an activity so long as it is relevant and reasonable.⁵⁶ The Court reasoned that because a sufficiently proximate link exists between the mining of thermal coal in NSW and global warming, an assessment would enable the decision-maker to make an informed decision regarding potential environmental consequences.

Climate change/global warming is widely recognized as a significant environmental impact to which there are many contributors worldwide but the extent of the change is not yet certain and is a matter of dispute. The fact there are many contributors globally does not mean the contribution from a single large source such as the Anvil Hill Project . . . should be ignored in the environmental assessment process. . . . That the impact from burning the coal will be experienced globally as well as in NSW, but in a way that is currently not able to be accurately measured, does not suggest that the link to causation of an environmental impact is insufficient.⁵⁷

In reaching its decision, the Court relied explicitly on ESD principles, particularly intergenerational equity and the precautionary principle.⁵⁸ It reasoned that environmental impact assessments are key considerations because they include the public interest and they enable the “present generation to meet its obligation of intergenerational equity by ensuring the health, diversity and productivity of the environment is maintained and enhanced for the benefit of future generations.”⁵⁹ The Court observed how cumulative impact determinations help a decision maker to more accurately predict future environmental effects, while viewing impacts in a piecemeal fashion undermines the

planning process. Notably, the Court read the ESD principles set out in the Act's objectives section to apply to all of its parts, including Part 3A's environmental assessment requirements.⁶⁰ Based on these principles, the Court held that a decision maker is legally required to consider intergenerational equity during the environmental assessment process⁶¹ and specifically rejected the argument that a GHG assessment without coal burning emissions appropriately took into account ESD principles.⁶²

The Anvil Hill project is under a new round of judicial scrutiny, following amendment to its EIA to account for the impact of its coal burning. The Minister for the Environment and Water Resources decided in early 2007 that the Anvil Hill Project is not a controlled action under the EPBC Act, because the action is not likely to have a significant impact on any of the matters protected under the Act.⁶³ After examining the assessment reports submitted by the Anvil Hill Project Watch Association ("AHPWA") and taking into account the precautionary principle and public comments, the Minister found that "a possible link between the additional greenhouse gases arising from the proposed action and a measurable or identifiable increase in global atmospheric temperature or other greenhouse gas impacts is not likely to be identifiable."⁶⁴ "The climate system is complex," it reasoned, and connecting specific sources of GHG to potential impacts on protected matters is "uncertain and conjectural."⁶⁵

On appeal, the AHPWA challenged the Minister's interpretation of section 75(2)'s "likely" language, arguing that he erroneously required a "measurable or identifiable increase in the global atmospheric temperature or other greenhouse gas impacts"⁶⁶ and thus misconstrued the causal relationship necessary for legal responsibility.⁶⁷ The correct test, according to the AHPWA, is whether the proposed action is likely to have an impact on a matter protected under Part 3 that is "important, notable, or of consequence having regard to its context or intensity."⁶⁸ A single judge of the Federal Court rejected AHPWA's contextual argument, finding that the relatively small contribution of Anvil Hill's proposed emissions to total global emissions fell short of a significant impact.⁶⁹ AHPWA appealed to the full Federal Court on October 11, 2007.⁷⁰

The most recent coal mine expansion case, *Xstrata Coal Queensland Pty Ltd. v. Queensland Conservation Council*, recites familiar facts but adds a new twist in its remedy request: the QCC argued for a conditional permit as long as the company could "avoid, reduce or offset the emissions of greenhouse gases that are likely to result from the mining, transport and use of the coal from the mine."⁷¹ The proposed mine would produce up to 2.5 million tons of black coal a year for fifteen years, which

would be used in domestic and/or export markets for electricity production. The QCC relied heavily on evidence that GHG emissions from human activities (particularly energy production) cause climate change, which in turn levies significant economic, social, and environmental costs on Australia and the

world. But cross examination of their experts brought out that the mine's annual contribution to GHG emissions was minimal and that substantial scientific challenges to the IPCC report and the Stern Review exist.⁷²

While the Court considered ESD principles, it was not satisfied that QCC had established a demonstrable causal link between the proposed mine's GHG emissions and any discernable harm.⁷³ The only sure impact the Court saw was the adverse economic consequences of

restrictive growth; absent universally applied policies for GHG reduction, it concluded that requiring this mine to limit or reduce its GHG emissions would be arbitrary and unfair.⁷⁴ Thus, the Court recommended that the Minister for Mines and Energy grant Xstrata's additional surface area application as well as approve the environmental authority application under the Environmental Protection Act. The QCC appealed and the Queensland Court of Appeal remitted the matter to the Land Court for rehearing, based on procedural grounds.⁷⁵ Now the Land Court must re-evaluate the climate change science to determine if coal companies will not only have to assess their contribution to climate change, but initiate programs in order to avoid, reduce, or offset GHG emissions.

CONCLUSION: NEXT STEPS IN CLIMATE CHANGE LITIGATION DOWN UNDER

On one level, the victories experienced by climate change advocates seeking to use EIAs to make explicit the link between coal mining, coal burning, greenhouse gas emission, and global warming are real ones. The language in the EPBC Act and related state environmental statutes has been interpreted broadly, in light of overarching principles of ecologically sustainable development. Importantly, this application to climate change has resulted in EIAs having to account for the indirect effects of burning coal. Yet on another level, it would be relatively easy to see these requirements as pyrrhic victories, for no coal expansion project has been stopped in its tracks. Each was slowed down, admittedly, by the litigation and resulting requirements of more careful analysis and documentation of GHG emissions. But even the robust statutory language enshrining the precautionary principle and intergenerational equity did not keep an Australian coal mine from expanding.⁷⁶

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Nonetheless, these recent Australian climate change decisions have pointed a certain way. As the Australian government undergoes major changes in the wake of Rudd's election, the international community fashions an agreement to succeed the Kyoto Protocol, and the IPCC continues to refine its data, the questions of causation, burdens of proof, and evidentiary requirements that made Australian courts pause before holding individual coal mines accountable for their contribution to

climate change will soon likely find answers. Thus via case-by-case judicial interpretation of statutory intent, which provoked and refined this analysis of ecologically sustainable development in practice, Australian climate change litigation has played an important role in showing how individual countries might grapple with issues like climate change that cross temporal and spatial boundaries.



Endnotes: Recent Developments in Australian Climate Change

¹ JOSEPH SMITH & DAVID SHEARMAN, CLIMATE CHANGE LITIGATION: ANALYSING THE LAW, SCIENTIFIC EVIDENCE AND IMPACTS ON THE ENVIRONMENT, HEALTH & PROPERTY 43 (Presidian Legal Publications 2006). For example, Australia still allows the dumping of highly toxic metal waste, chlorine, and other chemicals into its ecologically sensitive waters. *Id.* at 43-44.

² SMITH & SHEARMAN, *id.*

³ See Wendy Frew, *Loyalty to Coal Takes Wind Out of Clean Energy Advocates' Sails*, SYDNEY MORNING HERALD, NOV. 3, 2007, at 30, available at <http://www.smh.com.au/articles/2007/11/02/1193619145340.html> (last visited Jan. 27, 2008).

⁴ Coal Fact Sheet, NSW Greens parliamentary website, <http://lee.greens.org.au/index.php/content/view/1328/65/> (last visited Jan. 27, 2008).

⁵ See Key Statistics, New South Wales Mineral Council Ltd. website, http://www.nswmin.com.au/minerals_an_essential_part_of_life/key_statistics (last visited Feb. 20, 2008) (indicating that the New South Wales minerals industry currently employs around 46,000 people and that another 200,000 jobs in New South Wales are reliant on the mineral industry, and that the New South Wales mining industry contributed \$1.5 billion in government royalty payments and state and federal taxes in fiscal year 2006); see also Coal Fact Sheet, *supra* note 4 (stating that New South Wales and the neighboring state of Queensland produce one hundred percent of Australia's black coal exports).

⁶ Australia's Electricity Briefing Paper #37, September 2007, Australian Uranium Association website, <http://www.uic.com.au/nip37.htm> (last visited Jan. 27, 2008) [hereinafter Briefing Paper #37].

⁷ Briefing Paper #37, *id.*

⁸ Coal Fact Sheet, *supra* note 4.

⁹ See news.com.au, *Thousands March for Walk Against Warming* (Nov. 11, 2007), available at <http://www.news.com.au/story/0,23599,22739694-1702,00.html> (last visited Jan. 27, 2008); see also ScienceDaily, *Climate Change Threatens Human Health, According to Australian Report* (Nov. 1, 2007), available at <http://www.sciencedaily.com/releases/2007/10/071030094648.htm> (last visited Jan. 27, 2008); Emma Maris, *Australia Warms to Climate Change* (Oct. 18, 2007), available at <http://www.nature.com/climate/2007/0711/full/climate.2007.62.html> (last visited Jan. 27, 2008).

¹⁰ Climate Change 2007: Synthesis Report, Intergovernmental Panel on Climate Change, http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf (last visited Jan. 27, 2008).

¹¹ See John Vidal, *Australia Suffers Worst Drought in 1,000 years*, GUARDIAN, Nov. 8, 2006, at 25, available at <http://www.guardian.co.uk/australia/story/0,,1941942,00.html> (last visited Jan. 27, 2008).

¹² Julian Glover, *The Lucky Country?*, GUARDIAN, Nov. 23, 2007, at 10, available at <http://www.guardian.co.uk/environment/2007/nov/23/climate-change.australia> (last visited Jan. 27, 2008).

¹³ See Barbara McMahon, *Australia's New Prime Minister Ready to Sign Kyoto Pact*, GUARDIAN, Nov. 26, 2007, at 16, available at <http://www.guardian.co.uk/australia/story/0,,2216949,00.html> (last visited Jan. 27, 2008).

¹⁴ See discussion *infra* Part II.

¹⁵ See discussion *infra* Part I.

¹⁶ See, e.g., Mary Wood, *Atmospheric Trust Litigation* (draft chapter on file with authors) (arguing that U.S. courts, via the development of the common law

public trust doctrine, have a pivotal role in policing the legislature and agencies, given "the enormity of climate crisis and the crucial role of the judiciary").

¹⁷ See Hari M. Osofsky, *Climate Change Liability and the Allocation of Risk: Climate Change Litigation as Pluralist Legal Dialogue?*, 43 STAN. J. INT'L L. 181, 186 (2007) (positing that the many forms of climate change litigation currently taking place around the world "might lead to a better understanding of [climate change litigation's] regulatory role" in the pluralistic international legal discourse on climate change).

¹⁸ See generally Lee Godden & Jacqueline Peel, *The Environment Protection and Biodiversity Conservation Act 1999: Dark Sides of Virtue*, 31 MELB. U.L. REV. 106, 143 (2007) (positing that despite present impediments, the EPBC Act should play a prominent role in the future, "bring[ing] about lasting changes to the culture of environmental decision-making").

¹⁹ Ben Boer, *The Globalisation of Environmental Law*, 76 AUSTRALIAN LAW REFORM COMMISSION 33 (2000), available at <http://www.austlii.edu.au/other/alcrc/publications/reform/reform76/07.html> (last visited Jan. 27, 2008).

²⁰ WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT, *OUR COMMON FUTURE* (Oxford University Press 1987).

²¹ An Overview of the National Strategy for Ecologically Sustainable Development, Australian Government, Department of the Environment, Water, Heritage and the Arts website, <http://www.environment.gov.au/esd/national/nsesd/overview/index.html> (last visited Jan. 27, 2008) [hereinafter Overview].

²² Overview, *id.*

²³ Overview, *id.* (explaining that the Commonwealth has taken measures to ensure that the precautionary principle, intergenerational equity, and the conservation of biodiversity work themselves into the decision-making process via the EPBC Act). State and local governments also implement the principles by infusing them into relevant planning and development legislation. *Id.*

²⁴ Intergovernmental Agreement on the Environment, Australian Government, Department of the Environment, Water, Heritage and the Arts website, <http://www.environment.gov.au/esd/national/igae/index.html> (last visited Jan. 27, 2008) [hereinafter IGAE].

²⁵ IGAE, § 3.5.2 (referring to intergenerational equity by stating that the "present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations").

²⁶ IGAE, *id.*

²⁷ IGAE, *id.*

²⁸ Environment Protection and Biodiversity Conservation Act 1999, ch. 1, § 3 (1)(a)-(g)(Austl.) [hereinafter EPBC Act].

²⁹ See EPBC Act, ch. 1, § 3 (2) (b). Bilateral agreements currently exist between the Commonwealth and Queensland, Western Australia, Tasmania, New South Wales, and the Northern Territory. These agreements ensure that state environmental assessments meet the standards of the EPBC Act, thereby making additional commonwealth assessments superfluous.

³⁰ EPBC Act, ch. 1, § 3(2)(d).

³¹ EPBC Act, ch. 1, § 3(2)(g).

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CHINA'S RENEWABLE ENERGY LAW:

NOT ENOUGH TO OVERCOME CHINA'S ENERGY AND ENVIRONMENTAL PROBLEMS

by Nathan Borgford-Parnell*

China's rapid economic growth over the last two decades has brought numerous environmental problems. Today, China contains seven of the ten most polluted cities in the world and is now the second-largest source of carbon dioxide emissions, behind the United States.¹ China's new renewable energy law recognizes the looming energy and environmental crisis on the horizon but may not be enough to solve the problem.

Current trends show China's energy use growing faster than its GDP.² Over two-thirds of its energy is produced from coal.³ Current projections for China's energy consumption in the near future could be as much as fifty percent higher than expected.⁴ Given China's dependency on coal for energy, its greenhouse gas emissions could grow equally as fast unless there is a significant shift to cleaner energy sources.

The Standing Committee of the National People's Congress of China passed a comprehensive renewable energy law on February 28, 2005. The law sets an aggressive target for renewable energy—fifteen percent of China's energy will come from renewable sources by 2020, up from approximately seven percent today.⁵ Overall, the law calls for the creation of 137 gigawatts of new renewable power generation in the next thirteen years.⁶ The law offers financial incentives, like a national fund to foster renewable energy development, discounted lending, and tax preferences for renewable energy projects.⁷ Due to the new law, China showed a sixty percent increase in wind power generation between 2004 and 2005; biogas and solar show similar growth.⁸

Unfortunately, this growth of renewable energy may not be enough to have a substantial impact on China's increasing dependency on fossil fuels. This is due in part to the fact that renewable energy projects have much higher up-front costs than fossil fuel projects, making financing of the projects much more difficult. Additionally, due to antiquated laws governing coal energy production, the environmental controls for renewable energy projects are much stricter than those for coal plants, making approval for energy projects much more costly and difficult.⁹

The Chinese law also mandates that power grid operators purchase energy produced from renewable sources at a price set by state authorities.¹⁰ For example, the national rate set for wind

energy is 6.5 cents per kilowatt hour, a forty percent increase over the average 4.5 cent rate for coal-generated power.¹¹ Unfortunately due to the higher cost for wind energy production, even at 6.5 cents per kilowatt hour, wind farm development in China is still slow.¹² At this rate, only one-third of one percent of wind projects approved in 2004 were completed and none were approved in 2005 or 2006.¹³ Mongolia pays between 8 and 9.5 cents per kilowatt hour for wind energy and is projected to see rapid growth in renewable energy development.¹⁴ To increase the speed of development, some of China's provin-

cial governments are now allowing payments of around 8.1 cents per kilowatt hour. All wind projects selling at that rate have been completed.¹⁵ These provincial rate increases have helped considerably, doubling installed wind capacity in China in 2006.¹⁶

At its current rate of consumption, China is likely to face serious energy shortages and growing environmental problems as it draws upon readily available coal resources and oil imports to remedy the problem.¹⁷ China's renewable energy law is not facilitating development of renewable sources fast enough to meet demand, and new and creative solutions are needed to meet this challenge.



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Endnotes:

¹ Zhang Zhengming et al., *Renewable Energy Development in China: The Potential and the Challenges* 3 (Jan. 3, 2007), available at <http://www.worldbiofuelssymposium.com/Renewable-Energy-Dev-in-China.pdf> (last visited Feb. 20, 2007).

² Jonathan E. Sinton et al., Lawrence Berkeley National Laboratory, *Evaluation of China's Energy Strategy Options* (May 2005).

³ Sinton et al., *id.*

⁴ Jiang Lin et al., Lawrence Berkeley National Laboratory, *Achieving China's Target for Energy Intensity Reduction in 2010* (Dec. 2006).

⁵ The Energy Foundation, *China Emerging as New Leader In Clean Energy Policies* (Dec. 2007), available at <http://www.efchina.org/csepupfiles/news/200712745928684.4034173459462.pdf/China%20Clean%20Energy%20Fact%20Sheet%20071206.pdf> (last visited Jan. 11, 2008).

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*Nathan Borgford-Parnell is a J.D./M.A. candidate, May 2009, at American University, Washington College of Law.

LANDMARK AGREEMENT TO STRENGTHEN MONTREAL PROTOCOL PROVIDES POWERFUL CLIMATE MITIGATION

by Donald Kaniaru, Rajendra Shende & Durwood Zaelke*

INTRODUCTION

Last September's historic agreement under the Montreal Protocol to accelerate the phase-out of hydrochlorofluorocarbons ("HCFCs") marked the first time both developed and developing countries explicitly agreed to accept binding and enforceable commitments to address climate change.¹ This is particularly significant because the decision was taken by consensus by the 191 Parties to the Protocol—all but five countries recognized by the United Nations.² Accelerating the HCFC phase-out could reduce emissions by sixteen billion tons of carbon dioxide-equivalent ("CO₂e") through 2040.³ In terms of radiative forcing, this will delay climate change by up to 1.5 years.⁴ This is because, in addition to depleting the ozone layer, HCFCs also are potent greenhouse gases ("GHGs")—with some thousands of times more powerful than carbon dioxide ("CO₂") at warming the planet. Thus, from September 2007 both Montreal and Kyoto can be considered climate protection treaties.

The HCFC agreement and its climate benefits were possible largely because of the Montreal Protocol's unique history of continuous adjustment to keep pace with scientific understanding and technological capability.⁵ The Parties to the Protocol generally regard the treaty as fair, due to its objective technical assessment bodies and its effective financial mechanism, the Multilateral Fund. These features and others have made the Protocol the world's most successful multilateral environmental agreement, phasing out ninety-five percent of global production of ozone-depleting substances in just twenty years and placing the ozone layer on a path to recovery.⁶

The Montreal Protocol offers additional opportunities to reduce GHG emissions further, including by creating greater incentives for the recovery and destruction of ozone-depleting substances currently in chemical inventory or contained in refrigerators, air conditioners, and other products and equipment still in service or not yet disposed.⁷ As with the HCFC agreement, these opportunities can achieve immediate and substantial reductions in GHG emissions, as well as further speed the recovery of the ozone layer. More significantly, they can be pur-

sued immediately and independently of the international climate treaty negotiations.

THE MONTREAL PROTOCOL: "START AND STRENGTHEN"

In 1987, the Parties to the Montreal Protocol required a freeze in halon production and a fifty percent reduction in the production of chlorofluorocarbons ("CFCs"), and have continually strengthened the treaty since then as it became clear that

ozone protection required that other ozone-depleting substances must be controlled and as new environmentally-superior substitutes and alternatives were developed. This is one of the great strengths of the Protocol, and it did not arise by accident. To the contrary, the treaty is designed to be flexible, allowing the Parties to strengthen and fine-tune its provisions to stay abreast of

current scientific understanding and technological capability.⁸ As Mostafa Tolba, the former UNEP Executive Director and "father" of the Montreal Protocol, has said of the treaty's evolution: "Start and strengthen."⁹

Adding or removing substances from the treaty's control measures generally requires an "amendment," which then must be ratified by each Party's government.¹⁰ Amendments can be time-consuming, often taking years, or even decades, before every Party completes ratification. For example, the most recent "Beijing Amendment" agreed on in 1999 did not enter into force until January 2001 and today is ratified only by 135 of the 191

*The Montreal Protocol
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GHG emissions.*

* Donald Kaniaru is an Advocate for Kaniaru & Kaniaru Advocates located in Nairobi. Mr. Kaniaru is the former Director, Division of Environmental Policy Implementation, for the United Nations Environment Programme ("UNEP"). Rajendra Shende is the Head of the OzonAction Branch in the Division of Industry Technology and Economics at UNEP-Paris. Mr. Shende is an expert on the implementation of multilateral environmental agreements and transfer of environmentally sound technologies to the developing countries, and policy advisor to more than 150 governments for the implementation of the Montreal Protocol. Durwood Zaelke is President of the Institute for Governance & Sustainable Development ("IGSD"); Co-Director for the Program on Governance for Sustainable Development, University of California, Santa Barbara; Director of the International Network for Environmental Compliance & Enforcement; and Partner in Zelle, Hofmann, Voelbel, Mason, & Getty. The authors are grateful for the research assistance of Thomas Higdon.

Parties to the Montreal Protocol. The treaty has been amended four times.¹¹

But the Parties can change or, more specifically, accelerate the Protocol's phase-out schedules by "*adjustment*," a procedure used six times. Adjustments do not require ratification and take effect within six months of agreement, except for parties that affirmatively opt out. In the United States, for example, Congress included "adjustments adopted by the Parties thereto and amendments that have entered into force" in its definition of the Montreal Protocol when it incorporated its provisions into the 1990 Amendments to the Clean Air Act.¹²

The adjustment procedure was instrumental in the evolution of the Protocol. The original text of the 1987 Protocol included only CFCs and halon ozone-depleting substances and required developed countries to phase out fifty percent of CFC production by 2000 and to freeze halon production. This was woefully inadequate in terms of protecting the ozone layer, but nevertheless a political and diplomatic triumph given concerns at the time that the science was not yet certain, the substitutes did not yet exist, and the projected costs looked prohibitive.

Shortly after the Protocol entered into force, the science of stratospheric ozone depletion and the Antarctic Ozone Hole were confirmed with empirical evidence—showing that the situation was potentially more grave than originally perceived. The modest control measures imposed in 1987 created a market for substitutes and alternatives, which were quickly developed and deployed. And many businesses complied at no cost or, in some cases, at a profit. As a result, the fifty percent phase-out of CFCs by 2000 was subsequently adjusted in 1990 to require a seventy-five percent phase-out by 1998 (and one-hundred percent by 2000), and then adjusted again in 1992 to require a one-hundred percent phase-out by 1996—all within the treaty's first five years. Through amendment and adjustment, the Montreal Protocol now regulates ninety-six different chemicals used in more than 240 sectors and thousands of applications.

RAPID INCREASE IN HCFC USE THREATENS CLIMATE AS WELL AS OZONE

At their nineteenth meeting on September 22, 2007, the Parties agreed to adjust the Montreal Protocol to accelerate the phase-out of HCFCs. Fittingly, the meeting celebrated the twentieth anniversary of the Montreal Protocol.

HCFCs are ozone-depleting substances regulated under the Montreal Protocol as "transitional" substitutes for the more damaging CFCs. Like CFCs, they were used in a variety of applications, including refrigerators and air conditioners, as foam blowing agents, and as chemical solvents. By 2006, it was clear that the use of HCFCs in developing countries was growing rapidly and threatening the recovery of the ozone layer and potentially undermining efforts to mitigate climate change.

Estimates reported by the Montreal Protocol's Technology and Economic Assessment Panel ("TEAP") showed that HCFC use could exceed 700,000 tonnes by 2015—roughly five times more than the TEAP's 1998 projection of just 163,000 tonnes.¹³ The Protocol's Scientific Assessment Panel reported in 2006 that the recovery of the ozone layer to pre-1980 levels would likely be delayed by fifteen years over Antarctica, to 2065, and by five years at mid-latitudes, to 2049, with the delay at mid-latitudes partly due to the high estimates of future production of HCFCs.¹⁴ In addition, the Environmental Investigation Agency reported in 2006 that HCFC emissions by 2015 could cancel out the reductions achieved by the Kyoto Protocol during its first commitment period of 2008–2012.¹⁵

The increased HCFC use was driven partly by economic growth in developing countries and by a "perverse incentive" under the Kyoto Protocol's Clean Development Mechanism ("CDM").¹⁶ The most commonly used HCFC is HCFC-22, which produces by-product emissions of HFC-23 when it is manufactured. Under the CDM, eligible HCFC-22 producers in developing countries could generate Certified Emissions Reductions ("CERs") by capturing and destroying HFC-23 by-product emissions.¹⁷ HFC-23 is a super-GHG with a global warming potential ("GWP") of 11,700.¹⁸ HFC-23 CERs could earn up to ten times the cost of capturing and destroying HFC-23 emissions and are exceeding the sales revenue of HCFC-22,¹⁹ effectively subsidizing the cost of producing HCFC-22 and driving its expanded use, including in applications where it has not been widely used or had already been replaced.²⁰

The original HCFC control measures were not negotiated with these higher than expected levels in mind. Originally, the Montreal Protocol required developing countries to freeze HCFC consumption by 2016 at 2015 levels and phase-out one hundred percent of HCFC production by 2040. It required developed countries to phase out 99.5 percent of HCFCs by 2020, with 0.5 percent allowed for servicing existing equipment until 2030.²¹ By early 2007, there was concern that without urgent action, developing countries would have difficulty in complying with the 2016 freeze and the 2040 phase-out.²²

MONTREAL PROTOCOL'S SUCCESS MADE IT THE WORLD'S BEST CLIMATE TREATY

As it approached its twentieth anniversary, the Montreal Protocol already was widely considered the world's most successful multilateral environmental agreement. But what many did not know is that its success in phasing out ozone-depleting substances also made it the world's best climate treaty—so far.

The publication of a groundbreaking paper in the Proceedings of the National Academy of Sciences ("PNAS") calculated the climate benefits of the Montreal Protocol, and the results helped spur the international community to action.²³ Because

The adjustment procedure was instrumental in the evolution of the Protocol.

CFCs are such potent GHGs, the Montreal Protocol is reducing emissions by 135 GtCO₂e between 1990 and 2010 and delaying climate forcing by seven to twelve years.²⁴ When pre-Montreal Protocol efforts to protect the ozone layer are included, such as voluntary reductions in CFCs and domestic regulations in the 1970s, the delay in climate forcing is thirty-five to forty-one years.²⁵

The PNAS article drew greater attention to both the ozone and the climate impacts of the increased HCFC use. It became the foundation for key Parties and non-governmental organizations to make the case for strengthening the Montreal Protocol by accelerating the HCFC phase-out to maximize its climate benefits—as well as to ensure the continued success of the treaty in protecting the ozone layer. In particular, the article received considerable attention at meetings of the Stockholm Group, an informal gathering of ozone and climate experts that played a critical role in reviewing the technical and economic data supporting an accelerated HCFC phase-out and building consensus among developed and developing country governments.

PROPOSALS TO ACCELERATE HCFC PHASE-OUT CITED CLIMATE BENEFITS

In March 2007, an “unusual coalition” of nine Parties submitted six separate proposals (some jointly) to accelerate the phase-out of HCFCs.²⁶ Proposals came from both developed and developing countries, and nearly all cited the potential climate benefits of an accelerated HCFC phase-out, as well as the ozone benefits. Small island and coastal developing countries, including Argentina, Brazil, Mauritius, and the Federated States of Micronesia, were among the Parties stressing the need to take immediate action to mitigate the causes of climate change as part of their justification for an accelerated HCFC phase-out. The United States also referenced climate considerations in its proposal, which put forward one of the most aggressive accelerated phase-out schedules.

The Parties met at the 27th Open-Ended Working Group in June 2007, to discuss the proposals and recognized a “clear need to accelerate the timetable for the phase-out of ozone-depleting substances, in particular HCFCs.”²⁷ On June 7, the *G8 Summit Declaration* added further support, committing to “accelerating the phase-out of HCFCs in a way that supports energy efficiency and climate change objectives.”²⁸

As the twentieth anniversary Meeting of the Parties approached, key Parties and influential scientists and policy-makers began to weigh in on the HCFC issue. Dr. Mario Molina, who in 1995 shared the Nobel Prize with Dr. Sherwood Rowland for their work in the 1970s on the impacts CFCs had on the ozone layer, wrote an influential opinion piece for the *Financial Times* of London, stating,

Now it is time for the ozone treaty to make its role in reducing climate emissions more explicit. This should start next month with an agreement among the parties to accelerate the phase-out of hydrofluorocarbons in a way that promotes energy efficiency and climate change objectives. . . . In the light of the short time

before we reach the planet’s ‘tipping point,’ they cannot afford to fail.²⁹

As the negotiations progressed, the key questions, particularly for developing countries, were the availability of substitutes and whether assistance through the treaty’s financial mechanism, the Multilateral Fund, would be available.

With regard to substitutes, the evidence clearly showed that they were commercially available for virtually all HCFC applications. The *UNEP 2007 Synthesis Report* concluded that technically and economically feasible substitutes were available for almost all HCFC applications.³⁰

Financing the accelerated phase-out was more complicated. Under the 1990 Amendments to the Montreal Protocol, developed country Parties must provide financial assistance, through the Multilateral Fund, to developing country Parties to cover the agreed incremental costs of making the transition out of ozone-depleting substances and into more environmentally friendly substitutes and alternatives. Thus far, the Fund has disbursed approximately \$2.3 billion in financial assistance. The high levels of HCFC use, particularly in China, meant that the amount of financial assistance would need to increase substantially to cover incremental costs for HCFCs at a time when many donor Parties were expecting financing for the Montreal Protocol to be winding down. Indeed, many thought the ozone layer problem had already been solved and the time had come to discontinue the Montreal Protocol itself.

HCFC AGREEMENT PROVIDES FOR CLIMATE-FRIENDLY SUBSTITUTES AND FINANCING

After a week of intense negotiations in Montreal, the Parties reached an agreement to accelerate the HCFC phase-out.³¹ For developing countries, the new control measures shift the base year from 2015 to an average of 2009 and 2010 and the freeze date from 2016 to 2013. Developing countries must then phase-out ten percent of production by 2015, thirty-five percent by 2020, 67.5 percent by 2025, and 97.5 percent by 2030, with 2.5 percent allowed for servicing existing equipment until 2040. Developed countries, many of which have already completed a transition out of HCFCs, must now phase-out seventy-five percent of production by 2010, instead of sixty-five percent, with a 99.5 percent phase-out by 2020, and 0.5 percent allowed for servicing existing equipment until 2030.

Accelerating the HCFC phase-out will reduce emissions an estimated sixteen GtCO₂e or more through 2040, with the actual climate benefits depending on the success replacing HCFCs with zero and low GWP substitutes, and/or preventing future emissions of these substitutes by providing for a robust system to recover and recycle or destroy used chemicals at equipment end-of-life.³²

In an effort to maximize these potential climate benefits, the adjustment decision calls on the Parties to “promote the selection of alternatives to HCFCs that minimize environmental impacts, in particular impacts on climate” and to give priority to “substitutes and alternatives that minimize other impacts on the environment, including on the climate, taking into account glob-

al-warming potential, energy use, and other relevant factors.”³³

By explicitly referencing the climate impacts of HCFC substitutes and alternatives, the adjustment marks the first time that both developed and developing countries have agreed to accept binding commitments to mitigate climate change.

The adjustment decision also includes provisions to ensure that developing countries receive financial assistance through the Multilateral Fund to make the transition out of HCFCs, although the details of implementation will continue to be negotiated at the Fund’s Executive Committee meetings.

The agreement was hailed worldwide. Achim Steiner, the Executive Director of the United Nations Environment Programme, called it “the most important breakthrough in an environmental negotiation process for at least five or six years because it sets a very specific target with an ambitious timetable.”³⁴ Romina Picolotti, Argentina’s Minister of Environment and an early and vocal proponent of the accelerated HCFC phase-out, described it as “important for the ozone layer, and even more important for the climate. It shows us what we can do when we have the spirit to cooperate.”³⁵

NEXT UP AT THE MONTREAL PROTOCOL: CREATING GREATER INCENTIVES FOR THE RECOVERY AND DESTRUCTION OF BANKS

There are several other measures that the Parties can take that will mitigate climate change, including the “practical measures” developed as part of the Ozone Secretariat’s Workshop on the IPCC/TEAP Special Report held in July 2006.³⁶ The TEAP calculates that an accelerated HCFC phase-out plus the “practical measures” identified at the Workshop can result in cumulative emissions reductions of about 1.25 million ozone depleting potential (“ODP”) tonnes and thirty GtCO₂e.³⁷

In particular, banks of CFCs and other ozone-depleting substances (“ODSs”) represent a significant threat to the ozone layer and the climate. Banks are defined as ODSs contained in existing equipment (e.g. air conditioners and refrigerators), products (e.g. foam insulation), and stockpiles (e.g. the military stockpiles various chemicals for specialized uses). These exist in both developed and developing Parties. Approximately 7.4 GtCO₂e of CFCs, currently contained in banks of existing equipment and products, is expected to be released into the atmosphere between 2002 and 2015.³⁸ There will be additional significant emissions beyond 2015 as more CFC and HCFC-based equipment reaches end-of-life.³⁹

Emissions of CFCs and other ODSs from banks could be avoided by creating greater incentives for their recovery and destruction. This should include allowing destruction credits to carry forward for more than one year, to be traded between Parties, and to transfer among chemical groups, where the destruc-

tion of an amount of one chemical, for example, CFCs, would allow the production or consumption of an equal amount, on an ODP-weighted basis, of an ODS from another chemical group, for example, HCFCs.⁴⁰ It could include programs to encourage greater recovery and recycling or destruction, such as Refrigerant Reclaim Australia.⁴¹ In addition, the Chicago Climate Exchange issued the first carbon offset methodology in late 2007 that would allow the destruction of ODS banks to generate offset credits.⁴²

One additional benefit of a robust recovery and recycle/destruction program is that it undercuts the traditional paradigm where consumption of ODS or ODS substitutes is treated as equal to emissions. With guaranteed recovery and destruction, it would be possible to allow the continued use of certain chemicals whose direct impacts on the ozone and the climate may be high, but whose indirect benefits, such as

improved energy efficiency, make them desirable to available alternatives.⁴³

There is growing support for new measures creating greater incentives for the recovery and destruction of banks. At the September 2007 Meeting of the Parties to the Montreal Protocol, the Administrator of the U.S. Environmental Protection Agency, Stephen Johnson, challenged, “all delegations to consider ways of destroying the banks of ozone-depleting substances currently installed in equipment. These large sources of CFCs and other ozone-depleting substances represent a ripe opportunity to both further protect the ozone layer and to reduce emissions that contribute to global climate change.”⁴⁴ At the December 2007 Climate Conference in Bali, the United States, Argentina, Micronesia, and Mauritius answered this challenge at a side event organized by the Institute for Governance & Sustainable Development, where they stated their interest in strengthening the Montreal Protocol to address the threat from banks.

OTHER MEASURES

Other strategies for strengthening the Montreal Protocol were described in the original SDLP article,⁴⁵ including exempting HCFC-123 from phase-out and allowing its continued use until superior substitutes are developed, based on its negligible ozone impacts and the energy efficiency advantage of HCFC-123 chillers over the primary alternative, HFC-134a, where HCFC-123 results in lower GHG emissions associated with power generation to run the chillers, as well as lower operating costs over the thirty-year life of the equipment.

The Montreal Protocol also should strengthen its compliance efforts by building on work already underway in the Secretariat, UNEP OzonAction’s compliance assistance program, and elsewhere, to promote an ambitious capacity building program. This can be accomplished by linking with the Green Customs

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Initiative of UNEP, and the International Network for Environmental Compliance & Enforcement. A much more aggressive effort is warranted by the combined ozone and climate benefits from strict compliance.

With regard to the use of ODSs for feedstocks, process agents, and quarantine and preshipment (“QPS”) applications, requiring mandatory periodic review of current uses and their direct and indirect impacts on the ozone and climate, utilizing a Life Cycle Analysis, would lay the groundwork for future action banning the use of ODSs where alternatives that are less harmful to the environment are available. Half of the HCFC-22 produced today is used as feedstocks and process agents exempt from the Montreal Protocol accelerated phaseout; and thus half of the global emissions of HFC-23, a super GHG, is a consequence of allowing exempted HCFC uses. Unfortunately, the Montreal Protocol and its TEAP have not yet investigated the technical feasibility of reducing and eliminating these uses—including the options of not-in-kind technology for the products that currently depend on HCFCs in production.

Finally, the Montreal Protocol also should require use of the concept of Life Cycle Climate Performance (“LCCP”), which is considered a practical elaboration of Life-Cycle Analysis. LCCP was proposed by the TEAP to calculate the “cradle-to-grave” climate impacts of the use of ODSs in equipment. Direct emissions result from the leaks of chemicals into the atmosphere. Indirect emissions result from the energy consumption due to manufacturing, operation, and disposal at the end of product life and also account for the carbon content of the fuel utilized in each process and product life. The Mobile Air Conditioning Climate Protection Partnership has posted its LCCP model on the U.S. EPA website showing the combined climate life cycle impact

of refrigerant greenhouse gases directly emitted and the indirect greenhouse gas emissions of fuel used to produce, power, transport, and dispose the equipment.⁴⁶

CONCLUSION

The Montreal Protocol and its success in protecting both the ozone layer and the climate show that global environmental problems can be solved through international cooperation. As the world works toward a post-2012 climate treaty, the twenty-year history of the Montreal Protocol offers invaluable lessons for climate negotiators and demonstrates the potential of international environmental law in the pursuit of sustainable development.⁴⁷

Climate mitigation under the Montreal Protocol is one of several key strategies for achieving immediate climate mitigation, along with strategies for energy efficiency, reductions in black carbon, or soot, expansion of renewables, and enhancement and protection of forests and other sinks. These and other immediate mitigation strategies are needed to buy critical time to develop a sufficiently strong post-2012 climate regime.

It is impossible to say just how much the planet will warm before triggering abrupt climate changes, but critical thresholds could be as near as ten years away, and it is imperative to strengthen the Montreal Protocol to avoid every ton of CO₂e emissions that it can. In addition to finishing the job of protecting the ozone layer, this is one of the best insurance policies the world can buy to give us time to succeed with our long-term climate controls. And it is an insurance policy that we can be confident will be delivered by the world’s best environmental treaty.



Endnotes: Landmark Agreement to Strengthen Montreal Protocol

¹ Eli Kintisch, *Tougher Ozone Accord Also Addresses Global Warming*, 317 Sci. 1843 (Sept. 2007).

² States that have not yet ratified the Montreal Protocol are Andorra, Holy See, Iraq, San Marino, and Timor Leste.

³ See U.S. Env’tl. Protection Agency, Analysis—Overall HCFC Agreement: Potential Climate Benefits of New Stronger HCFC Phaseout Controls, available at <http://www.epa.gov/spdpublic/intpol/mpagreedanalysis.html> (last visited Mar. 5, 2008). The climate benefits of the accelerated HCFC phase-out depend on the GWPs of the chemicals used as substitutes. The U.S. EPA calculated that a transition to zero or low GWP chemicals will result in a reduction of approximately 16 GtCO₂e over the course of the phase-out. [hereinafter Overall HCFC Agreement]. Four independent calculations of the potential climate benefits were made in advance of the adjustment, ranging from 17.5 to 25.5 GtCO₂-eq. between 2010 and 2050; all noted that the estimates depended upon how carefully the transition out of HCFCs was managed to maximize climate benefits and energy efficiency. See Donald Kaniaru, Rajendra Shende, Scott Stone, & Durwood Zaelke, *Frequently Asked Questions: Strengthening the Montreal Protocol by Accelerating the Phase-Out of HCFCs at the 20th Anniversary Meeting of the Parties in CELEBRATING THE MONTREAL PROTOCOL: 20 YEARS OF ENVIRONMENTAL PROGRESS—OZONE LAYER AND CLIMATE PROTECTION* (Donald Kaniaru ed., 2007).

⁴ Correspondence with Dr. Guus J.M. Velders of the Netherlands Environmental Assessment Agency (on file with authors).

⁵ See STEPHEN O. ANDERSEN & K. MADHAVA SARMA, *PROTECTING THE OZONE LAYER: THE UNITED NATIONS HISTORY* (Earthscan 2002). See also STEPHEN O. ANDERSEN, K. MADHAVA SARMA, & KRISTEN N. TADDONIO, *TECHNOLOGY TRANSFER FOR THE OZONE LAYER: LESSONS FOR CLIMATE CHANGE* (Earthscan 2007); THE MONTREAL PROTOCOL: CELEBRATING 20 YEARS OF ENVIRONMENTAL PROGRESS: OZONE LAYER AND CLIMATE PROTECTION, (Donald Kaniaru, ed., Cameron 2007).

⁶ World Meteorological Organization & UN Env’t Programme, Science Assessment Panel of the Montreal Protocol on Substances that Deplete the Ozone Layer, *Scientific Assessment of Ozone Depletion: 2006* (2006).

⁷ CFC and HCFC refrigerants are contained in some vehicle and stationary air conditioning systems that will be in service for many years to come. CFC and HCFC foam-blowing agents are contained in the thermal insulating foam of refrigerators and refrigerated cases and in building insulating foam. Halon fire extinguishing agents are contained in hand-held, wheeled and fixed fire suppression systems. CFCs, HCFCs, Halons, and other ODS are stockpiled by chemical speculators expecting price increases after phaseout and by product manufacturers left with excess supplies after conversion to ozone-safe alternatives. Although many countries prohibit the venting of ODS, numerous investigations have documented that owners often prefer to allow the chemicals to leak away rather than paying the costs of destruction.

Endnotes: Landmark Agreement to Strengthen Montreal Protocol
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ANALYTICAL TOOLS SHAPING THE NEXT GENERATION OF CARBON REGULATION AND TRADING: THE NEW YORK METROPOLITAN AREA CASE STUDIES

by Edward J. Linky, Vatsal J. Bhatt & John C. Lee*

INTRODUCTION

The next generation of carbon regulation is under discussion. The United Nations Climate Change Conference in Bali, Indonesia concluded with the collective sense that the United States is now an active participant in the future of an international carbon regime. Undoubtedly, skepticism about U.S. domestic regulation of greenhouse gases (“GHGs”) as well as the timetable for U.S. participation will remain. State, regional, and local initiatives to control GHGs, principally from the electric power sector, however, are well developed and on the road to implementation with draft administrative rules available for public review and comment. For instance, in the Northeastern United States, the most familiar of these initiatives is the Regional Greenhouse Gas Initiative (“RGGI”), and the recently implemented Western Regional Climate Action Initiative (“WRCAI”) has gained sizeable momentum in the West. It is unlikely these initiatives will be tabled to wait for a uniform federal response.

On the programmatic side, New York City Mayor Michael Bloomberg’s administration has created PlaNYC 2030, an initiative to bring clarity and definition to principles of urban sustainability. As well-intentioned as these efforts are, the first two remain confined, as RGGI is in its first generation with limited scope and geographical coverage, and the PlaNYC is still a programmatic goal statement with some initial implementation projects. The New York City-based Regional Plan Association has launched an integrated energy-land use-transportation and GHG mitigation program, Long Island 2035, in Nassau and Suffolk Counties, which adjoin the five county-boroughs of New York City.

The U.S. Environmental Protection Agency (“U.S. EPA”) Regional Office in New York City (“U.S. EPA Region II”) has formed a diverse partnership with Brookhaven National Laboratory, academic institutions, regional transportation, and land use planning organizations to develop a suite of analytic system models which can provide a quantitative vision of technology and management strategy options for reducing the region’s

carbon footprint while maintaining the energy demands of the community and the servicing of environmental infrastructure.

In this Article we provide results of a case study using models completed for New York City and one under development for Long Island, which utilizes an integrated urban energy-water systems analysis tool. The case study demonstrates integration of the MARKAL model with land use, transportation, and human health models. Combined with appropriate stakeholder participation, such case studies promise to influence the current environmental regulatory regime, including multi-media aspects of carbon control, whether at the regional or national level.

The next generation of carbon registration and exchange is going to be far more rigorous than its predecessor.

TOP-DOWN AND BOTTOM-UP INITIATIVES IN U.S. CARBON REGULATION AND MARKETS

The next generation of carbon regulation in the United States is under consideration with three competing pieces of legislation in the United States Senate: S.280, S.485, and S.1766.¹ This next generation legislation will be much more sophisticated and hence, more complicated than previous energy and air regulatory schemes such as the 1990 Clean Air Act Amendments and the Energy Policy Act Amendments of 2006. The goal of this proposed legislation is to account for GHG generation from the usual industrial, commercial, and residential sources, in addition to land use patterns. The successor to the Kyoto Protocol of the United Nations Framework Convention on Climate Change now under discussion is very likely to address key performance elements such as “additionality and leakage.” Both of these ele-

* Edward J. Linky, Esq. is Senior Energy Advisor, U.S. EPA Region II and can be reached at Linky.Edward@epamail.epa.gov. Vatsal J. Bhatt and John C. Lee work at the Brookhaven National Laboratory and can be reached for comment at vbhatt@bnl.gov and jcl@bnl.gov. This Article is written as part of the authors’ program responsibilities at the U.S. Environmental Protection Agency and Brookhaven National Laboratory. The activities presented describe ongoing work in U.S. EPA Region II in collaboration with the Brookhaven National Laboratory in support of the Air Quality Management and Climate Partnership Programs. The Article is the responsibility of the authors.

ments have been issues surrounding carbon market exchanges in the United States and the European Union. Further, a future Asian Climate Exchange located in India or China poses additional challenges to those who claim carbon reductions and then post them for sale and exchange. Thus the next generation of carbon registration and exchange is going to be far more rigorous than its predecessor.

Despite the sense of inevitability surrounding U.S. carbon legislation and presumed conformance to the Kyoto successor, the timing of such measures remains very uncertain. For this reason, this paper focuses on bottom-up initiatives, particularly those in the Northeastern United States. In this region and specifically in the New York Metro area, there are a variety of mega-stakeholders that are uniting behind several sustainability plans and programs. These initiatives are not dependent on any of the top-down legislative proposals described above, and they may very well act independently of them for a period of time. As is suggested below, one particular analytical tool—the New York Metro MARKAL Integrated System model—can produce a quantitative vision for any of the efforts described below either individually or collectively. The output of this tool can help shape more precise regulatory schemes and financing mechanisms for greenhouse reduction technologies and strategies, and, as we show, help produce higher quality carbon credits which will be well received in the domestic and international markets.

Enactment of any of the top-down approaches will ultimately need to be reconciled with regulatory and planning initiatives already launched in the Northeastern and Western States. Currently, these initiatives are limited to electric power production facilities, but if federal legislation is not enacted then these initiatives will likely expand in the near future, probably around 2012.² RGGI is further along the regulatory track with the adoption of a memorandum of understanding (“MOU”) and a Model Rule on power plants³ working its way into several states’ administrative rule procedures. The Western States Initiative was recently launched in 2007.⁴

The next wave of regulatory and planning initiatives is found at the local level of government. It is at this level that the body of this Article concentrates. Networks of researchers, municipal and regional government officials, and regional offices of federal agencies and one National Laboratory have coordinated their efforts in the New York Metropolitan area. This evolving network illustrates how local interests and needs can move ahead of top-down federal and even international regulatory schemes. The applications of the New York Metro MARKAL tool range from the next generation of electric power production and wastewater treatment facilities down to community redevelopment through zero thermal footprint zoning ordinances. The goal of ongoing studies using this tool is not to direct or influence the regulatory

process *per se* but to suggest that with proper analysis virtually any of the GHG reductions requirements through international treaty or federal/state legislation can be met with existing and emerging technologies. This analytical framework provides legislators and policy makers with a quantitative vision of a sustainable future. To be sure, this sustainable future will require an extraordinary amount of self-discipline, which the United States has not needed since World War II and the international community has never faced: holding carbon caps in place for at least a century with the possibility of returning the climate in time to the patterns of the last century.⁵

NEW YORK METROPOLITAN AREA’S BOTTOM-UP INITIATIVES

There are three on-going programs in the New York Metro region, which directly focus on climate change and sustainability. These are: New York Metro Urban Modeling Consortium, PlaNYC, and the Regional Plan Association’s Fourth Regional Plan, and the Northeast “Mega region.” Since each of these efforts is either utilizing or considering the MARKAL tool, a brief description of each plan is warranted, as it will help crystallize some of the proposed future uses of the tool. As will be illustrated below, PlaNYC still needs a unifying tool that can, for example, evaluate the costs and benefits of using shade trees either in combination or as a substitute for other

forms of building energy efficiency. Through its work with the Urban Modeling Consortium, the NYC MARKAL is uniquely positioned to provide guidance.

THE NEW YORK METRO URBAN MODELING CONSORTIUM

This Consortium is composed of the U.S. EPA Region II, Brookhaven National Laboratory, The Earth Institute at Columbia University, Units of the City University of New York, and the NASA Goddard Institute of Space Studies (“GISS”). Each of the members had been engaged in loosely affiliated research in various aspects of climate change in New York City, however, the principal focus of these efforts is the urban heat island (“UHI”) and its impact on the electrical power network along with air quality implications for human health.

U.S. EPA Region II facilitated a MOU to be ultimately signed by Consortium members, containing a set of principles for climate models and their applications. These principles were adopted from the American Council for an Energy Efficient Economy and essentially pledge the signatories to total transparency and critical examination in modeling and applications. It is thought that this declaration of principles is the first of its kind, at least in the United States. The central model in the Consortium is the New York Metro MARKAL. Other models involve climate and health models as well as weather related models from Columbia University and NASA-GISS, respectively.

*The next wave of
regulatory and planning
initiatives is found at the
local level of government.*

To date, the Consortium has advised several Community Planning Boards—the ultimate decision-makers on zoning ordinances—on low climate impact zoning ordinances based on the thermal impact of new development or redevelopment projects on their areas. The recent sale of two middle class housing developments Stuyvesant Town and Peter Cooper Village to private developers has raised concerns about the future sustainability of these forms of public housing in an urban, heat-island-intensified environment.⁶

PLAN NYC

Mayor Bloomberg's Administration has created an ambitious and groundbreaking public forum on the future of the five boroughs of New York City through PlaNYC.⁷ The effort has three basic areas for public input and technical research: population growth, infrastructure needs, and maintenance and greening of the city in order to cope with rising temperatures and sea level rise. The planning horizon is 2030. Within PlaNYC there is a comprehensive discussion of energy costs and carbon emissions from an ineffective market, inefficient buildings, and growing needs. The needs are exemplified by both the quantity and quality of electric power needed to service the demands of a dynamic academic and private sector research community along with enhanced entertainment and information services demanded in the commercial and residential sectors. Key elements of the energy section of PlaNYC include reforming the planning process for new generation, recognizing that attention must be paid to the transmission and distribution of electricity, and creating an energy efficiency authority. The working group for PlanNYC has completed a GHG inventory for the city and identified that the building sector is the biggest contributor. The Regional Plan Association⁸ has stated that there are approximately 940,000 buildings in the five boroughs (counties) of New York City but that currently only 400 are "green" in some form.

The green category includes Energy Star Rated Buildings along with LEED certified, plus all other forms of green designation. Clearly, if the city is to reduce its GHG emissions from the building sector, a massive effort must be mounted to stimulate energy efficiency. Technology and accounting mechanisms exist through the Energy Star Buildings Program to reduce electric power consumption in most building types by forty percent. The principal objective of the Energy Efficiency Authority will be to dramatically increase the efficiency of the building sector and lower electric power consumption.

A second element of PlanNYC is "Million Trees NYC," a city-wide initiative to restock and reforest parks and street trees to plant one million trees within the 2030 horizon of PlanNYC. Trees can be effective in cooling certain types of buildings but are not considered as a cooling strategy per se in PlaNYC. Trees, and by implication vegetative roofs, can also have storm water control benefits. Finally, it is believed that to make use of the extended benefits of urban canopy, key regulatory issues not even yet identified must be faced. For example, only fifty percent of the urban canopy is thought to be under public control. High costs associated with maintaining the urban canopy as an effective technique for reducing climate impacts may lead to an

understanding that the canopy should be designated as a regulated utility and governed by enhanced control schemes. However, one never gets to that threshold issue unless a quantitative analysis conducted by the NYC MARKAL is completed.

THE REGIONAL PLAN ASSOCIATION AND THE NORTHEAST MEGA REGION

In a joint venture, the Regional Plan Association ("RPA") and the Lincoln Land Institute ("LLI"), convened a meeting in Healdsburg, California to examine the concept of mega regions in the United States.⁹ The Regional Plan Association has taken this report a step further and produced America 2050, in which ten emerging mega regions in the United States are identified.¹⁰ Beyond identifying the regions the initiative is trying to identify the relationships that define mega regions and test new financing and governance methods as well as finding equitable mechanisms to distribute benefits to bypassed regions.

One of the ten mega regions in the American 2050 report is the Atlantic Coast Northeast region. The RPA usually produces in a decadal frame its vision for its traditional region—the thirty-one counties of New York City, central and northern New Jersey, western Connecticut and downstate and central New York State, which includes Nassau and Suffolk County, collectively known as Long Island. The RPA is using Long Island as a test bed for smart growth and low-carbon approaches to land use and envisions using the Long Island extension of the NYC MARKAL as its principal analytical tool.¹¹

Long Island's basic infrastructure, including its commuter railroad, electric generating stations, and wastewater treatment plants, are all threatened by a rise in sea level.¹² Whether the existing network can be maintained cost effectively or will have to be modified to serve new population centers protected from the sea in a more efficient land use pattern, is the type of long-range low-carbon direction that will be explored in this planning paradigm. How the state's public utility regulatory structure may need to be reshaped to accommodate a future of low-carbon requirements and an impending sea level rise can at least be preliminarily quantified by the NYC MARKAL-Long Island extension.

FUTURE DIRECTIONS FOR THE REGULATORY PROCESS

As we noted, in the on-going RGGI rule adoption process, the regulation of power generation facilities in the signatory states will change by 2012. Regulatory elements of PlaNYC in the energy sector will stimulate markets for energy efficiency in buildings and these efficiency improvements may generate tradable carbon credits in the New York State electric grid. Planning processes under development on Long Island and at the Community Planning Board in New York City can potentially reshape zoning ordinances relating to low-carbon and low-thermal impact on land use patterns.

The New York City MARKAL and its Long Island extension are tools fully capable of responding to all of the challenges noted above. This bottom-up approach can serve as an example of how low-carbon planning approaches can be implemented when guided by a tool such as an urban-based MARKAL.

URBAN ENERGY, WATER, AND SOLID WASTE SYSTEMS ANALYSIS

An integrated urban energy-water systems analysis tool, Urban MARKAL, recently developed by the Brookhaven National Laboratory, has the capability to influence existing air, water, solid waste, and zoning regulations. The urban energy model, MARKAL, along with the building energy simulation model and a meso-scale climate model, was developed under a grant from the U.S. EPA Region II. Water and wastewater analysis capabilities were integrated with urban energy in MARKAL with the grant from the U.S. Department of Energy's ("DOE") grant to support the Energy-Water Nexus program. The Urban MARKAL model incorporates a technology database rich with existing and future technologies that is tied to the performance of urban infrastructure systems. The Urban MARKAL model incorporates active and passive approaches to central and distributed energy resources, electric grids and energy consumption, water supply and wastewater treatment grids, and passive approaches to reducing thermal load on the sites of public housing and commercial building projects.

MARKAL MODELING FRAMEWORK FOR INTEGRATED STRATEGIC PLANNING

Energy, water, wastewater, and solid waste disposal systems are highly interdependent. For optimal sustainable operation of cities, long-term strategic planning and management is required for the detailed sub-system and the integrated macro-system. MARKAL provides a comprehensive and integrated systems planning and management methodology.

The MARKAL model is a technology-driven linear optimization model of the urban energy system that runs in five year intervals over a fifty year projection period.¹³ MARKAL provides a framework to evaluate all resource and technology options within the context of the entire energy/materials system, and it captures the market interaction among fuels to meet demands (e.g., competition between gas and coal for electricity generation). The model explicitly tracks the vintage structure of all capital stock in the economy that produces, transports, transforms, or uses, energy and the associated materials.

In MARKAL, the entire energy system is represented as a network based on the reference energy system ("RES") concept. The RES depicts all possible flows of energy from resource extraction, through energy transformation, distribution, and transportation, to end-use devices that satisfy the demands of useful energy services (e.g., ton in cooling, lumen-second in lighting). Figure 1 illustrates a simplified RES in graphical form. The U.S. MARKAL model has detailed technical representations of four end-use sectors: residential, commercial, industrial, and transportation, as well as fossil fuel and renewable resources, petroleum refining, power generation, hydrogen production, and other intermediate conversion sectors.

Technology choice in the MARKAL framework is based on the present value of the marginal costs of competing technologies in the same market sector. On the demand side, the marginal cost of demand devices is a function of levelized capital cost: Operation and Maintenance ("O&M") cost, efficiency, and the imputed price of the fuel used by these devices. For a specific energy-service demand and period, the sum of the energy-service

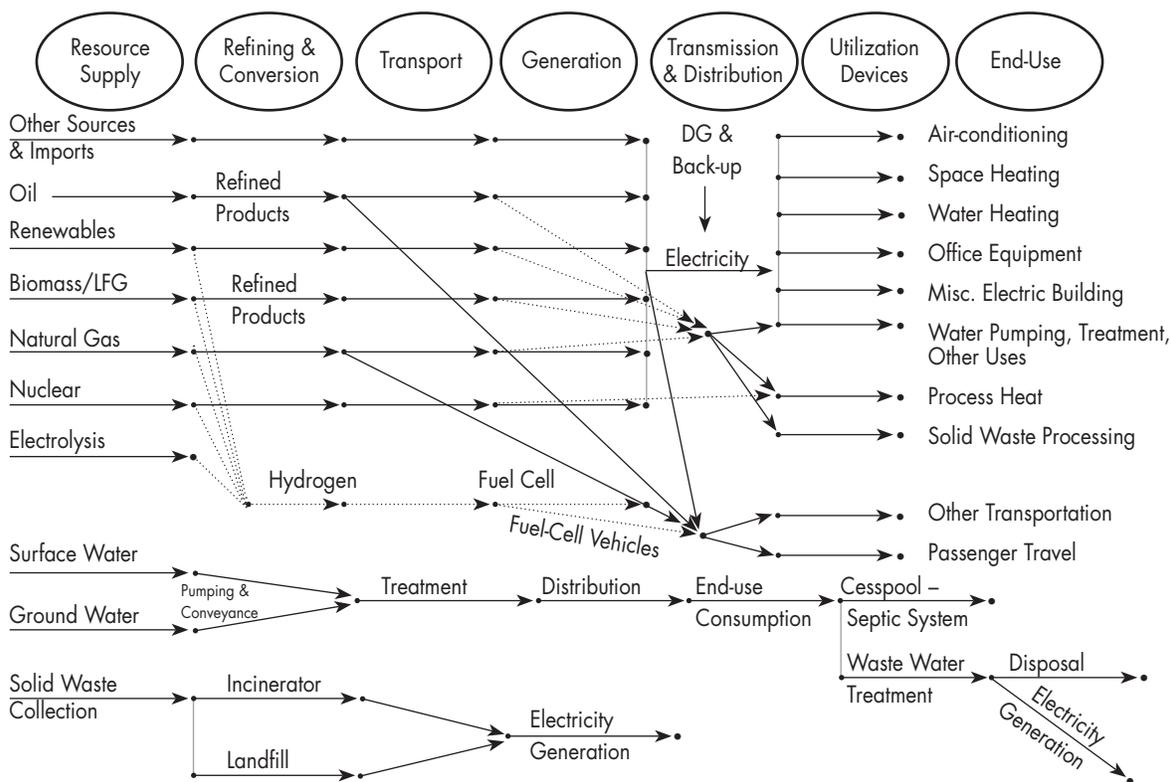


FIGURE 1. MARKAL REFERENCE ENERGY SYSTEM WITH WATER, WASTE WATER, AND SOLID WASTE SYSTEMS

output of competing technologies has to meet the projected demand in that period. The relative size of the energy-service output, or market share, of these technologies depends not only on their individual characteristics—technical, economic, and environmental—but also on the availability and cost of the fuels they use. The actual market size of a demand sector in the future depends on the growth rate of the demand services and the stock turnover rate of vintage capacities. MARKAL dynamically tracks these changes and defines future market potential. Another factor considered in MARKAL that affects the market penetration of a specific demand device is the sustainability of the expansion in the implied manufacturing capacity to produce these devices.

On the supply side, the technology choices made in MARKAL are based on the imputed price of the energy products (e.g., coal, natural gas, biomass) and the marginal cost of producing energy from conversion technologies (e.g., power plants, burners, distributed generation plants) to meet electricity demand (endogenously determined in MARKAL). The cost of resource input for production, exogenously projected in MARKAL, such as imported oil prices and cost of uranium ore, together with the characteristics of supply technologies (including electricity generation) determine the market share of a particular fuel type and the technology that uses it. The supply-demand balance achieved for all fuels under the least energy-system cost represents a partial equilibrium in the energy market. In particular, the intertemporal new investments in nuclear technologies under this equilibrium determine the market deployment of these technologies. Additionally, policies can be modeled that explicitly or implicitly provide economic incentives for less competitive technologies to accelerate their learning curves or market penetration.

NEW YORK CITY INTEGRATED MARKAL FOR URBAN ELECTRIC PEAK LOAD STUDIES

Brownouts and blackouts in America's Northeast and West, as well as in Europe in the recent years, have been attributed to overloaded grids and substations coupled with the UHI effect.¹⁴ Ensuing adverse economic impacts led to lawsuits against the utilities.¹⁵ Concerned with the economic impacts along with the effects on human health, energy, and the environment, planners have felt the need for better energy planning and mitigation strategies in major metropolitan areas.¹⁶

The New York City integrated MARKAL project, supported by U.S. EPA Region II, is a collaboration of Brookhaven National Laboratory ("BNL") and State University of New York at Stony Brook. The project uses a portfolio of models interactively to evaluate mitigation strategies covering demand-side management (e.g. energy star technologies) and UHI mitigation measures, such as city greening techniques. A detailed New York City multi-regional MARKAL model was developed to simulate

current and projected energy and electricity demands, electricity transmission and distribution requirements, and peak load patterns in the city and selected hot spots. EnergyPlus, a building energy simulation model developed by the U.S. DOE, is used to

quantify specific building end-use energy flows and electricity load patterns.¹⁷

During the same time, the New York State Energy Research and Development Authority ("NYSERDA") and Department of Environmental Conservation initiated a project to examine "green" UHI mitigation strategies like urban forestry and green/reflective

roofs. The project, comprising Hunter College, City University of New York, and the NASA-Goddard Institute of Space Studies, uses a meso-scale climate model, MM5, supported by geographical information system-based land use and land cover models. Researchers on both projects had long-standing cooperation on related projects such as the Metroeast Regional Climate Study for New York City. This study was part of the U.S. Global Change Research Program and had basic scoping elements of energy saving and UHI.

Cooperation between these two projects was sought to quantify UHI effects in EnergyPlus resulting from "green" mitigation strategies. The reduction of end-use energy demands in buildings due to these changes is measurable in EnergyPlus, which is then fed to MARKAL to measure peak load and emission reductions. Figure 2 schematically represents the "portfolio of models" approach and interactions of EnergyPlus and UHI study with MARKAL framework

The energy utility for New York City, the Consolidated Edison Company, identified overloaded sub-stations and high heat emitting locations considered as hot spots to study the impacts of mitigation strategies and reduced electric demand during the summer peak period. The New York City MARKAL project considered the Lower Manhattan hot spot as a case study to measure the benefits of the mitigation strategies. This task of integrating all modeling approaches, however challenging, provides an insightful methodology to enable New York City and other urban areas to develop and test policies for energy efficiency and UHI mitigation and to determine the expected economic and pollution prevention ("P2") metrics for mitigation policies.¹⁸ This experimental exercise provides a "validation of concept," and it is anticipated that as the exercise moves toward a "proof of concept" methodology that will be prudent enough to be used at a utility scale.

The model calculates the least-cost system configuration that satisfies externally defined demands for final energy services (e.g., air conditioning), while taking into account environmental objectives such as reductions in CO₂, NO_x, and SO_x emissions.

The MARKAL outputs include quantified P2 metrics for each time period over the time horizon of interest such as

*Energy, water,
wastewater, and solid
waste disposal systems are
highly interdependent.*

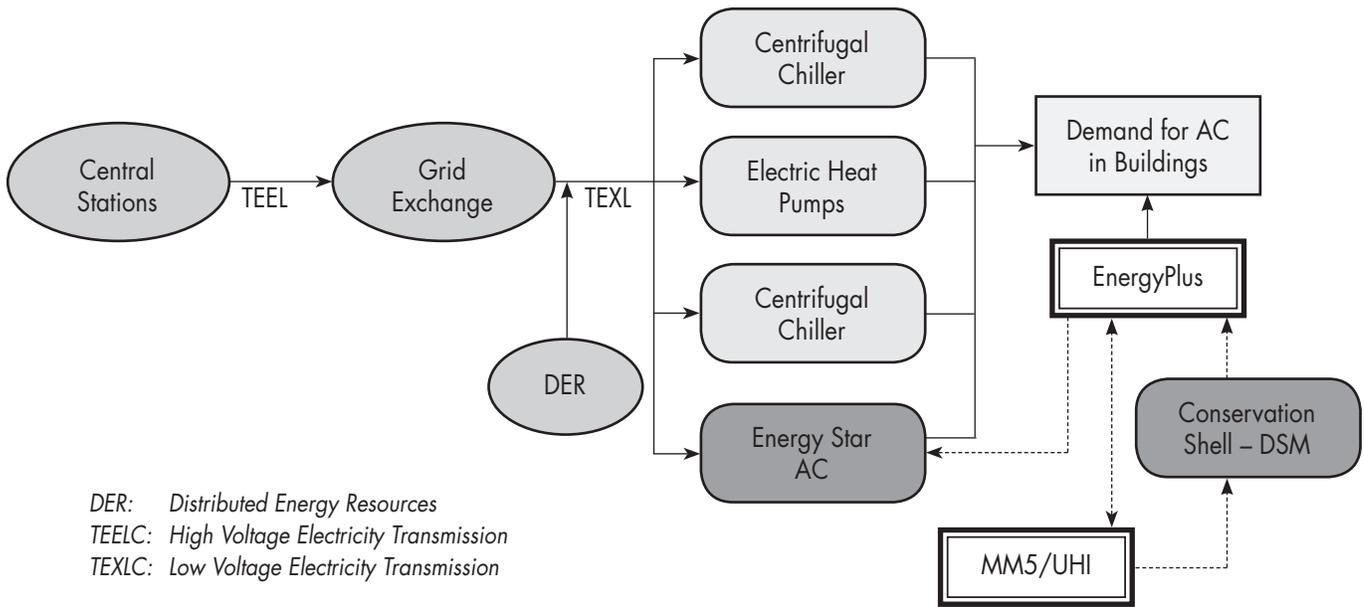


FIGURE 2: ENERGYPLUS AND UHI STUDY INTERACTIONS WITH MARKAL FRAMEWORK

projected reductions in waste emissions from stack gases from implementation of energy efficient technologies, the U.S. EPA Energy Star Building Program or renewable energy technology portfolios. Potential future extensions of the model to incorporate material flows into the standard model to produce an

energy-materials version of MARKAL would support a broader systems approach to addressing waste minimization and pollution prevention than discussed in this report and could contribute in the future to broader adoption of ISO-14000 environmental management systems.¹⁹

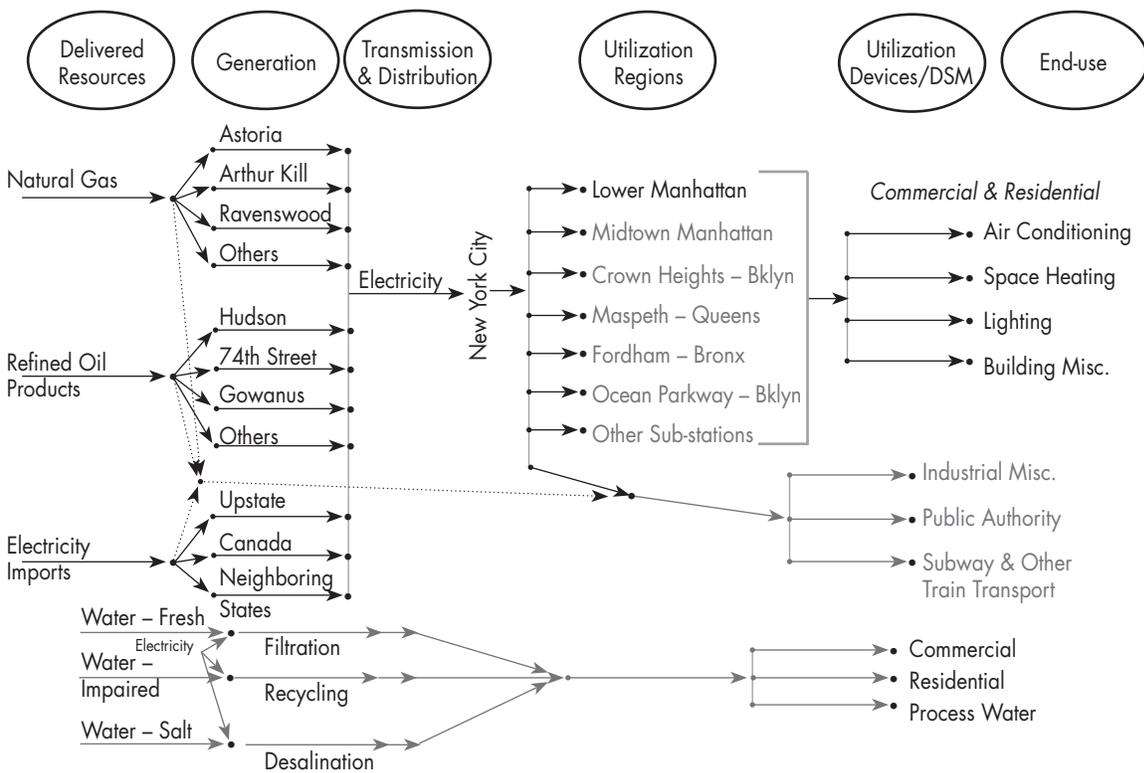


FIGURE 3: REFERENCE ENERGY SYSTEM FOR NEW YORK CITY REGIONAL MARKAL MODEL²⁰

MARKAL has been applied with the joint efforts of U.S. EPA and BNL, for instance, towards examining the effects of implementing Energy Star Building Program technologies in Hong Kong and Taiwan to measure reductions in energy use and subsequent CO₂ emissions.²¹ U.S. EPA is currently funding a project to develop a Northeastern regional version MARKAL model (“NEMARKAL”) for the six New England states. The states of New York and New Jersey may participate in the exercise once the concept is validated. The U.S. EPA Office of Research and Development (“ORD”) is the principal funding agency along with in-kind contributions from state participants. Unlike the MADRI and RGGI, the NEMARKAL is a comprehensive stationary and mobile source technology evaluation tool that addresses issues from GHG reductions in the electric generation and transportation sectors, reductions of Clean Air Act criteria pollutants, and reducing energy intensity in commercial and industrial buildings. This model is intended as the pilot and flagship of a group of nine regional models for the continental United States. NEMARKAL primarily focuses on State Air Quality Programs as they are developed by the Northeastern States Coordinated Air Use Management (“NESCAUM”)—an organization composed of State Government Air Quality Directors. Taking this framework into consideration, future regional MARKAL models should be developed on the structure of nation’s electric grid, considering Regional Transmission Organizations (“RTOs”) as boundaries for other regional models.

NEW YORK CASE STUDY OUTCOMES

The integrated MARKAL/EnergyPlus/UHI framework for modeling the energy supply/demand electric loads of buildings, along with the effects of UHIs in major urban areas, provides a systematic approach toward identifying and implementing opportunities and policies for the reduction of energy system loads and related P2 metrics. This framework pulls together the recognized and widely-applied MARKAL reference energy system model, the U.S Department of Energy’s EnergyPlus model for buildings, and recent UHI mitigation modeling. Taken together, these facilitate the study of electric peak loads as well as energy system supply side capacity requirements and P2 metrics.

BENEFITS OF URBAN MARKAL MODEL

The benefits of using integrated urban MARKAL methodology include the following:

Energy, Water, and Solid Waste Systems

- Provide reliable energy, water, and wastewater systems
- Reduction in energy use per capita (Btu/capita)
- Increased use of renewable resources
- Decreased reliance on imported fossil fuels
- Increased use of efficient appliances and green technology
- Increased use of bio-fuels and solid waste recycling
- Increased production of electricity from water treatment plants
- Decrease in energy for buildings, water supply, and treatments and transportation

Sustainability

- Reduction in water use per capita
- Increase in recycling of solid waste
- Efficient and reliable building technologies and transportation
- Reduction of GHG emissions, criteria pollutants, and other multi-media pollution

Urban Community

- Assure reliability of systems
- Provide a clean environment
- Keep energy costs as low as possible

Preliminary results obtained from this portfolio approach indicate that Energy Star and UHI mitigation strategies, employed in tandem, can potentially lead to savings in energy, P2 metrics, and system cost:

- Lower aggregate demands and consequentially, reduced supply-side requirements indicated by MARKAL.
- Reduced peak load requirement of the Lower Manhattan Sub-station, which moderately impacts the New York City’s energy system peak as shown in Figures 4 and 5.
- Curtailed emissions of carbon dioxide and other criteria pollutants within the city are expressed in Figure 6.

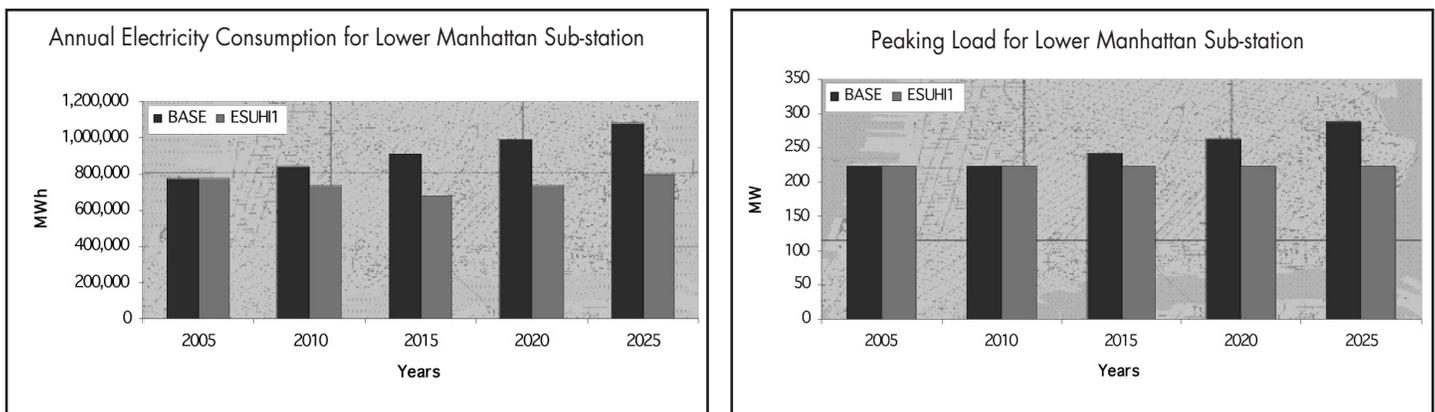


FIGURE 4: MARKAL SIMULATIONS FOR LOWER MANHATTAN CASE-STUDY

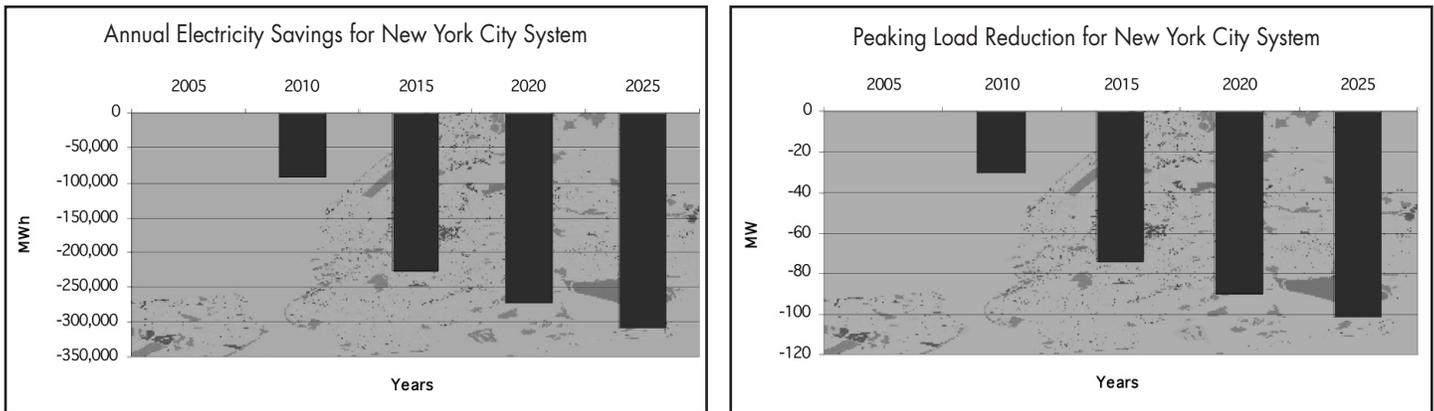


FIGURE 5: IMPACTS OF LOWER MANHATTAN REDUCTIONS ON NEW YORK CITY ENERGY SYSTEM

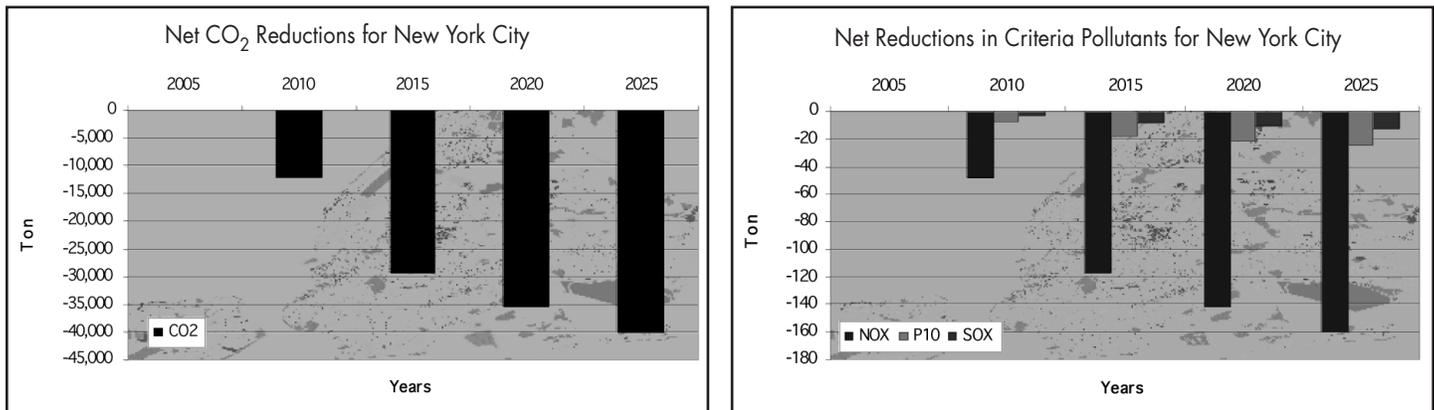


FIGURE 6: SYSTEM WIDE P2 BENEFITS

These activities and current programs in the U.S. EPA regions create infrastructure to study energy saving and emissions reduction strategies. The framework of the New York City MARKAL project features cooperation between different state and federal agencies, academic institutions, and the industry, highlights “validation of concept.” Further “proof of concept” for necessary development mechanisms is required to create implementation projects as a next step. A new generation of programs and public and private sector partnerships, state energy agencies (e.g., NYSERDA), regional transmission grid operators and green building community can be augmented to provide effective implementation projects. Such a concept and portfolio approach can be replicated on a national level to achieve desired reductions in energy consumption to relieve grid congestions, UHI effects, and emissions.

MARKAL INTEGRATION WITH OTHER URBAN SUB-SYSTEMS

MARKAL models dynamic interactions among energy and water availability, supply, distribution, and consumption technologies. This novel approach uses highly interconnected formulations to represent and integrate the inherent multidimensional feedbacks with other systems important to the multi-disciplinary

urban systems analysis. Examples of factors include the energy-water nexus, solid waste, transportation, land-use change, climate change, and public health, as shown conceptually in overview in Figure 7. The MARKAL methodology quantifies these relationships while accounting for evolutionary and revolutionary technologies and parametric characteristics pertaining to energy and water supply, distribution, and consumption.

This approach explicitly models fundamentally crosscutting issues and their interactions, which then determine technology performance and ultimately Research, Development, Demonstration, and Deployment (“RDD&D”) expenditure decisions. Additionally, it can model endogenous technological learning and learning-by-doing formulations at the forefront of research and technology improvements over the years. Based on programmatic or research objectives, the project develops benefits metrics (measurable targets) for proposed technologies and scientific solutions, and the project then tests the technologies for water-efficient energy supply and energy-efficient water supply through scenario-based examination. These metrics help prioritize technologies for deployment on the basis of short and long-term technical, economic, environmental, and social benefits. The approach uses various sensitivity analyses to explore key technical and economic risks and barriers to the future deploy-

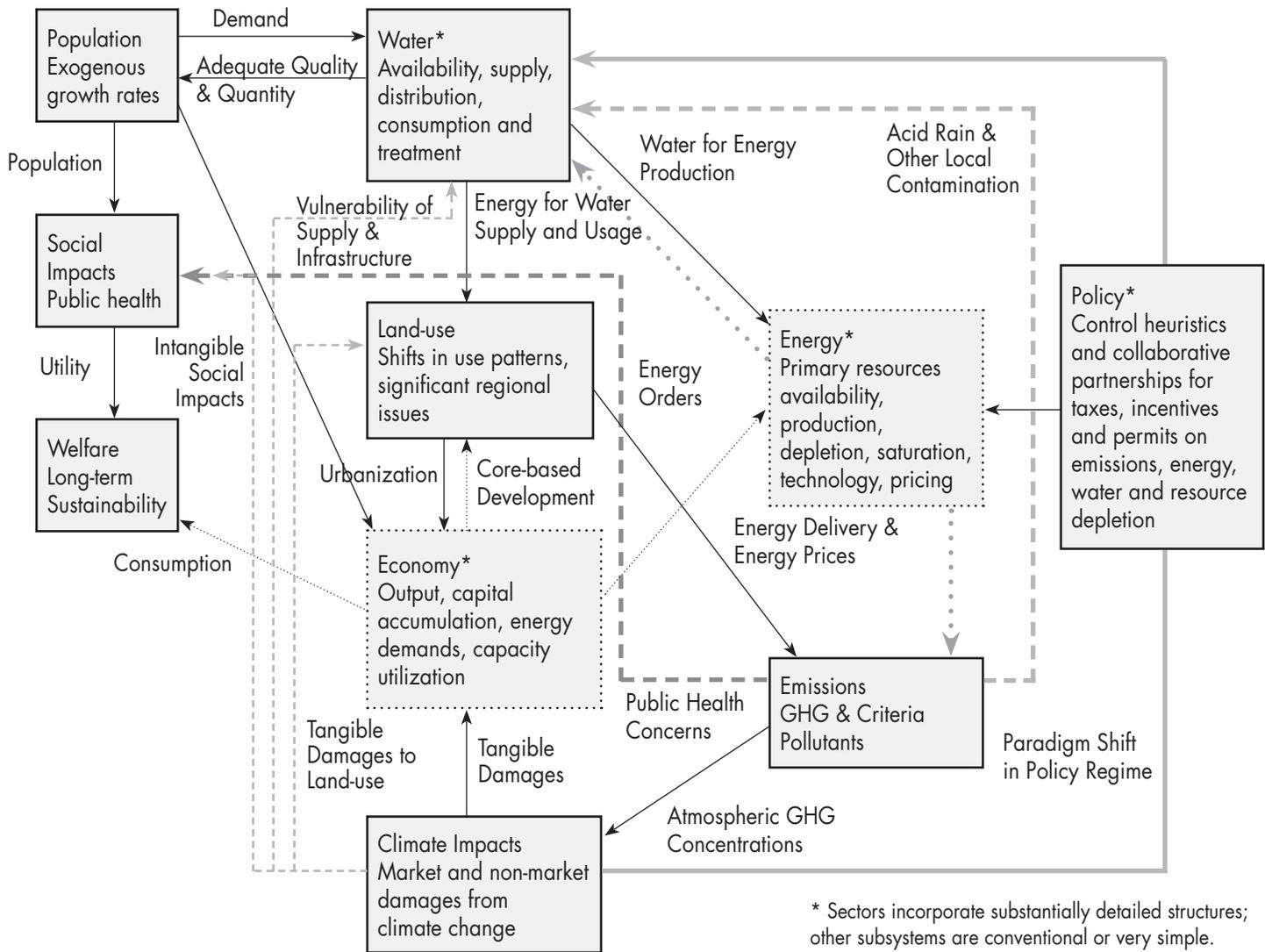


FIGURE 7: MAJOR FEEDBACK PROCESSES AMONG ENERGY, WATER, AND ASSOCIATED SYSTEMS TO BE INCORPORATED WITH THE MARKAL ANALYSIS

ment of the competing technologies. For example, the urban MARKAL methodology is able to analyze the expected benefits of solar energy and biologically-derived fuels. In addition, the MARKAL model can work with existing modeling platforms such as water body models for Chesapeake Bay, New York Harbor Estuary, and Long Island Sound to produce estimate-targets of GHG reductions from both individual media and from an ecosystem as a whole.

Successfully modeling cross-media ecosystems entails solving a number of scientific and computational challenges such as ensuring that consistent assumptions are used at the boundary of the media, and managing the large number of models and data sets that are typically required. The National Oceanic and Atmospheric Administration and the U.S. EPA Atmospheric Sciences Modeling Division jointly developed a Multimedia Integrated Modeling System (“MIMS”) that provides solutions for some of those challenges.²² MIMS is a non-substantive model architecture which allows media specific models to share and cross relate

data and results, which will be used to integrate MARKAL with other proven integrating models such as the U.S. EPA Community Multiscale Air Quality Model (“CMAQ”) because the alignment of stakeholders on Long Island and New York City has already been accomplished through PlaNYC and Long Island 2035.

In spite of its detailed nature, the model formulation is transparent; its behavior is clearly connected to the assumptions and causal structure of the model, and it has a simple-to-work-with model interface. It is very helpful, therefore, in creating a common understanding with stakeholder participation to address complex challenges of energy, water, solid waste, climate change, and land-use, as well as improving fundamental understanding of these interconnected sub-systems in a comprehensive approach. The model is able, but not limited to: (1) quantify water needs for the future and the amount of “new” water produced or water efficiency achieved by enabling technologies; (2) predict gaps in the regional water availability and energy sector

demand and the energy saved or produced as a result of the applied technologies; (3) identify energy and water efficiency and conservation opportunities; (4) promote new science and technology for advanced water treatment and reclamation; (5) quantify environmental sustainability and energy security benefits of proposed technologies; and, (6) describe potential markets and benefits of energy-related science and technology programs, along with their energy and water-related impacts.

Promoting the need to accelerate adaptation and mitigation to the impacts of climate change in the New York Metro Region is where the suite of models centered on MARKAL analysis provides a unique framework with ongoing environmental planning programs. The results of these ongoing case studies can provide the analytical basis and background for future carbon control in a compressed timeframe. Combined with appropriate stakeholder participation, such case studies hold the promise of influencing the current environmental regulatory regime, including multi-media aspects of carbon control, whether at the regional or national level.



Endnotes: Analytical Tools Shaping the Next Generation of Carbon Regulation and Trading

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DOMESTIC OCEAN AND COASTAL RESOURCE LAW AND POLICY AND CLIMATE CHANGE

by Thomas Street*

INTRODUCTION

The United States Commission on Ocean Policy, a Presidentially-appointed panel of sixteen advisers, with genesis in the Ocean's Act of 2000,¹ has noted that “[although] coastal watershed counties comprise less than 25 percent of the land area in the United States, they are home to more than 52 percent of the total U.S. population.”² With such a large percentage of the American population living in or near the coastal zone, it is unsurprising that the value of the coastal and ocean economy is also high. In 2000, the contribution to United States GDP from services and manufacturing from and in the marine and coastal economy exceeded U.S. \$1.1 trillion.³ When the term coastal is taken to its broadest reading to include all coastal watershed counties, the value to the United States from the coastal and ocean economy rises to over U.S. \$5.5 trillion (2000).⁴

The coastal and ocean environment is under great stress from development and resource exploitation. On the “wet-side” of the coastal baseline,⁵ over-utilization of fishery resources, degraded water quality from anthropogenic impacts, and invasive species are the primary, but not sole, stressors.⁶ On the “dry-side,” the coastal environment has largely been impacted from coastal development associated with population growth. With the increasing development of the terrestrial and littoral coastal environment, natural hazards such as hurricanes, tsunamis, and seashore erosion have become serious and growing problems.

Of all the factors impacting the coastal and oceanic environment, perhaps one of the most grave is climate change. It is well-accepted that average global temperatures have risen over the past century. The Intergovernmental Panel on Climate Change (“IPCC”) has “[reported] that the average near-surface temperature of the Earth increased by about 1°F between 1861 and 1990, but is expected to increase by another 2.5–10.4°F by the end of the [21st Century.]”⁷

Global climate change will likely have significant impact upon the U.S. coastal zone and be felt in a number of ways. Perhaps most visible, as a result of an anticipated sea level rise of between four and forty-three inches, the coast line of the

United States may be significantly altered.⁸ As a direct result of climate change-induced sea level rise, “saltwater contamination of fresh-water sources, coastal erosion, damage to natural barriers such as coral and mangroves, and loss of agricultural sites and infrastructure” is likely to result.⁹ In addition, with climate change-induced disruption of chemical, biological, and oceanographic processes in the marine environment as a result of climate change, significant effects upon marine fish stocks are probable. Although not strictly in the coastal zone, climate change will also likely have great impact upon domestic water resource (and associated freshwater fishery) management.

ROADMAP

This Article will focus upon the major federal agencies that have jurisdiction in the United States coastal zone, as well as reviewing their underlying legal mandates. Next, this Article will examine two laws that are of general importance. It will then examine those areas of the law that will likely have particular relevance in terms of and as a result of climate change. This

Article will conclude by briefly assessing how coastal and ocean law and policy is especially relevant in the domestic response to the consequences of climate change in the United States.

FEDERAL AGENCIES WITH A RESOURCE MANAGEMENT INTEREST IN THE COASTAL ENVIRONMENT

Five federal agencies of the United States have a resource management interest in the coastal zone of the United States specifically relevant to climate change: the Army Corps of Engineers (“ACE”), the Fish and Wildlife Service (“FWS”), the Minerals Management Service (“MMS”), the Environmental Protection Agency (“EPA”), and the National Oceanic and Atmospheric Administration (“NOAA”). Of these agencies, the ACE and FWS largely regulate on the terrestrial side of the coastal baseline, with MMS regulating generally in the near-shore marine environment, and NOAA and EPA in both.

* Thomas Street is an Attorney Advisor in the Office of the General Counsel of the National Oceanic and Atmospheric Administration. The views expressed in this Article are the author's alone and do not necessarily represent those of the Office of the General Counsel, NOAA, the Department of Commerce, or the United States Government. The author can be contacted at thomas.street@yahoo.com.

MINERALS MANAGEMENT SERVICE

The MMS has jurisdiction over the energy resources of the Outer Continental Shelf (“OCS”) of the United States. The Outer Continental Shelf Lands Act (“OCSLA”), as amended by the Outer Continental Shelf Lands Act Amendments,¹⁰ provides the pertinent legal authority for offshore oil and gas leases to companies for marine mineral extraction.¹¹ Relatively recently, the Energy Policy Act of 2005 also gave jurisdiction over OCS alternative energy projects to MMS.¹²

Pursuant to OCSLA, the OCS is largely those areas of the marine environment that extend beyond three nautical miles (“NM”) from the coastal baseline. In the case of the Gulf Coasts of Florida and Texas, state jurisdiction extends to three marine leagues, approximately nine nautical miles. Under OCSLA, the federal government is entitled to all revenue from lease sales beyond six NM, with the states receiving twenty-seven percent of such revenues in the three to six NM zone, with a similar protocol, based upon the different jurisdictional boundaries, used for the gulf coasts of Florida and Texas. Pursuant to OCSLA, leasing decisions are required to consider environmental considerations and impacts to fisheries and endangered species.

FISH AND WILDLIFE SERVICE

The FWS manages domestic, largely freshwater, fishery resources, birds, associated habitat, and wetlands. The statutory authority underlying the operation of the FWS is largely found in the Migratory Bird Treaty Act,¹³ protecting birds subject to one of a number of international treaties, the Endangered Species Act,¹⁴ conserving threatened or endangered species and associated critical habitat, and the Fish and Wildlife Coordination Act,¹⁵ which provides a consultation role for the FWS in domestic “water-resource development projects.” The FWS also co-manages marine mammals with the National Oceanic and Atmospheric Administration, with each taking the lead on a number of different species. Other important and relevant laws protecting the coastal environment, involving the FWS, include the Coastal Wetlands Planning, Protection and Restoration Act,¹⁶ which created “national coastal wetlands conservation grants,” allowing for funds to be awarded to states for wetlands conservation projects and also provided for a specific role in wetlands restoration efforts in coastal Louisiana. The FWS also plays a lead role in the Coastal Barrier Resources Act,¹⁷ which created a system of undeveloped barrier islands along the East, Gulf, and Great Lakes coastlines of the United States. This act is especially interesting as it does not preclude development, but forbids any sort of federal assistance, especially federally subsidized hurricane insurance.

Perhaps the most important law providing underlying statutory authority to FWS is the Fish and Wildlife Coordination Act (“FWCA”).¹⁸ Under the FWCA, “whenever the waters of any stream or other body of water are proposed or authorized to be impounded, diverted, the channel deepened, or the stream or other body of water otherwise controlled or modified for any purpose whatever,” by a federal agency or by a private entity as a result of a federal license, the FWS must be consulted “with

a view to the conservation of wildlife resources by preventing loss of and damage to such resources as well as providing for the development and improvement thereof in connection with such water resource-development.”¹⁹ Significantly, the FWCA also requires that the FWS provide recommendations to federal agencies for any proposed “water resource development projects” that they are involved in. These agencies are required to give “full consideration” to FWS’s recommendations.

ENVIRONMENTAL PROTECTION AGENCY

As noted by a commentator, “[o]ne of the most basic divisions in federal water quality regulation is the distinction between point source and nonpoint source pollution. This division derives [by negative implication] from the [Clean Water Act].”²⁰ Although the Clean Water Act (“CWA”)²¹ does have impact in the marine environment, its focus is on domestic terrestrial water quality, with its centrum in point source pollution regulation and with the EPA in a lead role. NOAA, through the Coastal Zone Management Act (“CZMA”),²² has federal responsibility over non-point source regulation, with programmatic authority essentially delegated to the States.

Pursuant to the CWA, a point source of pollution is defined as “any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water run-off.”²³ The characterization of whether or not a pollution source will be considered point or non-point is generally done at where it would first be introduced into United States waters.²⁴

The overarching goal of the CWA is “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.”²⁵ Pursuant therefore to this goal, the “discharge of any pollutant [into the navigable waters of the United States] by any person [is] unlawful.”²⁶ Under the CWA, the EPA is given responsibility for permits in terms of coastal activities under two programs.²⁷ The first is for Section 404 Secretary of the Army permits, necessary for the release of dredged materials into specific coastal sites in accordance with guidelines jointly created by the ACE and EPA. The Administrator of the EPA is specifically given the authority

to prohibit the specification . . . of any defined area as a disposal site, and is authorized to deny or restrict the use of any defined area for specification . . . as a disposal site, whenever he determines, after notice and opportunity for public hearings, that the discharge . . . will have an unacceptable adverse effect on municipal water supplies, shellfish beds and fishery areas (including spawning and breeding areas), wildlife, or recreational areas.²⁸

The second program is for National Pollutant Discharge Elimination System (“NPDES”) permits, necessary for the discharge of point sources of pollution into navigable waters of the United States.

Although initially vested in the Administrator of the EPA, Section 402 of the CWA provided authority for EPA to delegate to the States the ability to manage their own NPDES programs and issue permits for discharge, under guidelines set by EPA.²⁹ As one commentator has noted, the NPDES permit system essentially provides for

an exception to [the] zero pollution approach [as provided for in the CWA]. Under the NPDES permit program, ‘the Administrator may, after opportunity for public hearing issue a permit for the discharge of any pollutant, or combination of pollutants,’ [into navigable waters] upon condition that the discharger meets all applicable effluent standards under the law.³⁰

Upon delegation to the states, similar authority exists. Under the CWA, navigable waters are defined as “the waters of the United States, including the territorial seas,”³¹ the latter as marked from the low water tidal line.

The breadth of the “waters of the United States” under the CWA has long been controversial. Ultimately known as the “Migratory Bird Rule,” the ACE in 1986 declared it had jurisdiction over intrastate waters and wetlands adjacent to navigable waters that were used, or might be used, as habitat by migrating birds. Over the years, numerous courts have examined this contentious issue. In 2006, the Supreme Court of the United States, in *Rapanos v. Army Corps of Engineers*,³² limited the definition of “waters of the United States” under the CWA to only flowing or standing waters of relative permanence. This restriction has relevance to other laws that relate to the CWA.

ARMY CORPS OF ENGINEERS

Of all federal resource agencies, the ACE has perhaps one of the largest roles in terms of coastal development and its mission is closely related to that of the EPA.³³ Organized into eight national divisions and forty-eight subordinate districts, the ACE has jurisdiction over coastal navigation, coastal dredging, and the discharge of refuse into the navigable waters of the United States pursuant to the Rivers & Harbors Act of 1899³⁴ and its successor, the Clean Water Act of 1972.³⁵ Special emphasis must be placed upon Section 404 of the Clean Water Act.³⁶ This section allows for Secretary of the Army permits providing for the release of dredged materials into specific coastal sites, with such sites chosen in light of guidelines jointly created by EPA and the ACE. The ACE is also specifically given a lead role in protecting and preserving Louisiana’s wetlands in the Coastal Wetlands Planning, Protection and Restoration Act.³⁷

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

In part, the mission of NOAA is to “conserve and manage coastal and marine resources to meet [the United States’] economic, social, and environmental needs.”³⁸ In terms of managing coastal development, chief among the tools utilized by NOAA is

the Coastal Zone Management Act of 1972.³⁹ Recognizing that “[t]he key to more effective protection and use of the land and water resources of the coastal zone is [the encouragement of] the states to exercise their full authority over the lands and waters in the coastal zone . . . [.]”⁴⁰ the Coastal Zone Management Act created a voluntary federal-state partnership for coastal management. Aside from the relatively limited federal financial support available to states who participate in the program, the crux of the partnership is the concept of “federal consistency.”

Federal consistency is a powerful tool that state partners possess to manage development in the coastal zone. There are, in effect, two types of consistency under the CZMA. The first relates to direct federal agency activity,⁴¹ with the second being connected with the issuance of a required license or permit by a federal agency.⁴² In terms of direct federal agency activity, pur-

suant to 16 U.S.C. § 1456(c) (1)(a), federal consistency requires that “[e]ach federal agency activity within or outside the coastal zone that effects any land or water use or natural resource of the coastal zone . . . be carried out in a manner . . . consistent to the maximum extent practicable with . . . enforceable policies of [federally]

approved State management programs.” A second type of consistency applies to federally permitted or licensed activity that “effects any land or water use or natural resource of the coastal zone” by virtue of 16 U.S.C. § 1456(c)(3)(a).⁴³ Under this second type of consistency, a developer must submit certification to a relevant state coastal management agency that a project is consistent with enforceable policies of a federally approved state coastal management program. If a State coastal management agency objects to a project requiring a federal license or permit (arguing that the project is inconsistent with its state enforceable policies), then no relevant federal agency may issue a permit, unless the Secretary of Commerce overrides the objection on one of two policy grounds: “. . . the activity is consistent with the objectives of this [CZMA] or is otherwise necessary in the interest of national security.”⁴⁴

Importantly, the CZMA also provides states with the authority to regulate non-point sources of pollution, noting that:

each State [with a federally approved CZM management program] shall prepare and submit to the Secretary [of Commerce] and Administrator [of EPA] a Coastal Nonpoint Pollution Control Program. . . . The purpose of the Program shall be to develop and implement management measures for nonpoint source pollution to restore and protect coastal waters, working [with State and local partners].⁴⁵

Pursuant to the CZMA each state non-point source pollution program is required to identify and provide for land uses which impact coastal waters, critical coastal areas, governance

The coastal and ocean environment is under great stress from development and resource exploitation.

measures to address problematic land uses and critical coastal regions, opportunities for public input, measures for administrative coordination between state agencies, and the possible modification of coastal boundaries to address the above concerns.

In terms of managing marine fishery resources, NOAA's chief tool is the Magnuson-Stevens Fishery Conservation and Management Act ("MSFCMA"), which created eight regional fishery management councils ("RFMCs"), each responsible for a region of United States waters (generally 3-200 NM). For most domestic marine fishery resources, the councils prepare Fishery Management Plans ("FMPs") in accordance with ten national policy standards.⁴⁶ Pursuant to the MSFCMA, FMPs are also to identify essential fish habitat in "waters of the United States," as defined by the CWA. Essential Fish Habitats ("EFH") are "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity."⁴⁷ Federal law requires that "[e]ach federal agency . . . consult with the Secretary [of Commerce] with respect to any action authorized, funded, or undertaken, or proposed to be authorized, funded or undertaken, by such agency that may adversely affect any ["EFH"] identified . . ."⁴⁸

Due to the amount of coastal development, other activities may also have adverse effects upon EFH. Consequently, all FMPs must identify activities other than fishing that may adversely effect EFH. Broad categories of such activities include, but are not limited to: dredging, filling, excavation, mining, impoundment, discharge, water diversions, thermal additions, actions that contribute to non-point source pollution and sedimentation, introduction of potentially hazardous species, and the conversion of aquatic habitat that may eliminate, diminish, or disrupt the functions of EFH.⁴⁹

Furthermore FMPs must also identify habitat areas of particular concern ("HAPCs"), based upon a number of specific criteria: (1) ecological significance, (2) sensitivity to anthropogenic impact, and (3) sensitivity to impacts from development.⁵⁰ RFMCs are given permissive authority to comment on any federal agency action with adverse effects upon EFH, but are required to do so in regards to anadromous fish habitat under a council's authority. Last, "[f]ederal agencies must consult with NMFS regarding any of their actions authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken that may adversely affect EFH."⁵¹ In response, NMFS will provide recommendations for conservation. This issue is especially triggered by coastal energy projects, both under traditional power sources (nuclear and fossil-fuel) and renewable sources (hydrokinetic and wind).⁵²

OTHER GENERAL LAWS

There are two other laws of particular relevance to domestic ocean and coastal law and policy and climate change. The first is the Federal Power Act ("FPA").⁵³ The FPA creates a regulatory protocol for the establishment of hydrokinetic power generating stations on domestic navigable waters, defined, for purposes of the Act, as those waters to which Congress' jurisdiction extends under the Commerce Power. Pursuant to this Act, the Federal Energy Regulatory Commission ("FERC") may issue licenses

for the construction and operation of hydrokinetic power generation facilities. In deciding whether or not to issue licenses, FERC is statutorily required to consider several factors, among them, the project's potential power-generating capacity as well as its possible impact upon fishery resources, specifically including fishery habitat. In direct reference to fishery resources, each license is required to include considerations relating to fishery conservation. FPA Section 18 is especially important as it requires that any license granted by FERC contain conditions relating to "fishways as may be prescribed by the Secretary of the Interior [through FWS] or the Secretary of Commerce [through NOAA], as appropriate."⁵⁴ The second law is the National Aquatic Invasive Species Act ("NAISA").⁵⁵ NAISA created a ballast water management program intended to combat the introduction and dispersal of invasive species into United States waters through the creation of voluntary guidelines by the Secretary of Transportation. The act also sponsors research into combating invasive species.

LAWS OF PARTICULAR RELEVANCE TO CLIMATE CHANGE

Although all of the above-examined laws are of significance in terms of climate change, it is this author's opinion that several general legal areas are of the most potential relevance. These will be examined below, with a short explanation of their possible eventual implications.

The first relates to the Energy Policy Act of 2005 and the enhanced role that it provides for the Minerals Management Service. With the advent of climate change, it is likely that coal-powered and other high carbon-emitting power plants will be supplemented and/or eventually replaced by alternative energies such as wind, wave, tidal, ocean current, and solar. As it is well known that wind resources located in the littoral and coastal United States are strong and relatively consistent, that ocean tides are well known and constant, and that broad areas of the coastal zone are subject to strong and continuous wave energy, it is likely that this is an area of strong growth.

The second relates to the Coastal Barrier Resources Act, which although it does not forbid development, prohibits federal assistance on certain barrier islands on the East and Gulf coasts. As climate change-induced sea level rise becomes evermore evident, it is conceivable that this law could become more popular to limit federal expenditures for at-risk barrier islands, and possibly even expanded to include the West Coast.

The third relates to the Clean Water Act, which regulates point sources of pollution. If climate change has substantial effect upon the physical layout of the coastal zone, as some forecast, it is likely that areas of current intense development may be impacted by rising sea levels. It is thus likely that pollution sources that currently do not have interactions with "waters of the United States" may eventually do so by encroaching water lines.

The fourth relates to the Coastal Zone Management Act and is of particular importance. Unlike many of the above-examined laws, the CZMA allows States to plan for and actively manage coastal development, while also regulating non-point sources of

pollution. Under the CZMA, states can adopt coastal management plans, addressing local geographic and physical variations, and can plan themselves for climate change, while forcing federal consistency with federally-approved programs.

The fifth relates to the group of laws that address fisheries and marine resources. Under the Fish and Wildlife Coordination Act and the Magnuson-Stevens Fishery Conservation and Management Act, the FWS and NOAA have a key role in managing freshwater and marine fish, respectively. With climate change, fishery resources are likely to be significantly impacted due to changes in chemical, biological, and oceanographic processes, with a possible large federal response so as to protect food sources as well as biodiversity. In addition, climate change is also likely to have impact upon flow rates of American coastal and continental rivers. Such an impact will also likely have concomitant implications in terms of the Federal Power Act and the conservation/utilization balance between fisheries and power generation. Finally, climate change will also likely have impact

upon the range of marine (and freshwater) species, creating problems in terms of defining the meaning of an invasive species.

CONCLUSION

The coastal and ocean environment is home to extensive development and substantial resource utilization. A number of laws have been created to attempt to manage this development and resource use, under the cognizance of a number of federal agencies. With ever increasing development in the coastal zone and ocean industry, it can be seen that coastal and ocean law and policy is particularly relevant to climate change due to the incredible diversity of resources and uses that are likely to be impacted by rising sea levels and a changing marine environment. With such a large proportion of the American population residing in or near the coastal zone and an ocean and coastal industry worth trillions of dollars, it is clear that this issue is primed to become one of the most pressing of the coming century. 

Endnotes: Domestic Ocean and Coastal Resource Law and Policy

¹ See 33 U.S.C. §§ 857-13 – 857-20 (2000).

² U.S. COMMISSION ON OCEAN POLICY, AN OCEAN BLUEPRINT FOR THE 21ST CENTURY 150 (2004), available at <http://www.oceancommission.gov/documents/welcome.html> (last visited Feb. 26, 2008) [hereinafter U.S. COMMISSION ON OCEAN POLICY].

³ See U.S. COMMISSION ON OCEAN POLICY, *id.* at 31.

⁴ See U.S. COMMISSION ON OCEAN POLICY, *id.*

⁵ Normally the high or low water lines, depending on specific and applicable law.

⁶ Invasive species are also a grave concern in bays, the Great Lakes, and other coastal and interior waterways.

⁷ U.S. COMMISSION ON OCEAN POLICY, *supra* note 2, at 43 (citing J.T. HOUGHTON ET AL. EDs., CLIMATE CHANGE 2001: THE SCIENTIFIC BASIS (2001), available at http://www.grida.no/climate/ipcc_tar/wg1/index.htm (last visited Feb. 28, 2008)).

⁸ See U.S. COMMISSION ON OCEAN POLICY, *id.* at 44. (citing J.T. HOUGHTON ET AL. EDs., CLIMATE CHANGE 2001: THE SCIENTIFIC BASIS (2001), available at http://www.grida.no/climate/ipcc_tar/wg1/index.htm (last visited Feb. 28, 2008)).

⁹ U.S. COMMISSION ON OCEAN POLICY, *id.* at 44.

¹⁰ See 43 U.S.C. §§ 1331-1356 (2000).

¹¹ Much of the OCS is currently under a moratorium on new oil and gas leasing.

¹² See 43 U.S.C. § 1337(p) (2000).

¹³ See 16 U.S.C. §§ 703-712 (2000).

¹⁴ See 16 U.S.C. §§ 1531-1544 (2000).

¹⁵ See 16 U.S.C. §§ 661-667e (2000).

¹⁶ See 16 U.S.C. §§ 3951-3956 (2000).

¹⁷ See 16 U.S.C. §§ 3501-3510 (2000).

¹⁸ See 16 U.S.C. §§ 661-667e (2000).

¹⁹ 16 U.S.C. § 1662(a) (2000).

²⁰ Robin Kundis Craig, *Urban Runoff and Ocean Water Quality in Southern California: What Tools Does the Clean Water Act Provide*, 9 CHAP. L. REV. 313, 318-19 (2006).

²¹ See 33 U.S.C. §§ 1251-1276 (2000).

²² See 16 U.S.C. §§ 1451-1464 (2000).

²³ 40 C.F.R. Part 122.2 (2007); 40 CFR Part 122.3(b)(2007)(excluding “[d]ischarges of dredged or fill material into waters of the United States which are regulated under section 404 of CWA”).

²⁴ See Brad W. Blank, *The Unitary Waters Approach: The Government's Misguided Attempt to Limit the Reach of the Clean Water Act*, 42 SAN DIEGO L. REV. 1259, 1273 (2005).

²⁵ 33 U.S.C. § 1251(a) (2007).

²⁶ 33 U.S.C. § 1311(a) (2000); see also Blank, *supra* note 24, at 1273.

²⁷ See Craig, *supra* note 20, at 333.

²⁸ 26 U.S.C. § 1344(c) (2000).

²⁹ See Craig, *supra* note 20, at 335.

³⁰ Blank, *supra* note 24, at 1268 (internal reference removed).

³¹ 33 U.S.C. § 1362(7) (2000).

³² See 547 U.S. 715 (2006).

³³ See discussion *supra* pp. 62-63 (providing more discussion of the mission of EPA).

³⁴ See 33 U.S.C. § 403 (2000).

³⁵ See 33 U.S.C. §§ 1251-1376 (2000).

³⁶ See 33 U.S.C. § 1344 (2000).

³⁷ See 16 U.S.C. §§ 3951-3956 (2000).

³⁸ About NOAA, National Oceanic and Atmospheric Administration website, <http://www.noaa.gov/about-noaa.html> (last visited Feb. 20, 2008).

³⁹ See 16 U.S.C. §§ 1451-1464 (2000).

⁴⁰ 16 U.S.C. § 1451(i) (2000).

⁴¹ See 16 U.S.C. 1456(c)(1)(A) (2000).

⁴² See 16 U.S.C. 1456(c)(3)(A) (2000).

⁴³ 40 C.F.R. § 930.11(g) (2007) (defining by regulation, in terms of both types of consistency, “effects any land or water use [as] . . . any reasonably foreseeable effect on any coastal use or resource resulting from a Federal agency activity or federal license or permit activity. . . . Effects are not just environmental effects, but include effects on coastal uses. Effects include both direct effects which result from the activity and occur at the same time and place as the activity, and indirect (cumulative and secondary) effects which result from the activity and are later in time or farther removed in distance, but are still reasonably foreseeable”).

THE POLLUTER SHOULD PAY: ADAPTING TO A CHANGING CLIMATE

by Rachel T. Kirby*

With the release of the last report from the Intergovernmental Panel on Climate Change (“IPCC”), it is clear that climate change is already a reality, and future warming caused by the burning of fossil fuels is probably unavoidable.¹ As gradually warming temperatures lead to stronger storms, longer droughts, and more frequent flooding, communities all over the world must adapt to this new reality. The blame for climate change, however, is not spread equally throughout the world, and the impacts of a warmer climate will not be spread equally either. The developed nations, which are most responsible for the carbon emissions warming the climate, have a moral obligation to help less developed nations adapt.²

The next few decades will bring significant changes to global weather patterns and deviations from historical norms. Both drought-affected areas and flooding will increase as precipitation patterns change, glaciers melt, and sea levels rise.³ Crop productivity will drop in seasonably dry and tropical areas, increasing the risk of hunger.⁴ Poor coastal communities will begin to flood annually as the sea level rises, threatening small island states and delta communities in Asia and Africa where adaptive capacity is especially low due to extreme poverty.⁵ Adapting to a changing climate is vital to the survival of communities all over the world.

While the developed world benefited from cheap energy provided by burning fossil fuels, the developing world will be the first to suffer. Climate models suggest that agriculture in the United States will benefit from longer growing seasons and warmer temperatures, but crops in Africa and elsewhere are already near the upper end of their temperature tolerance.⁶ Millions of people least able to cope with environmental change will suffer as the developed world escapes the initial effects of climate change.⁷

In addition to the urgent obligation to drastically reduce carbon emissions, developed countries have a moral obligation to help the rest of the world adapt to the climate change created by development.⁸ The consequences of development are being felt largely in those communities that benefited least from this development. Developed countries must both mitigate future harm by reducing emissions and provide major assistance to reduce the harm caused by previous emissions.⁹

The IPCC defines adaptation as an “adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial

opportunities.”¹⁰ Successful adaptation goes hand in hand with sustainable development. More developed communities—measured by income, education, capacity of institutions, and access to technology and information—are more capable of adapting to changes in the climate.¹¹ To successfully adapt to a changing climate, communities require knowledge of likely impacts and efficacy of possible responses, capacity to successfully plan and design responses, the financial resources to implement adaptation measures and cope with impacts, institutions to organize responses, and technologies that meet the needs of specific

communities.¹² To prevent additional warming, developing countries must avoid following in the footsteps of developed countries. Instead, development must skip many technological generations to jump straight to efficient renewable technologies.

Adaptation efforts must be balanced between measures that respond to emergencies and measures that increase the adaptive capacity

of a community.¹³ Specific adaptations in response to immediate threats, such as disaster assistance, emergency stockpiles, and early warning systems, are vital in emergency situations. Larger benefits, however, are possible from measures that increase adaptive capacity, such as strengthening competent government institutions, public health services, and research into alternative crops.¹⁴

Successful adaptation will require a significant investment by developed nations, but that investment need not require difficult choices. Successful measures that pay for adaptations achieve the dual goals of mitigating climate change by reducing emissions and increasing the adaptive capacity of the world. In the United States, efforts to reduce carbon emissions will likely yield an energy tax, whether by a direct tax or a cap-and-trade system, and may include a reduction in subsidies provided to non-renewable energy companies. While most of the new revenue provided by new taxes and reductions in subsidies should go towards offsetting other taxes and research into renewable technologies, a portion of that revenue must go to developing nations to support efforts to adapt to a changing climate. 

Endnotes: The Polluter Should Pay *continued on page 90*

*Rachel T. Kirby is a J.D./M.A. candidate, May 2010, at American University, Washington College of Law.

CARBON TAX: READY FOR PRIME TIME?

by Michael J. Zimmer*

INTRODUCTION

The international debate over reducing worldwide carbon emissions increasingly focuses on effectively reducing carbon emissions by formulating novel policy tools after the Kyoto Protocol expires in 2012. One recommendation posits that if a tax is levied on carbon emissions it would promote environmentally-minded business decisions, encourage incremental investment in new clean technology, attract the necessary level of capital formation in impacted sectors, and achieve national and global environmental goals. Yet, to effectively reduce carbon emissions, businesses and individuals will have to adopt significant lifestyle and behavioral changes and endorse choices with dramatic economic consequences. Rather than dwelling on the immediate impacts on business and household budgets, all users of energy must eventually confront and assume responsibility for reducing the economic and environmental consequences of carbon emissions. Once governed under the law of “commons,” carbon will now become governed by the laws of science, physics, and economics in global markets. To this end, the most effective plan will ensure that all sources of carbon are meaningfully addressed.

If economic markets were forced to integrate the cost of environmental externalities caused by carbon emissions into the costs of doing business, the ensuing price signals and economic incentives would force a dramatic shift toward developing cleaner energy sources and more sustainable energy habits. Economic consequences will likely be imposed on the industries that created carbon emissions if there is any hope of effectively reversing the legacy of environmental damage. This Article argues that implementing a tax on carbon dioxide (“CO₂”) imposes economic accountability and would impact the use of precious resources in a more direct, transparent, and sustainable manner than any proposed cap-and-trade program. The critical issue is managing the perceived political consequences of exercising such policy choices.

A carbon tax would directly influence both industry and individual behavior with transparency, fairness, speed, and balance. Industry would have an economic incentive to reduce their carbon emissions to avoid the tax, which would likely be a cost passed on to consumers, and thus, the price signals created would modify consumer behavior. Accurate price signals for carbon (with diminished volatility) will also direct the marketplace so that clean renewable sources of power, energy efficiency, demand-side management, and combined heat and power technologies enjoy a level playing field with the CO₂-producing conventional fossil fuel generation resources. A cap-and-trade system will reward traders, commodities merchants,

and financial institutions. An astute use of the federal tax system can build companies, development of equipment and technology, and ensure that physical investments are made in sustainable business models.

But the question remains whether the carbon tax is ready for widespread application in light of the clear impediments to, and uncertainty about, a cap-and-trade system. Currently, carbon trading cannot establish with reasonable accuracy how much carbon is being bought and sold over a period of time. The product is not physical, it is not readily usable, and the purchaser faces limited utility after the purchase is consummated. It is also subject to a level of reliance on fiduciary conduct that has been compromised in past decades and is not fully embedded in all global financial and legal systems. Industry self-reporting will remain an essential component to any new CO₂ emissions-control system, but the most effective policies will institute a further measure of verification and transparency. No technology can confirm and validate such continuous emissions monitoring for new CO₂ products in support of a cap-and-trade system.

CARBON TAX BASICS

A “carbon tax” is a tax on the carbon content of fuels; effectively, it is a tax on the CO₂ emissions produced from burning fossil fuels.¹ The current prices of gasoline, electricity, oil, coal, and other fuels do not include the full economic costs of the health, resource, and environmental externalities associated with the broad usage of these energy sources in the United States and around the world. The failure to force industry and consumers to shoulder these externalities suppresses the economic incentive to develop and implement carbon-reducing measures like energy efficiency, renewable energy, advanced metering, storage, additional transmission, or clean technology. On the other hand, taxing fuels based on their carbon content infuses these incentives at every point in the chain of production and consumption, from an individual’s choice of the type and usage of vehicles, appliances, and housing, to business choices of product design, capital investment, facilities location, and government’s choices when setting regulatory policy direction.²

* Mr. Zimmer is an attorney at Thompson Hine LLP in the energy practice and also serves this academic year with the Ohio University Consortium of Energy, Economics and the Environment. Mr. Zimmer expresses his appreciation for the assistance, research, and editorial guidance provided by Jennifer M. Rohleder in the preparation of this article. Ms. Rohleder is a J.D. candidate at the Washington College of Law and a law clerk at Thompson Hine LLP in Washington, D.C. The views herein are based on the author’s research and do not necessarily represent the views of any clients the author represents nor organizations in which the author participates.

TAX VS. CAP-AND-TRADE

Regardless of whether creating a price for carbon emissions takes the form of a tax or tradable emissions allowances, the cost of carbon emissions will be passed through to the ultimate consumers. This fundamental market result occurs while ninety-eight percent of United Kingdom (“U.K.”) businesses recognize it is important to reduce the environmental impact of industry.³ Over fifty percent of U.K. companies today are struggling with long-term strategic and business modeling decisions in the face of the current unstable policy and tax environment.⁴ Interestingly, after global cap-and-trade emissions trading experience, almost sixty-six percent of U.K. companies welcome the use of the tax system to provide incentives for them to become carbon neutral.⁵ Only the public policy processes fail to recognize this current market-based distinction in managing what has been characterized as one of the greatest market failures in the world today—that failure to clearly account for the externalities of fossil fuel use.

PRICE PREDICTABILITY

A carbon tax sets a market clearing price that encourages predictable energy prices. Predictability is important because when future energy and power prices can be reliably calculated in advance, energy-critical decisions can be made with the full awareness of carbon price signals. Once these price signals are added to the costs that industry must factor into the cost of doing business, they can affect plant and building design considerations, new clean technology development, electricity storage and deployment for industry, and appliance selection and the purchase of the family car for the individual.⁶

The United States has had tradable permits for sulfur dioxide (“SO₂”) since the enactment of the Clean Air Act Amendments of 1990. In that period, the tradable permits have varied in price by over forty percent.⁷ Yet due to carbon’s higher relative market penetration within the United States and global economy, compared to that of SO₂, similar price fluctuations would likely affect all aspects of the U.S. economy, including consumer spending, budgeting, capital expansion, and inflation.⁸

SIMPLE ADMINISTRATION

The carbon content of every form of fossil fuel is precisely known, as is the amount of CO₂ released when that fuel is burned.⁹ This precision presents few technical problems for documentation or measurement. The type of fuel and the amount purchased or used is already tracked by most industrial and private consumers. Thus, instituting a carbon tax would require few, if any, additional reporting or accounting burdens, while enjoying clarity and transparency.

In addition, administering the carbon tax could utilize current tax collection mechanisms and existing enforcement, compliance, reporting, and administrative resources. In contrast, the cap-and-trade approach embraced by the financial industry envisions creating a complex new system for compliance reporting, audits, and verification with an uncertain value proposition in return. Without developing rigorous new accounting and verification mechanisms, such a system is unworkable and will be highly volatile and subject to gaming, thereby undermining confidence and certainty in planning the outcome. A carbon tax is much more feasible than

a cap-and-trade system, except for the threat of its dire political consequences.

TIMING

A carbon tax can be implemented much more quickly than a cap-and-trade program. This factor is critical to the effectiveness of any CO₂ emissions reduction policy because time is of the essence from a scientific performance basis.¹⁰ So far, cap-and-trade has proven to be unsuccessful in reducing carbon emissions in the European Union and other global markets.¹¹ Although a cap-and-trade system has been extremely successful in the United States for reducing SO₂ emissions in the past decade, the SO₂ model is not dispositive for carbon. A carbon cap-and-trade program will have to be designed one hundred times larger in scale than its SO₂ counterpart, which creates an enormous problem of scale, complexity, administration, and cost of compliance for cross-border purposes. In a comparable example, the success of the U.S. acid rain program required solid data collection and transparent verification combined with the use of continuous emissions monitoring technology. Readily available technology does not currently exist for filtering or capturing CO₂. Carbon storage or sequestration will likely take another decade to become cost effective and will create operational de-rating of ten to thirty percent, water supply demands, fuels shifting, and higher operating costs to succeed.

Cap-and-trade systems are also complex and difficult to design. Issues concerning the proper level of the cap, timing, allowance allocations, pre-emption, certification procedures, standards for use of offsets, penalties and regional conflicts must all be addressed before the system can be implemented.¹² These issues require complex operational and political considerations that surely would hinder any timely solution to regulating U.S. CO₂ emissions. Further, while this design and implementation process is taking place, polluters are free to continue unchecked while uncertainty reigns for another decade. A cap-and-trade approach for CO₂ will not be as effective as a carbon tax in the

A carbon tax would directly influence both industry and individual behavior with transparency, fairness, speed, and balance.

short term because it will lag behind the needs of the marketplace, scientific inquiry, and global policy making. It would not offer transparency, nor a clear stable price signal to support capital investment and new investment decision-making until 2020.

LESS FRAUD AND MANIPULATION

The protracted negotiations necessary to develop a comprehensive and politically acceptable carbon cap-and-trade program leave the process vulnerable to parties shaping the program to maximize narrow economic benefits, maximizing their market positions in industry sectors, or constraining competition rather than designing an economically efficient system that maximizes public gain and a competitive U.S. economy. In a cap-and-trade program, although market prices will increase, just as with a carbon tax, the reasons for the increase are hidden in a maze of new bureaucracy, regulatory impositions, and cost partnerships that render it more opaque and politically attractive.

A carbon tax can be implemented with far less opportunity for manipulation. Carbon taxes are transparent and easily understandable by the public. Once the market targets for carbon are set, they can be readily adjusted according to market success or failure. However, it is this transparency and flexibility that makes a carbon tax politically undesirable because it is clear where and how society will have to take responsibility, make direct changes and improvements, and pay for the CO₂ by-products of society.

CAP-AND-TRADE IS A TAX IN ANOTHER FORM

The key attribute of cap-and-trade that has made it so popular is that future emission targets for reductions are fixed and known. This is mostly propaganda, however, because most cap-and-trade systems under development include a “safety-valve” provision. This safety valve would counter the operations of markets and provide for the auctioning of additional allowances if the price exceeds a certain predetermined value.¹³ In addition, the knowledge of the future trajectory of carbon emissions is questionably valuable because there is no agreed-upon trajectory for achieving climate stability and preventing disaster.¹⁴

Cap-and-trade programs have traditionally provided initial allowances for free. Freely giving away financial assets prevents the government from reducing the economic costs of carbon control by cutting taxes elsewhere, or by providing rebates to protected classes of consumers. Certain industries capitalize upon the economic benefit and prioritize the costs in products regarding services, which flow generally to utilities and traditional energy providers. Costs are passed through twice to consumers; this was the case in European electricity markets following the European Emissions Trading System. While the newer proposed cap-and-trade programs include a government auction of permits to generate revenue and emulate the advantage of a carbon

tax,¹⁵ I argue it is more effective to skip the middleman with its administrative costs and complexity, verification problems, and lack of transparency in favor of a clear tax. To succeed, the carbon tax would need to be coupled with other tax offsets in the tax code to be revenue neutral, and be managed in trust to avoid profligate political expenditures.

ECONOMIC EFFICIENCY

Setting a clearing price for carbon that can be periodically evaluated for its effectiveness in achieving public policy and market performance objectives is a simpler and more economically efficient approach than a cap-and-trade program. The cost of carbon can be set through a tax mechanism, and its progress in reducing energy intensity can be evaluated every five years. This built-in evaluation process permits adjustments to be made, which will ensure achievement of emission reduction goals. Technical inputs can be provided by DOE,

EPA, NOAA, and the National Academy of Science each cycle for review with final economic evaluations of the tax conducted by Treasury and the Federal Reserve.

In the United States, potential economic harm could be diminished by offsetting the revenue resulting from a new carbon tax upon its enactment, with mirroring reductions in the payroll tax, the corporate tax rate, and the alternative minimum tax. Additional revenue can be reserved in trust for government funding of clean energy technology and advanced energy R&D. Economic feedback would be provided with balance to benefit the corporate, small business, and individual tax payers to reduce the economic burden of the new carbon tax scheme by starting with a tax that is “revenue neutral.” The key effectiveness of a carbon tax program that is currently being overlooked is that such a tax may become revenue neutral. Revenue neutrality shifts the economic burden to industries requiring behavioral and competitive modification consistent with global policy shifts while preserving efficiency, energy intensity, and benefits of stability in the U.S. economy. No cap-and-trade proposal offers similar revenue neutrality and the specter of economic stability. Rather, cap-and-trade arguably creates some market winners, many market or industry sector losers, opportunities for gaming, and makes U.S. consumers the biggest losers of all.

ISSUES IN DESIGNING THE CARBON TAX

None of the current carbon tax discussions are ready for implementation yet for several reasons:

1. LACK OF ADEQUATE ENFORCEMENT AND STRATEGY FOR TAX

Additional tax and energy specialists would need to be shifted from the U.S. DOE and EPA to the U.S. Treasury Department. Initially, additional staffing would be required for

A carbon tax can be implemented much more quickly than a cap-and-trade program.

the additional rulemaking, audits, enforcement, and advisory work. Tax treaties and the World Trade Organization are in place to administer international consequences. Within a decade, administrative precedents could be established, and staffing management would likely decline as the tax system is largely self-implementing thereafter.

2. ABILITY TO RATCHET

The whole reason for implementing a tax for carbon is to harness economic power to quickly attack a serious environmental problem. The goal is to create a market for reducing greenhouse gas emissions in order to avoid the extraordinary costs of climate change-induced adaptation. To ensure that emissions reductions are actually occurring, rather than simply permitting people to pay more in order to emit much like they are paying more to continue to drive, a ratcheting mechanism can be studied. The ratchet would periodically increase the tax rate depending on the emission reductions achieved, evaluated every five years through the processes shared above. This will provide a consistent price signal to encourage development of less carbon-intensive technologies, accelerate clean technology deployment and planning certainty, and stimulate a societal behavioral shift toward sustainable business and commercial practices to maintain U.S. competitiveness.

This ratcheting plan was introduced to the House of Representatives in April 2007 when Representative Stark (D-CA) introduced a bill to amend the Internal Revenue Code of 1986 to impose a tax on fossil fuels based on their carbon content.¹⁶ This structure could be adapted to begin at \$10 per ton of carbon content and increased by \$10 per ton every five years until the United States reaches an annual emissions level that does not exceed a specified level of CO₂ emissions. This structure would reward early company actions and establish an economic benchmark, while recording market reaction and response and managing price volatility.

3. NOT AS WORKABLE FOR TRANSPORTATION AND COMMERCIAL BUILDINGS

The cap-and-trade system or carbon tax may not impact the transportation and commercial building sectors as effectively as the electric power production sector. More focus is provided on stationary sources through cap-and-trade while mobile and building sources are ignored. The new fuel efficiency standards for passenger and non-passenger vehicles, however, will create a more direct impact on the transportation sector. In addition, green buildings could benefit from a required market evaluation of energy efficiency improvements in building appraisals upon sale or resale. Moreover, a cost of capital, insurance reductions and resale valuation “adders” from LEED certified new or existing buildings could be implemented with clearer market signals. Federal tax credits, accelerated depreciation, state building codes, and state tax incentives could round out this market for construction where substantial CO₂ savings are possible through funding with carbon tax revenues. The new recognition of forestry and agricultural impacts might also favor a tax solution to cut back administrative costs in these important carbon markets.

4. REQUIRES AN OVERHAUL OF ENERGY AND ENVIRONMENTAL TAXES IN THE TAX CODE

Consistent with the enactment of a new carbon tax, existing tax provisions in the Internal Revenue Code would require review for consistency and “deadwood” overhaul. Legacy decisions of the past are not the building blocks of our national future. The outdated or inconsistent provisions in the tax code must be removed as part of a carbon tax enactment. A tax or fee could be levied on CO₂ emissions, which would establish the costs of such emissions with clarity. The market can then establish the emission level and degree of market penetration in a revenue neutral environment engaging in classic tax planning and capital investment in carbon tax avoidance strategies. This fosters a more productive market transaction than the artificial cap-and-trade scheme with uncertain prices, little transparency, additionality and verification concerns—with no corresponding guarantees of similar levels of capital support for investment in physical assets to reduce carbon.

5. PROBLEMS WITH SOCIAL STEWARDSHIP

The neediest citizens of our country need a set-aside of funds from any new tax revenues. This set-aside should be split between improving multi-family housing stock upon audit and Low Income Housing Energy Assistance Program fuel assistance, and affordable housing incentives, structures and support administered through state, county, and city governments and foundations. A cap-and-trade system offers no contribution to our obligations for social stewardship.

6. WATER IMPACT ANALYSIS

No carbon strategy should be considered credible without analyzing the water impact of the technology choices and strategies for the future. Specifically, the analysis should include the technology’s impact on water resources, water availability, and sustainability for CO₂ purposes administered through EPA and the Army Corps of Engineers.

CONCLUSION

A fair assessment of these strategy alternatives and implementation consequences is critical because the national choices we make in managing carbon will become the foundation of the next environmental initiatives: water management, brown-field restoration, and new patterns of U.S. real estate and community development. The business model, market solution, and strategies for CO₂ will set the stage for the next global trading product—water rights—because of its implications for health, new power generation, food, and weather impacts on famine, economic growth, and power production.

Our future course in managing carbon may be unclear, but the stakes involved in the choice between a new trading system or the tax system are quite high. After watching market based responses artificially built around trading and financial risk management from savings and loans, dot-coms, electric power marketing, natural gas marketing, agricultural commodities, and sub-prime mortgage lending, a fresh innovative approach built around the federal tax system could become a powerful tool of

market-based action across stationary, mobile, and building emission sources. This true market-based approach also ensures that physical investment will match with financial risk management strategies to diminish volatility and achieve the desired result. Other financial derivatives wrapped around trading schemes do not provide that comfort, and limit the return and benefits to narrow sectors of society and create distortions in markets.

The consequences of a developed and imposed carbon tax should be consistently offset against other less desirable business and individual taxes striving for revenue neutrality. The revenues should never be converted into sources of new funding for grand social programs or legislative earmarks that benefit political elites, instead of benefiting true markets, U.S. companies, industries, and the underlying public policy objectives of the carbon tax operating in a global economy. Carbon can become a driver for innovation and job creation and technology advancement in the 21st century as opposed to being a mere externality. Success will depend upon the choices we make managing the laws of science, economics, and politics with balance and true protection of U.S. markets and industry. In addressing honestly the greatest market failure of the 20th century, we can create an economic renaissance built on sustainable and sound technology and business practices.



Endnotes: Carbon Tax

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³ PRICEWATERHOUSECOOPERS, SAVING THE PLANET – CAN TAX AND REGULATION HELP? 11 (July 2007), available at http://www.pwc.co.uk/pdf/saving_the_planet.pdf (last visited Mar. 4, 2008).

⁴ PRICEWATERHOUSECOOPERS, *id.* at 16.

⁵ PRICEWATERHOUSECOOPERS, *id.* at 29.

⁶ Tax vs. Cap-and-Trade, Carbon Tax Center website, <http://www.carbontax.org/issues/carbon-taxes-vs-cap-and-trade> (last visited Mar. 4, 2008) [hereinafter Tax vs. Cap-and-Trade].

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¹⁰ INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: SYNTHESIS REPORT SUMMARY FOR POLICY MAKERS 20 (2007), available at http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf (last visited Mar. 4, 2008).

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¹³ Tax vs. Cap-and-Trade, *id.*

¹⁴ Tax vs. Cap-and-Trade, *id.*

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¹⁶ Save Our Climate Act of 2007, H.R. 2069, 110th Cong. (2007).

THE THIRSTY RIO GRANDE: SUSTAINABLE WATER PLANNING ALONG THE RIO GRANDE IN THE AGE OF GLOBAL WARMING

by Matthew Padilla*

The snow that falls in the Rockies' Sierra Sangre de Cristo range holds water during the winter months, slowly releasing water over the spring and summer months into the tributaries and aquifers that feed the Rio Grande basin.¹ As the climate continues to warm, the ability of the Rio Grande basin to replenish itself may become increasingly threatened as snowpack decreases and evaporation rates increase.² Past droughts and environmental catastrophes are archeologically preserved in the ruins of ancient southwestern cities such as Chaco Canyon³ and serve as dire warnings of what may occur in a dryer climate. As the Southwest prepares for population growth and increased water scarcity, Albuquerque and El Paso's stories illustrate how the destinies of all the communities in the Rio Grande valley are intertwined.

In the 1980s, New Mexico and the city of El Paso litigated and negotiated water rights in federal court and before the New Mexico State Engineer.⁴ New Mexico's "beneficial use" provision in its state Constitution and related water management statutes place strict restrictions on water exports.⁵ Eventually, New Mexico was not compelled to provide its water to El Paso, thus allowing farmers and cities in the state to keep part of an already limited supply of water from booming El Paso.⁶ As a result, El Paso was forced to pump more water out of its aquifer in the Hueco Bolson. El Paso and Ciudad Juarez, which both draw water from the Hueco Bolson water basin, have been estimated to have as little as two years of freshwater remaining in their aquifer and both face population growth.⁷

El Paso is experiencing increased growth because of military base realignments, which will add nearly 28,000 soldiers, not to mention their families, to Fort Bliss through 2013.⁸ With limited groundwater or water from the Rio Grande to sustain growth, the city of El Paso turned to the federal government and Senator Kay Bailey Hutchinson (R-TX) for federal assistance.⁹ The solution was the largest inland desalination plant in the world, meant to treat the remaining brackish ground water and ensure El Paso's future growth.¹⁰ It is estimated that depleting the Hueco will enable the city of El Paso to maintain an estimated fifty years of projected growth.¹¹ The Hueco, however, is not easily recharged and there appear to be no plans for the city if the Hueco is tapped dry.

* Matthew Padilla is a J.D. candidate, May 2010, at American University, Washington College of Law.



The lifeblood of multiple communities is the Rio Grande. Above is a portion of the Rio Grande Valley State Park near downtown Albuquerque. Photo taken by Matthew Padilla.

North of El Paso, Albuquerque, New Mexico's largest city, is urgently trying to balance growth and make use of the San Juan-Chama diversion project instead of tapping its finite aquifer. Through a series of mountain pipes and dams, the project diverts New Mexico's water from the Colorado River basin southwards towards Albuquerque via the Rio Grande.¹² The project was spearheaded by former Senator Dennis Chavez (D-NM) and signed into law by President Kennedy in 1961.¹³ Senator Chavez spent nearly three decades of his Senate career working to pass the diversion project as a safeguard against drought.¹⁴

Albuquerque, after learning that its aquifer was smaller than previously believed, has begun to rely on the additional San Juan-Chama water as a primary potable water source.¹⁵ It is believed that the San Juan-Chama diversion project will enable Albuquerque to sustain predicted growth for the next sixty years without draining its aquifer.¹⁶ In addition to the diversion project, the city of Albuquerque has curtailed its water use by over thirty-percent in the past decade and begun efforts to promote increased water awareness and eco-friendly development.¹⁷ Albuquerque is experiencing rapid growth rates, and will have to contend with proposed developments which will place greater strain on its water supplies.¹⁸

Population growth is not the only variable affecting the sustainability of water supplies along the Rio Grande. Exacerbating the problems posed by population growth, climate change has the potential to derail any planning in the Rio Grande basin that is based on current water models.¹⁹ Declining water supplies due to decreased snowpack and increased evaporation in the Rio Grande system will lead to less water and increased litigation over what is left. Ensuring there is enough water for all entities could impact agricultural land availability and result in bidding wars over water rights between stakeholders as has been the case in other water-scarce regions.²⁰

How the states monitor available water in light of global warming is also important. The Chair of the Senate Energy and Natural Resources committee Senator Bingaman (D-NM) and senior member Senator Domenici (R-NM) have both called for an accounting of western water in light of increased stress due

to global warming.²¹ Such preparation is vital if the communities of the Rio Grande are to continue using the available water for the beneficial use of all in the warmer future. Regardless of the outcome, as snowpack lessens and evaporation increases, the thirsty Rio Grande will have less to share with the communities she sustains.



Endnotes:

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LEGISLATIVE UPDATE

A CHANGING CLIMATE IN THE U.S. CONGRESS

by Emily Alves*

When the 110th Congress convened last January, the new Democratic majority repeatedly pledged that comprehensive and aggressive legislation to address global climate change would be a top priority. Many freshmen members of Congress were elected on platforms of improving America's energy security by investing in clean technologies and reducing our dependence on oil. Heightened interest in the connection between carbon pollution and U.S. energy consumption has provided further incentive to follow through on such promises.

An important cornerstone in developing a framework to address climate change was the passage of the Energy Independence and Security Act, on December 17, 2007.¹ The most notable achievement in the bill was the first increase in Corporate Average Fuel Economy ("CAFE") standards for automobiles in over three decades. Starting in 2020, all new cars will be required to have a fuel economy of thirty-five miles per gallon. This mandate is expected to save up to 3.7 billion metric tons of greenhouse gas emissions by 2030, which will go a long way towards reducing overall emissions.² Another important component of the bill is a mandate to increase the production of biofuels to thirty-six billion gallons by 2015, which will help shift energy production from foreign oil to domestic and lower greenhouse gas emitting sources.³ The bill further requires a whole suite of energy efficiency standards for appliances, most notably a new mandate for all light bulbs to use seventy percent less electricity by 2020.⁴

Dropped from the bill at the last minute was a tax package intended to roll back tax breaks for oil companies in favor of incentives for renewable energies. Lawmakers were forced to remove the package under the threat of a filibuster as well as a Presidential veto. The House also conceded to removing a provision in their original bill that would have mandated a renewable portfolio standard. That provision faced fierce opposition in the Senate from lawmakers concerned that their particular regions had insufficient renewable resources to meet the standard.

The Farm Bill, H.R. 2419, is another legislative initiative with global warming implications.⁵ The agricultural sector is

responsible for seventy-one percent of nitrous oxide emissions and thirty percent of methane emissions in the U.S.—two greenhouse gasses that are considered even more potent than carbon dioxide.⁶ While various environmental safeguards can be found throughout the Farm Bill, the most important in terms of reducing greenhouse gas emissions is the conservations title. The funding provided in this title, which supports programs geared at protecting wildlife, keeping water reserves clean, and pro-

moting energy efficiency, was in high demand after the last Farm Bill in 2002. There is a great deal of pressure to expand the funding of this title so that farmers may engage in conservation practices that include no-till agriculture and general crop and manure management

that will vastly reduce greenhouse gases. At the close of the first session of Congress in December, both chambers had passed their own versions of the Farm Bill, and the plan is to start merging the two in early 2008.

In terms of climate specific legislation, more than 125 bills were introduced within the first few months of the 110th Congress, compared with 106 climate specific bills introduced in the last two Congresses combined.⁷ The legislation varies widely in their methods and in levels of targeted reductions. The most common solution proposed is that of a national cap-and-trade system, which would assign permits to companies allowing them to emit a certain amount of carbon pollution. The debate around these proposals concerns whether the government should oversee such an operation, and whether the permits should be auctioned off or freely given. Another far less common proposal is to institute a carbon tax. Under this system, polluters would be required to pay a tax based on the tonnage of their carbon emissions.

Of all these bills, only one has actually seen a vote. The America's Climate Security Act of 2007, S. 2191, was intro-

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*Emily Alves is a J.D. candidate, May 2011, at American University, Washington College of Law.

Endnotes: Legislative Update

duced last October by Senator Joseph Lieberman of Connecticut and Senator John Warner of Virginia.⁸ The bill aims to reduce U.S. carbon emissions to a level somewhere between sixty-two and sixty-six percent of today's level by 2050.⁹ The bill would set up a declining cap on U.S. carbon emissions that would cover eighty-six percent of all current U.S. emissions.¹⁰ The bill strives to achieve these methods through several means. It would set up a cap and trade system to be regulated by the Environmental Protection Agency, which would be required to implement an emissions tracking and monitoring system. It would also create a carbon market efficiency board to monitor any trading of emissions and make necessary adjustments for permit allowances. The bill was successfully voted out of the Senate Environment and Public Works Committee on December 5, 2007 by a vote of 11-8.¹¹ According to several capitol hill staffers, floor action is expected to be brought to the Senate floor around Memorial Day.

It remains uncertain what further steps Congress will take to address climate change as it reconvenes for the second session of the 110th Congress. With 2008 being an election year, lawmakers' attention may be diverted elsewhere. If, however, lawmakers choose to continue making climate legislation a priority, they certainly have momentum to build upon. 

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LITIGATION UPDATE

OKESON V. SEATTLE

by Matt Irwin*

INTRODUCTION

On January 18, 2007, the Washington State Supreme Court declared that the City of Seattle owned electric utility company, Seattle City Light, could not use electric utility rate payments to buy offsets of greenhouse gas ("GHG") emissions from companies unassociated with Seattle City Light. The suit was filed by four individual rate payers, and on behalf of all other Seattle City Light ratepayers.¹ While the case has been legislatively overturned, it demonstrates the need for state legislatures to consider the traditional judicial limitations of public utilities in crafting legislation to meet environmental goals.

LEGAL BACKGROUND AND ARGUMENTS

On April 10, 2000, the City of Seattle passed Resolution 30144 to accompany the 30th Anniversary of Earth Day.² Resolution 30144 stated that "[Seattle] City Light will meet growing [electricity energy] demand with no net increase in greenhouse gas emissions by . . . [m]itigating or offsetting greenhouse gas emissions associated with any fossil fuels to meet load growth."³ In the spring of 2001, the Seattle city council passed resolution 30359.⁴ Resolution 30359 stated that because it is more expensive to reduce GHG emissions locally in the Seattle area than in other areas, Seattle City Light was directed to pay other entities

*Matt Irwin is a J.D. candidate, May 2009, at American University Washington College of Law.

throughout the country to reduce their GHG emissions to offset Seattle City Light's GHG emissions.⁵ An example of Seattle City Light's agreements with outside entities was Seattle City Light's agreement with DuPont in which Seattle City Light paid DuPont \$650,000 to buy 300,000 tons of GHG emission offsets from a DuPont plant in Kentucky.⁶

Plaintiff ratepayers challenged the legality of Seattle City Light's GHG offset contracts, arguing that under Washington law, utility expenditures must have a sufficient nexus to the utility's purpose.⁷ Therefore, under the plaintiff's argument, Seattle City Light's arrangements to pay entities such as DuPont to reduce their GHG emissions did not have a sufficient connection to supplying electricity to Seattle ratepayers.⁸ Defendant City of Seattle argued that it may choose any means to reduce GHG emissions as long as it offsets the GHG emissions associated with supplying power to Seattle ratepayers, including paying other emitters to reduce their GHG emissions.⁹

HOLDINGS

The trial court granted summary judgment for the City of Seattle.¹⁰ The trial judge summarized the court's position:

I think that City Light has the authority to reduce its own emissions. It can do that by managing its own facilities, its own producing facilities, or it can spend money to have its emissions, its contribution reduced by someone else. This all makes sense only because of the unusual nature of the greenhouse gas canopy; the fact that it is an envelope around the entire globe; that it's not localized.¹¹

Thus, the trial court upheld Seattle City Light's agreements to pay unrelated emitters of GHGs because, considering the nature of GHG reduction, there is no difference between reducing GHGs in the Seattle area or thousands of miles away.

The plaintiffs appealed the summary judgment order to the Washington State Supreme Court ("Supreme Court"). The state's Supreme Court applied a longstanding Washington state rule that a municipal corporation is limited to the powers expressly granted to them, powers implied or incident to the express powers, or powers essential to the purpose of the municipal corporation.¹² The Supreme Court stated that as a municipal corporation, Seattle City Light lacks the authority to take actions that benefit the public as a whole.¹³ Instead, as a municipal corporation, Seattle City Light can only take actions that benefit ratepayers.¹⁴ The Supreme Court determined that by paying other organizations to reduce their GHG emissions, Seattle City Light is not actually reducing its own emissions and is therefore benefiting the public as a whole, not just the Seattle City Light ratepayers.¹⁵ Therefore, the Supreme Court held that Seattle City Light's GHG emissions offset contracts were not within the utility's proprietary powers because they were designed to

reduce the world's GHG emissions on an aggregate, not Seattle City Light's own GHG emissions in regards to the operation of supplying electricity.¹⁶

CONCLUSION

Individual plaintiff Okeson released a statement that the "lawsuit doesn't mean he opposes fighting global warming . . . But he wants utilities to deal with their own pollution and calculate the price into what they sell rather than paying someone else to deal with the problem."¹⁷ While under the previous statutory regime the plaintiffs were successful in preventing Seattle City Light from paying other companies to reduce their GHG emissions, Washington has passed legislation that specifically overrules *Okeson v. City of Seattle*.¹⁸ The Washington

State Legislature has passed H.B. 1929, which allows municipal utilities and public utility districts to mitigate their GHG emissions through activities such as, "purchase, trade, or banking of greenhouse gasses offsets or credits."¹⁹ Thus the state of Washington has overcome previous statutory and judicial limitations to allow Seattle City Light to mitigate its impact on global climate change. 

Plaintiff ratepayers challenged the legality of Seattle City Light's GHG offset contracts.

Endnotes: Litigation Update

¹ See *Okeson v. City of Seattle*, 150 P.3d 556, 558 (Wash. 2007).

² *Okeson, id.* at 558.

³ *Okeson, id.* at 558.

⁴ *Okeson, supra* note 1, at 558.

⁵ *Okeson, supra* note 1, at 559.

⁶ *Okeson, supra* note 1, at 559.

⁷ *Okeson, supra* note 1, at 559-60.

⁸ *Okeson, supra* note 1, at 560.

⁹ *Okeson, supra* note 1, at 560.

¹⁰ *Okeson, supra* note 1, at 560.

¹¹ *Okeson, supra* note 1, at 560.

¹² *Okeson, supra* note 1, at 560-61 (*citing* *Farwell v. City of Seattle*, 86 P. 217, 218 (1906)).

¹³ *Okeson, supra* note 1, at 561-62.

¹⁴ *Okeson, supra* note 1, at 563.

¹⁵ *Okeson, supra* note 1, at 564-65.

¹⁶ *Okeson, supra* note 1, at 565.

¹⁷ Warren Cornwall, *City Light Can't Buy Pollution "Offsets," Court Says*, SEATTLE TIMES, Jan. 19, 2007, available at http://seattletimes.nwsourc.com/html/localnews/2003531679_greenhouse19m.html (last visited Jan. 14, 2008).

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¹⁹ West's RCWA 54.16.390 (2).

BOOK REVIEWS

THE MONTREAL PROTOCOL

CELEBRATING 20 YEARS OF ENVIRONMENTAL PROGRESS

Edited By Donald Kaniaru

*Reviewed by Michael Distefano**

The majority of today's environmental discourse tends to deal with current and on-going battles, and rightly so. Climate change, renewable energy, and species conservation are issues that are still playing out in civil society, and thus draw heavily on the resources of environmental advocates. For this reason it is refreshing, even inspiring, to reexamine past environmental victories.

The Montreal Protocol stands as one of the most effective environmental treaties ever, and there are many lessons to be learned from its success. The collection of essays in *The Montreal Protocol: Celebrating 20 Years of Environmental Progress*, edited by Donald Kaniaru, traces the history of the Montreal Protocol, examines the mechanisms and organization which enabled its success, and finally teases out the lessons which can be learned and employed in today's confrontation with climate change.

The primary aim of the Protocol was to halt the depletion of stratospheric ozone by chlorofluorocarbons ("CFCs"), which are chemical compounds commonly used as propellants and refrigerants. Beginning in the mid-70s, scientists were noticing a disturbing trend in the breakdown of CFCs and their reaction with ozone. Though the science of the time was struggling to understand this process completely, by the mid-80s it was clear to many that a response was needed. The Montreal Protocol was that response. The Protocol was finalized in September 1987, but the final document was the culmination of a ten-year process of constructing frameworks, debating implementation strategies, and building relationships. It included the themes of burden sharing and differentiated responsibility, which although they are common today, were quite novel at the time.

The agreement was for a fifty percent reduction in the use and consumption of five types of CFCs by 1999, using 1986 as

the base year. Signatories included the United States, Japan, the European Union, and the Soviet Union, which along with a few smaller consumers represented more than two-thirds of world-wide CFC consumption.

As many of the authors included in this book argue, there are clear parallels between the challenges of ozone depletion and climate change. While the effects of CFCs and other ozone-depleting substances are common knowledge today, the science at the time was still uncertain in many respects. It did not deal with an immediate threat, but rather one that would fully manifest itself in the future. It would affect not just certain individuals, but everyone on earth. The Mon-

treational Protocol boldly instituted short-term economic costs to prevent this threat from materializing, and in so doing, undertook preventive action on a global scale. In these ways, the Protocol demanded of its signatories the same commitments that treaties addressing climate change require today.

Another argument running through the book is that the Montreal Protocol itself has done much to combat climate change. In fact, many of the authors believe that further changes to the Protocol, such as an accelerated HCFC phase-out, would produce a valuable short-term reduction in greenhouse gases. Such a strengthening of the Protocol could serve to shift the Protocol's focus from ozone-depleting substances to climate change more generally. This strategy is recommended because such a move may provide insurance against the slow progress of the Kyoto Protocol.

*There are clear parallels
between the challenges
of ozone depletion and
climate change.*

* Michael Distefano is a J.D. candidate, May 2010, at American University, Washington College of Law.

While opponents of an HCFC phase-out point to the relative absence of energy efficient and cost-effective replacements, a key lesson of the Montreal Protocol is that the knowledge that a market is in decline will often provide the creative stimulus and financial resources needed to develop alternatives. No alternatives to CFCs existed when the Montreal Protocol's ban on CFCs was first proposed, but when faced with a phase-out, chemical producers, notably DuPont, quickly developed alternatives and committed themselves to new production strategies. The book goes on to suggest that this realization is the missing element at the Kyoto Protocol. If energy producers were assured of immi-

nent changes, technological innovation would be the only means of survival, and society could finally expect the advances for which it has been waiting.

The authors of this book present a valuable and policy-oriented approach to understanding environmental protocols. They celebrate the success of the Montreal Protocol while at the same time seeking to translate that success into further environmental victories. Their message is that as we turn to face the problems of today, insight and lessons from the past are perhaps our best hope. 

COOL IT:

THE SKEPTICAL ENVIRONMENTALIST'S GUIDE TO GLOBAL WARMING

by Bjørn Lomborg

Reviewed by Mary J. Bortscheller*

Bjørn Lomborg, a professor at the Copenhagen Business School, is a self-described "skeptical environmentalist."¹ *The Skeptical Environmentalist* is also the title of his 2001 book, a controversial volume proposing that, far from deteriorating, the state of the environment is actually improving. The book set off a wave of criticism in Lomborg's native Denmark, including allegations that his arguments were "scientifically dishonest."² These allegations were later proved false by the Danish Ministry of Science, Technology and Innovation.³ The firestorm surrounding *The Skeptical Environmentalist* has not deterred the writer from continuing his pursuit of provocative arguments in the environmental debate in his latest book, *Cool It: The Skeptical Environmentalist's Guide to Global Warming*.

Lomborg sets an ambitious agenda from the start of *Cool It*, which seeks to reframe the international debate about the challenges and solutions presented by climate change. In a volume dedicated "to future generations," Lomborg acknowledges the existence of global warming and its significant impact on humanity. Simultaneously, however, he asserts that the current societal debate is getting it all wrong by designing costly and inefficient solutions to a problem that is overblown.

In recent years, the causes and effects of global warming have received increasing attention in the media. Most predictions have been dire. Lomborg attempts to persuade his readers that the media and many, if not most, environmental activists focus on data that is wrong or taken out of context. His central example for this point is the emphasis on rising global temperatures and the deaths that will be caused by extreme heat waves similar to what Europe experienced in the summer of 2003. Lomborg maintains that while a warmer Earth will provoke more deathly

heat waves, it will also prevent hundreds of thousands of deaths caused by extremely cold temperatures.

He returns to this point several times to illustrate what he emphasizes is the mistaken focus of the environmental debate. The comparative reduction in overall deaths caused by weather is a central factor in Lomborg's overall cost-benefit analysis of global warming solutions. Under his analysis, most of the proposed solutions to global warming that involve carbon-emission reduction are, economically-speaking, a "bad deal," producing benefits that are not worth the effort.

Lomborg is particularly critical of the Kyoto Protocol and similar international efforts calling for high taxes on carbon emissions. He stresses that the Protocol is too costly for the benefits it would confer. According to Lomborg's assessment, if implemented to the fullness of its provisions, the Kyoto Protocol would only yield a global temperature reduction of 0.3 degrees Fahrenheit by 2100. In Lomborg's view, the billions of dollars spent implementing the Kyoto Protocol could be better spent elsewhere, combating disease, malnutrition and other global maladies. Lomborg also defends the United States' reluctance to ratify the Protocol, because the United States would get the worst deal by spending the most money on implementation for the least return or benefit.

Rather than follow a Kyoto Protocol-style model, Lomborg advocates a global carbon tax model that balances the cost of the tax with the tangible environmental benefits derived from the carbon emission cuts. A model of this type would avoid a

*Mary J. Bortscheller is a J.D. candidate, May 2010, at American University, Washington College of Law.

situation illustrated by the law of diminishing returns, where the more carbon emissions are cut, the fewer the “social benefits” to humans. Lomborg quotes economists who believe “going much beyond the small optimal initiative is economically unjustified.”

Lomborg urges the international community to consider the range of issues facing the world today, from epidemic diseases like HIV/AIDS and malaria to malnutrition and trade barriers. As a founding member of the Copenhagen Consensus, a conference of economists whose stated goal is to “provoke international debate about prioritization,” Lomborg tries to steer the focus away from global warming to problems that have more feasible solutions. While recognizing that climate change and its attendant consequences are real, Lomborg and the members of the Copenhagen Consensus rank it low on the list of international priorities. In a list of seventeen of the “world’s greatest challenges,” climate change comes in dead last behind solutions to problems such as disease, malnutrition, migration, and corruption.⁴

A prominent figure in *Cool It* is former Vice President Al Gore, whom Lomborg repeatedly cites as having misled the debate over global warming. Responding to the popular acclaim for the 2006 documentary *An Inconvenient Truth*, Lomborg wonders how the film and Mr. Gore, by showing the chain reaction of global warming, melting ice caps and rising sea levels, “can say something so dramatically removed from the best science.” Lomborg cites Intergovernmental Panel on Climate Change data to refute the documentary’s images of coastal cities inundated

by rising sea levels. According to Lomborg, the IPCC’s data indicates that as the Earth’s temperature increases, “Antarctica will not noticeably start melting” but there will be more precipitation and “Antarctica will actually...[accumulate] ice, *reducing* sea levels by two inches.”

Whether Bjørn Lomborg’s *Cool It* will succeed in changing the tenor and framework of the climate change debate remains to be seen. What is not in doubt, however, is that Lomborg’s ideas are provocative and his goals ambitious. *Cool It* is a challenging and interesting read for anyone concerned with global warming, whatever your reading of the current crisis may be. 

Endnotes: Cool It

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WORLD NEWS

by Nathan Borgford-Parnell*

AFRICA & ASIA

U.S. scientists recently released a report showing that crops in Southern Asia and Africa will likely be the worst affected by climate change. Equally as important, the research showed that the people in these regions utilize the likely affected crops for a majority of their calorie intake, increasing the likelihood of mass-malnutrition and starvation.¹ The most affected crops include millet, groundnuts, rapeseed, and wheat in Asia, and sorghum and maize in Africa.² To increase research and investment into developing foods that can withstand climate change, the Gates Foundation has announced that it will grant \$19.9 million to the International Rice Research Institute (“IRRI”) to develop rice species to fill the role.³ IRRI will develop a strain of rice that is resistant to floods, droughts, and salty water, and distribute it to 400,000 farmers in needy areas.⁴

AMERICAS

On January 30th, the U.S. Department of Energy (“DOE”) quit supporting the FutureGen project in Mattoon, Illinois because of predicted cost overruns and other concerns.⁵ FutureGen was to be a near zero emission coal plant and a prototype for the next generation of clean-coal plants around the world.⁶ Its goal was to convert coal into flammable hydrogen, which would power electric turbines, and carbon dioxide would have been sequestered underground.⁷ In response to the growing estimated costs, \$1.8 billion, the consortium of private companies working on FutureGen with the government offered to split any overrun costs, however, the DOE acknowledged that costs were not the only issues.⁸ A report from MIT highlighted that a single power plant could not provide all the trials that clean coal sequestration requires.⁹

With the United States relying on coal fired power plants for over half of its electricity, experts believe it is necessary for the United States to discover uses of coal that do not result in large releases of carbon dioxide.¹⁰ The DOE hopes to receive comments on clean coal sequestration technology and then build multiple plants like the previously proposed FutureGen, without the previous issues of cost overruns and burdensome federal rules.¹¹

EUROPE

Norway plans to cut its greenhouse gas emissions to nearly nine percent below 1990-levels by 2012 and become carbon

neutral by 2030.¹² This is twenty years sooner than Norway’s announcement last year of going carbon neutral by 2050.¹³ Norway plans to drop their emissions to forty-five million tons from their current production of fifty-eight million by 2012. However, scientists in Norway point out that there are very few planned cuts in emissions.¹⁴ In fact, Norway’s greenhouse gas emissions are expected to increase in the coming years because of a growing dependence on gas and oil for energy.¹⁵ Norway currently gets much of its energy from its hydroelectric stations, but plans to increase natural gas use to satisfy growing demand.¹⁶ While Norway does plan to force industry to purchase quotas on Norwegian markets, that will only decrease production by an expected 9.7 million tons.

The remaining cuts are expected to come from the purchase of carbon credits via the U.N.’s Clean Development Mechanism (“CDM”), and the planting of forests.¹⁷ The Norwegian plan includes spending more than \$550 million a year on reforestation efforts around the world. Under the Kyoto Protocol, countries can only get CDM credits for planting trees in developing countries.¹⁸ Many groups have criticized the plan as vague and impossible, but Norwegian officials say that the far sighted goals are necessary and liken reaching the carbon neutral goal to the environmental equivalent of landing on the moon.¹⁹

MIDDLE EAST

The United Arab Emirates (“UAE”) is planning to build the world’s first carbon neutral city, Masdar City, in the desert outside of the UAE capital of Abu Dhabi. Work has already begun on the massive project which is slated to open in 2016 and is expected to cost \$22 billion.²⁰ The government has put up \$4 billion for the project with the rest financed by private enterprise looking to make money from the carbon credits.²¹ Masdar City will use solar collection for power, be one hundred percent car free, with full waste recycling, and use seventy percent less energy and fifty to sixty percent less water than conventional cities.²² Masdar City hopes to use both rooftop solar panels as well as large concentrated solar power (“CSP”) outside the city for all their power needs.²³ CSP is different from traditional photovoltaic solar cells because it uses mirrors to focus heat from the sun to produce power and is ideal for hot desert climates like in the UAE.²⁴

* Nathan Borgford-Parnell is a JD/MA candidate, May 2009, at American University, Washington College of Law.

POLAR REGIONS

New research is showing that the ability of trees to act as a carbon sink for the world may be decreasing as climate change increases. The higher temperatures created by climate change are beginning to alter the carbon cycle of trees taking in carbon through photosynthesis and then releasing it when they decompose or burn.²⁵ Until recently, it was believed that climate change would spur greater growth in plants, at least initially, because of the increased growing season, thereby increasing their carbon uptake. This increased growth is already evident and can be seen

from space. However, a research group monitoring forests in thirty northern polar regions for the past twenty years has shown that increased carbon uptake has not followed the increased growth.²⁶ Their research focused on the autumn months when most forests release more carbon than they take in because of decomposition. The research shows that autumn is coming earlier in the year, in some cases as much as a few weeks, meaning that the forests are producing much more CO₂ than previously expected.²⁷ Although the net effect of this finding is still not known, forest adaptation or the forestation of areas currently covered in tundra could make up for the extra CO₂.²⁸



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⁵ Rebecca Smith & Stephen Power, *After Washington Pulls Plug on FutureGen, Clean Coal Hopes Flicker*, WALL ST. J., Feb. 2, 2008, at A7; *Clean Coal: Up in Smoke*, ECONOMIST, Feb. 2, 2008, at 42 [hereinafter *Up in Smoke*].

⁶ Smith & Power, *supra* note 5, at A7; *Up in Smoke*, *supra* note 5, at 42.

⁷ *Up in Smoke*, *supra* note 5, at 42.

⁸ Smith & Power, *supra* note 5, at A7; *Up in Smoke*, *supra* note 5, at 42.

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¹⁴ Doyle, *supra* note 12.

¹⁵ Doyle, *supra* note 12.

¹⁶ Acher & Bergsli, *supra* note 13.

¹⁷ Doyle, *supra* note 12.

¹⁸ Acher & Bergsli, *supra* note 13.

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²⁰ Bryan Walsh, *Zero-carbon city leads UAE climate push*, TIME, Feb. 13, 2008, available at http://www.time.com/time/specials/2007/article/0,28804,1712863_1712864,00.html (last visited Mar. 21, 2008).

²¹ Walsh, *id.*

²² Walsh, *id.*

²³ *Renewable Energy: Desert Dreams*, CARBON NEWS, Feb. 13, 2008, available at <http://www.carbonpositive.net/viewarticle.aspx?articleID=992> (last visited Mar. 21, 2008).

²⁴ *Renewable Energy: Desert Dreams*, *id.*

²⁵ *Trees Are Not The Answer To Climate Change*, ENN, Jan. 3, 2008, available at <http://www.enn.com/climate/commentary/28571> (last visited Mar. 30, 2008).

²⁶ *Trees Are Not The Answer To Climate Change*, *id.*

²⁷ *Trees Are Not The Answer To Climate Change*, *id.*

²⁸ *Trees Are Not The Answer To Climate Change*, *id.*

ENDNOTES: CLIMATE CHANGE AND THE STATES *continued from page 13*

⁸ The actual credits can originate from emissions allowances assigned to facilities, auctioned by a central body overseeing the market, and from CER and ERU credits.

⁹ Even though the United States does not currently have a federal cap-and-trade program, Senator Feinstein introduced a bill in December 2007 to facilitate price transparency in markets for the sale of emissions allowance. See Emission Allowance Market Transparency Act of 2007, S.2423, 109th Cong. (2007). This bill would direct the Environmental Protection Agency and the Commodities Futures Trading Commission to issue regulations that would protect the integrity and transparency of a federally-mandated emissions trading system.

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¹⁵ EISA, *id.* § 102(b)(2)(A).

¹⁶ EISA, *id.* §§ 401-495.

- ¹⁷ EISA, *id.* § 202(a)(2)(B)(i)(I).
- ¹⁸ U.S. HOUSE OF REPRESENTATIVES COMMITTEE ON ENERGY AND COMMERCE, CLIMATE CHANGE LEGISLATION DESIGN WHITE PAPER: COMPETITIVENESS CONCERNS/ENGAGING DEVELOPING COUNTRIES (2008), *available at* http://energyccommerce.house.gov/Climate_Change/White_Paper.Competitiveness.013108.pdf (last visited Mar. 11, 2008) [hereinafter CLIMATE CHANGE WHITE PAPER].
- ¹⁹ CLIMATE CHANGE WHITE PAPER, *supra* note 18, *id.* at 11.
- ²⁰ CLIMATE CHANGE WHITE PAPER, *supra* note 18, *id.*
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- ²² CLIMATE CHANGE WHITE PAPER, *supra* note 18, *id.*; *see supra* note 9 for discussion of S. 2423, the Emission Allowance Market Transparency Act of 2007.
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- ²⁴ CAL. HEALTH & SAFETY CODE § 38500 (Deering 2008) [hereinafter CHSA].
- ²⁵ CHSA, *id.* § 38550.
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- ³² States with Renewable Portfolio Standards, *id.*
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- ⁴³ Cal. Pub. Util. § 8341(a) (2007).
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- ⁴⁵ *See* Cal. Pub. Util., *id.* § 8341(e)(8); *see also* SB 1368 Fact Sheet, Natural Resources Defense Council, *available at* <http://www.solutionsforglobalwarming.org/docs/SB1368FactSheet.pdf> (last visited Mar. 13, 2008).
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- ⁴⁹ *See generally* *Gibbons v. Ogden*, 22 U.S. 1 (1824) (laying the foundations for the development of the Dormant Commerce Clause).
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- ⁵¹ *Id.*
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- ⁵⁴ U.S. CONST. art I, § 10, cl. 3.
- ⁵⁵ *Cuyler v. Adams*, 449 U.S. 433, 440 (1981).
- ⁵⁶ *But see* *Virginia v. Tennessee*, 148 U.S. 503 (1893) (providing an exception, where the compact at issue was over historical border between two states). In this case, congressional approval was unnecessary.
- ⁵⁷ *Ne. Bancorp v. Fed. Reserve*, 472 U.S. 159 (1985).
- ⁵⁸ *Ne. Bancorp*, 472 U.S. at 175.
- ⁵⁹ U.S. CONST. art VI, cl. 2.
- ⁶⁰ *U.S. v. Locke*, 529 U.S. 89 (2000).
- ⁶¹ *Crosby v. Nat’l Foreign Trade Council*, 530 U.S. 363, 372 (2000) (internal citations omitted).
- ⁶² *Locke*, 529 U.S. at 108.
- ⁶³ *Locke*, 529 U.S. at 108.
- ⁶⁴ 127 S. Ct. 1438 (2007).
- ⁶⁵ *Massachusetts*, 127 S. Ct. at 1461.
- ⁶⁶ *Massachusetts*, 127 S. Ct. at 1462.
- ⁶⁷ *Massachusetts*, 127 S. Ct. at 1463.
- ⁶⁸ CLIMATE CHANGE WHITE PAPER, *supra* note 18.
- ⁶⁹ CLIMATE CHANGE WHITE PAPER, *supra* note 18, at 18-19.
- ⁷⁰ CLIMATE CHANGE WHITE PAPER, *supra* note 18, at 25.
- ⁷¹ *See* CLIMATE CHANGE WHITE PAPER, *supra* note 18, at 16-17.
- ⁷² America’s Climate Security Act of 2007, S. 2191 (“Sec. 3402 – Allocation For States With Programs That Exceed Federal Emission Reduction Targets”).
- ⁷³ *Rowe v. New Hampshire Motor Transp. Ass’n*, 128 S. Ct. 989 (2008).
- ⁷⁴ 49 U.S.C. § 14501(c)(1).
- ⁷⁵ *See* ME. REV. STAT. ANN. tit. 22, § 1555-C(1) (2007).
- ⁷⁶ *Rowe*, 128 S. Ct. 989.
- ⁷⁷ *See, e.g.,* *Riegel v. Medtronic, Inc.*, 128 S. Ct. 999 (2008) (pre-emption clause in Medical Device Amendments of 1976 pre-empts state tort law requirements that are different from, or in addition to, federal requirements for medical devices).
- ⁷⁸ Personal correspondence with Prof. Laurence Tribe, Feb. 2, 2008.
- ⁷⁹ *Zschernig v. Miller*, 389 U.S. 429 (1968).
- ⁸⁰ *Zschernig*, 389 U.S. at 440-41.
- ⁸¹ *Zschernig*, 389 U.S. at 441.
- ⁸² *Crosby v. Nat’l Foreign Trade Council*, 530 U.S. 363 (2000).
- ⁸³ *Crosby*, 530 U.S. at 366-67.
- ⁸⁴ *Crosby*, 530 U.S. at 381.
- ⁸⁵ *Nat’l Foreign Trade Council v. Giannoulis*, 523 F. Supp. 2d 731 (N.D. Ill. 2007).
- ⁸⁶ *Giannoulis*, 523 F. Supp. 2d at 745.
- ⁸⁷ *Giannoulis*, 523 F. Supp. 2d at 746.
- ⁸⁸ *Giannoulis*, 523 F. Supp. 2d at 744-45.
- ⁸⁹ 539 U.S. 396 (2003).
- ⁹⁰ *Garamendi*, 539 U.S. at 407.
- ⁹¹ *Garamendi*, 539 U.S. at 415.
- ⁹² *Garamendi*, 539 U.S. at 439 (Ginsburg, J., dissenting).

ENDNOTES: CALIFORNIA SUES EPA *continued from page 14*

¹ Press Release, California Office of the Governor, Governor Schwarzenegger Announces EPA Suit Filed to Reverse Waiver Denial (Jan. 2, 2008), *available at* <http://gov.ca.gov/press-release/8400/> (last visited Jan. 19, 2007).

² Press Release, California Office of the Attorney General, Brown Sues EPA for Illegally Blocking California's Plan to Curb Tailpipe Emissions (Jan. 2, 2008), *available at* <http://www.ag.ca.gov/newsalerts/release.php?id=1514&> (last visited Jan. 19, 2007).

³ California Office of the Attorney General, *id.*

⁴ California Office of the Attorney General, *id.*

⁵ California Office of the Governor, *supra* note 1.

⁶ California Office of the Governor, *supra* note 1.

⁷ California Office of the Governor, *supra* note 1.

⁸ California Office of the Attorney General, *supra* note 2.

⁹ California Office of the Governor, *supra* note 1.

¹⁰ California Office of the Governor, *supra* note 1.

¹¹ California Office of the Governor, *supra* note 1.

¹² EPA Administrator Stephen Johnson released a Federal Register notice detailing reasons denying the waiver on February 29, 2008, including, that Section 209 (b)(1) of the Clean Air Act did not intend for California to set state standards for new motor vehicles designed to address global problems and in the alternative, that the effects of climate change in California are not compelling and extraordinary compared to the rest of the country. See Federal Register Notice of Decision Denying a Waiver of Clean Air Act Preemption for California's 2009 and Subsequent Model Year Greenhouse Gas Emission Standards for New Motor Vehicles of Feb. 29, 2008, *available at* <http://www.epa.gov/otaq/url-fi/fr-waiver.pdf> (last visited Mar. 1, 2008).

¹³ Letter from Stephen Johnson, administrator, USEPA, to Arnold Schwarzenegger, Governor, California (Dec. 19, 2007), *available at* <http://www.epa.gov/otaq/climate/20071219-slj.pdf> (last visited Jan. 19, 2007).

¹⁴ John M. Broder, Bush Signs Broad Energy Bill, N.Y. TIMES, Dec. 19, 2007, *available at* <http://www.nytimes.com/2007/12/19/washington/19cnd-energy.html?hp> (last visited Jan. 19, 2007).

¹⁵ Broder, *id.*

¹⁶ Broder, *id.*

¹⁷ Janet Wilson, EPA chief is said to have ignored Staff, L.A. TIMES, Dec. 21, 2007, *available at* http://www.latimes.com/news/print/edition/asection/la-me-epa21dec21,1,1021228.story?coll=la-news-a_section (last visited Jan. 19, 2007).

¹⁸ Wilson, *id.*

¹⁹ Wilson, *id.*

²⁰ Wilson, *supra* note 17.

²¹ Wilson, *supra* note 17.

²² Wilson, *supra* note 17.

²³ Margot Roosevelt, California sues government for rejecting bid to curb emissions, L.A. TIMES, Jan. 3, 2008, *available at* <http://www.latimes.com/business/la-me-epa3jan03,1,6968553.story> (last visited Jan. 19, 2007).

²⁴ Roosevelt, *id.*

²⁵ Wilson, *supra* note 17.

ENDNOTES: IS THE CLEAN DEVELOPMENT MECHANISM SUSTAINABLE? *continued from page 21*

²¹ See Kenber, *supra* note 15, at 265; see also CHRISTOPH SUTTER, SUSTAINABILITY CHECK-UP FOR CDM PROJECTS – HOW TO ASSESS THE SUSTAINABILITY OF INTERNATIONAL PROJECTS UNDER THE KYOTO PROTOCOL 3 (Wissenschaftlicher Verlag 2003); Duncan French, *Climate Change Law: Narrowing the Focus, Broadening the Debate*, in SUSTAINABLE JUSTICE: RECONCILING ECONOMIC, SOCIAL AND ENVIRONMENTAL LAW 273 (Marie-Claire, Cordonier-Segger & Christopher Gregory Weeramanthy eds., Martinus Nijhoff Publishers 2005).

²² See UNFCCC, *Further guidance relating to the clean development mechanism*, FCCC/KP/CMP/2007/L.3 (Dec. 3–14, 2007), *available at* <http://unfccc.int/resource/docs/2007/cmp3/eng/103.pdf> (last visited Feb. 18, 2008).

²³ Figueres, *supra* note 19, at 2.

²⁴ UNFCCC, *Report of the Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol on its Second Session, held at Nairobi from 6 to 17 November 2006*, FCCC/KP/CMP/2006/10/Add.1 (Mar. 2, 2007), *available at* <http://unfccc.int/resource/docs/2006/cmp2/eng/10a01.pdf> (last visited Feb. 18, 2008) (“affirming that it is the host Party’s prerogative to confirm whether a clean development mechanism project activity assists it in achieving sustainable development”) [hereinafter UNFCCC 2006 COP/MOP Report]; see also United Nations Environmental Programme [UNEP], *Legal Issues Guidebook to the Clean Development Mechanism*, 49 (June 2004), *available at* <http://cd4cdm.org/Publications/CDM%20Legal%20Issues%20Guidebook.pdf> (last visited Feb. 18, 2008) [hereinafter UNEP CDM Guidebook].

²⁵ See CHRISTINA FIGUERES, INTERAMERICAN DEVELOPMENT BANK, INSTITUTIONAL CAPACITY TO INTEGRATE ECONOMIC DEVELOPMENT AND CLIMATE CHANGE CONSIDERATIONS: AN ASSESSMENT OF DNA’S IN LATIN AMERICA AND THE CARIBBEAN (2004).

²⁶ See, e.g., Steve Thorne & Emilio Lèbre La Rovere, Helio International, *Criteria and Indicators for Appraising Clean Development Mechanism (CDM) Projects* (Oct. 1999), *available at* www.pelangi.or.id/database/Artikel/CriteriaPaper.doc (last visited Feb. 19, 2008); WWF International, *The Gold Standard: Quality Standards for CDM and JI Projects* (2003); see UNEP, *CDM Information and Guidebook*, 16–28 (2d ed. 2004), *available at* <http://cd4cdm.org/Publications/cdm%20guideline%202nd%20edition.pdf> (last visited Feb. 18, 2008) [hereinafter UNEP CDM Information and Guidebook] (provid-

ing examples of major sustainability indicators that can be used in relation to CDM projects).

²⁷ The rationale behind this requirement is that the host State is free to explore the main linkages between the CDM projects and impacts on social, environmental, and economic dimensions of their national policies. Thus, host countries can select CDM projects that bring about the largest developmental benefits.

²⁸ UNFCCC, Marrakesh Accords, *Modalities and Procedures for a Clean Development Mechanism, as defined in Article 12 of the Kyoto Protocol*, FCCC/CP/2001/13/Add.2 (Jan. 21, 2002), *available at* <http://unfccc.int/resource/docs/cop7/13a02.pdf> (last visited Feb. 18, 2008) [hereinafter CDM Modalities & Procedures]; see also CDM Modalities & Procedures, *id.* annex, para. 40(a).

²⁹ See, e.g., UNEP CDM Information and Guidebook, *supra* note 26, at 15 (suggesting a range of co-benefits, such as reduction in air and water pollution through reduced fossil fuel use, extended water availability, reduced soil erosion, and protected biodiversity, creation of employment opportunities in target regions or income groups, promotion of local energy self-sufficiency); see also CATHLEEN KELLY & NED HELME, CTR. FOR CLEAN AIR POLICY, ENSURING CDM PROJECT COMPATIBILITY WITH SUSTAINABLE DEVELOPMENT GOALS (2000) (quoting Costa Rica’s national definition of CDM Projects that: CDM projects should be compatible with and supportive of Costa Rica’s national environmental and developmental priorities and strategies, including biodiversity conservation, reforestation and forest preservation, sustainable land use, watershed protection, air and water pollution reduction, reduction of fossil fuel consumption, increased utilization of renewable resources and enhanced energy efficiency. Projects should enhance the income opportunities and quality of life for rural people, transfer technological know-how, and minimize adverse consequences).

³⁰ See Figueres, *supra* note 19, at 2.

³¹ See Kenber, *supra* note 15, 266 (noting that in practice it is unlikely that projects will be made subject to stringent approval criteria as governments, especially countries short of foreign investment, will be reluctant to risk losing inflow of funds and the opportunity to build a portfolio of projects).

³² See WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT, *OUR COMMON FUTURE* 201 (Oxford Univ. Press 1987) [hereinafter *OUR COMMON FUTURE*].

³³ OECD Contribution to the United Nations Commission on Sustainable Development 14, *On the Themes of Climate Change, Energy and Industry 9* (2006), available at <http://www.oecd.org/dataoecd/58/44/36655076.pdf> (last visited Feb. 18, 2008).

³⁴ ENERGY INFORMATION ADMINISTRATION, U.S. DEP'T OF ENERGY, INTERNATIONAL ENERGY OUTLOOK 2006 71 (June 2006), available at [http://www.eia.doe.gov/oiaf/ieo/pdf/0484\(2006\).pdf](http://www.eia.doe.gov/oiaf/ieo/pdf/0484(2006).pdf) (last visited Feb. 18, 2008); EIA, SYSTEM FOR THE ANALYSIS OF GLOBAL ENERGY MARKETS (2006), available at <http://www.eia.doe.gov/oiaf/archive/ieo06/pdf/appi.pdf> (last visited Feb. 28, 2008); EIA, INTERNATIONAL ENERGY OUTLOOK 2004: TEXT NOTES (2004), available at <http://www.eia.doe.gov/oiaf/archive/ieo04/notes.html> (last visited Feb. 28, 2008) (noting that the figures can be converted to carbon equivalent units by multiplying by 12/44).

³⁵ See *OUR COMMON FUTURE*, *supra* note 32, at 168.

³⁶ *OUR COMMON FUTURE*, *supra* note 32, at 201.

³⁷ United Nations, Annan stresses energy security and its environmental consequences ahead of G-8 Summit (July 10, 2006), available at <http://www.un.org/apps/news/story.asp?NewsID=19152&Cr=annan&Cr1=travel> (last visited Feb. 16, 2008) [hereinafter *Annan Statement*].

³⁸ *Annan Statement*, *id.*

³⁹ See Daniel C. Esty & Bradford S. Gentry, *Foreign Investment, Globalization and Environment*, in *GLOBALIZATION AND ENVIRONMENT* 141-72 (Organization for Economic Cooperation and Development 1997).

⁴⁰ Press Release, UNFCCC Secretariat, Emission Reductions From Kyoto Protocol's Clean Development Mechanism Pass the One Billion Tonnes Mark, June 9, 2006, available at http://unfccc.int/files/press/news_room/press_releases_and_advisories/application/pdf/20060608_cdm_1_billion_tonnes-english.pdf (last visited Feb. 16, 2008).

⁴¹ Projects have been concentrated in a few countries only, and project types that are most likely to contribute to host country sustainable development, such as renewable energy, energy efficiency, and transport projects are not competitive in the CDM Market and are in danger of becoming marginalized. See WOLFGANG STERK & BETTINA WITTEBEN, WUPPERTAL INST. FOR CLIMATE, ENV'T & ENERGY, JIKO POLICY PAPER 1/2005: ADDRESSING OPPORTUNITIES AND CHALLENGES OF A SECTORAL APPROACH TO THE CLEAN DEVELOPMENT MECHANISM (Aug. 2005), available at http://www.wupperinst.org/en/publications/entwd/uploads/tx_wibeitrag/addressing-opportunities.pdf (last visited Feb. 18, 2008); see also Charlotte Streck & Thiago B. Chagas, *The Future of the CDM in a Post-Kyoto World*, 1 *CARBON & CLIMATE L. REV.* 53, 53-63 (2007).

⁴² See Figueres, *supra* note 19, at 7; see also Kenber, *supra* note 15, at 268.

⁴³ See BETTINA WITTEBEN ET AL., IN FROM THE COLD: THE CLIMATE CONFERENCE IN MONTREAL BREATHES NEW LIFE INTO THE KYOTO PROTOCOL, 13-14, 19 (Wuppertal Inst. for Climate, Env't & Energy, 2006), available at http://www.lne.be/themas/klimaatverandering/klimaatconferentie/vlaamseklimateconferentie/werkgroepen-1/strategie/eerste-vervolgtraject-opvolg-werkgroepen-strategie/Wuppertal_Inst_COP11MOP1-report.pdf (last visited Feb. 18, 2008).

⁴⁴ See IPCC, *Carbon Dioxide Capture and Storage: Summary for Policymakers* (Sept. 2005) (providing an overview of technologies related to ensuring permanence and monitoring and legal questions as to whether the injection of CO₂ in geological formations should count as a non-emission, emission reduction or carbon sequestration), available at http://www.ipcc.ch/pdf/special-reports/srccs/srccs_summaryforpolicymakers.pdf [hereinafter *IPCC Summary for Policymakers*].

⁴⁵ *IPCC Summary for Policymakers*, *id.* at 14.

⁴⁶ UNFCCC 2006 COP/MOP Report, *supra* note 24, at 3.

⁴⁷ UNFCCC 2006 COP/MOP Report, *supra* note 24, at 3.

⁴⁸ See UNFCCC, Subsidiary Body for Scientific & Technological Advice, *Implications of the implementation of project activities under the clean development mechanism, referred to in decision 12/CP.10, for the achievement of objectives of other environmental conventions and protocols*, FCCC/SBSTA/2005/L.27/Add.1 (Dec. 6, 2005), available at <http://unfccc.int/resource/docs/2005/sbsta/eng/127a01.pdf> (last visited Feb. 16, 2008); see also UNFCCC, Subsidiary Body for Scientific & Technological Advice, *Methodological issues under the Kyoto Protocol Implications of the establishment of new hydrochlorofluorocarbon-22 (HCFC-22) facilities seeking to obtain certi-*

fied emission reductions for the destruction of hydrofluorocarbon-23 (HFC-23), FCCC/SBSTA/2007/L.13 (Dec. 8, 2007), available at <http://unfccc.int/resource/docs/2007/sbsta/eng/113.pdf> (last visited Feb. 18, 2008).

⁴⁹ See generally Xuemen Wang & Glenn Wiser, *The Implementation and Compliance Regimes under the Climate Change Convention and its Kyoto Protocol*, 11(2) *REV. EUR. COMMUNITY & INT'L ENV'T L.* 181, 181-98 (2002), available at http://www.ciel.org/Publications/Wang_Wiser.pdf (last visited Feb. 25, 2008); see also Geir Ulfstein & Jacob Werksman, *The Kyoto Compliance System: Towards Hard Enforcement*, in *IMPLEMENTING THE CLIMATE REGIME: INTERNATIONAL COMPLIANCE* 39-62 (Olav Schram Stokke, Jon Hovi & Geir Ulfstein eds., 2005); UNFCCC, Marrakesh Accords, *Procedures and mechanisms relating to compliance under the Kyoto Protocol*, FCCC/CP/2001/13/Add.3, decision 24/CP.7, annex (Jan. 21, 2002), available at <http://unfccc.int/resource/docs/cop7/13a03.pdf> (last visited Feb. 18, 2008).

⁵⁰ See Dane Ratliff, *Arbitration in 'Flexible Mechanism' Contracts*, in *LEGAL ASPECTS OF IMPLEMENTING THE KYOTO PROTOCOL MECHANISMS MAKING KYOTO WORK* 377 (David Freestone & Charlotte Streck eds., 2005).

⁵¹ See Tomer Broude, *Elements of the Principle of Integration in WTO Jurisprudence: Another Look at the Shrimp Case*, in *INT'L L. OF SUSTAINABLE DEV.* 1, 26-32 (Int'l Law Ass'n ed., 2006), available at <http://www.ila-hq.org/pdf/International%20Law%20on%20Sustainable%20Development/Report%202006.pdf> (last visited Feb. 19, 2008) (noting in the context of WTO law, that WTO law and practice of sustainable development as a principle of integration gives evidence of State practice and of a legal obligation, thereby contributing to the establishment of the principle as a general principle or even customary law).

⁵² *Kyoto Protocol*, *supra* note 1, art. 12(5)(b).

⁵³ Kenber, *supra* note 15, at 268.

⁵⁴ Kenber, *supra* note 15, at 268; see also The Gold Standard Home Page, www.cdmgoldstandard.org (last visited Feb. 11, 2008).

⁵⁵ See The Gold Standard: Manual for CDM Project Developers, May 2006, available at http://www.cdmgoldstandard.org/uploads/file/DeveloperManual_GS-CER.pdf (last visited Feb. 16, 2008) (providing the list of key indicators for the sustainability performance of a project: local, regional, and global environment including water quality and quantity, air quality (emissions other than GHGs), other pollutants (including, where relevant, toxicity, radioactivity, POPs, and stratospheric ozone layer depleting gases), soil condition (quality and quantity), biodiversity (species and habitat conservation); social sustainability and development (including employment, job quality, fulfilment of labour standards), livelihood of the poor (including poverty alleviation, distributional equity, and access to essential services), access to energy services, human and institutional capacity (including empowerment, education, involvement, gender); economic and technological development including employment (numbers), balance of payments (sustainability), and technological self reliance (including project replicability, hard currency liability, skills development, institutional capacity, technology transfer).

⁵⁶ Helio International, SouthSouthNorth Network, <http://www.southsouthnorth.org/> (last visited Feb. 19, 2008) (containing links to information about criteria and work on projects in Brazil, South Africa, Indonesia, and Bangladesh); see Christoph Sutter, *Sustainability Check-up for CDM Projects: How to Assess the Sustainability of International Projects Under the Kyoto Protocol* (Wissenschaftlicher Verlag, 2003).

⁵⁷ *Kyoto Protocol*, *supra* note 1, art. 12(8); UNFCCC, Marrakesh Accords, *Principles, nature and scope of the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol*, FCCC/CP/2001/13/Add.2, decision 15/CP.7, para. 15 (Jan. 21, 2002), available at <http://unfccc.int/resource/docs/cop7/13a02.pdf#page=2> (last visited Feb. 18, 2008). The most straight-forward component of benefit-sharing is the two percent levy on CDM projects investor countries must pay into a Clean Development Fund, to cover administrative expenses and help particularly vulnerable developing countries adapt.

⁵⁸ UNFCCC Montreal COP 2005, *supra* note 10, at decision 2/CMP.1-7/CMP.1 (containing decisions related to the Clean Development Mechanism and also known as the Kyoto Rule Book 2005, though it contains no specification on sustainable developments indicators or requirements).

⁵⁹ UNFCCC Decision 17/CP.7, *supra* note 18, annex, para. 37(c) & appendix B, art. 2(e).

⁶⁰ UNEP, *CDM Information and Guidebook*, 61-62, (2d ed. 2004), available at <http://cd4cdm.org/Publications/cdm%20guideline%202nd%20edition.pdf> (last visited Feb. 16, 2008). However, the identification of international standards

provides additional challenges. It has been suggested that existing international or regional standards, such as the Convention on Environmental Impact Assessment in a Transboundary Context, Feb. 25, 1991, 30 I.L.M. 800, or the World Bank's operational procedures on environmental assessment, World Bank Operational Policy/Bank Procedures 4.01, available at <http://wbln0018.worldbank.org/Institutional/Manuals/OpManual.nsf/OPolw/9367A2A9D9DAED38525672C007D0972?OpenDocument>, could be useful in this context. See Meijer & Werksman, *supra* note 6, at 210.

⁶¹ Meijer & Werksman, *supra* 6, at 210.

⁶² UNFCCC, Marrakesh Accords, FCCC/CP/2001/13/Add.2, Decision 16/CP.7, annex, para. 1(e) & Decision 17/CP.7, annex, para. 1(e) (Jan. 21, 2002), available at <http://unfccc.int/resource/docs/cop7/13a02.pdf> (last visited Feb. 16, 2008).

⁶³ Kenber, *supra* note 15, at 267.

⁶⁴ See, e.g., Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters, June 25, 1998, 38 I.L.M. 517.

⁶⁵ Erik Haites, *Conclusion: Mechanisms, Linkages and the Direction of the Future Climate Regime*, in CLIMATE CHANGE AND CARBON MARKETS: A HANDBOOK OF EMISSION REDUCTION MECHANISMS 321 (Farhana Yamin ed., Earthscan 2005).

⁶⁶ Press Release, UNFCCC Secretariat, Kyoto Protocol's Clean Development Mechanism passes 100 millionth certified emission reduction milestone (Dec. 18, 2007).

⁶⁷ Kyoto Protocol, *supra* note 1, art. 12(2).

ENDNOTES: INTERNATIONAL TRADE LAW *continued from page 26*

⁴ At the conclusion of the Bali Conference, the White House expressed cautious support for the Bali Roadmap, noting that it might lead to a "global consensus" on reductions in greenhouse gas emissions provided that certain "serious concerns" could be adequately addressed. These concerns include the importance of recognition that "the problem of climate change cannot be adequately addressed through commitments for emissions cuts by developed countries alone." Press Release, White House Office of the Press Secretary, Statement by the Press Secretary (Dec. 15, 2007), available at <http://www.whitehouse.gov/news/releases/2007/12/20071215-1.html> (last visited Mar. 11, 2008). The three major U.S. presidential candidates all support U.S. participation in a post-Kyoto Protocol global agreement on greenhouse gas emissions reductions.

⁵ Bali Action Plan, *supra* note 2, para. 1(a).

⁶ Bali Action Plan, *supra* note 2, para. 1(a).

⁷ Bali Action Plan, *supra* note 2, para. 1(b)(ii).

⁸ Richard Black, BBC News, Trade Can 'Export' CO₂ Emissions (Dec. 19, 2005), available at <http://news.bbc.co.uk/2/hi/science/nature/4542104.stm> (last visited Mar. 11, 2008) (internal quotation marks omitted).

⁹ The carbon leakage problem is exacerbated by the tendency to shift production of greenhouse gas-intensive goods to countries where production is less efficient and therefore consumes more energy, leading to even higher greenhouse gas emissions than would otherwise be the case. Black, *id.*

¹⁰ See Joe MacDonald, Associated Press, *China's Trade Surplus Surges to Record* (Jan. 11, 2008), available at <http://abcnews.go.com/Business/wireStory?id=4118619> (last visited Mar. 11, 2008). For recent information concerning China's carbon emissions, see, e.g., World Resources Institute, EarthTrends Environmental Information, December 2008 Monthly Update: China's Future in an Energy Constrained World, available at <http://earthtrends.wri.org/updates/node/274> (last visited Mar. 11, 2008).

¹¹ America's Climate Security Act, S. 2191, 110th Cong. 1st Sess. (2007). Supporters of ACSA are currently working to secure sixty votes in the Senate—the number required to overcome an expected filibuster of the bill. See Posting of Joseph Romm to Climate Progress website, <http://climateprogress.org/2007/12/06/lieberman-warner-survives-committee/> (last visited Mar. 13, 2008) (Dec. 6, 2007, 11:54 EST).

¹² See generally ACSA, S. 2191, § 1201, 110th Cong. 1st Sess. (2007).

¹³ See generally ACSA, *id.* §§ 3101-3904.

¹⁴ See ACSA, *id.* § 6003.

¹⁵ ACSA, *id.* § 6006(c)(2)(A). The allowances at issue would be generated pursuant to an International Reserve Allowance Program ("IRAP") as prescribed in ACSA section 6006(a)-(d). The IRAP would operate separately from, but parallel to, the Emission Allowance Account Program established for domestic industries under ACSA section 1201. Importantly, under ACSA section 6006, the international allowances that would be made available for sale to U.S. importers would not be permitted to be sold at prices exceeding the value of domestic allowances covering the same period.

¹⁶ ACSA, S. 2191, § 6006(c)(2)(B), 110th Cong. 1st Sess. (2007). ACSA defines "comparable action" at section 6001(2).

¹⁷ See ACSA, *id.* §§ 6001(5) (defining "Covered Good"), 6001(10) (defining "Primary Product").

¹⁸ U.S. HOUSE OF REPRESENTATIVES COMMITTEE ON ENERGY AND COMMERCE, CLIMATE CHANGE LEGISLATION DESIGN WHITE PAPER: COMPETITIVENESS CONCERNS/ENGAGING DEVELOPING COUNTRIES (2008), available at http://energycommerce.house.gov/Climate_Change/White_Paper.Competitiveness.013108.pdf (last visited Mar. 11, 2008) [hereinafter CLIMATE CHANGE WHITE PAPER].

¹⁹ CLIMATE CHANGE WHITE PAPER, *id.* at 10-11.

²⁰ CLIMATE CHANGE WHITE PAPER, *id.*

²¹ *Climate Change: Competitiveness Concerns and Prospects for Engaging Developing Countries*, Hearing on S. 2191 Before the H. Energy & Air Quality Sub Comm., Energy & Commerce Comm., 110th Cong. 13 (2008) (written testimony of Jim Slattery, Partner, Wiley Rein LLP, counsel to Nucor Corp., appearing on behalf of the American Iron and Steel Institute and the Steel Manufacturers Association), available at http://www.steel.org/AM/Template.cfm?Section=Climate_Change_Focus&TEMPLATE=/CM/ContentDisplay.cfm&CONTENTID=23019 (last visited Mar. 11, 2008). Mr. Slattery also explained why, from the perspective of the U.S. steel industry, producers in developing and developed countries should be subject to the same greenhouse gas emissions standards:

The major steel producers in 'developing' countries like China, India, and Brazil are among the largest—and in many cases the newest—in the world. They have the same access to capital, to markets, and to technology that the U.S. steel industry has. They should be subject to the same requirements regarding greenhouse gas emissions that we are, instead of being handed a windfall that will increase global greenhouse gas emissions.

Id. at 14-15.

²² CLIMATE CHANGE WHITE PAPER, *supra* note 18, at 11-12.

²³ CLIMATE CHANGE WHITE PAPER, *supra* note 18, at 11-12.

²⁴ See generally, Commission of the European Communities, Proposal for a Decision of the European Parliament and of the Council on the Effort of Member States to Reduce their Greenhouse Gas Emissions to Meet the Community's Greenhouse Gas Emission Reduction Commitments up to 2020 (2008/0014 (COD)) (Jan. 23, 2008), available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2008:0017:FIN:EN:PDF> (last visited Mar. 11, 2008).

²⁵ See generally EUActiv.com, *Commissions weighing up options on CO₂ border tax* (Feb. 27, 2008), available at <http://www.euractiv.com/en/climate-change> (last visited Mar. 19, 2008).

²⁶ See Susan C. Schwab, U.S. Trade Representative, Remarks to the U.S. Chamber of Commerce (Jan. 17, 2008), available at http://www.uschamber.com/press/speeches/2008/080117_schwab.htm (last visited Mar. 11, 2008).

²⁷ See Commission of the European Communities, Proposal for a Directive of the European Parliament and of the Council on the Promotion of the Use of Energy from Renewable Sources (2008/0016 (COD)) (Jan. 23, 2008), available at http://ec.europa.eu/energy/climate_actions/doc/2008_res_directive_en.pdf (last visited Mar. 11, 2008) [hereinafter Proposed Directive]. The Proposed Directive would indirectly restrict imports into the EU of certain biofuels by dictating that the only biofuels that may be taken into account in calculating compliance with EU renewable energy and emissions reductions targets are those that represent greenhouse gas emissions savings of "at least 35 [percent]," as compared to fossil fuels. Proposed Directive, *id.* art. 15, para. 2.

²⁸ Bruce Stokes, *Going Green in Trade Policy*, NAT'L J., Feb. 9, 2008, at 55.

²⁹ See CLIMATE CHANGE WHITE PAPER, *supra* note 18, at 3.

³⁰ General Agreement on Tariffs and Trade, art. III.2, Apr. 15, 1994, 33 I.L.M. 1153 [hereinafter GATT].

³¹ GATT, *supra* note 30, art. XX.

³² Articles III and XX of the GATT are part of the original GATT agreement reached in 1947. The WTO Agreements, which entered into effect in 1995, incorporate the 1947 GATT agreement.

³³ The ongoing WTO Doha Round negotiations may culminate in substantial revisions to the current WTO Agreements. However, with the exception of the negotiations toward a possible Agreement on Trade in Environmental Goods and Services, discussed below, the Doha Round negotiations are unlikely to lead to any new agreement that would clarify the operation of GATT III and XX as to import restrictions linked to efforts to reduce greenhouse gas emissions. At any rate, it remains unclear whether the Doha Round will result in any revisions to the WTO Agreements currently in effect.

³⁴ WTO Members could conceivably attack ACSA's import restrictions on other WTO grounds. For example, a complaining WTO Member might allege that ACSA's import provisions are inconsistent with GATT Article II, which does not permit WTO Members to impose "duties or charges of any kind imposed on or in connection with the importation in excess of" bound tariff rates. GATT art. II.1(b).

³⁵ Appellate Body Report, *Brazil – Measures Affecting Imports of Retreaded Tyres*, WT/DS332/AB/R (Dec. 3, 2007), available at <http://docsonline.wto.org/DDFDocuments/t/WT/DS/332ABR.doc> (last visited Mar. 12, 2008).

³⁶ CLIMATE CHANGE WHITE PAPER, *supra* note 18, at 13.

³⁷ A particularly well-known example is the retaliatory measures against the United States approved under the WTO dispute settlement process in the case of *United States – Tax Treatment for "Foreign Sales Corporations."* In that case, an arbitrator convened under Article 22.6 of the DSU determined that the European Communities could impose "countermeasures" against the United States in the form of a hundred percent *ad valorem* duties amounting to over \$4 billion per year. See, e.g., Decision by the Arbitrator, *United States – Tax Treatment for "Foreign Sales Corporations,"* WT/DS108/ARB (Aug. 30, 2002), available at <http://docsonline.wto.org/DDFDocuments/t/WT/DS/108ARB.doc> (last visited Mar. 12, 2008).

³⁸ See Steve Charnovitz, *The Law of Environmental 'PPMs' in the WTO: Debunking the Myth of Illegality*, in *WTO JURISPRUDENCE AND POLICY: PRACTITIONERS' PERSPECTIVES* 717 (Cameron May ed., 2004).

³⁹ See Panel Report, *United States – Import Prohibition of Certain Shrimp and Shrimp Products*, WT/DS58/R (May 15, 1998), available at http://www.wto.org/english/tratop_e/dispu_e/distab_e.htm#r58 (last visited Mar. 12, 2008); Appellate Body Report, WT/DS58/R (Oct. 12, 1998), available at http://www.wto.org/english/tratop_e/dispu_e/58abr.pdf (last visited Mar. 12, 2008); Panel Report, WT/DS58/R (June 15, 2001), available at http://www.wto.org/english/tratop_e/dispu_e/58rw_e.pdf (last visited Mar. 12, 2008); Appellate Body Report (Recourse to Article 21.5 of the DSU by Malaysia) (Oct. 22, 2001),

available at http://www.wto.org/english/tratop_e/dispu_e/58abr_e.pdf (last visited Mar. 12, 2008) [hereinafter *October 2001 Appellate Body Report*].

⁴⁰ See *October 2001 Appellate Body Report*, *id.* paras. 122-24.

⁴¹ Letter from Susan C. Schwab, U.S. Trade Representative, to Rep. Joseph L. Barton, Ranking Member, U.S. House of Representatives Committee on Energy and Commerce at 1-2 (Mar. 4, 2008), available at http://republicans.energy-commerce.house.gov/Media/File/News/030408_Schwab_Letter_toBarton.pdf (last visited Mar. 14, 2008) [hereinafter Schwab Letter].

⁴² Schwab Letter *id.* at 2.

⁴³ See, e.g., Press Release, Office of the U.S. Trade Representative, USTR Schwab to Announce New Climate Initiatives for WTO, Including a New Environmental Goods and Services Agreement (EGSA) (Nov. 30, 2007), available at [http://www.ustr.gov/Document_Library/Press_Releases/2007/November/USTR_Schwab_to_Announce_New_Climate_Initiatives_for_WTO,_Including_a_New_Environmental_Goods_Services_Agreement_\(EGSA\).html](http://www.ustr.gov/Document_Library/Press_Releases/2007/November/USTR_Schwab_to_Announce_New_Climate_Initiatives_for_WTO,_Including_a_New_Environmental_Goods_Services_Agreement_(EGSA).html) (last visited Mar. 14, 2008).

⁴⁴ World Trade Organization, Ministerial Declaration of 14 November 2001, WT/MIN(01)/DEC/1, 41 I.L.M. 746 (2002), available at http://www.wto.org/English/thewto_e/minist_e/min01_e/mindecl_e.pdf (last visited Mar. 14, 2008) [hereinafter WTO Declaration].

⁴⁵ WTO Declaration, *id.* para. 31(iii).

⁴⁶ Schwab Letter, *supra* note 41, at 1.

⁴⁷ See Tariff Act of 1930, Title VII, Subtitle B, 46 Stat. 741 (1930) (current version at 19 U.S.C. §§ 1673-1673h (2000) ("Imposition of Antidumping Duties")).

⁴⁸ See Tariff Act, *id.* Title VII, Subtitle A, 46 Stat. 741 (current version at 19 U.S.C. §§ 1671-1671h (2000) ("Imposition of Countervailing Duties")).

⁴⁹ See Agreement on Implementation of Article VI of the General Agreement on Tariffs and Trade 1994, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, Multilateral Agreements on Trade in Goods, 33 I.L.M. 1140 (1994), available at http://www.wto.org/english/docs_e/legal_e/19-adp.pdf (last visited Mar. 14, 2008); Agreement on Subsidies and Countervailing Measures, April 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, Multilateral Agreements on Trade in Goods, 33 I.L.M. 1140 (1994), available at http://www.wto.org/english/docs_e/legal_e/24-scm.pdf (last visited Mar. 14, 2008).

⁵⁰ See, e.g., Ronald A. Wirtz, *Anti-Dumping: The Free-Trade Antacid*, THE REGION (FEDERAL RESERVE BANK OF MINNEAPOLIS), available at <http://www.minneapolisfed.org/pubs/region/01-12/wirtz.cfm> (last visited Mar. 14, 2008).

⁵¹ See ASCA, *supra* note 11, § 6001.

⁵² Press Release, U.S. Senator Max Baucus, Baucus Takes Strong Stance on Global Warming (Oct. 24, 2007), available at <http://baucus.senate.gov/newsroom/details.cfm?id=286038> (last visited Mar. 14, 2008).

ENDNOTES: SECURING RIGHTS TO CARBON SEQUESTRATION *continued from page 33*

¹ Department for Planning and Infrastructure, Management of State Land, <http://www.dpi.wa.gov.au/crownland/1782.asp> (last visited Jan. 28, 2008).

² Transfer of Land Act, 1893, § 68 (W. Austl. Stat.).

³ Transfer of Land Act, *id.* §201.

⁴ Halsbury's Laws of Australia para. 355-8005.

⁵ Halsbury's Laws of Australia para. 355-35.

⁶ Sale of Land Act, 1970, § 22 (W. Austl. Stat.).

⁷ Land Administration Act, 1997, § 3(1) (W. Austl. Stat.).

⁸ Land Administration Act, *id.* § 19.

⁹ Carbon Rights Act, 2003 § 6(1) (W. Austl. Stat.).

¹⁰ Carbon Rights Act, *id.* § 5(1), 3.

¹¹ Carbon Rights Act, *id.* § 5(2)(e); see also Transfer of Land Act, 1893, § Pt.IV Div 2A (W. Austl. Stat.).

¹² Carbon Rights Act, 2003 § 8(1) (W. Austl. Stat.).

¹³ Second Reading Speech in Legislative Assembly of Western Australian Parliament on Carbon Rights Bill, Hansard, p. 10961 (May 22, 2002).

¹⁴ Hansard, *id.* at 10961.

¹⁵ Carbon Rights Act, 2003 § 6(2) (W. Austl. Stat.); Transfer of Land Act, 1893, § 104B (W. Austl. Stat.).

¹⁶ Carbon Rights Act, 2003 § 11(1), 12(1) (W. Austl. Stat.).

¹⁷ Carbon Rights Act, *id.* § 10(1).

¹⁸ Carbon Rights Act, *id.* § 12(3).

¹⁹ Statistics provided by Western Australian Land Information Authority.

²⁰ Since Nov. 1991, 1,514 timber share farming agreements have been registered (Western Australian Land Information Authority).

²¹ Carbon Rights Act, 2003, § 5(2)(e) (W. Austl. Stat.).

²² Conveyancing Act, 1919, § 87(a) (N.S.W. Stat.).

²³ Forestry Act, 1959, Schedule 3 (Queensl. Stat.).

ENDNOTES: THE FUTURE OF THE EU EMISSIONS TRADING SYSTEM *continued from page 38*

- ² EU-ETS Directive, *id.* annex 1.
- ³ EU-ETS Directive, *id.* art. 9.
- ⁴ EU-ETS Directive, *id.* art. 10.
- ⁵ EU-ETS Directive, *supra* note 1, art. 9; Questions and Answers on the Commission's Proposal to Revise the EU Emissions Trading System, ques. 2, Memo/08/35 (Jan. 23, 2008), available at <http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/08/35&format=HTML&aged=0&language=EN&guiLanguage=en> (last visited Mar. 1, 2008) [hereinafter EU-ETS Questions and Answers].
- ⁶ EU-ETS Questions and Answers, *supra* note 5, ques. 1.
- ⁷ Commission Proposal for a Directive of the European Parliament and of the Council Amending Directive 2003/87/EC so as to Improve and Extend the Greenhouse Gas Emission Allowance Trading System of the Community, 2008/0013 (COD) (Jan. 23, 2008), available at http://ec.europa.eu/environment/climat/emission/pdf/ets_revision_proposal.pdf (last visited Jan. 27, 2008) [hereinafter Proposal EU-ETS].
- ⁸ Proposal EU-ETS, *supra* note 7.
- ⁹ Proposal EU-ETS, *supra* note 7, at 13.
- ¹⁰ Proposal EU-ETS, *supra* note 7, at 13.
- ¹¹ Proposal EU-ETS, *supra* note 7, at 13.
- ¹² Proposal EU-ETS, *supra* note 7, at 34-36.
- ¹³ EU-ETS Questions and Answers, *supra* note 5, ques. 19; Mark Scott, *Giant Steps for Carbon Trading in Europe*, BUS. WK., Jan. 23, 2008, available at http://www.businessweek.com/globalbiz/content/jan2008/gb20080123_051988.htm (last visited Feb. 9, 2008).
- ¹⁴ Proposal EU-ETS, *supra* note 7, at 14, 21.
- ¹⁵ Proposal EU-ETS, *supra* note 7, at 21; EU-ETS Questions and Answers, *supra* note 5, ques. 9.
- ¹⁶ See EU-ETS Questions and Answers, *supra* note 5, ques. 8.
- ¹⁷ Proposal EU-ETS, *supra* note 7, at 14.
- ¹⁸ Proposal EU-ETS, *supra* note 7, at 22.
- ¹⁹ Proposal EU-ETS, *supra* note 7, at 15-16.
- ²⁰ Proposal EU-ETS, *supra* note 7, at 16.
- ²¹ Proposal EU-ETS, *supra* note 7, at 15.

ENDNOTES: RECENT DEVELOPMENTS IN AUSTRALIAN CLIMATE CHANGE LITIGATION *continued from page 44*

- ³² EPBC Act, ch. 1, § 3A.
- ³³ EPBC Act, ch. 2, pt. 3, div. 1 (including several matters of national environmental significance: (1) world heritage property; (2) national heritage place; (3) wetlands of international importance; (4) listed threatened species and communities; (5) listed migratory species; (6) nuclear actions; (7) marine environment).
- ³⁴ EPBC Act, ch. 8, pt. 23, div. 1, subdiv. A, § 523.
- ³⁵ EPBC Act, ch. 4, pt. 7, div. 1, § 68(1).
- ³⁶ EPBC Act, ch. 4, pt. 7, div. 2, § 75(2)(a).
- ³⁷ AUSTR. GOV'T, DEP'T OF THE ENV'T AND HERITAGE, EPBC ACT POLICY STATEMENT 1.1: SIGNIFICANT IMPACT GUIDELINES ON MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE 4 (2006), available at <http://www.environment.gov.au/epbc/publications/pubs/nes-guidelines.pdf> (last visited Jan. 27, 2008).
- ³⁸ *Minister for the Env't & Heritage v. Queensland Conservation Council Inc.*, [2004] FCAFC 190 (Austl.).
- ³⁹ Increased irrigation practices made possible by damming the river would lead to more pesticide and insecticide runoff. The QCC argued that such chemicals would eventually find their way to the GBRWHA.
- ⁴⁰ D.E. Fisher, *The Meaning of Impacts—the Nathan Dam Case on Appeal*, 21 ENVTL. & PLAN. L.J. 325, 327-28 (2004).
- ⁴¹ *Queensland Conservation Council Inc.*, *supra* note 38, ¶57.
- ⁴² *Queensland Conservation Council Inc.*, *supra* note 38, ¶53.
- ⁴³ *Queensland Conservation Council Inc.*, *supra* note 38, ¶53.
- ⁴⁴ *Queensland Conservation Council Inc.*, *supra* note 38, ¶61.
- ⁴⁵ *Austl. Conservation Found. & Ors v. Minister for Planning*, [2004] VCAT 2029 (Austl.); see also SMITH & SHEARMAN, *supra* note 1, at 59.
- ⁴⁶ Various approvals were required, including an amendment to the Latrobe Planning Scheme, an environmental effects statement ("EES"), and approvals under the Mineral Resources Development Act (Victoria), the Environmental Protection Act of 1970 ("E&P Act") (Victoria), and the EPBC Act (Commonwealth). *Austl. Conservation Found.*, *id.* ¶ 8.
- ⁴⁷ An EES is the Victorian equivalent of an environmental impact assessment ("EIA") under the EPBC Act or an environmental assessment ("EA") under NSW law. See Environmental Planning and Assessment Act 1979, pt. 3A, div. 2, § 75F.
- ⁴⁸ *Austl. Conservation Found.*, *supra* note 45, ¶¶ 9, 12 (recounting that the Victorian Government had told IPH that a separate government process would look into this issue. After a panel formed to evaluate the EES, the Minister for Planning issued a "terms of reference" explicitly instructing the panel not to consider the station's greenhouse gas emissions).
- ⁴⁹ *Austl. Conservation Found.*, *supra* note 45, ¶¶ 37-41 (looking to Section 6, which broadly states that the scheme should address the planning objectives in Victoria, and section 4(1), which frames these objectives by the principle of ecologically sustainable development, providing for the "maintenance of ecological processes" and the balance of "present and future interests of all Victorians").
- ⁵⁰ *Austl. Conservation Found.*, *supra* note 45, ¶ 47.
- ⁵¹ By construing "about the amendment" language similarly to the EPBC Act's "all adverse impacts," the Tribunal also standardized the environmental impact assessment across jurisdictional lines.
- ⁵² *Wildlife Preservation Soc'y of Queensland Proserpine/Whitsunday Branch Inc. v. Minister for Env't & Heritage*, [2006] FCA 736, ¶ 11 (Austl.).
- ⁵³ *Wildlife Preservation Soc'y*, *id.* ¶ 44, 72 (stating that "I am far from satisfied that the burning of coal at some unidentified place in the world, the production of greenhouse gases from such combustion, its contribution towards global warming and the impact of global warming upon a protected matter, can be so described").
- ⁵⁴ *Wildlife Preservation Soc'y*, *id.* ¶47.
- ⁵⁵ *Gray v. The Minister for Planning, Dir.-General of the Dep't of Planning & Centennial Hunter Pty Ltd.*, [2006] NSWLEC 720 (Austl.).
- ⁵⁶ *Gray*, *id.* ¶ 87 (quoting *Kivi v. Forestry Commission of NSW*, [1982] 47 LGRA 38 (Austl.)).
- ⁵⁷ *Gray*, *id.* ¶ 98.
- ⁵⁸ See, e.g., Fraser K. Cameron, *The Greenhouse Effect: Proposed Reforms for the Australian Environmental Regulatory Regime*, 25 COLUM. J. ENVTL. L. 347, 367 (2000) (arguing for the strengthening of the precautionary principle by requiring its enforcement as a legal rule, rather than as a general principle of statutory interpretation).
- ⁵⁹ *Gray*, *supra* note 55, ¶ 116 (quoting *Bentley v. BGP Properties*, [2006] NSWLEC 34, 67-70 (Austl.)). When discussing intergenerational equity, the court relied heavily on three conservation principles that Edith Brown Weiss explored in *IN FAIRNESS TO FUTURE GENERATIONS: INTERNATIONAL LAW, COMMON PATRIMONY, AND INTERGENERATIONAL EQUITY* (Transnational Publishers 1988): (1) options—requiring each generation to conserve the natural and cultural diversity to make development options available to future generations; (2) quality—requiring each generation to maintain the quality of the earth to pass it on in no worse condition than it was received; and (3) access—ensuring that each generation has a reasonable and equitable right of access to the earth's natural and cultural resources. *Gray*, *supra* note 55, ¶ 119.
- ⁶⁰ *Gray*, *supra* note 55, ¶ 117.
- ⁶¹ *Gray*, *supra* note 55, ¶ 126; see also *Taralga Landscape Guardians Inc. v. Minister for Planning*, [2007] NSWLEC 59 (Austl.) (in upholding a permit

for a wind farm development project, the Court looked to two requirements of intergenerational equity in the energy sector, namely (1) mining of fossil fuel resources in a sustainable manner, and (2) substituting energy sources that result in less greenhouse gas emissions for energy sources that result in more greenhouse gas emissions).

⁶² *But see Thornton v. Adelaide Hills Council* (2006) SAERDC 41 (in ruling on an application to put in a four-megawatt capacity coal-fired boiler on a flower farm, the Environmental Court in South Australia considered principles of ecologically sustainable development, but because neighbors opposing the application offered no evidence supporting a likely increase overall in GHG emissions, ESD principles were not applicable and the economic growth argument prevailed).

⁶³ Envlaw.com.au, Statement of Reasons for Decision on Not Controlled Action under the EPBC Act (Apr. 18, 2007) ¶ 9, <http://www.envlaw.com.au/anvil7.pdf> (last visited Jan. 27, 2008).

⁶⁴ Envlaw.com.au, *id.* ¶ 32. The Minister concluded that Anvil Hill's impact was so small after calculating the average GHG emissions per year and finding it equivalent to about .04 percent of current GHG emissions. Envlaw.com.au, *id.* ¶ 28.

⁶⁵ Envlaw.com.au, *id.* ¶ 32.

⁶⁶ *Anvil Hill Project Watch Ass'n Inc. v. Minister for the Env't & Water Res.*, [2007] FCA 1480 (Austl.), ¶ 32, available at http://www.austlii.edu.au/au/cases/cth/federal_ct/2007/1480.html (last visited Jan. 27, 2008).

⁶⁷ *Anvil Hill*, Applicant's Outline of Argument ¶ 75, available at <http://www.envlaw.com.au/anvil11.pdf> (last visited Jan. 27, 2008).

⁶⁸ *Anvil Hill*, Applicant's Outline of Argument ¶ 75, *id.* (arguing that context includes not only total Australian and global emissions of greenhouse gases, but also a comparison to other actions reasonably assessed under the EPBC Act); see also EPBC ACT POLICY STATEMENT, *supra* note 37, at 4.

⁶⁹ *Anvil Hill*, *supra* note at 66, ¶ 40.

⁷⁰ Envlaw.com.au, Notice of Appeal, <http://www.envlaw.com.au/anvil13.pdf> (last visited Jan. 27, 2008). A decision is expected in early 2008.

⁷¹ *Xstrata Coal Queensland Pty Ltd. & Ors. v. Queensland Conservation Council*, [2007] QLRT 33, ¶ 8 (Austl.).

⁷² Based on scientific testimony and evidence, the Court found it surprising that a 0.45-degree Celsius increase over fifty-five years was causing so much climate system concern.

⁷³ *Xstrata Coal*, *id.* ¶ 21.

⁷⁴ *Xstrata Coal*, *id.* ¶ 23.

⁷⁵ *Queensland Conservation Council v. Xstrata Coal Queensland Pty Ltd.*, [2007] QCA 338 (Austl.). The Court of Appeals found that the Land and Resources Tribunal should have allowed QCC to respond to the Tribunal's climate change doubts, as well as amend the amount of offsets it sought from Xstrata.

⁷⁶ Cf. Andrew Macintosh, *Why the Environment Protection and Biodiversity Conservation Act's Referral, Assessment, and Approval Process is Failing to Achieve its Environmental Objectives*, 21 ENVTL. & PLAN. L.J. 288, 309 (2004) (arguing that the EPBC Act fails to promote the ecologically sustainable use of natural resources because the EPBC Act is "based on the nature and extent of the potential impact of the relevant action, rather than the nature of the action").

ENDNOTES: CHINA'S RENEWABLE ENERGY LAW *continued from page 45*

⁶ The Energy Foundation, *id.*

⁷ Hu Cong, *Legislature Passes Renewable Energy Bill*, DAILY CHINA NEWS (Mar. 2005), available at http://www.chinadaily.com.cn/english/doc/2005-03/01/content_420450.htm (last visited Jan. 11, 2008).

⁸ Jianxiang Yang, Worldwatch Institute, *China Speeds Up Renewable Energy Development* (Oct. 26, 2006), available at <http://www.worldwatch.org/node/4691> (last visited Jan. 11, 2008).

⁹ Keith Bradsher, *China's Green Energy Gap*, INT'L HERALD TRIB., Oct. 24, 2007, available at <http://www.iht.com/articles/2007/10/24/business/24power.php?page=1> (last visited Feb. 8, 2008).

¹⁰ Renewable Energy Law (promulgated by the Standing Comm. Nat'l People's Cong., Feb. 28, 2005, effective Jan. 1, 2006), art. 19 (P.R.C.).

¹¹ Bradsher, *supra* note 9.

¹² Zhengming et al., *supra* note 1.

¹³ Bradsher, *supra* note 9.

¹⁴ Renewable Energy Law (promulgated by the State Great Hural of Mongolia, Jan. 11, 2007), art. 11 (Mogn.).

¹⁵ Bradsher, *supra* note 9.

¹⁶ Press Release, Global Wind Energy Council, *Global Wind Energy Markets Continue to Boom – 2006 Another Record Year*, (Feb. 2, 2007), available at http://www.awea.org/newsroom/pdf/070202__GWEC_Global_Market_Annual_Statistics.pdf (last visited Feb. 15, 2008).

¹⁷ Lin et al., *supra* note 4, at 3.

ENDNOTES: LANDMARK AGREEMENT TO STRENGTHEN MONTREAL PROTOCOL *continued from page 50*

⁸ DAVID HUNTER, JAMES SALZMAN & DURWOOD ZAELEKE, INTERNATIONAL ENVIRONMENTAL LAW & POLICY (3d ed., Foundation Press 2007).

⁹ Conversation with Dr. Tolba (notes on file with authors).

¹⁰ See UN ENV'T PROGRAMME, THE MONTREAL PROTOCOL CONTROL SCHEDULE AND ITS EVOLUTION (Oct. 2002), available at http://www.moef.gov.bd/html/env_bangladesh/data/schedule.pdf (last visited Mar. 7, 2008) (discussing the substances controlled under the Montreal Protocol and the date and matting when each Amendment and/or Adjustment was agreed upon).

¹¹ The London Amendment (1990), the Copenhagen Amendment (1992), the Montreal Amendment (1997), and the Beijing Amendment (1999).

¹² See 42 U.S.C. § 7671(9) (2008).

¹³ UN Env't Programme, *1998 Assessment Report of the Technology and Economic Assessment Panel* (Oct. 1998), available at http://ozone.unep.org/teap/Reports/TEAP_Reports/index.shtml (last visited Mar. 5, 2008) ("HCFC global consumption is expected to decrease from 412 to 163 ktonnes between the years 1998 and 2015, respectively."). See also UN Env't Programme & Tech. Econ. Assessment Panel, *Response to Decision XVIII/12: Report of the Task Force on HCFC Issues and Emissions Reduction Benefits Arising from Earlier HCFC Phase-out and other Practical Measures*, at 25 (Aug. 2007), available at http://ozone.unep.org/Assessment_Panels/TEAP/Reports/TEAP_Reports/

TEAP-TaskForce-HCFC-Aug2007.pdf (last visited Mar. 6, 2008) [hereinafter TEAP Accelerated HCFC Phase-Out Task Force Report]; UN Env't Programme, Intergovernmental Panel Climate Change & Tech. Econ Assessment Panel, *Special Report: Safeguarding the Ozone Layer and the Global Climate System: Issues Related to Hydrofluorocarbons and Perfluorocarbons*, Technical Summary, at 81 (2005) ("In developing countries, the production of HCFC-22 for both feedstock and nonfeedstock uses has grown rapidly in recent years; over the period 1997–2001, production for commercial (or nonfeedstock) uses grew linearly at 20 ktonnes yr⁻¹ and feedstock use grew at 4.1 ktonnes yr⁻¹. Projected at these rates until 2015, the total global requirement for HCFC-22 would become about 730 ktonnes yr⁻¹—about 40% of which would be for feedstock—compared with a total of 470 ktonnes yr⁻¹ in the year 2000.").

¹⁴ World Meteorological Organization & UN Env't Programme, Science Assessment Panel of the Montreal Protocol on Substances that Deplete the Ozone Layer, *Scientific Assessment of Ozone Depletion: 2006, Executive Summary*, at 21 (Aug. 2006), available at <http://www.esrl.noaa.gov/csd/assessments/2006/executivesummary.html> (last visited Mar. 5, 2008) ("The date when equivalent effective stratospheric chlorine at midlatitudes returns to pre-1980 levels is no calculated to be 2049, for the case of global compliance with the Montreal Protocol with no significant exceptions. This date is about 5 years later than projected in the previous (2002) assessment. This projected

later date primarily results from (i) an increase in CFC-11 and CFC-12 emissions due to the larger recent estimates of amounts currently contained in equipment and products (banks) and (ii) an increase in HCFC-22 emissions due to larger estimated future production. . . . The return to pre-1980 conditions of equivalent effective stratospheric chlorine for the Antarctic vortex is projected to occur around 2065, more than 15 years later than the return of midlatitude equivalent effective stratospheric chlorine to pre-1980 levels. This projected later recovery is because, unlike previous Assessments, we now recognize that the age of air is greater in the Antarctic lower stratosphere, which affects the amount of ozone-depleting gases available for ozone depletion. . . .”).

¹⁵ ENV’T INVESTIGATION AGENCY, TURNING UP THE HEAT: LINKAGES BETWEEN OZONE LAYER DEPLETION AND CLIMATE CHANGE: THE URGENT CASE OF HCFCs AND HFCs (Aug. 2006), available at www.eia-international.org/files/news324-1.pdf (last visited Mar. 7, 2008) [hereinafter TURNING UP THE HEAT].

¹⁶ UN Env’t Programme, *Supplement to the IPCC/TEAP Report* at 17, (Nov. 2005), available at www.ozone.unep.org/teap/Reports/TEAP_Reports/teap-supplement-ippc-teap-report-nov2005.pdf (last visited Mar. 7, 2008) (“Although mitigation of HFC-23 release is technically possible and economically attractive under the UNFCCC Clean Development Mechanism (CDM), the availability of funds through the sale of CDM credits obtained from the reduction of HFC-23 emissions could provide a perverse incentive for the continuation or expansion of HCFC-22 production in Article 5(1) countries in order to generate such credits.”) [hereinafter IPCC/TEAP Supplement]. See also TURNING UP THE HEAT *supra* note 15 (“The cost of destroying the HFC-23, however, is very low (around \$0.20 per mt), allowing for extremely high profits.”).

¹⁷ IPCC/TEAP Supplement, *supra* note 16, at 17; see TURNING UP THE HEAT, *supra* note 15.

¹⁸ See UN Env’t Programme, Intergovernmental Panel on Climate Change & Technology and Economic Assessment Panel, *Special Report: Safeguarding the Ozone Layer and the Global Climate System: Issues Related to Hydrofluorocarbons and Perfluorocarbons, Summary for Policymakers*, at 8 (2005).

¹⁹ TEAP Accelerated HCFC Phase-Out Task Force Report, *supra* note 13, at 6 (“Monies flowing from the sale of Certified Emission Reductions (CERs) could be up to 10 times higher than the costs of mitigation and, under expected future carbon prices, will exceed the sales revenue for the HCFC-22 itself.”); Michael Wara, *Is the Global Carbon Market Working?* 445 NATURE 595, 595-96 (2007) (“HFC-23 emitters can earn almost twice as much from CDM credits as they can from selling refrigerant gases—by any measure a major distortion of the market. The distortion exists because it is extremely cheap to cut HFC-23 emissions from these facilities.”); IPCC/TEAP Supplement, *supra* note 16, at 7 (“Although mitigation of HFC-23 release is technically possible and economically attractive under the UNFCCC Clean Development Mechanism (CDM), the availability of funds through the sale of CDM credits obtained from the reduction of HFC-23 emissions could provide a perverse incentive for the continuation or expansion of HCFC-22 production in Article 5(1) countries in order to generate such credits.”). See *Turning Up the Heat*, *supra* note 15, at 9 (“The cost of destroying the HFC-23, however, is very low (around \$0.20 per mt), allowing for extremely high profits.”); WORLD BANK, STATES AND TRENDS OF THE GLOBAL CARBON MARKET 2006, UPDATE: JANUARY 1 – SEPTEMBER 30, 2006, 11 (2006), available at www.carbonfinance.org/docs/StateandTrendsMarketUpdateJan1_Sep30_2006.pdf (last visited Mar. 6, 2008) (“HFC-23 destruction projects continued to dominate with 52% of all project-based volumes transacted in 2006 (down from 64% in 2005, see Figure 6). The authors are aware of additional large transactions at advanced stages, so the remainder of the year should see the HFC-23 share remaining the same or even rise. Many buyers are keenly aware of the stiff competition for and the finite availability of this asset class beyond this year. . . .”). The HFC-23 projects also are squeezing out projects from developing countries involving renewable energy and energy efficiency and driving down the price of carbon credits in the European Union’s Emissions Trading System, further reducing investment in needed energy reform. Finally, they may be canceling the benefit for the climate, by driving increased production of HCFC-22.

²⁰ TEAP Accelerated HCFC Phase-Out Task Force Report, *supra* note 13, at 6 (“In extreme cases, it might even be possible that low HCFC-22 prices encourage the re-introduction of the chemical into foam applications in which it has already been replaced or as an aerosol propellant, where it has not been used widely before, or into other applications where environmentally superior technology is widely available.”).

²¹ Developed countries were not experiencing increased use of HCFCs and for the most part had already made the transition to non-ozone-depleting

substitutes, such as HFCs. The European Union completed its phase-out of virtually all HCFCs by 2004.

²² *Stockholm Group 3rd Meeting Report* at 4-5 (Feb. 2007), (“An accelerated phase-out of HCFCs is both possible and necessary, in light of the availability of alternatives, concerns over compliance, and the costs of late transitioning out of HCFCs. . . . Given the concerns over projected HCFC production and consumption levels by 2015 as well as compliance with the 2016 freeze date by developing countries, an earlier freeze date should be considered to avoid increased production of HCFCs.”) [hereinafter *Third Stockholm Group Meeting*].

²³ The PNAS paper was spearheaded by the Co-Chair of TEAP and scientists from the Scientific Assessment Panel who realized that the co-benefits of ozone and climate protection were underappreciated by policymakers because the data had never been presented in ways that conveyed the extraordinary magnitude of the opportunity.

²⁴ Guus J. M. Velders et al., *The Importance of the Montreal Protocol in Protecting Climate*, 104 PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES 4814, 4815 (2007) (The 135 GtCO₂-eq. between 1990 and 2010 is an aggregated total, including direct and indirect effects), available at <http://www.pnas.org/cgi/reprint/104/12/4814> (last visited Mar. 6, 2008); Correspondence with Dr. Guus Velders, on file with authors. The per year reduction is 11 GtCO₂-eq. yr⁻¹ between 1990 and 2010. See also *Hearing on “Achievements and Opportunities for Climate Protection under the Montreal Protocol,”* Hearing Before the U.S. House Committee on Oversight and Government Reform, 2 (2007) (statement of Dr. Guus Velders, on the Dual Benefits of the Montreal Protocol: Protecting Ozone Layer and Climate).

²⁵ Velders et al., *supra* note 24, at 4817.

²⁶ Proposals were submitted by Argentina, Brazil, Iceland, Mauritania, Mauritius, the Federated States of Micronesia, Norway, Switzerland, and the United States. Argentina and Brazil submitted a joint proposal, as did Iceland, Norway, and Switzerland. See Keith Bradsher, *Coalition Urges Limits on Perilous Refrigerant*, INT’L. HERALD TRIB., Mar. 14, 2007, available at <http://www.iht.com/articles/2007/03/14/business/warming.php> (last visited Mar. 6, 2008).

²⁷ UN Env’t Programme, *Report of the Twenty-Seventh Meeting of the Open-ended Working Group of the Parties to the Montreal Protocol*, UNEP/OzL.Pro.WG.1/27/9 at 25 (June 2007), available at http://ozone.unep.org/meeting_Documents/oewg/27oewg/OEWG-27-9E.pdf (last visited Mar. 6, 2008). See also, *Third Stockholm Group Meeting*, *supra* note 22, at 4 (“An accelerated phase-out of HCFCs is both possible and necessary, in light of the availability of alternatives, concerns over compliance, and the costs of late transitioning out of HCFCs.”).

²⁸ G8 Summit in Heiligendamm, Germany, *Growth and Responsibility in the World Economy, Summit Declaration*, para. 59, (June 2007), (“We will also endeavour under the Montreal Protocol to ensure the recovery of the ozone layer by accelerating the phase-out of HCFCs in a way that supports energy efficiency and climate change objectives. In working together toward our shared goal of speeding ozone recovery, we recognize that the Clean Development Mechanism impacts emissions of ozone-depleting substances.”) available at <http://www.state.gov/documents/organization/92264.pdf> [hereinafter *G8 Summit Declaration*]. See also U.S.-Japan Joint Statement on Energy Security, Clean Development, and Climate Change, (Apr. 2007) (“We will also endeavor under the Montreal Protocol to ensure the recovery of the ozone layer to pre-1980 levels by accelerating the phase-out of HCFCs in a way that supports energy efficiency and climate change objectives.”); U.S.-EU Summit Statement on Energy Security, Efficiency, and Climate Change, Apr. 2007 (“We also commit under the Montreal Protocol to seek to speed up the recovery of the ozone layer by accelerating the phase-out of HCFCs. We will weigh the impact of our proposals on climate change and energy efficiency. In working together toward our shared goal of speeding ozone recovery, we recognize that the Clean Development Mechanism impacts emissions of ozone-depleting substances.”).

²⁹ Mario Molina, *The Ozone Treaty Can Do Much More for the Planet*, FINANCIAL TIMES, Aug. 24 2007, available at <http://www.ft.com/cms/s/0/ad5a4ba2-51da-11dc-8779-0000779fd2ac.html> (last visited Mar. 6, 2008).

³⁰ UN Env’t Programme, *Open-ended Working Group of the Parties to the Montreal Protocol, Synthesis Report*, UNEP/Oz.Pro.WG.1/27/3 at 6, (Feb. 22, 2007), available at http://ozone.unep.org/Meeting_Documents/oewg/27oewg/OEWG-27-2E.pdf (last visited Mar. 6, 2008). (“Technically and economically

feasible substitutes are available for almost all applications of HCFCs, although transitional costs remain a barrier for smaller enterprises, particularly in developing countries.”). See also *Third Stockholm Group Meeting*, *supra* note 22, at 5 (“Alternatives exist for HCFCs in all applications. To capture climate benefits in transitioning out of HCFCs, alternatives should be evaluated in terms of their cumulative environmental impacts, such as under Life Cycle Analysis and Life Cycle Climate Performance, which would consider both direct impacts based on a substance’s GWP and indirect impacts such as by-product emissions and GHG emissions from energy consumption.”). See also ANDERSEN & SARMA, *supra* note 5 at 201-02.

³¹ See Press Release, U.S. Dep’t of State, Accelerated Phase-Out of Ozone Depleting HCFCs (revised Oct. 16, 2007), available at <http://www.state.gov/t/pa/prs/ps/2007/sep/92598.htm> (last visited Mar. 10, 2008).

³² See Overall HCFC Agreement, *supra* note 3.

³³ Decision XIX/6: Adjustments to the Montreal Protocol with regard to Annex C, Group I, substances (hydrochlorofluorocarbons), available at <http://www.epa.gov/ozone/downloads/HCFCDecision.pdf> (last visited Mar. 5, 2008).

³⁴ Philippe Sauvagnargues, ‘Historic’ deal reached on cutting ozone threats, AGENCE-FRANCE PRESSE, Sept. 22, 2007.

³⁵ INSTITUTE FOR GOVERNANCE & SUSTAINABLE DEVELOPMENT, STRENGTHENED OZONE TREATY PROVIDES POWERFUL CLIMATE MITIGATION, Sept. 23, 2007, available at <http://www.igsd.org/PressRelease23Sept.pdf> (last visited Mar. 5, 2008).

³⁶ UN Env’t Programme, *Report of the Ozone Secretariat Workshop on the IPCC/TEAP Special Report*, UNEP/OzL.Pro/Workshop.2/2 (July 2006), available at <http://ozone.unep.org/teap/Reports/TEAPReports/Workshop2-2E.pdf> (last visited Mar. 10, 2008). See also K. Madhava Sarma, *Strengthening the Montreal Protocol: The Step-by-Step Approach for the Montreal Protocol*, Chapter 14 (2006).

³⁷ TEAP Accelerated HCFC Phase-Out Task Force Report, *supra* note 13, at 10 (“The most advanced accelerated HCFC phase-out schedule combined with all other practical measures provides cumulative ozone-related savings of nearly 1.25 million ODP tonnes (see Figure ES-8) and in excess of 30 billion tonnes CO₂-eq of potential climate protection (see Figure ES-9).”).

³⁸ IPCC/TEAP Supplement, *supra* note 15, at Annex.

³⁹ Emissions from banks of HFC substitutes used in refrigeration and air conditioning equipment also will be emitted, as HFCs have been among the leading substitutes for CFCs.

⁴⁰ Velders, *et al.*, *supra* note 24, at 4818 (“... parties to the Montreal Protocol have considered options to further mitigate ozone depletion while incidentally reducing climate forcing. Some important examples are the following: (i) further acceleration of the HCFC phase-out (8, 41) and use of low-GWP substitutes; (ii) collection and destruction of ODSs contained in ‘banks’ of old refrigeration, air conditioning equipment, and thermal insulating foam products (8, 42, 43); and ...”).

⁴¹ See About Us, Refrigerant Reclaim Australia website, <http://www.refrigerantreclaim.com.au> (last visited Mar. 5, 2008) (“Refrigerant Reclaim Australia (RRA) is the product stewardship organisation for the Australian refrigeration and air conditioning industry. RRA is a not-for-profit organisation created to work nationally with industry to share the responsibility for, and costs of, recovering, reclaiming and destroying surplus and unwanted refriger-

ants. RRA’s aim is to improve the industry’s environmental performance by reducing the level of emissions of refrigerants through its take-back program. Since established in 1993, RRA has become part of the industry fabric. Created by industry, for industry, RRA is a best-practice, producer responsibility organisation. RRA: adopts a co-regulatory approach, which produces positive environmental outcomes; operates efficiently through one coordinated scheme, saving industry members time, money and effort; and provides rebates for contractors who recover and return refrigerant (around \$1.3 million in 2005/2006).”). See also The Global Climate and Ozone Layer Protection Act of 2007, H.R. 3448, 110th Cong. (2007) (introduced by Congressman Henry A. Waxman and providing for a similar program to promote greater recovery and recycle/destruction of used refrigerants). The bill also recognizes the climate benefits of the Montreal Protocol to date and includes a sense of Congress resolution directing the U.S. to negotiate with other Parties to maximize the climate benefits of the accelerated HCFC phase-out, “by focusing on the climate impacts of ozone depleting substances and their substitutes, and on the energy efficiency of equipment in which such substances and their substitutes are used”; America’s Climate Security Act of 2007, S.2191, 110 Cong. (2007). Introduced by Senators Lieberman and Warner and reported out of the Senate’s Environment and Public Works Committee in December 2007 also provides for some ODS recovery.

⁴² See Ozone Depleting Substance Destruction Emissions Offsets, Chicago Climate Exchange, available at http://chicagoclimateexchange.com/docs/offsets/CCX_Ozone_Depleting_Substance_Destruction_Offsets.pdf (last visited Mar. 18, 2008).

⁴³ For example, the use of HCFC-123 in chillers achieves superior energy efficiency than alternatives. But because it is an ozone-depleting substance, it is scheduled for phase-out with the rest of the HCFCs. Continued use of HCFC-123 in chillers would benefit the climate by reducing the energy consumption from chillers. See STEPHEN ANDERSEN & DURWOOD ZAELEKE, *INDUSTRY GENIUS: INVENTIONS AND PEOPLE PROTECTING THE CLIMATE AND THE FRAGILE OZONE LAYER* (Greenleaf 2003).

⁴⁴ Stephen Johnson, Administrator, U.S. Evtl. Protection Agency, Remarks to the 19th Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer, Montreal, Canada (Sept. 17, 2007), available at <http://yosemite.epa.gov/opa/admpress.nsf/Speeches%20-%20By%20Date?OpenView> (last visited Mar. 10, 2008).

⁴⁵ Donald Kaniaru, Rajendra Shende, Scott Stone & Durwood Zaelke, *Strengthening the Montreal Protocol: Insurance Against Abrupt Climate Change*, SUSTAINABLE DEV. L. & POL’Y, Winter 2007, at 3.

⁴⁶ The GREEN MAC LCCP model was developed by General Motors, the Japanese Automobile Manufacturers Association, the Society of Automotive Engineers, and the U.S. Environmental Protection Agency to calculate the lifecycle climate performance of mobile air conditioners with different refrigerants. See U.S. EPA, Climate Protection Partnership website, <http://www.epa.gov/cpd/mac/compare.htm> (last visited Mar. 18, 2008).

⁴⁷ INSTITUTE FOR GOVERNANCE & SUSTAINABLE DEVELOPMENT, MONTREAL PROTOCOL’S KEY LESSONS FOR CLIMATE NEGOTIATIONS (Dec. 4, 2007), available at <http://www.igsd.org/Lessons-of-the-Montreal-Protocol-for-Climate.pdf> (last visited Mar. 18, 2008).

ENDNOTES: DOMESTIC OCEAN AND COASTAL RESOURCE LAW AND POLICY *continued from page 65*

⁴⁴ 16 U.S.C. § 1456(c)(3)(A) (2000).

⁴⁵ 16 U.S.C. § 1455b(1) (2000).

⁴⁶ NOAA itself manages highly migratory species such as tunas, sharks, swordfish, and billfish in consultation and coordination with the U.S. Department of State.

⁴⁷ 16 U.S.C. § 1802(10) (2000).

⁴⁸ 16 U.S.C. § 1855(b)(2) (2000).

⁴⁹ 16 U.S.C. § 600.815(a)(4) (2000).

⁵⁰ See 16 U.S.C. § 600.815(a)(8) (2000).

⁵¹ 16 U.S.C. § 600.920 (2000).

⁵² See Heather Ludemann, *Essential Fish Habitat: What do Council Members Need to Know?* (Oct. 23, 2007), available at http://www.nmfs.noaa.gov/sfa/reg_svcs/Council%20stuff/council%20orientation/2007/2007TrainingCD/TabT-EFH/TABT_EFH_Oct07_ppt.pdf (last visited Feb. 28, 2008).

⁵³ See 16 U.S.C. §§ 791-828c (2000).

⁵⁴ 16 U.S.C. § 811 (2000).

⁵⁵ See 16 U.S.C. §§ 4701-4751 (2000).

¹ INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE 2007, SUMMARY FOR POLICYMAKERS CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS 2-12 (Susan Solomon et al. eds. 2007), available at <http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf> (last visited Jan. 14, 2008).

² OXFAM, ADAPTING TO CLIMATE CHANGE 2 (May 2007), available at http://www.oxfam.org/en/files/bp104_climate_change_0705.pdf (last visited Jan. 14, 2008).

³ INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE 2007, SUMMARY FOR POLICYMAKERS CLIMATE CHANGE 2007: IMPACTS, ADAPTATION AND VULNERABILITY 11 (Martin L. Parry et al. eds. 2007), available at <http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-spm.pdf> (last visited Jan. 14, 2008).

⁴ INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE 2007, *id.*

⁵ INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE 2007, *id.*

⁶ Sarah DeWeerd, *Climate Change, Coming Home: Global Warming's Effects on Populations*, WORLD WATCH, May 1, 2007, at 8-9.

⁷ DeWeerd, *id.* at 8.

⁸ George Monbiot, *Costing Climate Change*, NEW INTERNATIONALIST MAG., Dec. 1, 2006, at 30-31.

⁹ OXFAM, *supra* note 2.

¹⁰ INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE 2001, ADAPTATION TO CLIMATE CHANGE IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT AND EQUITY 879 (Anand Patwardhan & Jean-Francois Soussana eds., 2001), available at http://www.grida.no/climate/ipcc_tar/wg2/pdf/wg2TARchap18.pdf (last visited Jan. 14, 2008).

¹¹ Ian Burton, Elliot Diringer & Joel Smith, ADAPTATION TO CLIMATE CHANGE: INTERNATIONAL POLICY OPTIONS 10 (Pew Center on Global Climate Change 2006), available at http://www.pewclimate.org/docUploads/PEW_Adaptation.pdf (last visited Jan. 14, 2008).

¹² Burton, *id.* at 9.

¹³ Burton, *id.* at 10.

¹⁴ Burton, *id.* at 10-11.

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