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SUSTAINABLE DEVELOPMENT LAW & POLICY



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

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<http://www.wcl.american.edu/org/sustainabledevelopment>

EDITORS' NOTE

Modern elections have found a new issue upon which to engage voters. Over the past few years, electorates around the globe are voting in response to environmental issues in general and climate change in particular. The impact of these elections will have profound effects far into the future, they will decide when and how we decide to cap carbon emissions, how we will supply our future energy needs—wind, hydro, nuclear—if we should pursue environmental restoration projects, or provide greater protections for our coastal areas and marine resources.

With an eye to the future, *Sustainable Development Law & Policy* decided to focus on the direction domestic environmental policy is taking and should take. We asked all presidential candidates for a brief statement stating their priorities and hopes for the nation's environmental policy if they were elected president. In this issue you will find Senator Edwards' and Governor Romney's responses, the only two candidates to reply to our request. In addition, we have placed the link to each presidential candidate's website that states their environmental and/or energy policy.

Australians recently voted for a new Prime Minister in an election coined the "Climate Change Election." Perhaps the changing climate will similarly motivate Americans in 2008. With less than a year until the United States decides who its next president will be, the American electorate will soon show how committed it is to supporting the environment and combating climate change. We hope this issue of *Sustainable Development Law & Policy* serves as a useful tool for those in the legal community, policy makers, and the public in general when making their decisions for the future of this country and the world.



Marcel De Armas
EDITOR-IN-CHIEF



Maria Vanko
EDITOR-IN-CHIEF

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AN OVERVIEW OF THIS ISSUE:

SUSTAINABLE DIRECTIONS FOR DOMESTIC ENVIRONMENTAL LAW

by Senator Barbara Boxer*

Over the past six years the Environmental Protection Agency, under the guise of the Bush Administration, has rolled back countless environmental regulations that protect the air we breathe, the water we drink, and ensure the very health of our communities. Meanwhile, the rest of the world is moving ahead to address the greatest challenge of our generation—global warming.

Historically, our nation has swiftly responded to scientific consensus to solve major environmental problems. When scientists told us that the reason the Cuyahoga River caught fire in Ohio in 1969 was because toxic pollution was accumulating there, we didn't walk away from the challenge or await further study: we passed the Clean Water Act. When scientists told us why the air had become so polluted we could see it and were choking on it, we didn't walk away from the challenge: we passed the Clean Air Act in 1970. When scientists told us that contaminated tap water was causing widespread waterborne disease and exposing people to cancer, we didn't walk away from the challenge: we passed the Safe Drinking Water Act in 1974. In none of these instances did the federal government ignore the challenge and in every one of these cases we are a better nation for it.

At the moment, there are numerous environmental challenges facing our nation and the entire world; yet none greater than global warming. It is a challenge we should meet with hope and not fear. It is a challenge that will make us stronger as a nation if we meet it head-on. In order to meet the challenge of global warming, we need to cap and eventually reduce our greenhouse gas emissions by at least 80 percent below 1990 levels by 2050. This will require action by all sectors of our economy.

We must become far more energy efficient and cleaner. It is the federal government's role to create incentives for new and green technologies. Electricity providers must look to renewable energy sources like wind and solar power, or capture and sequester their global warming emissions. Our national automobile fleet must become dramatically more efficient. Our industries and buildings must become state-of-the-art energy savers through retrofitting existing stock and incorporating green design in new construction.

America must lead the world in clean technology development and renewable energy. It is essential for our economy's ability to grow and remain internationally competitive. Other countries should become dependent on our clean technologies. It will be these technologies that will free us from our dependencies on foreign energy sources and will enable other economies to achieve development in a carbon-constrained world.

It is also the federal government's role to lead the international community. We will soon become the only industrialized country not to ratify the Kyoto Protocol. If we become reengaged with the international community and take the lead on climate change, other nations like India and China will follow. Combating climate change will also help avoid other environmental disasters like species extinction and prevent global political instability from floods, diseases, mass migration, and conflicts over water, food, and other natural resources. By facing this challenge now, we can maximize our chances of avoiding the most dangerous effects of climate change and capitalize on the tremendous opportunities that lie ahead.

Our country's response to global warming is not only a measurement of international leadership, but also a reflection of our national character. From the National Environmental Policy Act to the very idea of a "cap-and-trade" this country has been a pioneer in environmental policy. The time has come for the United States to reclaim its position as the preeminent world leader in environmental policy—and not just global warming.

Overview: *continued on page 3*

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Overview: *continued from page 2*

This issue of *Sustainable Development Law & Policy* examines critical domestic issues requiring the attention of environmental policymakers and this Congress. The issue examines the impact a harmonized federal renewable portfolio standard would have on the electricity sector. The issue also looks to the role a renewable portfolio standard should play within the context of a carbon dioxide cap-and-trade regime. This issue also explores the need to move the domestic and international climate discussion toward adaptation policies. Articles also look to

global environmental legal developments to highlight the United States' need to update our chemical management and oceans governance structures. The federal Coastal Zone Management Act is also explored within the context of California's offshore oil drilling battle with the federal government. The need to adequately fulfill the National Environmental Policy Act requirements to examine the impact of increases in oil and gas drilling, or tar sands and oil shale development and other interesting topics are also explored in this issue.



GOVERNOR ROMNEY'S POLICY STATEMENT

by Governor Mitt Romney

While I believe that any effective CO₂ emission reduction program should be global, I believe in a “no regrets” approach to improve our energy efficiency, reduce our CO₂ emissions, and end our dependency on foreign oil. America needs an energy plan that includes reducing our consumption of oil; increasing our use of alternative sources of energy like nuclear, ethanol, and biodiesel; and investing in the necessary research and development programs for alternative energy, energy efficiency, and low-carbon technologies. These actions will enable us to heat our homes, drive our vehicles, and run our businesses with a much smaller environmental footprint than ever before.

I believe we must become energy independent. As I always do when I look for solutions to America's problems, I look to

America's greatest source of strength—the American people. We need to be fostering American ingenuity and innovation to develop new technologies. The government can play an important role. It is imperative that we increase our energy research funding. We need to initiate our generation's equivalent of the Manhattan Project to develop these new technologies. We must create new economic sources of energy—clean energy, as well as new energy-efficient technologies. We should be licensing these technologies to other countries as well as employing them here at home. The government should be working with industry to accelerate the rate at which these technologies enter the market. These actions will enable us to heat our homes, drive our vehicles, and run our businesses with a much smaller environmental footprint than ever before.



REPUBLICAN CANDIDATES' ENERGY AND ENVIRONMENT STATEMENTS

Rudy Giuliani:

No issue statement found on campaign website.

Mike Huckabee:

Energy: http://www.mikehuckabee.com/index.cfm?FuseAction=Issues.View&Issue_id=21

Duncan Hunter:

No issue statement found on campaign website.

John McCain:

Environment: <http://www.johnmccain.com/Informing/Issues/65bd0fbe-737b-4851-a7e7-d9a37cb278db.htm>

Mitt Romney:

Energy: <http://www.mittromney.com/Issue-Watch/Energy>

See also Governor Romney's statement above.

Ron Paul:

Environment: <http://www.ronpaul2008.com/issues/environment/>

Fred Thompson:

Energy: <http://www.fred08.com/Principles/PrinciplesSummary.aspx?View=OnTheIssues>

ACHIEVING ENERGY INDEPENDENCE & STOPPING GLOBAL WARMING THROUGH A NEW ENERGY ECONOMY

by Senator John Edwards

Global warming is a crisis. We now know that global warming is happening and that human activity is to blame. If we don't change course, within decades we could be living on a fundamentally different planet—one with tens of millions of people facing starvation or forced to become refugees.

For too long, many in Washington have turned a blind eye to problems when the solutions were right in front of us. In part, that's because powerful special interests want to keep things the way they are. Oil companies running gas stations don't want to carry alternative fuels. Utilities making money by selling more power don't want to use it more efficiently. Automakers squeezing profits out of high-polluting SUVs don't see the need to develop the cars of the future.

But this crisis is also an opportunity. With strong leadership, we can emerge from the crisis of global warming with a new energy economy that embraces innovation and creates more than 1 million jobs.

To achieve energy independence and halt global warming, I will cap the emission of carbon dioxide and other greenhouse gases starting in 2010 to reduce emissions by 20 percent by 2020 and by 80 percent by 2050. Because all nations must join the effort, I will share clean energy technology with cooperating nations and, if necessary, require climate-change commitments in our trade deals.

To cut oil imports by 7.5 million barrels a day by 2025, I will promote improvements in fuel economy, ethanol use, and hybrid cars. I will raise fuel economy standards to 40 miles per gallon by 2016 and will invest \$1 billion a year in helping U.S. automakers advance and apply the latest technology.

Renewable energy sources like wind, solar power, biomass and ethanol are cleaner and can be cheaper than traditional sources of energy. I will require their use to generate 25 percent of the nation's electricity by 2025 and invest more resources in researching and encouraging these clean forms of energy.

I will also open the electricity grid to competition. Thousands of smaller producers of electricity could spark innovation and generate cleaner, cheaper, more reliable power. I will support local renewable power and require utilities to buy it from homes and entrepreneurs.

Energy technology can create a nationwide economic boom, including clean tech investments from Silicon Valley, jobs in renewable energy in rural America, a revitalized manufacturing base and "green-collar" jobs. I will create a \$13 billion a year New Energy Economy Fund to invest in renewable energy and energy-efficient technology. The Fund will be financed by a cap-and-trade system that uses market forces to reduce pollution in a cost-effective and flexible manner.

None of this will happen unless we demand it. The oil companies won't do it. The utilities won't do it. The mining companies won't do it.

Our generation must do it—we can't wait for someone else to take responsibility. Our generation must be the one that says, "We must halt global warming." Our generation must be the one that says "yes" to alternative, renewable fuels and ends our dependence on foreign oil. If we don't act now, it will be too late. It won't be easy, but it is time for Americans to be patriotic about something other than war.



DEMOCRATIC CANDIDATES' ENVIRONMENT, CLIMATE, AND ENERGY STATEMENTS

Joe Biden:

Energy: <http://biden.senate.gov/documents/BidenRecordEnergy.pdf>

Climate: <http://www.joebiden.com/issues?id=0011>

Hillary Clinton:

Energy: <http://www.hillaryclinton.com/issues/energy/>

Christopher Dodd:

Energy: http://chrisdodd.com/issues/energy_independence/

John Edwards:

Environment: <http://johnedwards.com/issues/energy/>
See also Senator Edwards' statement above.

Mike Gravel:

Climate: <http://www.gravel2008.us/issues.php>

Dennis Kucinich:

Environment: <http://www.dennis4president.com/go/issues/a-sustainable-future/>

Barack Obama:

Energy: <http://www.barackobama.com/issues/energy/>

Environment: <http://www.barackobama.com/issues/environment/>

Bill Richardson:

Energy: <http://www.richardsonforpresident.com/issues/energy/>

Environment: <http://www.richardsonforpresident.com/issues/environment/>

STATE EFFORTS TO PROMOTE RENEWABLE ENERGY: TRIPPING THE HORSE WITH THE CART?

by Benjamin K. Sovacool & Christopher Cooper*

INTRODUCTION

Conventional electricity generation is by far the largest source of air pollutants that harm human health and contribute to global warming. For instance, emissions from just nine conventional power plants in Illinois directly contributed to 300 premature deaths, 14,000 asthma attacks, and more than 400 thousand daily incidents of upper respiratory symptoms per year among the 33 million people living within 250 miles of the plants.¹ Moreover, fossil-fueled power plants in the United States emitted 2.25 billion metric tons of carbon dioxide (“CO₂”) in 2003, more than ten times the amount of CO₂ compared to the next-largest emitter, iron and steel production.² Of all American industries, electricity generation is—by substantial margins—the single largest contributor of the pollutants responsible for global warming.

For these and other sobering reasons, many state governments promote renewable energy technologies through policies such as renewable portfolio standards (“RPS”) and fees such as a systems benefit charges (“SBCs”). By these mechanisms, state regulators intend to correct three major failures of the existing “free” market for electricity fuels. First, electricity prices do not reflect the social costs of generating power. Hidden costs, or negative externalities such as the need to secure foreign imports of fuel, environmental damage from resource extraction, air and water emissions, medical expenses associated with air pollution, and the risk of climate change, are not typically reflected in the rates Americans pay for electricity.

Second, energy subsidies create an unfair market advantage for conventional energy technologies. A majority of the federal budget for energy research and development over the past fifty years has gone to conventional fossil fuel and nuclear industries and not toward renewable energy technologies. From 1948 to 1998, for instance, roughly eighty percent of U.S. Department of Energy appropriations for research and development (“R&D”) have gone to nuclear and fossil fuel technologies.³ Even though coal, natural gas, and nuclear energy industries are relatively mature sectors, federal R&D expenditures continue to favor these industries. In fiscal year (“FY”) 2006, for example, the federal government allotted \$580 million in R&D funds to fossil fuels and \$221 million to the nuclear industry. The wind indus-

try, in contrast, received only \$38.3 million.⁴

Third, renewable energy generation is subject to a free rider problem. Since everyone benefits from the environmental advantages of renewable energy, private companies that invest millions of dollars in researching and developing clean energy technologies are often unable to recover the full profit of their investments. Inevitably, the market allows some consumers to be free riders, benefiting from the investments of others without paying for them.

STATE GOVERNMENT MECHANISMS FOR PROMOTING RENEWABLE ENERGY

State policy interventions intend to stimulate a market for renewable resources and spur additional research, development, and implementation of renewable energy technologies. So far, state governments in the United States have relied predominately on RPSs and SBCs to level the playing field by neutralizing a legacy of unequal federal subsidies and directly requiring

renewable energy. While state policies are innovative and well intentioned, the time has come to shift to federal regulation and intervention. Continued reliance on state-based activity alone will ironically promote more market externalities and “free riding” than harmonized federal action.

SYSTEM BENEFIT CHARGES

Systems benefit charges (also called public benefit funds, system benefit funds, and clean energy funds) originated in the 1990s at a time when state policy makers were considering electric utility restructuring legislation. Afraid that gains made in pursuing research, development, and implementation of environmentally-preferable renewable energy technologies would end after markets were deregulated, advocates of the novel

Energy subsidies create an unfair market advantage for conventional energy technologies.

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technologies won concessions in some states for a new funding mechanism for high-risk or long-term projects. A SBC places a small tax on every kilowatt hour (“kWh”) of electricity generated and utilizes those funds to pursue socially-beneficial energy projects.⁵ Lawrence Berkeley National Laboratory estimates that SBCs have been responsible for promoting 1,117 megawatts (“MW”) of renewable energy capacity.⁶

SBCs were first implemented in Washington State in 1994 and were endorsed by the Federal Energy Regulatory Commission in 1995 as a way to fund services that had previously been included in customers’ bills from regulated utility companies.⁷ As part of the negotiations for California’s restructuring law, environmental advocates won a provision for a public benefit fund that would expend at least \$872 million on energy-efficiency work from 1998 to the end of 2001 and would allocate \$540 million on renewable energy projects.⁸ To develop renewable energy technologies and other programs expected to struggle after deregulation, the California Energy Commission created its Public Interest Energy Research program, which initially drew about \$62 million annually from the state’s SBC.⁹

By 2006, fifteen states created SBCs. The seventeen organizations that administer the funds, which are scheduled to total \$4 billion by 2017, collaborate through a nonprofit organization called the Clean Energy States Alliance. The organization sponsors original research, collects information and analyses, and seeks to expand the use of clean energy technologies with a special emphasis on solar, wind, and fuel cells. Moreover, the group seeks to increase the efficiency of state research by eliminating duplication of efforts and by providing forums for the states to share knowledge and insights.¹⁰

RENEWABLE PORTFOLIO STANDARDS

An RPS is a legislative mandate requiring electricity suppliers (often referred to as “load serving entities”) in a given geographical area to employ renewable resources to produce a certain percentage of power by a fixed date.

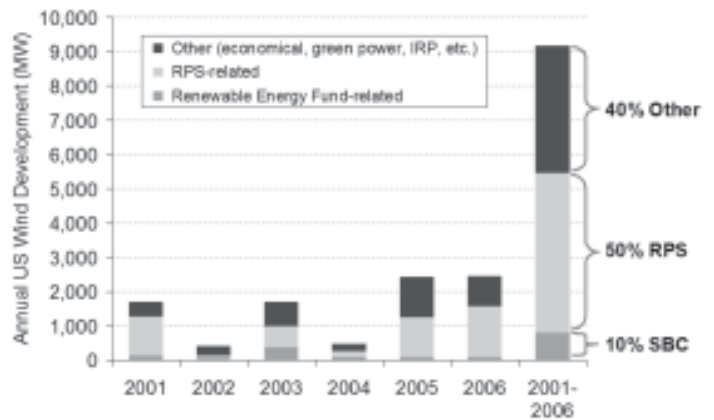
An RPS program transfers the risk of renewable energy investments from regulators to investors.¹¹ RPS uses the market as a mechanism to determine the efficacy of any given technology; as a result, higher costs, if they occur, are distributed evenly throughout society to those that benefit from them, and are blended with the lower costs of existing conventional generation.¹²

Unlike instruments developed by public utility commissions with long and complex procedures, often followed by litigation, RPSs are bureaucratically simple.¹³ RPSs enable customers to pay producers directly for renewable energy, obviating the need for the administration of funds by government agencies. And, unlike a one-time award for funds, no project is guaranteed a place in the market.¹⁴

First implemented by Iowa and Minnesota in the 1980s, twenty-four states and the District of Columbia have already passed RPS laws requiring utilities to use renewable resources as a portion of their overall provision of electricity.¹⁵ Four other states have nonbinding renewable energy goals.¹⁶ Five more states—Florida, Indiana, Louisiana, Nebraska, and Utah—are

considering mandating some form of RPS. Of the approximate 9,000 MW of wind energy in the United States, roughly fifty percent, or 4,500 MW, have been promoted directly by RPS policies, whereas ten percent, or 900 MW, have been promoted by SBCs from 2001 to 2006.¹⁷

FIGURE 1: ANNUAL U.S. WIND ENERGY DEVELOPMENT BY STATE POLICY MECHANISM, 2001 TO 2006



THE CASE FOR FEDERAL INTERVENTION

There are three reasons, however, why continued reliance on state-based efforts such as SBCs and RPSs will be insufficient to promote renewable energy technologies in the United States on the scale needed to fight climate change.

IMPROVING RELIABILITY

First, federal intervention is needed to improve electricity reliability. Contrary to what some opponents of renewable energy assert, the variability of renewable resources becomes easier to manage the more they are deployed. Electrical and power systems engineers have long held the principle that the larger a system becomes, the less reserve capacity it needs. Demand variations between individual consumers are mitigated by grid interconnection in exactly this manner. When a single electricity consumer, for example, starts drawing more electricity than the system allocated for each consumer, the strain on the system is insignificant because so many consumers are drawing from the grid that it is entirely likely another consumer will be drawing less to make up the difference. This “averaging” works in a similar fashion on the supply side of the grid. Individual wind turbines average out each other in electricity supply.¹⁸ So when the wind is not blowing through one wind farm, it is likely blowing harder through another.

Because the technical availability of one wind turbine rivals that of a single conventional power plant, wind farms of hundreds or thousands of turbines have even greater reliability because it is unlikely that all turbines would be down at the same time. Furthermore, when turbines do malfunction, they take far less time to recover than massive conventional power plants or nuclear reactors that have literally millions of individual components, arranged in complex circuits prone to mechanical failure.¹⁹ Analysts already confirmed the benefit of wind power’s greater technical availability in the United States. Indeed, a November 2006 study assessing the widespread use of wind power in Minnesota

concluded that “wind generation does make a calculable contribution to system reliability” by decreasing the risk of large, unexpected outages.²⁰

Improved reliability of supply is important, as blackouts and brownouts exact a considerable toll on the American economy. The U.S. Department of Energy (“DOE”) estimates that while power interruptions often last only seconds or minutes, they cost consumers an average of \$150 to 400 billion every year.²¹ The Electric Power Research Institute projects the annual costs of poor power reliability at \$119 billion, or forty-four percent of all electricity sales in 1995.²²

However, to capture such benefits, renewable energy technologies must be spatially deployed in every state and must have national penetration rates above ten percent. Penetration rates of renewable energy technologies nationwide are still low—around three percent of overall installed electricity capacity in 2007. Collective state efforts are expected to increase this amount to only around four percent by 2015 and five percent by 2030, but the environmental benefits of renewable energy only really start to accrue at penetration rates well above this rate. Federal intervention in the form of a nation-wide SBC or RPS aiming for targets of ten to twenty percent by 2020 would expand the diversity of technologies used to access renewable resources.

IMPROVING ENERGY SECURITY

Second, larger penetration rates are needed to ensure energy security. This is because the geographical dispersion of generators not only improves their overall reliability; it makes them more secure—and thus resilient to accidental power outages and failure, or intentional attack and disruption. Notwithstanding intense media focus on the security dangers from nuclear reactors and natural gas facilities, the nation’s power grid represents an equally serious threat to energy security. The security issues facing the modern electric utility grid are almost as serious as they are invisible.

For example, in 1975 the New World Liberation Front bombed assets of the Pacific Gas and Electric Company more than ten times, and members of the Ku Klux Klan and San Joaquin Militia have been convicted of attempting to attack electricity infrastructure.²³ Internationally, organized paramilitaries such as the Farabundo-Marti National Liberation Front were able to interrupt more than ninety percent of electric service in El Salvador and even had manuals for attacking power systems.²⁴

Some caution that all it would take to cause a “cascade of power failures across the country,” costing billions of dollars in direct and indirect damage, is a few motivated people with minivans and a couple of mortars and balloons, which they would use to chaff substations and disrupt transmission lines.²⁵ A deliberate, aggressive, well-coordinated assault on the electric power

grid could devastate the electricity sector. Replacement time would be “on the order of Iraq,” not “on the order of a lineman putting things up a pole.”²⁶

Several recent trends in the electric utility industry have increased the vulnerability of its infrastructure. To improve their operational efficiency, many utilities and system operators have increased their reliance on automation and computerization. Low margins and various competitive priorities have encouraged industry consolidation, with fewer and bigger facilities and intensive use of assets in one place. As the National Research Council noted, “control is more centralized, spare parts inventories have been reduced, and subsystems are highly integrated across the entire business.”²⁷

Federal promotion of renewable energy on a national scale can improve the security of the grid by decentralizing electricity generation. Even when renewable resources like wind and solar are concentrated, the tendency for them to produce power in incremental and modular amounts makes it much more difficult to disrupt large segments of generation. The International Energy Agency has noted that centralized energy facilities create significant targets for terrorism because attacking a few facilities

can cause large power outages.²⁸

In contrast to the security risks of large centralized generators, decentralizing energy facilities and providing power through more modular and distributed energy systems minimizes the risk of accidents and grid failures, and does not require transporting or storing hazardous or radioactive materials. Analysts have tended to refer to renewable energy systems (and other forms of distributed generation

such as fuel cells and small-scale cogeneration units) as “supple” power technologies because they are modular suited to dispersed siting.²⁹ A national RPS or SBC promoting renewables could greatly contribute to the overall security of the nation’s electric infrastructure by forcing more technologies into the portfolio of all American utilities.

PROVIDING CLIMATE BENEFITS

Third, and perhaps most important, federal intervention is needed to fight climate change and minimize “free-riding” going on in states that have chosen to rely on nuclear and fossil fuels to generate electricity, instead of promoting renewable energy. The DOE has already determined that only “the imposition of [a national] RPS would lead to lower generation from natural gas and coal facilities.”³⁰ Examinations of fuel generation in several states confirm this finding, as well as the tendency for a national RPS to displace oil-fired generation, which is still a significant source of electricity in Florida, New York, and Hawaii. Equally important, but often overlooked, is how SBC- or RPS-induced renewable generation would offset nuclear power in several regions of the United States.

A deliberate, aggressive, well-coordinated assault on the electric power grid could devastate the electricity sector.

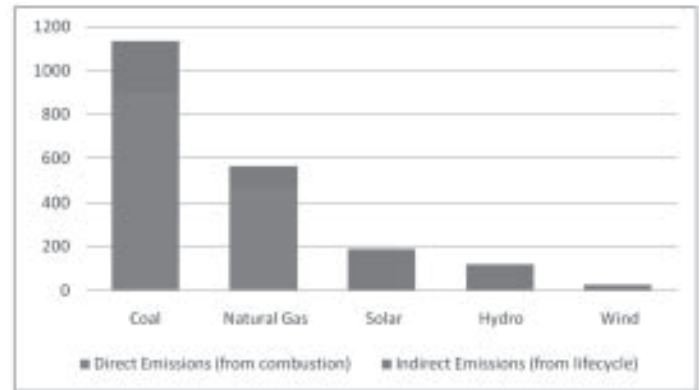
Researchers in North Carolina, for example, determined that a state-wide RPS would displace facilities relying on nuclear fuels and minimize the environmental impacts associated with the extraction of uranium used to fuel nuclear reactors.³¹ In Oregon, the Governor's Renewable Energy Working Group analyzed a twenty-five percent statewide RPS by 2025 and projected that every fifty MW of renewable energy would displace approximately twenty MW of base-load resources, including nuclear power.³² Environment Michigan estimates that a twenty percent RPS by 2020 would displace the need for more than 640 MW of power that would have otherwise come from both nuclear and coal facilities.³³

By offsetting the generation of conventional and nuclear power plants, only large-scale renewable energy penetration rates would avoid many of the environmental and social costs associated with the mining, processing, transportation, combustion, and clean-up of fossil and nuclear fuels. By promoting technologies that displace conventional forms of electricity generation, federal promotion of renewable energy would substantially decrease air pollution in the United States. A single one MW wind turbine running at only thirty percent of capacity for one year displaces more than 1,500 tons of carbon dioxide, 2.5 tons of sulfur dioxide 3.2 tons of nitrous oxides, and 60 pounds of toxic mercury emissions.³⁴

One study assessing the environmental potential of a 580 MW wind farm located on the Altamont Pass near San Francisco, California, concluded that the turbines displaced hundreds of thousands of tons of air pollutants each year that would have otherwise resulted from fossil fuel combustion.³⁵ The study estimated that the wind farm would displace more than twenty-four billion pounds of nitrous oxides, sulfur dioxides, particulate matter, and carbon dioxide over the course of its twenty-year lifetime—enough to cover the entire city of Oakland, California in a pile of toxic pollution forty-stories high.³⁶

Renewable energy technologies possess an even greater ability to mitigate climate change. The International Atomic Energy Agency estimates that when direct and indirect carbon emissions are included, coal plants are around ten times more carbon intensive than solar technologies and more than forty times more carbon intensive than wind technologies. Natural gas fares little better, at three times as carbon intense as solar and twenty times as carbon intensive as wind.³⁷ The Common Purpose Institute estimates that renewable energy technologies could offset as much as 0.49 tons of carbon dioxide emissions per every MWh of generation. According to data compiled by the Union of Concerned Scientists, a twenty percent RPS would reduce carbon dioxide emissions by 434 million metric tons by 2020—a reduction of fifteen percent below “business as usual” levels, or the equivalent to taking nearly seventy-one million automobiles off the road.³⁸

FIGURE 2: DIRECT AND INDIRECT CARBON EMISSIONS BY ELECTRICITY TECHNOLOGY (EQUIVALENT GRAMS OF CO₂/kWh)³⁹



These estimates are not simply theoretical. Between 1991 and 1997 renewable energy technologies in the Netherlands reduced that country's annual emissions of CO₂ between 4.4 million and 6.7 million tons. Renewable technologies were so successful at displacing greenhouse gas emissions that Europe now views renewable energy as “the major tool of distribution utilities in meeting industry CO₂ reduction targets.”⁴⁰

CONCLUSION

Given such obvious and overwhelming advantages, it is hard to believe that many utilities and policymakers diligently oppose national promotion on renewable energy, repeating myths that have long since been debunked. Largely, the remaining objections to federal intervention constitute a diminishing series of canards that mischaracterize a national SBC or RPS as an unnecessary federal intervention in a relatively free market. Forgetting that a majority of states are well on their way to imposing their own clunky, overlapping, inconsistent, competing, and sometimes irrational mess of mandates, opponents churn out four war-torn myths every time the issue is considered:

The first criticism is that a national SBC or RPS would create “winners and losers.” In reality, all states have renewable resources they can affordably develop. However, under the current system of state mandates, some states are “losers” by subsidizing the cheap, polluting electricity in other states. Other states are victims to inconsistencies between state mandates that produce perverse predatory trade-offs and require them to export their cheap in-state renewable electricity in exchange for more expensive electricity or renewable energy credits. A national mandate would level the playing field by creating consistent, uniform rules and by allowing utilities to purchase renewable energy credits or develop renewable resources anywhere they are cost competitive.

The second criticism is that a national mandate would increase electricity rates. However, in most states, renewable


An RPS program transfers the risk of renewable energy investments from regulators to investors.

energy mandates have not significantly increased rates and a consensus of economic models predict that a national policy would generate substantial consumer savings over the existing patchwork of state programs. By expanding the amount of energy that would offset gas-fired generation, a federal intervention would reduce demand on a strained and volatile natural gas market. Renewable energy units with markedly faster lead-times than conventional and nuclear reactors speeds the cost recovery of critical transmission investments and reduces the rate increases needed to pay for new transmission.

Another common criticism is that a federal mandate would harm the utilities sector in the form of future profits they will not be able to recover from consumers through higher electricity rates. For policymakers, balancing utility profits with electricity prices is one of the hard decisions we elect them to make. However, elected officials should consider that utility claims of lost profit are short-sited and strategically unsound. In reality, a more predictable regulatory environment decreases utility litigation and compliance costs relative to a growing tangle of vague and unstable state mandates. Expanding the universe of eligible renewable resources and establishing clear, uniform trading rules creates far more flexibility for regulated utilities and rewards utility investments on the basis of smart market strategy. By promoting a robust domestic renewable energy manufacturing sector, a national mandate reduces the costs utilities pay in unfavorable exchange rates for foreign parts and labor and redirects those investments to the U.S. labor market.

A final criticism is that a national RPS or SBC would promote only least-cost options such as wind turbines and landfill gas generators (and not solar photovoltaic, solar thermal,

small-scale hydroelectric, and geothermal plants). Existing state programs, however, reveal that mandates with broad qualifying resource eligibility actually have led to the development of many different renewable resources. Utilities have already demonstrated that they can meet state requirements by deploying a diverse portfolio of renewable resources that best match their service areas. By geographically and monetarily expanding the market for renewable resources, a national RPS is likely to further diversify the deployment of renewable energy technologies. In Nevada, geothermal energy may be cheaper to develop than wind. In the Pacific Northwest, incremental hydroelectric power may be cheaper than solar. In the Southeast, biomass may be the most affordable. A national RPS mandate with a fuel-based definition of eligible renewable resources ensures that free market principles, rather than regulatory set-asides or political patronage, determine which technologies will be most cost competitive in certain areas of the country. An added bonus is that a national RPS decreases compliance costs for regulated utilities, since a technology-neutral mandate allows utilities to meet RPS obligations using the technology that is most cost competitive for the fuels available.

Ultimately, by establishing a consistent, national mandate and uniform trading rules, a national SBC or RPS can create a more just and predictable regulatory environment for utilities while jump-starting a robust national renewable energy technology sector. By offsetting electricity that utilities would otherwise generate with conventional and nuclear power, a federal action would decrease electricity prices for American consumers while protecting human health and the environment at a scale and magnitude not possible with state programs. 

Endnotes: State Efforts to Promote Renewable Energy

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Endnotes: State Efforts to Promote Renewable Energy
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THE TRUTH ABOUT WIND TURBINES AND AVIAN MORTALITY

by Michael Distefano*

Wind turbines are often criticized for posing a significant risk to surrounding bird life. As certain numbers indicate, this argument has some merit. A 2001 study estimated that 33,000 birds are killed in the United States each year by wind turbines.¹ More troubling is the fact that of those 33,000, an estimated 28,500 are protected species.² Birds may collide with the structure itself, be struck by a spinning blade, or, if flying close enough, be pulled into the turbine's wake.³ Though these numbers seem troublesome at first glance, they are an inaccurate depiction of modern wind turbine sites nor do they constitute a valid reason to discourage wind turbine construction.

The most often criticized wind farm is California's Altamont Pass wind power site. Figures suggest that since its construction in the early 1980s, the 7,000 turbine site has been responsible for killing 22,000 birds, including 400 golden eagles.⁴ Altamont Pass represents an older generation of wind sites and by examining the factors that set it apart from modern sites, one can understand the causes of avian mortality.

The first factor is the site's location. Had an adequate environmental impact assessment taken place at Altamont Pass, it would have shown that it is an important migration route, as well as a wintering place for many species of raptors.⁵ Its craggy landscape and various canyons make it an ideal setting for birds of prey, many of which are listed on the endangered species list.⁶ Properly situating turbine sites in areas with low bird populations would drastically reduce collision rates simply by placing the turbines where there are less birds to fly into them. Today it is common practice to study bird traffic at proposed sites before construction begins. If the studies find that the proposed site is heavily trafficked, operation schedules can then take into account peak migratory periods.

The second factor is technology. The turbine designs at Altamont are considerably outdated. It takes fifteen Altamont turbines to produce the same energy as one modern, larger turbine.⁷ Newer turbines, with rotor diameters in excess of one hundred meters, sweep a larger patch of sky and therefore need not spin as fast as small turbines.⁸ The slower the rotation speed, the easier it is for flying birds to dodge the blades. Though more costly, large turbines reduce bird fatalities and generate energy more efficiently. Fortunately, there are plans to replace all of the



Courtesy of Kevin Dooley

Wind farm in San Geronio, California

Altamont turbines with larger, more efficient units within the coming decade.⁹

To put these factors in perspective, consider the Maple Ridge Wind Farm in upstate New York. In the last year or so 195 turbines have come online and collectively they produce 320 megawatts of electricity per year.¹⁰ By contrast, the Altamont Pass wind farm generates approximately 600 megawatts per year but employs 7,000 turbines to do so.¹¹ The Maple Ridge Wind Farm enjoys an efficiency rate almost twenty times that of the Altamont Pass. Because fewer turbines equal reduced chances of collision, every gain in efficiency reduces the occurrence of avian mortality.

Concerns have been raised with the possible increase in avian mortality, if wind energy were to experience a sudden boom and turbines increased by the thousands. However, it is not clear that an increase in wind energy will cause an avian mortality incidence swell. In absolute numbers bird fatalities

Is not clear that an increase in wind energy will cause an avian mortality incidence swell.

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would undoubtedly rise. But bird fatalities per turbine drop the more we learn about turbine technology and operation. As long as wind turbines can produce a substantial portion of our energy without posing an unnecessarily large risk to birds, their use is warranted. Our measure of success must be the next best alternative. Conventional energy resources such as coal and petroleum also pose a substantial danger to birds. Acid rain has done considerable damage to avian habitats and climate change has disrupted migratory patterns and synchrony with food sources.¹² Environmental catastrophes like the Exxon Valdez, though rare, continue to pose threats not just to individual birds, but entire ecosystems. There is no question that the use and extraction of coal and other fossil fuels has had and will continue to have a tremendous negative effect on birdlife.¹³

The Altamont Pass has been a learning experience not only for the California Energy Commission but for the renewable energy community as a whole. By improving wind turbine tech-

nology and properly choosing and operating turbine sites, the incidence of avian mortality can be reduced. Even concerned organizations, such as the American Bird Conservancy and Sierra Club, have pledged their support in favor of wind energy as long as proper attention is given to its location, design, and operation.¹⁴

Wind farms are, by their very nature, large industrial projects. It would be impossible to completely mitigate their impacts on wildlife and habitats but with careful attention those impacts can be reduced. Wind energy should be viewed within its larger context—that of the urgent need for diversified and renewable energy resources. As

the United States and other countries begin to explore energy alternatives, wind's role should not be sidelined because of this unfortunate consequence. Wind turbines will always pose a degree of danger to birdlife but the value to be gained from their responsible use is undeniable.



The most often criticized wind farm is California's Altamont Pass wind power site.

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TRANSLATING STATE EXPERIENCE INTO FEDERAL CLIMATE POLICY

by Jennifer M. Rohleder*

The debate over U.S. federal climate change policy has never been stronger. While a federal climate policy is being formulated, the states are developing climate experience and expertise that the federal government can leverage. This trend begs the question of whether state policies should be used as a template for federal climate policy.

One area where states have developed expertise is in the registration and tracking of greenhouse gas (“GHG”) emissions. Even though tracking GHG emissions has recently become a mainstream federal issue, Wisconsin has long been a leader in this area. Since 1993, Wisconsin has required any facility that emits more than 100,000 tons of carbon dioxide (“CO₂”) to report its emission levels to the state Department of Natural Resources. It is the only state with such a requirement.¹ Additionally, dozens of sources that fall well below the threshold voluntarily report their emissions, providing the state with a detailed, multi-year profile of its major CO₂ sources. The profile includes most major electric utilities in the state, a wide range of large industries, and a mixture of smaller sources.²

Moreover, several states have developed “carbon adders” to compare investment options with respect to the possible future costs of mitigating GHG emissions.³ A carbon adder is an expected future cost of CO₂ equivalent assumed during investment comparisons. Due to the highly uncertain and controversial nature of future damages of climate change, a carbon adder estimates only the future compliance costs of carbon restraint rather than the economic impacts of future climate change.⁴

Of the states with carbon adders, Oregon’s is the most broadly applied. The Oregon Public Utility Commission (“PUC”) requires all regulated utilities to include analysis on a range of carbon costs in their integrated resource planning process since 1993.⁵ Similarly, the California PUC requires the state’s investor-owned utilities to include a carbon adder in their resource plans.⁶ Colorado’s carbon adder only applies to one utility because the carbon adder resulted from a litigation settlement agreement with environmental groups.⁷

States have often led in policy development, which can influence federal action. States are often better positioned to reach consensus and act more quickly than the federal gov-

ernment. The political interests of most states are relatively cohesive when compared to the national policy-making process. State government units are smaller and closer to affected constituencies, thus states are better able implement policy responses more quickly.

Policy diffusion from the state to the federal level is known as vertical diffusion.⁸ Expanding effective state-level energy and climate policies to the national level seems to be a logical and efficient method of developing federal climate policy. The question is: how do we translate state experience into federal policy? The World Resources Institute conducted a study on how state

policies influence federal regulations. The study identified and evaluated several factors that contributed to successful vertical diffusion, the most important of which, particularly for environmental/energy issues, was state officials championing the cutting-edge policies their states have implemented in the federal policy debate.⁹ The study concluded that states can play a significant role in the development of a national policy. However,

no single factor can guarantee vertical diffusion although certain factors, such as the power of example and the extent of horizontal policy diffusion (from state to state) are cited strong factors informing federal policy.

States are considered the laboratories of democracy, testing new ideas and innovative policies that can be used by national policy-makers. Vertical diffusion is only effective if the federal policymakers learn from the experiences of the states and pull the best features together into an overarching national policy. Unfortunately for states, as climate policy discussions expand to the national level states risk losing their leadership status with respect to the policy agenda. In addition, a national discussion invites broader interests to the negotiating table. Further complicating vertical diffusion is the fact that states can only maintain their role as policy incubators and innovators so long as federal policy does not preempt state actions.

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States are often better positioned to reach consensus and act more quickly than the federal government.

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THE ROLE OF RENEWABLE PORTFOLIO STANDARDS IN THE CONTEXT OF A NATIONAL CARBON CAP-AND-TRADE PROGRAM

by Neal J. Cabral*

INTRODUCTION

As the Senate prepares to take up a measure, passed by the House of Representatives, for a national renewable energy portfolio standard (“RPS”),¹ and continues serious deliberations about a mandatory greenhouse gas (“GHG”) reduction program, it is an appropriate time to examine what role a national RPS would have within a mandatory GHG reduction program. Because Congress seems to prefer a broad cap-and-trade program as the best least-cost vehicle with which to implement a mandatory carbon reduction program, tension exists between a market-oriented cap-and-trade program and a command and control RPS mandate. This debate does not take place within a vacuum, as almost half the states have adopted an RPS or similar renewable energy targets.² A national RPS calls into question the role such state RPS programs would have both within a national RPS and within the context of a national carbon cap-and-trade program.

Three primary bases for tension exist between an RPS and a cap-and-trade program. First, renewables, as imposed through an RPS, are typically not the least-cost compliant solution to carbon reductions, particularly in the earlier stages of any carbon cap-and-trade program where the required reductions are expected to be relatively modest. Second, once a carbon cap-and-trade program is enacted, the purpose of an RPS program becomes more uncertain because renewable power purchased pursuant to an RPS program will no longer provide any additional carbon reductions beyond those required by the cap. Third, it is difficult to integrate RPS requirements into a carbon cap-and-trade program in a way that produces relatively fair results with respect to the entities that purchase the renewables and, therefore, bear their costs.

Taken together, these three tensions between an RPS program and a least-cost carbon cap-and-trade policy tend to weaken the current standard rationales for enacting RPS programs. In order to properly sort out these issues and develop a coordinated and sound national carbon policy that includes a renewables component, legislators must evaluate and agree on the specific purposes for enacting an RPS program in the context of an expected carbon cap-and-trade program. They must also structure both programs to meet the defined objectives of the RPS.

REASONS FOR ENACTING AN RPS

An RPS requires that electric generators or suppliers source a defined percentage of their power from renewable energy facilities.³ Qualifying renewables vary by program, but typically include wind, biomass, solar, geothermal, landfill gas, and sometimes hydropower.⁴ Although renewable energy is a term intended to describe energy sources that are considered renewable because they are powered by energy coming from an inexhaustible source, or from sources that regenerate fast enough that they will not be depleted, RPS can also include sources that do not fit that description. However, all qualifying RPS sources currently under the various state standards and proposed federal standard are also at least low-carbon or carbon-neutral sources of power, and it is this defining attribute that, from a policy perspective, is probably the most important aspect of renewables.

That RPS mandates are primarily carbon reduction mandates seems relatively clear. Although RPS requirements are almost never enacted primarily as specific carbon reduction programs, probably due to political concerns, this seems to be their primary perceived benefit. In other words, while states and Congress apparently count RPS programs as an important

contributor to GHG reductions, they rarely discuss any specific carbon-based programmatic aspects of an RPS, such as explaining how the RPS would fit within specifically adopted carbon reduction goals.

Instead, proponents often tout renewables as a sound policy measure because, in addition to being green from a general emissions perspective, they also provide other ancillary benefits. For example, renewables are said broadly to promote energy security. While renewables do promote certain aspects of energy security through supply diversity, they do not tend to reduce fuel imports since the power sector generally imports only a very small amount of fuel from outside North America. Studies on whether renewables contribute importantly to energy

That RPS mandates are primarily carbon reduction mandates seems relatively clear.

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price stability also conflict.⁵ In general, the International Energy Agency has concluded that while “environmental objectives will be uppermost,” RPS can provide some energy security enhancements.⁶

However, these ancillary reasons for promoting an RPS do not appear themselves to be sufficiently compelling to support national RPS legislation. Instead, the carbon reduction element of RPS requirements appears to be the driving force. That conclusion seems obvious when one considers whether states would ever adopt RPS programs if qualifying emission sources met all of the non-carbon benefits that RPS advocates purport renewables provide, but were in fact carbon-based sources of power. In such a case, little advocacy for RPS programs would exist at all, and few would be adopted. We can see this quite readily when we consider coal-to-liquids plants. In fact, such plants do rather efficiently reduce dependence on foreign energy supplies such as oil for mobile sources, diversify domestic energy facilities, and promote new technological developments, but they hardly receive support, and are instead typically opposed, because the process is very carbon-intensive.

If the policy support for an RPS primarily tends to be based on the carbon reduction component, it makes sense from a policy perspective to evaluate the efficacy and role of an RPS requirement within a larger national carbon reduction strategy. Based on congressional deliberations to date and proposed legislation,⁷ it seems clear that Congress’ current preference to address carbon nationally is through a broad cap-and-trade program. Hence, an evaluation of the efficacy and role of an RPS program should include an evaluation of how an RPS fits within a national GHG cap-and-trade program.

RPS UNDER A CAP-AND-TRADE PROGRAM

Because RPS programs seem largely intended to reduce carbon emissions, despite the fact that they do not actually target carbon emissions, but rather fuel choice, their approach is a potentially inefficient command-and-control mandate at odds with a market-based cap-and-trade program. Market-based cap-and-trade programs hold, as their fundamental premise, that allowing the regulated community to determine its own solutions to meet a mandatory emissions cap is far more cost-effective and more certain than a one-size fits all series of command-and-control mandates, which instead set specific performance or technology standards.⁸ As a consequence, cap-and-trade programs are expected to provide least-cost solutions to emission reduction goals.

BENEFITS OF A CAP-AND-TRADE PROGRAM

Cap-and-trade programs have two fundamental benefits as compared with command-and-control emission reduction programs. First, by allowing trading, the program does not decide who has to make reductions. This allows sources to take emissions reduction steps when the costs are favorable to the source and to forgo that option and instead purchase emissions allowances or credits when the costs are unfavorable to a source. Second, a cap-and-trade program does not decide what those reductions must be or how the source achieves the reduction.

Instead, the regulated community is free to determine what steps should be taken to meet the overall cap. Consequently, then, it can develop and pursue the least-cost solutions.

The sulfur dioxide emissions trading approach established under the 1990 Clean Air Act amendments⁹ produced vast compliance cost savings primarily because the U.S. power industry figured out how to burn low-sulfur coal in units not designed for such coal, and thereby avoided the costs associated with the assumed need to widely employ more expensive scrubbing control technology.¹⁰ In other words, the market figured out a method of compliance that was not anticipated when the requirements were adopted. This method likely would have been unavailable had a command-and control-mandate based on the performance of scrubber technology been adopted.

Notably, the least-cost result expected under a cap-and-trade program is not an end in itself, but rather allows policy makers to set more ambitious and more certain emissions reduction targets than they might otherwise be able to obtain. EPA observed:

[T]he cost-minimizing feature of cap and trade has long-term environmental benefits. Driving down the cost of reducing a unit of pollution means that policy-makers and regulating authorities can set targets that reduce more pollution at the same cost to society. This system makes it economically and politically feasible to achieve greater environmental improvement.¹¹

Given Congress’ concern about the overall impact of any national carbon reduction strategy on the health of the U.S. economy, the costs of any specific carbon reduction program become an important political question.

EFFECTS OF AN RPS CONFLICT WITH CAP-AND-TRADE

A national RPS program, as a command and control mandate, could conflict with a market-based cap-and-trade program. That conflict is primarily relevant if a known cost discrepancy actually exists between renewables as a carbon compliance option and other available methods of carbon reduction. The conflict emerges clearly in the case of an RPS because renewables in fact cost more in the aggregate than other carbon reduction options that might be employed, at least until the cap tightens over time.

The relative cost-effectiveness of a national RPS as a carbon reduction strategy has been evaluated a number of times. Most notably, the 2002 *Parer Report* to the Council of Australian Governments on national energy reform concluded that Australia’s national RPS program should be abolished and replaced with a national cap-and-trade policy for carbon because the RPS proved a cost-ineffective method of obtaining carbon reductions when compared with a cap-and-trade program.¹² Subsequent analyses of the Australian RPS program concluded that: (1) the dollar per ton cost of carbon reductions associated with a ten percent RPS standard would support four times the amount of carbon reductions if imposed instead as a carbon reduction requirement under a cap-and-trade program; and (2) an amount of carbon reductions equivalent to what a ten percent RPS standard would obtain could be achieved through a cap-and-trade program at a third of the price.¹³

Similar studies have been performed for a U.S. national RPS, and the conclusions are the same. One unpublished study concludes that the carbon reductions associated with an RPS that rises to ten percent cost more than four times as much as would be the case if a cap-and-trade program were placed on the power generation sector.¹⁴ Another study concluded that an RPS is “less cost-effective as a mechanism for reducing carbon emissions from electricity generators than a policy designed specifically to limit carbon emissions.”¹⁵

As these cost studies make clear, a carbon-cap-and-trade program is generally insufficient to sustain widespread penetration of renewables at higher RPS levels simply as a result of power price increases resulting from the cap. If that were true, then renewables would be the compliance option of choice in the economic modeling described above. Instead, it is generally energy efficiency and conservation measures, which often have a positive payback over time and thus cost nothing, that tend to replace renewables as a more cost-effective compliance option. However, some renewable projects remain cost-effective, and are undertaken even under a cap-and-trade program, where the cost of carbon raises power prices. All of these results can change when the stringency of the cap is increased, or if the cap-and-trade program provides specific incentives to renewables through a favorable allowance allocation.

In sum, an RPS appears to be, at bottom, largely intended as a carbon reduction policy and should be explicitly treated as such, including open discussion of how it fits into any national carbon policy, such as a cap-and-trade program; and an RPS mandate is a more expensive and less-cost effective method of carbon reduction than simply adopting a cap-and-trade program with no such command and control mandates. Because Congress has expressed great concern over the cost and broad economic impact of a mandatory carbon program, and intends to seek least cost solutions where available, the higher cost of an RPS versus alternatives to produce equivalent carbon reductions would seem to argue for a careful assessment of the specific goals and benefits of an RPS program in light of an expected mandatory carbon cap-and-trade requirement.

In addition, maintaining an RPS as a requirement independent of a cap-and-trade program does not provide more or additional carbon reductions. This is due to the fact that the carbon reductions from the RPS program are simply factored into the reductions needed to meet the cap, and therefore become a part of the compliance portfolio. As carbon reductions from renewables occur, alternative reductions that would otherwise have occurred to meet the cap are forgone. In general, most renewable energy produces carbon reductions because a power generator somewhere reduces its level of fossil fuel consumption, often natural gas, in an amount equal to the amount of renewable power that is added to the grid. The fossil fuel power genera-

tor that reduces its output is now left with allowances to sell or use itself under the cap. This results in an increase in carbon emissions somewhere that equals the carbon reductions caused, and emission allowances “freed up,” by the use of renewable power. Thus, overall emissions remain equal to the level permitted under the cap.

IMPACTS OF AN RPS UNDER A CAP-AND-TRADE PROGRAM

While RPS requirements do not provide additional reductions under a cap-and-trade program, they do define renewable power as a specific method of obtaining part of the reductions that will be achieved under the cap. This is true because a certain percentage of renewable power must be purchased under the RPS without regard for the cap. Additionally, the cost-ineffectiveness of an RPS is confined to, and incurred by, entities that must comply with the RPS mandate, and this occurs outside the cap. Thus, the cost of compliance within the cap itself is lowered, although the overall cost to meet the cap is higher when factoring in RPS costs.

In this light, RPS programs lose much of their stated policy support because, upon implementation of a cap, they are no longer a carbon reduction policy. Instead, an RPS becomes a mandate that a certain amount of reductions to be achieved

under a carbon cap must come from renewable power. Thus, the question for policy makers to debate is whether renewables, despite their cost, are sufficiently important to an overall national carbon reduction strategy so that they should be mandated as a carbon compliance mechanism? Despite the importance of these issues, virtually no serious

debate about them has taken place in the United States. Instead, the benefits of renewables as part of national carbon policy are largely assumed, and their drawbacks ignored.

POLICY CONSIDERATIONS SUPPORTING AN RPS

While good public policy requires a careful assessment of both the benefits and drawbacks of an RPS within the context of an expected national carbon reduction mandate, the Australian experience tells us this consideration is also important as a practical matter. After the issuance of the *Parer Report*, recommending that the Australian RPS be abolished and replaced with a more cost-effective cap-and-trade program, investment in renewables slowed due to the obvious regulatory uncertainty. That uncertainty remained unresolved for another two years as Australia reviewed the issues and decided to recommit to the RPS, albeit with some adjustments. Therefore, in order to provide long term certainty in renewables markets, the fact that an RPS requirement is not a least-cost solution to carbon reduction and does not provide any additional reductions beyond what a cap would require should be recognized and accepted after debate, so as not to cause surprises and associated uncertainty later.

RPS obligations often fall on the company that distributes power.

Notably, the Australian evaluation of whether to continue with an RPS or replace it with a carbon cap-and-trade program provides some insight into specific policies that would support continuation of the renewables mandate. The primary reasons articulated for continuing the RPS in Australia were based on the expectations that renewables would become a more cost-effective carbon reduction option as the cap tightened over time and as the costs of renewables decreased through continued build-out, and, perhaps more importantly, that renewables presented an attractive hedge against future technology or other failure for other carbon reduction measures.¹⁶ Similarly, the United States could also conclude that renewables do promote greater future compliance certainty and provide an expectation of lower relative costs over time, and that those are sufficient reasons to support continued investment in renewables now so as to preserve these future benefits.

These benefits, rarely articulated forcefully in the limited U.S. debate over the role of renewables in a carbon cap-and-trade program, do provide powerful policy arguments to support continuation of renewables programs. In essence, the primary attraction of renewables is that the technology is well understood, is fairly readily deployed, and can provide relatively large reductions, or avoided emissions, on a project basis. Indeed, it is these aspects of renewables that may make them attractive to industry. Despite the cost issue, industry has not yet objected to renewable mandates on any broad or sustained basis as a cost-ineffective method of carbon reduction, however industry has frequently raised other objections. This may simply reflect the fact that while the attributes of familiarity and certainty provide tangible benefits, they are not recognized in economic cost models. Further, as one compares a suite of specific and discrete renewables projects with a suite of ubiquitous energy efficiency projects that must be undertaken by third parties, namely power company customers, ease of implementation for renewables may prove to be an important factor in tacit acceptance of RPS programs.

Another benefit of an explicit legislative assessment of whether to promote higher-cost renewables requirements when a national carbon trading program is expected to follow is that specific policy reasons to adopt the higher cost alternative can be articulated, and the RPS program tailored to promote the identified objectives. For example, if one of the reasons advanced for an RPS is to make the United States a technology leader in renewables, then Congress should evaluate whether renewables research and development programs would help promote that objective. Similarly, if one of the articulated reasons for employing an RPS mandate is to help the renewables industry achieve critical economies of scale and so reduce the cost of renewables, then the RPS should be sized to specifically promote that objective, and no more.

Perhaps most importantly, if an RPS is to be adopted, legislation should provide a comprehensive package that also removes obstacles to broad renewables penetration and ensures the renewables target can be met. It is no secret that renewables, as intermittent sources often concentrated in specific geographic

regions of the country favorable to the type of generation at issue, require important and large-scale changes to the existing transmission and distribution grids in order to achieve significant levels of penetration. The Electric Power Research Institute recently published a paper that specifies precisely what sorts of large-scale grid and other technology improvements would be necessary to accommodate significant penetration of renewables.¹⁷ It is well known that grid improvements are difficult to make, take years to permit, and often are not favored investments by power companies. In addition, newer and better power storage technologies will be needed to accommodate large-scale renewables penetration.¹⁸ Hence, legislative packages seeking to address the research, permitting and financing issues associated with such improvements would seem to be a critical aspect of any sensible and realistic RPS objectives.

PROMOTING RENEWABLES UNDER A CAP AND TRADE PROGRAM

If it is decided as a policy matter that renewables should be promoted as part of a national cap and trade program, there are a variety of ways to do this. This Article has focused on an RPS because Congress is currently considering such a mandate, although other options to promote defined renewables goals are also available. An RPS program does have the benefit of providing certainty that a minimum amount of renewable power will be produced. However, that approach does limit the extent of renewables penetration to the amount of the RPS, at least until the time that renewables become competitive as a power source due to a rise in power prices as a result of a tightening carbon cap.

However, a certain inequity exists associated with RPS mandates, in that there is often a disconnect between the renewable purchases and the actual carbon reduction, or carbon avoidance. The power company purchasing the renewable power to meet RPS requirements has paid for the carbon reduction in the form of the cost difference between otherwise available fossil power and the renewable power. However, that company often cannot use the carbon reduction associated with the renewable power purchase for compliance under a carbon cap because the power plant that reduces its load to accommodate the renewable power is often a different company than the renewable power purchaser. Instead, it is either the power generator, which reduces its load that obtains the carbon benefit even though it did not pay for the carbon reduction, or the entire carbon market in general, which obtains a benefit because of lowered demand for allowances and greater availability of lower cost carbon reductions, which are not used in lieu of higher cost renewable power reductions (i.e., some of the costs of compliance with the cap are transferred to the RPS program).¹⁹

The reason for this inequity is twofold. First, RPS obligations often fall on the company that distributes power, and that company may not own any generating facilities. Second, and more importantly, RPS mandates can typically be met by purchasing renewable energy credits. Use of such credits allows renewable power sources to situate geographically at the least-cost sites for the power produced, and renewable power purchasers, located far away from renewable resources, to readily and

cost-effectively buy renewable power. The consequence of this is that companies obligated to comply with RPS requirements can suffer a double hit, in the form of mandatory purchases of often higher cost renewable power and the general inability to take carbon credit for those purchases under a carbon cap. If Congress elects to pass an RPS and/or to allow states to maintain RPS requirements after implementation of a carbon cap-and-trade program, careful thought need be given to identifying and accommodating, as best as possible, the impacts an RPS could have on cap equities.


Instead of an RPS, renewable incentives could be added in the cap-and-trade program itself by allocating allowances to renewable plants through a renewables set-aside, by allocating allowances to the power sector based on power output and not emissions, or by directing a portion of revenues from any allowance auction to renewables. Each of these mechanisms has individual benefits and complications.

The allowance approach has some appeal in that it provides some cost limits on what renewable power will be sold, thus renewable power is transformed from a power purchase obligation under an RPS to subsidized power that will be bought if the subsidized price is competitive. However, this approach also does not guarantee that a specific amount of renewable power will be produced or that the renewable policy objectives will be met. Other possibilities abound. For example, in some European countries, renewables are promoted outside of the carbon cap by feed-in tariffs or other mechanisms providing price supports.²⁰ These price supports begin to decline over time to reflect the expectation that renewable costs should decrease as market pen-

etration increases. Whatever solution is decided upon, experience has shown that renewable investment is very sensitive to regulatory uncertainty, and thus, care must be taken to ensure that regulatory support for renewables is not attenuated by the form of the mechanism selected to support it.

It is also important to consider the role and impact of existing state RPS standards, which present their own complexities and may have less well-defined roles once a carbon cap is put in place. Thorough discussion of that issue is beyond the scope of this Article. However, it should be noted that state RPS programs may also warrant reevaluation and refocus once a national carbon cap is adopted because these programs also will not produce any carbon reductions beyond the level of the national cap.

CONCLUSION

It seems premature for Congress to pass a national RPS in the face of an expected least-cost national carbon cap-and-trade program without first evaluating the costs and benefits of renewables, and assessing what role renewables should play in a national carbon strategy. Renewables are expected to play an important role in any national carbon strategy, and good policy reasons exist to support that conclusion. However, the debate over that issue should be open and clear, and should fully recognize the costs and other issues associated with reliance on renewables as a carbon compliance mandate, to ensure that specific policy objectives for renewables can be identified and agreed upon, legislation adopted to address those goals, and renewables markets provided with certainty. 

Endnotes: The Role of Renewable Portfolio Standards

¹ New Direction for Energy Independence, National Security, and Consumer Protection Act, H.R. 3221, 110th Cong. § 9611 (2007).

² See Barry Rabe, *Race to the Top: The Expanding Role of U.S. State Renewable Portfolio Standards*, SUSTAINABLE DEV. L. & POL'Y, Spring 2007, at 10.

³ Pew Center on Global Climate Change, States with Renewable Portfolio Standards, http://www.pewclimate.org/what_s_being_done/in_the_states/rps.cfm (last visited Nov. 3, 2007).

⁴ BARRY RABE, RACE TO THE TOP: THE EXPANDING ROLE OF U.S. STATE RENEWABLE PORTFOLIO STANDARDS, PEW CENTER ON GLOBAL CLIMATE CHANGE 5 (Jun. 2006), available at http://pewclimate.com/global-warming-in-depth/all_reports/race_to_the_top (last visited Nov. 16, 2007).

⁵ CAROLYN FISHER, HOW CAN RENEWABLE PORTFOLIO STANDARDS LOWER ELECTRICITY PRICES?, RESOURCES FOR THE FUTURE, 1-2 (May 2006), available at <http://www.rff.org/Documents/RFF-DP-06-20-REV.pdf> (last visited Nov. 16, 2007).

⁶ INT'L ENERGY AGENCY, CONTRIBUTION OF RENEWABLES TO ENERGY SECURITY 11 (Apr. 2007), available at www.iea.org/textbase/papers/2007/so_contribution.pdf (last visited Nov. 22, 2007).

⁷ See Global Warming Reduction Act of 2007, S. 485, 110th Cong. (2007).

⁸ Michelle Manion & Jason Mathers, *How it Works: Cap-and-Trade Systems*, CATALYST, Spring 2005, available at <http://www.ucsusa.org/publications/catalyst/page.jsp?itemID=27226959> (last visited Nov. 11, 2007).

⁹ Clean Air Act § 111, 42 U.S.C. § 7411 (2007).

¹⁰ See generally Joint Economic Committee, TRADABLE EMISSIONS 2, 5-6 (July 1997) (analyzing the success of the Sulfur Dioxide emissions trading scheme as a model for creating future systems), available at <http://www.house.gov/jec/cost-gov/regs/cost/emission.pdf> (last visited Nov. 11, 2007).

¹¹ EPA, TOOLS OF THE TRADE: A GUIDE TO DESIGNING AND OPERATING A CAP AND TRADE PROGRAM FOR POLLUTION CONTROL 1-4 (June 2003), available at <http://www.epa.gov/airmarkets/resource/docs/tools.pdf> (last visited Nov. 11, 2007).

¹² See AUSTRALIAN GREENHOUSE OFFICE, RENEWABLE OPPORTUNITIES—A REVIEW OF THE OPERATION OF THE RENEWABLE ENERGY (ELECTRICITY) ACT 2000, 83, 128 (2003).

¹³ *Climate Change: Lessons Learned from Existing Cap and Trade Programs: Hearing Before the Subcomm. On Energy and Air Quality of the H. Comm. on Energy and Commerce*, 110th Cong. 11 (2007) (prepared statement of Anne E. Smith) [hereinafter Smith].

¹⁴ Smith, *id.*

¹⁵ KAREN PALMER & DALLAS BURTRAW, COST-EFFECTIVENESS OF RENEWABLE ENERGY POLICIES, RESOURCES FOR THE FUTURE 20 (Jan. 2005), available at <http://www.rff.org/documents/RFF-DP-05-01.pdf> (last visited Nov. 16, 2007).

¹⁶ AUSTRALIAN GREENHOUSE OFFICE, *supra* note 7, at xix-xx.

¹⁷ Elec. Power Research Inst. Energy Tech. Assessment Ctr., *The Power to Reduce CO₂ Emissions: The Full Portfolio*, (Electric Power Research Institute, Discussion Paper for Summer Seminar, Aug. 2007), available at <http://www.epri-reports.org/DiscussionPaper2007.pdf> (last visited Nov. 11, 2007).

¹⁸ Elec. Power Research Inst. Energy Tech. Assessment Ctr., *id.* at 3-5.

¹⁹ ENERGY INFO. AGENCY [EIA], IMPACTS OF A 15-PERCENT RENEWABLE PORTFOLIO STANDARD 14 (June 2007).

²⁰ See U.N. ENVIRONMENT PROGRAMME, *Changing Climates: The Role of Renewable Energy in a Carbon-Constrained World*, 17 (Dec. 2005) (pre-publication draft prepared by John Christensen et al) (discussing the types of price support policies used in different countries), available at http://www.reep.org/media/downloadable_documents/n/d/REN21%20-%20Role%20of%20Renewable%20Energy%20-%20Feb%20'06.pdf (last visited Nov. 11, 2007).

NUCLEAR POWER: RENAISSANCE OR RELAPSE?

by J.C. Sylvan*

Thirty years of cost overruns,¹ power outages,² gaps in oversight,³ security lapses,⁴ a number of high-profile accidents, and unaddressed concerns about the temporary and permanent storage of radioactive waste,⁵ make nuclear power the *bête noire* of the U.S. energy sector. But growing popular concern about the threats posed by global climate change and the emerging support for a carbon tax or a cap on greenhouse gas (“GHG”) emissions is changing the cost-benefit analysis traditionally applied to nuclear power.⁶ Proponents are heralding the return of nuclear power as a “new day for energy in America.”⁷


The latest evidence of a nuclear renaissance comes with the recent license application by NRG Energy, Inc. (“NRG”) to the Nuclear Regulatory Commission (“NRC”) to build and operate two new reactors at its facility in Bay City, Texas—the first application filed with the NRC in thirty years, and the first of twenty-one such applications the NRC anticipates receiving over the next eighteen months.⁸ One of the principal arguments for this expansion is that by replacing coal and gas-fired electricity generation capacity nuclear reactors could slow the overall growth of GHG emissions.⁹ Nonetheless, nuclear power has financial and legal hurdles to clear before it can assume a role as a credible program to combat global warming.

Nuclear plants are economical to fuel and operate but prohibitively expensive to build. Thus, renewed investment in commercial nuclear power will only come when “the cost of producing electricity using nuclear power will be lower than the risk-adjusted costs associated with alternative electric generation technologies.”¹⁰ Moderate reductions in construction cost, construction time, operation costs, and capital costs could, theoretically, make nuclear competitive with coal and natural gas.¹¹ Nuclear electricity generation could also become more competitive if the externalities associated with carbon-emitting fuels are internalized through either a carbon tax, a cap-and-trade system, or a tax credit for carbon-free electricity generation.¹² Also, the Energy Policy Act of 2005 provides for a clean-energy loan program that would guarantee up to eighty percent of total project cost of innovative technologies—including nuclear power—that avoid “anthropogenic emissions of greenhouse gases.”¹³ Leaving aside the question of health and human safety, the competitiveness of nuclear power may ultimately depend on whether the federal government imposes additional costs on coal and natural gas—a notion with considerable political momentum.

Moving forward, the salient issue will not be financing, but safety. Due to the magnitude of the harm presented by nuclear materials, the frequency with which that harm can occur, and the limited prospects for mitigating it, a dramatic expansion of the nuclear power industry would pose considerable risks to the health and human safety of the American public.¹⁴ At its current level of operation, commercial U.S. reactors will discharge at

least 105,000 metric tons of spent fuel by 2035.¹⁵ So far only two countries have identified specific sites to deposit this waste—the United States (Yucca Mountain) and Finland (Olkiluoto). Neither facility will be ready to receive material for at least another decade.¹⁶ Since 1998, utilities have brought dozens of breach-of-contract suits against the U.S. government because the NRC has failed to honor its Standard Contract commitments to remove waste from temporary on-site storage facilities pursuant to the Nuclear Waste Policy Act;¹⁷ the NRC has argued that it cannot be obligated to remove waste before it has a place to store it permanently.¹⁸ No doubt methods will be developed to reduce the volume of waste and to improve the overall safety of the nuclear fuel cycle. Alternative disposal techniques, such as deep bore geologic disposal, might also be viable. Until then, waste disposal will remain an open question and a potential hazard.

Primary responsibility for nuclear safety belongs to the NRC.¹⁹ Unfortunately, the NRC’s decisions to outsource security functions to private contractors, to rely on voluntary reporting standards, and to enforce its regulations selectively have shaken public confidence.²⁰ Nonetheless, when it comes to forcing higher safety standards, the states’ hands are tied.²¹ State authority to regulate the safety of radiological materials either under state or federal statutes is pre-empted by the Atomic Energy Act.²² Private citizens can bring suits under the Price-Anderson Act, but such suits have little effect in forcing higher safety standards when operators are held to a federally determined standard of care (not strict liability) and citizens are barred from seeking punitive damages.²³ Moreover, new standing requirements for challenging plant licensing will make it more difficult for private citizens’ groups to challenge the construction of new plants.²⁴ Absent changes in federal law, the effectiveness of safety standards for the operation of plants and the disposal of waste will depend primarily on the NRC’s careful stewardship.

The nuclear industry is asking environmentalists to pick their poison—global warming or nuclear power—and some are cautiously opting for the latter.²⁵ Climate change has given nuclear power a second hearing. Rigorous safety standards, a plan for their robust enforcement, and a fail-safe scheme for permanent waste storage have the potential to create broad public support for nuclear power;²⁶ a single accident, on the other hand, could erase that support overnight.²⁷ By taking the lead and insisting on stricter safety standards and a plan for permanent storage of reactor waste materials, the industry could prevent a nuclear renaissance from becoming what the public will view pessimistically as a “relapse” for nuclear power in the United States. 

Endnotes: Nuclear Power *continued on page 78*

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THE NEXT LEVEL OF ENVIRONMENTAL PROTECTION: BUSINESS STRATEGIES AND GOVERNMENT POLICIES CONVERGING ON SUSTAINABILITY

by Dr. Alan D. Hecht*

INTRODUCTION

The ability to understand current risks and pressures and predict new ones is a prerequisite for developing successful sustainable business strategies and supportive government policies. Today, the future business-government landscape seems clearer than at any time in the past: a good opportunity for business and government to shape the future, rather than react to it. Climate change is only one of many pressures that affect overall business strategies and public policies. The following discussion highlights a broad range of social and environmental goals, including biomass and clean energy, access to safe water and sanitation, protection from chemical toxics, and protection of ecosystem services.

Sustainable development fosters policies that integrate environmental, economic, and social values in decision-making. From a business perspective, sustainable development favors an approach based on capturing system dynamics, building resilient and adaptive systems, anticipating and managing variability and risk, and making a profit.¹ Sustainable development reflects not the trade-off between business and the environment, but the synergy between them.

As discussed in this Article, the movement toward sustainable development is inevitable and has important implications for U.S. Environmental Protection Agency (“EPA”) research, regulations, and policies that together suggest that the next level of environmental protection will arise not only from disincentives to pollute, but also from the positive economic benefits of sustainability.

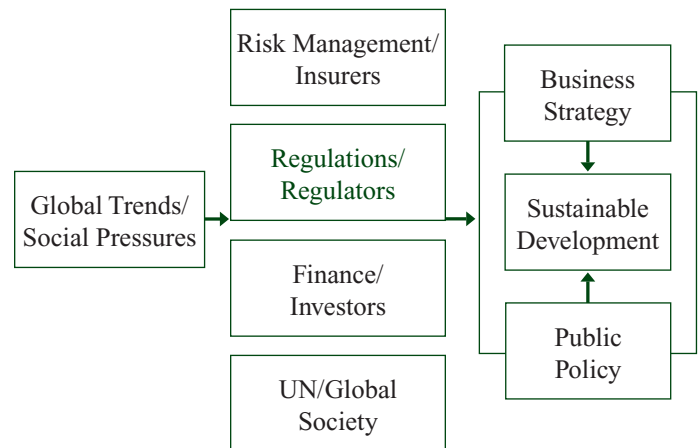
MODELING INTERACTIONS AMONG SOCIETY, BUSINESS, AND GOVERNMENT

A schematic representation of the factors contributing to the convergence of business strategies and government policies toward sustainability appears in Figure 1. The figure’s three columns depict how social and environmental pressures are affecting four groups of stakeholders and policy makers, shaping business strategies and government policies. Each element in Figure 1 is part of a dynamic system with positive and negative feedback loops. In a systems analysis, lines would connect each of the elements, displaying complex feedback among them. This system would have lags and leads as each set of decision makers responds to the others, and would contain non-linear feedback as critical thresholds are reached.

Although my discussion proceeds from left to right in Figure 1, I recognize that current business strategies and public pol-

icies are themselves affecting social and environmental factors, thus creating a closed loop for the whole system. For example, increasing concentrations of greenhouse gases (“GHGs”)—a result of current business and government policies—are affecting insurance practices, corporate strategies, and government policies. Investors and financial managers reacting to climate risks are encouraging companies to reduce their carbon footprint. Government feedback is both positive, e.g., in setting targets for emission reduction or GHG intensity, and negative, e.g., in resisting certain business and/or international pressures.

FIGURE 1: CONVERGENCE OF SUSTAINABLE BUSINESS STRATEGIES AND GOVERNMENT POLICIES



SOCIAL AND ENVIRONMENTAL PRESSURES

Concern for social and environmental well-being affects business strategy and government policies. Table 1 presents current United Nations (“UN”) statistics on distressing social conditions that especially affect the inhabitants of developing countries. The UN Millennium Development Goals² aim to reverse many of the undesirable trends, but progress to date has been uneven.³

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TABLE 1: STATE OF THE WORLD'S POPULATION⁴

- World population growing by approximately 80 million people per year (9 billion projected total by 2050)
- 2.9 billion living in urban environment (5 billion estimated by 2030)
- 972 million living on less than \$1 per day
- 2.6 billion without access to proper sanitation
- 1.1 billion without access to safe drinking water
- 924 million “slum dwellers” (expected to grow by 27 million per year to 2020)
- 829 million chronically undernourished, including 180 million children
- 790 million lacking health services
- 39 million adults and children living with HIV-AIDS

Michael Porter and Mark Kramer call the impact of these external social conditions on business “outside-in linkages.”⁵ The social distress of the world’s less fortunate people affects not only the stability of nations but business operations, with the result that a company like Unilever, which operates in many developing nations, must find ways to address these issues in order to maintain its “license to operate.”⁶

Such social conditions can also shape future business opportunities. Many social stressors affect those at the “bottom of the economic pyramid”—the four billion people in developing countries with annual income less than three thousand dollars in local purchasing power.⁷ While their individual daily income is very low, these four billion people have aggregate purchasing power of \$5 trillion.⁸ Firms that want to capture this emerging market must adopt socially relevant business strategies.⁹

The health of the environment also affects the behavior of business and government. The need for access to clean water and sanitation and the danger of ecosystem destruction are also powerful drivers. Fifteen of the twenty-four ecosystem services examined by the 2005 *Millennium Ecosystem Assessment* are being degraded or used unsustainably.¹⁰ While the full costs of the loss and degradation of these ecosystem services are difficult to measure, the available evidence demonstrates that the costs are substantial and growing.¹¹ Many of the losses in ecosystem services are a consequence of actions taken to increase the supply of other services, especially food production.¹² These trade-offs often shift the costs of ecosystem degradation from one group of people to another; the greatest costs may be borne by future generations.¹³

Climate change caused by rising concentrations of carbon dioxide in the atmosphere can significantly affect all aspects of human life. The 2007 Intergovernmental Panel on Climate Change (“IPCC”) report makes clear that climate change is largely a result of human activity and that it is likely to have significant social, economic, and security implications.¹⁴ Additionally, a recent study, *National Security and the Threat of Climate Change*, discusses how climate change might act as a threat multiplier in already fragile regions, exacerbating conditions that lead to failed states—the breeding grounds for extremism and terrorism.¹⁵ Such potential threats are driving U.S. lawmakers to consider mandating a national intelligence analysis of security

implications of climate change.¹⁶

Today, the impact of social conditions and environmental pressures manifests in real time. As Internet access grows, so does the public’s ability to access data and respond to it. Public involvement shapes government policies and business practices, making the public one of the important decision makers shown in Figure 1.

If the statistics in Table 1 are not enough of a wake-up call to business and government, then the combined impact of future population growth, urban development, and increased use of materials and energy should be. Over the next fifty years, the world’s population is expected to increase by fifty percent and global economic activity is projected to increase by five hundred percent, while global energy consumption and manufacturing activity are likely to increase at least threefold.¹⁷ All of us must learn how to deal with the consequences of this growth and development.

RISK MANAGERS AND INSURERS

The insurance industry may have a significant impact in implementing sustainable development due to its size, the extent of its reach into the community, and the significant role it plays in the economy.¹⁸ Importantly, unsustainable development is costly and risk managers are paid for avoiding problems. Floods, droughts, earthquakes, hurricanes, and tornados are the expected sources of most insurance losses. Changes in the frequency of such events are critical in anticipating risk. As such, techniques to evaluate and understand future risk are essential. Aiming to describe the new risk landscape, insurers such as Swiss Re have an extensive research program on the early detection and assessment of environmental and health risks.¹⁹ Other insurers have also been leaders in the study of natural catastrophes. For example, Munich Re publishes an annual review of disasters and catastrophes,²⁰ and has set up a foundation dedicated to sharing knowledge connected to the subject of risk.²¹

Munich Re, Swiss Re, and other major insurance and reinsurance firms are bringing new attention to issues of environmental sustainability. In reacting to expected pressures from climate change, these firms are adjusting their rate structures and calling for government action. Additionally, the insurance industry now offers businesses that are committed to sustainable business practices options to reduce their insurance costs.²² Innovative green insurance programs could offer significantly reduced insurance premiums for qualifying companies based on factors such as risk profile, commitment to sustainability, and business needs.

However, while the insurance industry is an important contributor, it cannot address the challenges of climate change on its own. The solution will require concerted effort by all stakeholders. Current and future risk goes well beyond just climate change. In the following sections, I will discuss chemicals and human health. In this area, risk managers are getting help from advances in science and technology that improve our ability to detect risks from new chemicals.²³ Businesses have learned that, if not handled properly, the combination of increased scientific understanding of the health effects of chemicals with public

access to information can seriously threaten any business.

REGULATORS

Environment regulators and business standards are affecting how businesses and society think about sustainability. How are all these players interacting with and responding to social and environmental pressures, and advancing sustainability?

EPA and State Regulations

In the 1960s, social unrest and environmental neglect compelled the Nixon administration—acting more out of political defensiveness than environmental enlightenment—to create the EPA.²⁴ From the 1970s to the 1990s, U.S. environmental legislation grew rapidly, with strong enforcement measures aimed at limiting known pollutants. Today, social and environmental pressures require EPA to address more than just enforcement.

EPA now confronts a suite of issues related to economic growth, demographics and aging, urban development and redevelopment, energy and materials use, non-point sources of pollution, ecosystem destruction, and new chemical and biological risks. In today's world, while regulating dangerous pollution and toxics certainly remains a necessary and vital task, eliminating the use of noxious materials altogether is a better, more sustainable alternative. It is therefore unsurprising that as pressures grow and new risks arise, EPA programs have moved toward life cycle analysis, green chemistry, green design, green engineering, smart growth, and industrial ecology. EPA's changes parallel a new management approach by many businesses that is more system-oriented and gives more attention to what goes into a product rather than simply what the production process emits.²⁵

In the area of waste management, there is a similar shift in thinking from managing waste to managing materials. This new attitude reflects the belief of many EPA programs “that developing new approaches for conserving resources, reducing the amount of toxic materials in society and the toxicity of materials that remain, and managing wastes properly can and should be an important part of responding to [the] challenge of making a more sustainable world.”²⁶

This kind of environmental management calls for the active participation of all stakeholders. In recognition of this need, EPA has begun to promulgate a vision of stewardship and sustainability, recognizing that a sustainable future “cannot be accomplished by government [and regulations] alone; rather it requires the active engagement of all people. To this end, [EPA has] a vision of environmental stewardship—where all parts of society actively take responsibility to improve environmental quality and achieve sustainable results.”²⁷

Sustainability has become a clear part of federal policy,

at least in the management of government buildings and other facilities. In January 2007, President Bush signed Executive Order 13423, entitled “Strengthening Federal Environmental, Energy, and Transportation Management,” that sets goals in the areas of energy efficiency, acquisitions, renewable energy, toxics reductions, recycling, sustainable buildings, electronics stewardship, vehicle fleets, and water conservation.²⁸ Executive Order 13423 explicitly directs heads of federal agencies to implement sustainable practices in these areas, and specifies that “sustainable” means “creat[ing] and maintain[ing] conditions, under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic, and other requirements of present and future generations of Americans.”²⁹ A next step is to ensure that sustainability practices are part of agencies' external programs and policies, so that this concept extends to all federal policies and programs.

Individual states have demonstrated leadership on many environmental and development issues, going well beyond federal policies. Acting through laws, policies, and voting initiatives, states are working with business communities to find sustainable solutions. State-EPA partnerships in this area are important; EPA has worked closely with the Environmental Council of the States (“ECOS”), a non-partisan association of state and territorial environmental agency leaders,³⁰ to advance sustainable practices. With EPA support, ECOS has created a searchable database of regulatory and non-regulatory programs, including projects on energy efficiency, smart growth, pollution prevention, multimedia permitting and inspections, consolidated reporting, small business assistance, and eco-efficiency.³¹

In response to the social and environmental pressures shown in Figure 1, regulators experience both positive and negative feedback. Conflicts between state and federal policies can result from different reactions to given pressures. This kind of conflict led to the 2007 U.S. Supreme Court case concerning whether the Clean Air Act gives EPA the authority to regulate carbon dioxide gas as a pollutant.³² The several states that filed the lawsuit argued that EPA has such authority, while EPA opposed this interpretation. Following the Supreme Court's ruling in favor of the states, EPA faces three options: (1) to make an affirmative judgment that GHGs do cause or contribute to climate change, and “may reasonably be anticipated to endanger public health or welfare;” (2) to make a judgment that GHGs do not have this effect; or (3) to provide “some reasonable explanation as to why it cannot or will not exercise its discretion to make that determination.”³³

On this issue, states and cities are aggressively implementing low-impact development and carbon-reduction policies. The U.S. Council of Mayors adopted a resolution on climate change

Sustainable development fosters policies that integrate environmental, economic, and social values in decision-making.

calling for “the federal government and state governments to enact policies and programs to meet or beat the target of reducing global warming pollution levels to 7 percent below 1990 levels by 2012.”³⁴ As of June 21, 2007, 504 mayors representing over sixty-two million Americans had endorsed this Climate Protection Agreement.³⁵

U.S. Accounting and Corporate Reporting

Environmental regulators are not alone in responding to growing social pressures on business. Disclosure requirements for public corporations have been strengthened significantly in recent years. For example, the Sarbanes-Oxley (“SOX”) Act of 2002, enacted in response to the Enron and WorldCom financial scandals and administered by the Securities and Exchange Commission, protects shareholders and the general public from accounting errors and certain fraudulent business practices.³⁶

Other pressure points promoting transparency in business operations come from the Financial Accounts Standards Board (“FASB”). In March 2005, FASB issued a new interpretation (known as “FIN 47”)³⁷ of its Accounting for Asset Retirement Obligations (“ARO”) standards³⁸ that has prodded firms that had been slow to record obligations for the anticipated expenses needed to retire physical assets in an environmentally safe and sound manner.

These accounting procedures require firms to identify assets such as building sites, mines, chemical plants, and nuclear power facilities that may cause long-term environmental damage and that the firms may be legally required to restore to their original conditions. Firms are now clearly required to recognize those future obligations as they purchase, construct, and use their physical assets. The FASB accounting procedures also require that firms estimate the potential risk and liability of operating facilities that produce environmentally dangerous products. Such life cycle analysis reinforces the movement toward more sustainable management practices, and should help to prevent future contamination, brownfield development, and legal disputes over toxic substances like asbestos.

International: Global Reporting Initiative and the European Union

Additionally, reporting initiatives are growing globally, the broadest of which is the Global Reporting Initiative (“GRI”).³⁹ Initially convened in 1997 by the Coalition for Environmentally Responsible Economies (“CERES”), a non-profit coalition of investor, environmental, religious, labor, and social justice groups, the GRI aimed at extending sustainability reporting to the breadth and rigor of financial reporting.⁴⁰ Today, more than one thousand organizations in sixty countries are using the GRI framework.⁴¹

Reporting similar to the reporting required under the SOX Act of 2002 is required under the EU Directive on Accounts Modernization, which requires companies to report on environmental and social impacts of their operations.⁴² The 2004 EU Transparency Directive “requires companies seeking a stock market listing to disclose risks associated with their capital assets.”⁴³ The 2004 Environmental Liability Directive estab-

lished “a framework for national-level statutes that impose . . . cleanup responsibilities for contaminated” sites.⁴⁴

Responding to growing trends in waste management and toxic chemicals, the EU has enacted several directives with important global environmental implications—including directives for the Restriction of Hazardous Substances (“RoHS”),⁴⁵ Waste Electrical and Electronic Equipment (“WEEE”),⁴⁶ and Registration, Evaluation, and Authorization of Chemicals (“REACH”).⁴⁷ These directives regulate products (input) rather than outputs, manage materials rather than waste, promote use of life cycle assessment and “cradle-to-grave” management, apply green engineering and green chemistry principles, shift the burden of proof to industry, and measure and manage future financial risk and liabilities. Combined with pressures from insurers, risk managers, and ARO accounting, these directives advance the movement to sustainability.

FINANCIAL MANAGERS AND INVESTORS

Environmental and social pressures are pushing bankers, pension fund managers, and individual investors toward more sustainable and socially responsible investing. The Equator Principles require banks to assess the social and environmental impacts of projects that they finance.⁴⁸ Influenced by actions and pressures from groups like the activist Rainforest Action Network, Citigroup has gone beyond the Equator Principles by committing to refuse funding for projects that could result in illegal logging, other environmental damage, or harm to indigenous people.⁴⁹ Such actions demonstrate the potential power of social pressures on business—a key element of the social license to operate.

Research on how Wall Street investors and managers are incorporating environmental and social trends into their investment decisions is showing mixed results, with U.S. investors apparently lagging behind those in Europe and Asia. Senior environmental officials at leading U.S. companies have told EPA staff that they are not getting traction with the investment community. While some capital market transactions, particularly those in which climate change is an issue, take the quality of corporate environmental management into account, such transactions do not constitute a widespread trend.

However, EPA’s assessment of links between environmental performance and fiscal incentives suggest that some progress is occurring: (1) “both investment firms and the companies they invest in are showing greater interest in environmental issues and performance;” and (2) “institutional investors are becoming more active in shaping the direction and practices of the companies they invest in.”⁵⁰

Some of the resistance on Wall Street may reflect the old adage that “the business of business is business.” Change in this perspective is evident from the growth of socially responsible mutual funds and from the evolution of the definition of “fiduciary responsibility” to include environmental risk and performance.⁵¹

The 2007 publication of the *Fiduciary Guide to Toxic Chemical Risk* (co-sponsored by the Investor Environmental Health Network, which represents twenty investment organiza-

tions managing \$22 billion in assets) demonstrates the shift in defining corporate responsibilities.⁵² This guide responds to the growing number of reports about chemicals, foods, and other products that reflect a “growing . . . concern about the impact on human health of relatively small amounts of chemicals in everyday products,”⁵³ and notes that some of the largest law firms in the world have “definitively concluded that considering environmental, social and governance issues is at the core of fiduciary Duty of Prudence”⁵⁴ and that “fiduciaries have an affirmative duty to consider toxic chemical issues that impact corporate risk, return and shareholder values.”⁵⁵ The guide provides “a comprehensive set of immediate action steps that can be taken to translate the long-term threats and opportunities associated with toxic chemical issues into prudent portfolio stewardship.”⁵⁶

If Figure 1 captured all the positive and negative feedbacks in the system, this new interpretation of fiduciary responsibility would be seen as a positive feedback of the changing risk landscape.⁵⁷

UN AND GLOBAL SOCIETY

Since 1972, the UN has been at the center of championing environmental and social issues by collecting data, encouraging national reporting, organizing world conferences and summits, and fostering international agreements. The Rio Earth Summit in 1992 launched Agenda 21, an aggressive international agenda for sustainable development.⁵⁸ A series of UN conferences followed, each focused on different development and social issues. The goal of sustainable development was further advanced in September 2000, when 189 countries adopted the Millennium Development Goals.⁵⁹ Among these goals was the determination: to “[i]ntegrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources.”⁶⁰ Two years later at the UN-sponsored International Conference on Financing for Development in Monterrey, Mexico, world leaders agreed on a new approach to development assistance based on shared responsibilities.⁶¹ In September 2002, the World Summit for Sustainable Development (“WSSD”) in Johannesburg, South Africa adopted the “Johannesburg Plan of Action,”⁶² an implementation plan emphasizing basic human needs such as health and access to clean water, as well as agriculture, energy, and biodiversity.⁶³

These UN-rooted activities have focused global attention on a suite of social and environmental issues that are increasingly affecting business strategies and government policies. Interaction among the business sector, government, and civil society has led to the emergence of partnerships within the UN system. These partnerships break with traditional UN approaches by establishing agreements among a modest number of relevant stakeholders aiming to address a concrete problem with a specific timetable and targets.⁶⁴ When the U.S. first proposed the

concept of global partnerships at the WSSD, initial reaction was skeptical, but the number of partnerships has been growing. The UN’s database on partnerships lists over 325 projects,⁶⁵ the largest number being water-related.⁶⁶ The Coca-Cola Company and many other businesses are collaborating with governments, non-government organizations (“NGOs”), and stakeholders.⁶⁷

While UN conferences may not lead to concrete and binding actions, they have elevated public debate on strategic issues and exerted significant pressure for member governments to take action. Concurrent with the growth of UN activities has been the increase in NGOs focusing on environmental and social issues. Today, these organizations are key partners with government and business in efforts to bring clean water, sanitation, clean energy, and medical care to billions of people around the world. NGOs also are exerting considerable pressure on business by using modern satellite and Internet technology. For example, the non-profit group Global Forest Watch uses satellite tracking to monitor logging activities around the world,⁶⁸ often spotting illegal logging in real time. Such capabilities can help governments struggling to control illegal logging, independent certifiers, such as the Forest Stewardship Council,⁶⁹ and multinational wood and product manufacturers, like IKEA, who are committed to using only legally and sustainably harvested products.⁷⁰

CONVERGENCE OF BUSINESS AND GOVERNMENT POLICIES: NEXT STEPS

Clear evidence demonstrates a convergence toward sustainability taking place among major companies in the world today.⁷¹ After interviewing dozens of business

Today, social and environmental pressures require EPA to address more than just enforcement.

leaders for their influential book, *Green to Gold: How Smart Companies Use Environmental Strategy to Innovate, Create Value, and Build Competitive Advantage*, Daniel C. Esty and Andrew S. Winston concluded that smart companies—whom they call “WaveRiders”—were able to respond to the environmental and social pressures shown in Figure 1 by developing a forward-looking and profitable business strategy.⁷² These innovative companies consistently behave in recognizable patterns: (1) anticipating environmental issues and addressing them; (2) staying ahead of new regulatory requirements; (3) managing government mandates to gain advantage in the marketplace; (4) designing innovative or greener products; (5) pushing suppliers to be better environmental stewards; (6) setting metrics and collecting data to track progress; and (7) partnering with NGOs and other stakeholders.⁷³

The business transition that Esty and Winston describe in *Green to Gold* heralds a new era of sustainable business practices. There is a comparable transition underway in U.S. government policy, but at a much slower pace. The government still does not have a sustainability strategy. Nevertheless, several positive steps can be identified that build on current activities and form the basis for a longer-term strategy. Just as progres-

sive businesses are responding to external pressures, EPA can develop and promote a strategy for achieving the next level of environmental protection in the U.S. by taking specific actions: (1) anticipating and responding to future problems; (2) partnering with business; (3) advancing sustainability science and technology; and (4) measuring results and affecting change.

Anticipating and Responding to Future Problems

No one can predict the future, but considering social and environmental stressors clearly operating in today's world and the trends recognizable in the business strategies described in this Article, the argument for an EPA role in advancing sustainability is a strong one. However, if a "sustainability train" is indeed coming, then EPA, as a regulatory agency with historic roots deep in controlling pollution, needs to reflect on and plan how it can foster sustainability. How does an agency organized by offices for specific media (air, water, toxics, and waste) develop an integrated systems approach to environmental protection? Moreover, how does a federal agency without a specific mandate for sustainability advance and achieve sustainable development?⁷⁴

EPA's first step must be a clear strategic plan that coherently connects the dots among existing policies and programs that affect sustainability. For example, many EPA programs—including building design and energy efficiency, urban development and revitalization, green buildings and smart growth, sustainable management of urban systems, sustainable water infrastructure, and improving air quality—cut across EPA's strategic goals and program offices to advance urban sustainability and the built environment.

All of these EPA programs emphasize the goal of sustainable development. Even if the term is not always explicitly used, the concept is clear. These programs and many others have contributed significantly in their own areas of responsibility. Viewed in an integrated manner, these programs together constitute a strategy for urban sustainability. The environmental results of these programs would benefit by better integration among them and a clearer focus on achieving sustainable outcomes.⁷⁵

Partnering with Business

Achieving sustainability has become a mainstream goal for private firms large and small that have responded to simple but forward-thinking questions: Why aim merely to reduce toxic waste when we can eliminate it with new chemicals and processes? Why handle and dispose of growing amounts of waste when we can more efficiently manage materials that eliminate, reduce, or recycle waste? What will be EPA's role in the new era of businesses managing for sustainability?

In working with the regulated community, EPA has followed the four broad approaches highlighted in a 2005 Government Accountability Office report on corporate social responsibility: (1) *Endorsing*, which encompasses policies that encourage or reward sustainable behavior, such as EPA's Energy Star and Design for the Environment programs; (2) *Facilitating*, which involves providing information, funding, or other incentives to advance sustainable practices, such as EPA programs for con-

sumer information, energy and water use, Performance Track, and its new stewardship initiative; (3) *Partnering*, which relies on voluntary and collaborative programs like Climate Protection Partnerships; and (4) *Mandating*, which requires adherence to legislation and executive orders.⁷⁶

Over the next decade, EPA needs to assess how it can best implement each of these approaches. The agency has already made cooperative problem solving and partnerships with business a priority. It will need to explore how best to partner and collaborate with business on many emerging issues and new regulatory concerns: product design, materials use, new technologies, corporate social responsibility, and environmental ethics. This has led EPA to focus on how to help decision makers (including businesses, citizens, and all levels of government and businesses) make more informed and sustainable decisions.

One key barrier to EPA's contribution to sustainable management—the mindset that federal action in the realm of the environment must be restricted to roles explicitly specified in existing regulations—must be recognized and overcome. This mentality reflects in part past history and outmoded business attitudes that burdensome federal regulations unnecessarily curtail economic growth. Such views are changing in some business quarters—such as among companies seeking federal action to limit carbon emissions⁷⁷—but the current debate on climate change and nanotechnology shows that business resistance to controls by agencies like EPA is still deeply embedded. Central to this debate over government's role—and to long-term sustainability—is the growing recognition on nearly all sides that reliance on regulations alone is not the most effective route to advance sustainable outcomes. Regulatory agencies like EPA need to follow a broader mandate to undertake core research to achieve better understanding of interactions among the economy, society, and the environment and to develop tools, models, and approaches that inform public debate and help business make better decisions. Regulatory agencies and industry must work together with evolving mindsets that reflect current risks and challenges for environmental protection.

The successes of the many companies pursuing the goal of sustainability come from the realization that protecting the environment makes good business sense. If the number of articles on green business and of actual changes by management in manufacturing design are reliable measures, then we are approaching the green "tipping point." Many EPA programs have anticipated and contributed to advancing sustainability concepts, e.g., several prominent EPA programs that relate to business in non-regulatory ways, emphasizing business practices ranging from raw materials and manufacturing to waste and recycling.⁷⁸

The key goal of these programs is to shape a new way of manufacturing and doing business that goes beyond controlling pollution to actually changing the strategic thinking of companies. Collectively, these programs demonstrate that the next level of environmental protection will arise not only from disincentives to pollute, but also from the positive vision of sustainability that is acceptable to business operation.

Partnerships between EPA and industry on sustainabil-

ity objectives can provide benefits to both sides. While EPA advances its sustainability goals, access to EPA's reputation and technical skills can be of considerable value to many companies. A prime example is Wal-Mart Stores, Inc. In response to social and environmental pressures, the giant retailer has established a set of "Sustainability 360" objectives, and is working with EPA to pursue those goals and to address issues of product design and energy and materials use.⁷⁹

Sustainability Science and Technology

Science and technology drive change and are critical elements of any sustainability strategy. The science of sustainability aims to go beyond the science needed for setting regulatory policies. Sustainability science anticipates problems, promotes innovation, and aids decision-making. A National Academy of Engineering report has suggested that the path to sustainability "involves the smart design of products, processes, systems, and organizations, and the implementation of smart management strategies that effectively harness technology and ideas to avoid environmental problems before they arise."⁸⁰

Good science is not something anyone would argue against; but it is the science for decision-making part that goes the vital next step. EPA today has a strong scientific foundation in systems research, risk assessment, and life cycle and materials flow analysis, and is working at the frontiers of research in computational toxicology, genomics, ecoinformatics, and nanotechnology. EPA clearly needs to expand these efforts in line with the priorities of a sustainability research strategy.⁸¹

Measuring Results—Affecting Change

EPA is currently measuring environmental quality through a set of environmental indicators, which EPA's *Draft Report on the Environment 2003* defines as measures that "help measure over time the state of air, water, and land resources, pressures on those resources, and resulting effects on ecological condition and human health."⁸² Looking ahead, EPA needs to develop a set of sustainability indicators for policy and public use that will affect strategic planning and inform decision makers inside and outside of government. The proposed EPA budget highlights this challenge: "In FY 2008 EPA's Sustainability research program will embark on a new effort that is aimed at creating a suite of science-based sustainability metrics that are readily under-

stood by the public."⁸³ These measures must become not just a report on the environment but a step in active engagement with all stakeholders. EPA needs greater engagement with a variety of stakeholders to help everyone better understand why measuring something like nitrate levels in surface water is important for everyday life and for sustainable practices.

Developing sustainability indicators will fulfill several valuable roles. It will: (1) assist decision makers in understanding the practical meaning of achieving a sustainable way of life; (2) provide guidance for decision makers in designing and implementing policies and practices to advance sustainability; (3) enable decision makers to see the interconnections among issues so they can understand systems and make better-informed decisions; (4) promote cross-media policies and strategies within EPA; (5) serve as a framework and focus for constructive dialogue and collaboration among business, government, and NGOs; and (6) provide ongoing access to the data and information that support decision making for sustainability.

CONCLUSION

Connecting the dots on the political, government, and business landscapes reveals a convergence of business strategies and government policies toward a more sustainable management of natural resources. It is more obvious now than ever before that the well-being of those both at the top and at the bottom of the economic pyramid cannot continue without sustaining our natural resource base. The next level of environmental protection will be created not only by disincentives to pollute, but also by the positive vision of sustainability that achieves acceptance by and motivates business leaders. This convergence towards sustainability is inevitable and its acceleration through concerted efforts by business, government, and the public will benefit all.

History has shown that EPA's air, water, and land programs have made significant contributions in the agency's areas of responsibility. The environmental results from these programs could significantly improve with greater integration among them and with a clearer focus on achieving sustainable outcomes. So much more is possible to advance environmental sustainability with a strong research focus and a clearer political and policy roadmap. In this way, EPA cannot simply respond to change but can help to create the future.



Endnotes: The Next Level of Environmental Protection

¹ See Joseph Fiksel, *Sustainability and Resilience: Toward a Systems Approach*, SUSTAINABILITY: SCI., PRACTICE, & POL'Y, Fall 2006, at 14-21, available at <http://ejournal.nbio.gov/progress/2006fall/0608-028.fiksel.pdf> (last visited Nov. 7, 2007).

² UNITED NATIONS, THE MILLENNIUM DEVELOPMENT GOALS REPORT 2007, available at <http://mdgs.un.org/unsd/mdg/Resources/Static/Data/2007%20Stat%20Annex%20current%20indicators.pdf> (last visited Nov. 7, 2007) [hereinafter MDG REPORT 2007].

³ World Bank, *A Midpoint Look at Progress on Millennium Development Goals* (July 5, 2007), available at <http://web.worldbank.org/WBSITE/EXTERNAL/NEWS/0,,contentMDK:21398721~pagePK:64257043~piPK:437376~theSitePK:4607,00.html> (last visited Nov. 7, 2007).

⁴ See, e.g., MDG REPORT 2007, *supra* note 2; United Nations Population Division, *World Population Trends*, available at <http://www.un.org/popin/wdtrends.htm> (last visited Nov. 7, 2007); UNITED NATIONS, STATE OF THE WORLD CITIES REPORT 2006-2007 (Stylus Pub., 2006); UNITED NATIONS, WORLD POPULATION PROSPECTS, THE 2006 REVISION 5 (2007), available at <http://www.un.org/esa/population/publications/wpp2006/English.pdf> (last visited Nov. 7, 2007); UNITED NATIONS, WATER, A SHARED RESPONSIBILITY: UN WORLD WATER DEVELOPMENT REPORT 2 at 46 (United Nations Education, Scientific and Cultural Organization 2006), available at <http://unesdoc.unesco.org/images/0014/001454/145405E.pdf> (last visited Nov. 7, 2007).

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DOING MORE WITH LESS: INCORPORATING ENERGY EFFICIENCY INTO A NATIONAL RENEWABLE ENERGY STANDARD

by Rachel Kirby*

In the absence of an effective national policy to combat climate change, states have enacted renewable portfolio standards (“RPS”) to require a percentage of supplied power with renewable resources which, among other things, reduces greenhouse gas (“GHG”) emissions.¹ As Congress considers a national RPS, it must be aware of the role of energy efficiency. Renewable energy production may not be sufficient to meet new demand for electricity. However, if electricity demand stabilizes because of greater efficiency, renewables can replace conventional sources and reduce U.S. GHG emissions.² A standard that requires renewable resources alongside greater efficiency is more effective and economically efficient than a renewable standard alone.³

Energy efficiency can reduce GHG emissions while renewable technologies become cost-effective. Renewable sources alone could result in a 22 percent drop in conventional electricity generation and combining renewables with efficiency increases could result in a 44 percent reduction in conventional generation by 2020⁴ and cut GHG emissions in half.⁵ While a renewable energy standard initially increases energy costs, it reduces consumer costs when combined with an efficiency standard.⁶ Additionally, lower demand reduces conventional fuel costs, potentially offsetting a future tax on GHG emissions.⁷

Of states with renewable energy requirements, fifteen have created or are considering energy efficiency targets.⁸ Each state has different standards of renewable energy, and different targets.⁹ Among those states, Texas established a requirement that utilities offset ten percent of demand growth with increased energy efficiency. The state’s utilities are currently exceeding that target.¹⁰ Connecticut, Nevada, and Pennsylvania have adopted legislation requiring the use of “white tags,” which represent one mega-watt-hour (MWh) of energy conserved, and can be traded on a market like GHG emissions or renewable energy credits.¹¹

GHG emissions are much more than a state problem and a national policy is necessary to bring about national reductions in emissions. A federal policy on renewable energy and efficiency would provide regulatory clarity and direct innovation.¹² However, a federal law should not adopt a weak national standard that would preempt stricter state standards.¹³ An effective

national energy policy needs to include elements such as improved appliance efficiency standards, building efficiency standards, decoupling utilities’ profits from electricity sales, promotion of combined heat and power systems, and a public benefits charge to fund efficiency programs.

Appliance efficiency standards eliminate the least efficient portion of the market. In the United States, homes and commercial buildings are responsible for over two-thirds of electricity use¹⁴ and large savings are possible. Because builders and designers are not ultimately responsible for future energy costs, they have little incentive for more efficient designs.¹⁵ Regulations mandating building efficiency standards will increase efficiency and educate consumers in possible energy savings.¹⁶

Decoupling utility profits from sales eliminates the incentive to sell more energy.¹⁷

Combined heat and power systems increase the efficiency of fossil fuels by converting waste heat produced by electricity generation into usable energy, increasing the efficiency from about thirty to ninety percent of the fuel’s potential energy.¹⁸ A public benefits charge provides

funding for state or federal agencies to implement and monitor efficiency programs.¹⁹

The next administration should assume global leadership by aggressively supporting innovative solutions to climate change. While renewable energy sources are a vital and effective tool in the effort to reduce GHG emissions, energy efficiency is a source of immediate and extensive benefits. The next national energy policy must require both renewable energy sources and greatly increased energy efficiency.



Energy efficiency can reduce GHG emissions while renewable technologies become cost-effective.

Endnotes:

¹ Marilyn A. Brown et al., *Reduced Emissions and Lower Costs: Combining Renewable Energy and Energy Efficiency into a Sustainable Energy Portfolio Standard*, THE ELECTRICITY JOURNAL, May 2007, at 62, 63.

² Joel N. Swisher, *Potential Carbon Emissions Reductions from Energy Efficiency by 2030*, in TACKLING CLIMATE CHANGE IN THE U.S. 39, 48 (Charles F. Kutscher ed., 2007).

Endnotes: Doing More with Less *continued on page 81*

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THE STATES AND THE WORLD:

TWIN LEVERS FOR REFORM OF U.S. FEDERAL LAW ON TOXIC CHEMICALS

by Daryl W. Ditz*

INTRODUCTION

At the 1992 Earth Summit in Rio de Janeiro, toxic chemicals were recognized as a serious threat to sustainable development.¹ Governments and civil society responded with an array of international treaties, regional agreements, and diverse national efforts to reduce the impacts on human health and the global environment from dangerous substances. For many years the United States played an important role in furthering these international efforts. Yet in one important respect, the United States still lags behind. After three decades of experience with the federal Toxic Substances Control Act (“TSCA”), the United States lacks effective national legislation to manage industrial chemicals within its own borders. This Article examines the unfortunate stagnation of U.S. chemical policy and the resulting response by many state governments that are acting to protect their citizens from the pervasive dangers of industrial chemicals.² This bottom-up pressure, combined with accelerating international progress, sets the stage for a long overdue overhaul of U.S. federal policy on chemicals.

The rise of state activism on toxic chemicals reflects the convergence of three powerful forces. First, scientific evidence is rapidly accumulating that hundreds to thousands of chemicals once deemed safe actually threaten public health. This includes new research examining the subtle biological and ecological consequences of chemicals at low concentrations, as well as a growing awareness of chemical exposures in industrialized countries and in regions far removed from polluting sources. Second, these state actions are a direct reaction to profound legal and political obstacles preventing an effective federal response. Third, these state actions are often inspired and bolstered by parallel international developments, including regulatory actions by other countries, multilateral treaties and other agreements, and corresponding shifts in global markets. Taken together, efforts by the states are driving the eventual reform of U.S. federal policy on chemicals and making an important contribution to sustainable development.

Before examining the nature of these state actions and their relationship to U.S. federal law, it is important to clarify the scope of chemicals policy. In contrast with environmental laws on air pollution, water pollution, and hazardous wastes that preceded

or followed enactment of TSCA in 1976, chemical policy aims to influence the basic ingredients of our industrial economy. At least in intent, chemical policy shares a common outlook with laws governing the pre-market approval of new medicines.

While pharmaceutical and agricultural chemicals are explicitly exempted from TSCA, so-called “industrial” chemicals are not confined to industrial uses alone. Indeed, the tens of thousands of chemicals under the purview of TSCA are routine constituents of myriad commercial and consumer products from household cleaners to computers, from cosmetics to construction materials. The authority for implementing TSCA rests with the U.S. Environmental Protection Agency (“EPA”) and is not delegable to the states.³ Generally speaking, states are authorized under TSCA Section 18 to prohibit uses of chemicals that EPA has not regulated.⁴

TSCA has proven a slow and cumbersome tool for compelling chemical manufacturers to provide key information.

THE FAILINGS OF TSCA

TSCA was launched in 1976 with great expectations. EPA Administrator Russell Train noted that the aim of the new law was “to give public health far more of the weight that it deserves in the decisions by which chemicals are commercially made and marketed, by which they enter and spread throughout the human environment.”⁵

Over the years, however, it has become clear the TSCA itself is incapable of meeting this goal.⁶ A 2005 report by the Government Accountability Office (“GAO”) reiterated the long-recognized defects of TSCA.⁷ Among its principal shortcomings is the high burden of proof placed on EPA to demonstrate that a chemical poses unreasonable risks as a precondition for taking regulatory action. This challenge is compounded by the fact that TSCA has proven a slow and cumbersome tool for compelling chemical manufacturers to provide key information. The federal toxics law fails to require even basic screening level data for most chemicals in the marketplace.⁸ EPA’s abilities are especially constrained for the tens of thousands of existing chemicals that were grandfathered when TSCA entered into force. This

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statutory distinction has a significant impact on EPA's ability to effectively regulate, because the vast majority of industrial chemicals in commerce today are the very same chemicals that U.S. industry produced in the 1970s. The crowning blow to TSCA's effectiveness is a nearly impossible requirement that any proposed EPA action be the least burdensome of all options.

There is ample evidence that EPA has accomplished little under TSCA, especially with regard to assessing and assuring the safety of tens of thousands of existing chemicals. According to GAO, EPA has issued regulations compelling toxicity testing for less than 200 of the 62,000 substances that existed at the time of TSCA's passage.⁹ Similarly, EPA has used the regulatory power of TSCA's Section 6 to prohibit the manufacturing, processing, or distribution of a mere five existing chemicals in thirty years.¹⁰ This crucial regulatory provision has not been used to control even a single chemical since 1991, when the U.S. Fifth Circuit Court of Appeals overturned EPA's asbestos rule.¹¹

Today, the law's few enthusiasts tend to be those chemical manufacturers with an interest in minimal regulation.¹² But the static state of current federal regulation has even some customers of the chemical industry worried. Ernie Rosenberg, President and CEO of the Soap and Detergent Association and former head of EPA's new chemicals review in the 1970s, has said: "The toxics law needs to impart confidence and TSCA no longer does."¹³

THE RISE OF STATE LAWS ON TOXIC CHEMICALS

Given EPA's remarkable inability to regulate most industrial chemicals under TSCA, it is unsurprising that state governments have felt pressured to fill the gap, stepping in to protect the health and well-being of their citizens. This trend is vividly illustrated by a series of state bills, executive orders, and legislative enactments to control a class of commercial flame retardants called polybrominated diphenyl ethers ("PBDEs"). These substances have been incorporated in a wide range of products, including electronic equipment, furniture and fabrics to inhibit fire. Unfortunately, PBDEs and other brominated flame retardants persist in the environment and can accumulate in the food chain. PBDEs concentrations have risen sharply in human breast milk and have been detected in people and wildlife, even in the Arctic. Research indicates that PBDEs and closely related compounds are associated with adverse effects on neurodevelopment, reproductive health, and endocrine function in mammals.¹⁴

In 2003 California passed the first state law to restrict the use of two commercial PBDE mixtures, penta-BDE and octa-BDE. Use of these chemicals in electronic equipment was already the subject to the new Restriction on Hazardous Substances ("RoHS") directive in Europe, a fact that helped bolster the case for controls in California.¹⁵ Over the next two years seven more states followed suit and a total of eleven states enacted comparable laws by 2007.¹⁶ In addition to the speed and geographical expansion of PBDE bans, states have broadened the scope of restrictions. In 2007 Washington and Maine each passed legislation restricting future uses of deca-BDE, a related PBDE compound that can degrade to more hazardous forms but which so far lacks the same clear evidence of harm. Legislation to restrict

deca-BDE was proposed in eight other states.¹⁷

The case of brominated flame retardants is the clearest example of how public demands, international precedents, and market forces have fueled a flurry of state action. But other chemicals have attracted attention as well. A class of plastic softeners called phthalates, bisphenol A used in the manufacture of hard plastic bottles and food can linings, pharmaceutical uses of the pesticide lindane, and perfluorinated chemicals used in nonstick and stain-resistant applications have all been the focus of proposed state regulation, along with more familiar pollutants such as mercury, lead, and other heavy metals. The Safer Alternatives bill in Massachusetts, which builds on the state's long experience under its pioneering Toxics Use Reduction Act, targets ten diverse chemicals including PBDEs, lead, formaldehyde, perchloroethylene, and dioxins.¹⁸

Some of these bills go beyond chemical-specific limitations to create new policy approaches and programs. Studies of toxic chemicals in people—including health experts, public officials, and ordinary Americans from newborns to grandmothers—provide a potent symbol of the failure to control industrial chemicals.¹⁹ Furthermore, so-called biomonitoring is also a feature of some policy reforms. In 2006 California enacted the nation's first statewide program for sampling chemical contamination in people. Biomonitoring was also part of state bills introduced in New York, Washington, and Indiana.²⁰ California has also launched one of the most ambitious efforts to explore the environmental and economic benefits of becoming a "world leader in developing, adopting and supplying green chemistry solutions for the 21st century."²¹ This builds on an important 2006 report commissioned by the state legislature that concludes that TSCA had directly contributed to gaps in data, safety, and technology—to the disadvantage of California businesses and citizens.²²

U.S. chemical manufacturers might reasonably conclude that efforts to regulate chemicals at the state and local level will expand, subjecting them to a convoluted patchwork of regulation. In the past session of the California legislature, some fifty bills were introduced relating to chemicals, pollutants, and environmental health.²³ To be sure, lobbyists for the chemical industry and manufacturers of specific chemicals have poured resources into fighting these state bills. They have also launched some unsuccessful efforts in Congress to explicitly preempt states from establishing stricter standards on individual chemicals, mandating tighter security at chemical plants or enacting other measures affecting environmental health and safety.

But these state initiatives are not random attacks on the chemical of the moment. In fact, they only appear surprising in contrast with the status quo of U.S. federal inaction. When viewed in the context of developments taking place in other industrialized countries, the state actions can be viewed as parallel actions guided by similar goals and founded on shared principles.

INTERNATIONAL PROGRESS ON CHEMICALS

These state policy initiatives on chemicals are clearly necessitated by the conspicuous absence of meaningful federal action. But international developments have also spurred state action.

The coordinated state focus on PBDEs restrictions benefited from the European RoHS Directive and its direct effects on the global electronics industry.²⁴ Such international precedents provide state campaigners with relevant information on chemical hazards, uses, and potential alternatives. They also demonstrate the political and commercial feasibility of taking action, a powerful counterweight to typical industry predictions of catastrophic impacts.

The 2001 Stockholm Convention on Persistent Organic Pollutants (“POPs”), an international treaty to control certain chemicals, offers another lever for state initiatives.²⁵ Countries that are party to the treaty commit to reduce or eliminate releases persistent, bioaccumulative, and toxic chemicals (“PBTs”) that pose a global threat to human health or the environment. The convention lists twelve POP chemicals and includes a mechanism for adding additional chemicals. As of late 2007, eleven chemicals are under review for possible addition to the Stockholm Convention, including penta-BDE and octa-BDE, lindane and a suite of perfluorinated compounds. Since its entry into force in 2004, the POPs treaty promises to provide a source of data, experience, and inspiration for future policy initiatives, including initiatives by states.²⁶ While the United States signed the POPs treaty in 2001, Congress has yet to pass the necessary amendments to TSCA and the federal pesticide statute to allow U.S. implementation. The 109th Congress considered but failed to adopt a proposal that would have preempted state rules on new POPs that were stricter than future federal regulations.²⁷ As a result, the United States remains an observer while 148 nations work to expand this important international environmental agreement.

While the RoHS Directive and the Stockholm POPs Convention target small numbers of chemicals, an expansive new European Union law is beginning to cause sweeping changes in the management of industrial chemicals. The regulation for Registration, Evaluation and Authorization of Chemicals, better known by the acronym “REACH,” is the product of an unprecedented political debate to overhaul a series of existing rules on the manufacture, import, and use of chemicals.²⁸ With the expansion of the European Union to twenty-seven nations, the EU is the world’s largest producer and largest market for chemicals, with a major impact on practices worldwide.²⁹

In brief, REACH will require basic safety information on chemicals made or imported in the EU above one metric ton per year, a scope that could eventually cover as many as 30,000 industrial chemicals. Industry bears the burden of proof under REACH, with government authorities providing evaluation and enforcement. Chemicals deemed of “very high concern,” including carcinogens, mutagens, and PBTs, are subject to authorization, which may lead to use-specific restrictions or bans.³⁰ As REACH is implemented over the next decade, U.S. states and the federal government can expect a steady influx of new data on chemical hazards, uses, and safer alternatives. U.S. advocates for policy reform are sure to make use of this important resource.

PRINCIPLES FOR REFORM

These international initiatives bear a striking resemblance to many of the state actions regulating chemicals. This is no

coincidence. These actions are driven by common concerns and shared objectives. An understanding of these underlying motivations helps to place recent state bills in perspective and suggest future directions. For example, at the World Summit on Sustainable Development in Johannesburg, South Africa in 2002—ten years after the Rio Earth Summit—world leaders reaffirmed the call to action of Agenda 21 and set a global goal for the sound management of chemicals by the year 2020.³¹

This 2020 Goal figured in the timeline for the implementation of REACH. In the United States, environmental advocates have also adopted 2020 as an important milestone for eliminating dangerous chemicals. The Louisville Charter for Safer Chemicals represents one important public statement about accomplishing federal reform by 2020.³² The Louisville Charter has been endorsed by dozens of environmental health advocates working at the community, state and federal levels. More importantly, it articulates a set of principles that are informing state and federal thinking on chemical policy: (1) requiring safer substitutes and solutions; (2) phasing out persistent, bioaccumulative, or highly toxic chemicals; (3) giving the public and workers the full right-to-know and participate; (4) acting on early warnings; (5) requiring comprehensive safety data for all chemicals; and (6) taking immediate action to protect communities and workers.

If these principles sound familiar, it may be because the drafters drew heavily on the Copenhagen Charter for Safer Chemicals, a public statement by European environmental and health advocates in the early days of the REACH debate.³³ It is instructive to consider the state actions on chemicals in light of these principles. The state bills targeting PBDEs, lindane, and other PBTs fit squarely with the priority attention that this statement gives to persistent, bioaccumulative toxics. The emphasis on developing safer substitutes and solutions is echoed in several state bills that call for a proactive examination of alternatives to avoid an inadvertent shift from bad to worse, and to facilitate a smooth transition for downstream users of banned substances.

The calls for comprehensive safety data and greater right-to-know speak to the serious legacy problems of inadequate information. Despite many years of the voluntary EPA-industry High Production Volume Challenge program, there is still a dearth of information needed for assessing risk and prioritizing action on chemicals.³⁴ This lack of information demonstrates the value of biomonitoring programs, which can be instrumental in identifying substances to which humans are intimately exposed rather than relying on hypothetical predictions.

It is also important to note that several of these principles address the process by which decisions about chemicals are made. The references to acting on early warnings and taking prompt measure to protect workers and communities are a reaction against a system that appears mired in a kind of risk analysis paralysis that frequently justifies business as usual. The statement conveys an urgency to provide environmental justice for communities disproportionately burdened by chemicals. In addition to the removing dangerous chemicals, the statement is framed in positive terms, including a stated desire to spur innovation, invest in new technologies, and empower workers and

communities to have a voice in decisions that can affect their health.³⁵

CONCLUSION: TOWARDS A NEW U.S. POLICY ON CHEMICALS

One consequence of state success in enacting stricter controls on chemicals is that it could lead to a patchwork quilt of disparate standards and requirements. But there are many reasons why most advocates for reform of U.S. policy would not be satisfied with scattered state progress alone. For one, such an outcome would not guarantee the same basic protection to all Americans. It would create structural incentives for shifting operations involving hazardous chemical to states with weaker laws. Furthermore, a state-based approach to chemicals management would not be able to employ the legal, technical, and financial resources available to the federal government. States are historically the laboratories of democracy, but it does not follow that the federal government should do nothing.

Indeed, the current upsurge of state laws on chemicals aims not only to protect their own citizens, but also to create a political environment for long overdue national reform. This political tumult in the states will increase pressure on Congress and future presidents to adopt a new outlook on chemicals. The Senate and the House of Representatives has yet to begin a broad debate over the issue, and deep partisan divides make it difficult to begin the process. Given the Bush Administration's lack of interest in TSCA reform—and its open animosity to the EU REACH legislation—the prospects for passing and enacting major chemical legislation is virtually nonexistent in the 110th Congress.

Yet, taking a longer view, there is some cause for optimism.³⁶ Even in the dark, harshly anti-environmental climate of the 109th Congress, with both houses and the White House in Republican hands, some proposed legislation set out bold goals. The Child, Worker, and Consumer-Safe Chemicals Act (“Kid Safe Chemicals Act”), was introduced by Senator Frank Lautenberg (Dem-NJ) and Jim Jeffords (Ind-VT) and in the House

by Representative Henry Waxman (Dem-CA).³⁷ The Kid Safe Chemicals Act proposed major amendments to the core provisions of TSCA borrowing heavily from policy elements of REACH and U.S. experience with pesticides. In addition, it would have included mandatory biomonitoring and provided dedicated funding for research and development into green chemistry. It also asserted the proper role for federal preemption as a floor, not a ceiling, for state action. Unfortunately, the majority never allowed for a hearing on the bill and it expired at the end of the term.

With the switch in political control in the 110th Congress, new committee chairs and new leadership created opportunities for debating a host of environmental, health, and economic issues that were not on the agenda for the past several years. This is particularly notable in connection with energy policy and climate change. In February 2007 Senator Lautenberg announced his intention to reintroduce the Kid-Safe Chemicals Act, although this has yet to happen. In any case, Congress has begun to consider some narrowly targeted chemical issues including perchlorate, phthalates, asbestos, and a few broader initiatives to strengthen environmental justice protection and public right-to-know.

If anything, this is further justification of the crucial importance of continued state action on chemicals. It could still take years to raise public and political awareness of the need for change, and even longer to undertake the hard work of negotiating policy solutions. In the meantime, effective state action provides a means for addressing specific chemical threats and for broadening the constituency for reform. As workers, health professionals, faith communities, businesses, and others come to see the sense of comprehensive reform, Congress will have no choice to but to confront the challenge. By then, thanks to steady progress on the international and local levels, federal lawmakers will be able to fashion a policy framework that puts the United States on a more sustainable path for the sound management of chemicals.



Endnotes: The States and the World

¹ U.N. Conference on Environment and Development, June 13–14, 1992, *Rio Declaration on Environment and Development*, U.N. Doc. A/CONF.151/26, ch. 19, available at <http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=78&ArticleID=1163> (last visited Nov. 17, 2007).

² 15 U.S.C. §§ 2601-2692 (2007).

³ 15 U.S.C. § 2602(1).

⁴ 15 U.S.C. § 2617.

⁵ Press Release, U.S. Environmental Protection Agency, Train Sees New Toxic Substances Law as “Preventative Medicine,” (Oct. 21, 1976), available at <http://www.epa.gov/history/topics/tsca/03.htm> (last visited Oct. 9, 2007).

⁶ Lynn Goldman, *Preventing Pollution? U.S. Toxic Chemicals and Pesticides Policies and Sustainable Development*, 32 ENVTL. L. REP. 11018 (2002), available at <http://www.elr.info/articles/vol32/32.11018.cfm> (last visited Nov. 17, 2007).

⁷ GAO, CHEMICAL REGULATION: OPTIONS EXIST TO IMPROVE EPA'S ABILITY TO ASSESS HEALTH RISKS AND MANAGE ITS CHEMICAL REVIEW PROGRAM, GAO 05-458 (June 2005), available at <http://www.gao.gov/new.items/d05458.pdf> (last visited Nov. 17, 2007) [hereinafter GAO, CHEMICAL REGULATION].

⁸ 15 U.S.C. § 2601(b) (“It is the policy of the United States that—(1) adequate data should be developed with respect to the effect of chemical substances and mixtures on health and the environment and that the development of such data should be the responsibility of those who manufacture and those who process such chemical substances and mixtures.”)

⁹ GAO, CHEMICAL REGULATION, *supra* note 7.

¹⁰ See GAO, CHEMICAL REGULATION, *supra* note 7 (stating that the five chemical substances include polychlorinated biphenyls (PCBs), fully halogenated chloro-fluoroalkanes (CFCs), dioxins, asbestos, and hexavalent chromium).

TSCA AND ENGINEERED NANOSCALE SUBSTANCES

by Lynn L. Bergeson & Ira Dassa*¹

INTRODUCTION

Nanotechnology is now the subject of much excitement and attention, with applications proliferating quickly. Thus, engineered nanoscale materials' ("ENM") implications for human health and the environment, and the critical need for governments throughout the world to get the policy and regulatory framework right has garnered much attention. Most would agree that the ultimate goal for society is to enable nanotechnology to realize its potential while effectively addressing the pertinent environment, health, and safety ("EHS") issues associated with ENM.

Domestically, the Toxic Substances Control Act ("TSCA") is the federal environmental law most often mentioned in connection with regulating ENM. It provides the framework for the U.S. Environmental Protection Agency ("EPA") to manage new and existing chemical substances throughout their production, use, and disposal.² This Article considers several issues in connection with the application of TSCA to ENM. It does not propose comprehensive resolutions, but rather seeks to raise awareness and promote further discussion of these issues.

BACKGROUND ON NANOTECHNOLOGY

Nanotechnology, the "understanding and control of matter at dimensions of roughly 1 to 100 nanometers, where unique phenomena enable novel applications,"³ is expanding rapidly. It is viewed broadly as encompassing many technologies that over time will generate many new products and applications. Lux Research, a nanotechnology research and advocacy firm, predicts that by 2014, products incorporating nanotechnology will constitute fifteen percent of global manufacturing output and will total \$2.6 trillion.⁴

One of the key reasons governments and inter-governmental organizations around the world are focusing on nanotechnology is the lack of understanding in all cases regarding the EHS effects of exposure to ENM. Some believe that the information that exists warrants caution. The small size of certain nanoparticles facilitates their biological uptake into cells and their movement in the body more readily than is the case with their macro/bulk counterparts.⁵ Other factors about nanoparticles contribute to a general sense of uncertainty regarding the health and environmental effects of exposure to ENM. ENM can have properties that do not conform to conventional physics and chemistry, potentially increasing risk.⁶

Set forth below is an overview of TSCA—the statute and EPA's implementing regulations—followed by a discussion of the key issues that have arisen regarding the application of TSCA to ENM and a review of EPA's TSCA-related nanotechnology initiatives to date.

TSCA OVERVIEW

Congress enacted TSCA in 1976 to protect human health and the environment from potentially harmful chemical substances and mixtures. The statute authorizes EPA to regulate "chemical substances,"⁷ defined to mean "any organic or inorganic substance of a particular molecular identity."⁸ EPA has explained that ENM "which meet the TSCA definition of 'chemical substance[]' are subject to TSCA."⁹

TSCA Section 8(b)(1) directs EPA to "compile, keep current, and publish a list of each chemical substance which is manufactured or processed in the United States."¹⁰ This list is known as the TSCA Chemical Substance Inventory ("Inventory"). Chemical substances included on the Inventory are considered existing chemical substances for purposes of TSCA, while the statute expressly defines "any chemical substance which is not included

[on the Inventory]" as a "new chemical substance."¹¹ Therefore, under TSCA, the government considers a chemical substance as an existing chemical substance or a new chemical substance. For ENM, this distinction is significant.

EPA published the initial Inventory in 1979 and continually updates it. EPA adds new chemical substances to the Inventory after a Premanufacture Notice ("PMN") and subsequent Notice of Commencement of Manufacture or Import ("NOC") have been submitted pursuant to TSCA Section 5.¹² As of early 2007, the Inventory listed approximately 83,000 chemical substances.¹³

EPA'S PMN AUTHORITY

TSCA Section 5 governs the manufacture and import into the United States of new chemical substances, in addition to the

The small size of certain nanoparticles facilitates their biological uptake into cells.

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manufacture, import, and processing of existing chemical substances for a use that the EPA determines to be a “significant new use.”¹⁴ New, but not existing, chemical substances are subject to the PMN requirement set forth in TSCA Section 5(a)(1) (A).¹⁵ Unless a PMN exemption applies, a company must submit a completed PMN form to the EPA at least ninety days before commencing the manufacture or import of any new chemical substance.¹⁶ Through the PMN review process, EPA assesses the new chemical and determines whether its manufacture, importation, processing, and/or distribution in commerce may present an unreasonable risk of injury to health or the environment.¹⁷

Exemptions from the PMN process are either “self-executing” or require prior EPA approval. Self-executing exemptions are those that take effect once an entity determines that the exemption applies, and the company can manufacture the new chemical substance in the United States without the need for a PMN, provided that they comply with any recordkeeping or other applicable requirements for the particular exemption. Self-executing PMN exemptions include the exemption for chemical substances with no separate commercial purpose,¹⁸ the polymer exemption,¹⁹ and the research and development (“R&D”) exemption.²⁰

Other exemptions from the PMN requirement require prior EPA approval. In those situations, entities must submit, and EPA must approve, an exemption application before the entity can commence manufacture of the new chemical, subject to compliance with any recordkeeping or other applicable requirements. PMN exemptions that require prior EPA approval include the low volume exemption (“LVE”),²¹ the low release and low exposure exemption (“LoREX”),²² and the test marketing exemption (“TME”).²³

The PMN exemptions of greatest importance to the emerging nanotechnology industry include the LVE, the LoREX, and the R&D exemption,²⁴ which appears to be uniquely well-suited for nanotechnology R&D undertaken by start-up companies, research laboratories, universities, and others. As noted above, the LVE and the LoREX require prior EPA review and approval.

The EPA bases eligibility for an LVE on the manufacture of a new chemical in quantities of 10,000 kilograms—approximately 22,000 pounds—or less per year, while it bases eligibility for a LoREX on meeting several regulatory criteria for release and exposure throughout the manufacture, processing, distribution, use, and disposal of the chemical.²⁵ Once EPA notifies an applicant that it granted the LVE or LoREX application, or if the thirty-day review period expires without notice from EPA, manufacture or import of the chemical substance may commence, consistent with the terms of the exemption.²⁶

TSCA Section 5(e) authorizes EPA to issue administrative orders controlling new chemical substances when it finds, after review of a PMN, that insufficient information exists to permit a reasoned evaluation of the risk, and either the chemical may present an unreasonable risk to health or the environment, or it will be produced in substantial quantities that will enter the environment or to which there will be substantial or significant

human exposure.²⁷ In an order, the EPA may ban or limit the manufacture, processing, distribution, use, or disposal of the chemical.²⁸ EPA must propose a Section 5(e) order prior to the expiration of the ninety-day PMN review period.²⁹ As a matter of practice, rather than acting unilaterally under Section 5(e), EPA typically enters into a consent order with a PMN submitter, under which the latter agrees to restrict the manufacture, processing, distribution, use, or disposal of the new chemical substance pending the development of data necessary to evaluate the potential hazards.

EPA’S “SIGNIFICANT NEW USE” AUTHORITY

TSCA Section 5 authorizes EPA to review and assess the potential risks posed by significant new uses of existing chemical substances.³⁰ A significant new use rule (“SNUR”) determines that a use is significant and new.³¹ A Significant New Use Notice (“SNUN”) is the form an entity must submit to EPA at least ninety days prior to any manufacture, import, or processing for that use.³² Some have suggested that the co-location of EPA’s SNUR authority and PMN requirement in the same statutory section is a clear indication that Congress intended EPA to regulate new chemicals and significant new uses of existing chemicals similarly.³³ In fact, the TSCA legislative history reveals that EPA’s SNUR authority complements its PMN authority.³⁴

A key distinction between EPA’s PMN authority and its SNUR authority is that under the latter, EPA first must issue a SNUR, whereas with the former, both the statute and a generic implementing rule already mandate the submission of a PMN.³⁵ Once EPA issues a SNUR, the two provisions operate in much the same way, and a SNUN is submitted on the same form and contains virtually the same information as a PMN.

In promulgating a SNUR, EPA must explain how it considered all relevant factors, including the following factors specifically mentioned in the statute: “the projected volume of manufacturing and processing . . . the extent to which a use changes the type or form of exposure to human beings or the environment . . . the extent to which a use increases the magnitude and duration of exposure of human beings or the environment . . . and . . . the reasonably anticipated manner and methods of manufacturing, processing, distribution in commerce, and disposal.”³⁶ EPA need not make a legal finding with respect to the potential harm that the existing chemical may pose, but rather, EPA need only consider the relevant factors.³⁷

Importantly for present purposes, EPA is authorized to issue SNURs for categories of chemical substances.³⁸ The term “category of chemical substances” is defined as “a group of chemical substances the members of which are similar in molecular structure, in physical, chemical, or biological properties, in use, or in a mode of entrance into the human body or into the environment, or the members of which are in some other way suitable for classification as such for purposes of [TSCA].”³⁹ Thus, the criteria for qualifying as a category are extremely broad.

EPA’S AUTHORITY UNDER TSCA SECTION 8

TSCA Section 8 gives EPA broad information-gathering powers. These powers include the ability to impose recordkeep-

ing and reporting requirements for production, use, and exposure-related information under Section 8(a),⁴⁰ and requirements for the submission of “health and safety study” data under Section 8(d).⁴¹ Pursuant to regulations issued by EPA under Section 8(c), manufacturers, importers, and processors of chemical substances must create and maintain records of allegations—whether written or oral—that a particular chemical “caused a significant adverse reaction to health or the environment.”⁴² A company must make its Section 8(c) records available for inspection by EPA at any time and submit them to EPA upon request.⁴³

Section 8(e), the self-executing “substantial risk” reporting provision of TSCA, obligates manufacturers, processors, and distributors as follows:

Any person who manufactures, processes, or distributes in commerce a chemical substance . . . and who obtains information which reasonably supports the conclusion that such substance . . . presents a substantial risk of injury to health or the environment shall immediately inform [EPA] of such information unless such person has actual knowledge that [EPA] has been adequately informed of such information.⁴⁴

This reporting requirement is important and may have special significance for companies working with ENM. Historically, penalties for non-compliance with the Section 8(e)’s substantial risk reporting obligation have been severe, and the EPA collected its largest civil administrative penalty ever from alleged Section 8(e) reporting violations.⁴⁵

APPLICABILITY OF TSCA TO ENM

Several of the key TSCA issues raised in connection with the application of TSCA to ENM include whether TSCA should regulate ENM consisting of Inventory-listed chemicals as “new chemical substances;” whether certain PMN exemptions are appropriate when applied to ENM; and whether TSCA’s information-gathering and reporting provisions are sufficiently robust to address issues arising in connection with ENM.

ENM CONSISTING OF INVENTORY-LISTED CHEMICALS

Several well-respected organizations, including Environmental Defense (“ED”) and the Natural Resources Defense Council (“NRDC”), have questioned whether TSCA is well-suited to manage potential EHS risks believed to be posed by ENM. These organizations have recommended that nanoscale versions of Inventory-listed chemicals be considered new chemical substances for purposes of TSCA Section 5.⁴⁶ As stated by ED, “engineered nanomaterials are ‘new’ substances under TSCA (and thus subject to PMN review), even where a material has a chemical structure that is identical to a substance already included on the Inventory, unless the nanomaterial’s chemical and physical properties are demonstrably identical to an existing conventional substance with the same chemical structure.”⁴⁷ In short, the argument is that because nanoscale versions of existing macro-scaled chemicals are designed to have novel and enhanced properties and/or characteristics that differ from the macro-sized counterparts, it is reasonable to conclude that the nanoscale versions may pose risks not associated with their con-

ventional counterparts, such that the nanoscale versions should be considered new chemicals and thus subject to PMN review.

TSCA applies to ENM that meet the broad statutory definition of “chemical substance.” Conceding that ENM, which are chemical substances, are subject to TSCA, the issue really is which TSCA provisions apply. Proponents of the argument that nanoscale versions of existing chemicals should be regulated as new substances claim this interpretation of TSCA is good public policy and could prevent any unintended adverse human health and environmental consequences that may be associated with ENM. They also assert that ENM are of interest precisely because they are new and special. Because these materials are believed to offer new features and added value, they should be subject to TSCA’s new chemical review provisions.⁴⁸ A third argument offered is that the TSCA definition of “chemical substance” encompasses more than just a substance’s molecular structure. ED, for example, claims nothing in TSCA expressly precludes the definition of “chemical substance” from including physical and chemical properties.⁴⁹

The American Chemistry Council (“ACC”) Nanotechnology Panel, on the other hand, claims that nanoscale versions of Inventory-listed substances are not new chemical substances for TSCA purposes and cannot be considered new based on the very definition of “chemical substance.”⁵⁰ A “chemical substance” is defined by its “particular molecular identity,” and the definition makes no mention of a substance’s physical and chemical properties.⁵¹ In ascertaining whether a particular substance appears on the Inventory, all that matters legally, according to the ACC Nanotechnology Panel, is whether, based on the substance’s molecular identity, it is or is not listed on the Inventory.⁵²

Additionally, the Panel claims that EPA’s historic course of conduct has been to consider only a chemical substance’s molecular identity, not its physical or chemical properties. This argument finds support in the ABA SEER Paper, which asserts “EPA’s emphasis on molecular structure is reflected in the PMN review process.”⁵³ The ABA SEER Paper continues:

The initial steps of the PMN review process involve EPA establishing a complete and accurate chemical name for the substance and determining whether the chemical is already on the Inventory. If EPA determines, based on the chemical identity of the substance, that it is already on the Inventory, the PMN review ceases and the submitter is notified that the chemical can be manufactured in the U.S. This determination is made without any reference to the physical or chemical properties of the chemical.⁵⁴

The ABA SEER Paper acknowledges that the statutory term “particular molecular identity” is “sufficiently flexible as to take into account physical properties or other defining characteristics in addition to molecular structure, at least to a limited degree,” but it concludes “molecular structure is the definitive characteristic in most instances.”⁵⁵

Even if EPA announced that nanoscale versions of Inventory-listed chemicals are existing and not new chemicals for TSCA purposes (and as will be seen below, EPA is leaning

strongly in this direction), EPA nonetheless has broad authority under TSCA to consider any potential risks posed by nanoscale substances. The ABA SEER Paper emphasizes that, beyond the PMN requirement, EPA has broad authority under other provisions of TSCA to address potential risks posed by ENM.⁵⁶

Key among the other provisions is EPA's SNUR authority. As indicated above, EPA can issue a SNUR, thereby triggering the need for companies to submit a SNUN.⁵⁷ TSCA Sections 5(a)(1)(B) and 5(a)(2) thus enable EPA to perform the same risk assessment and implement the same risk management controls on existing chemical substances engineered at the nanoscale that can be applied to new chemical substances through the PMN process.⁵⁸ SNUNs and PMNs use the same submission form, EPA Form 7710-25,⁵⁹ and both notices "undergo the same review process."⁶⁰ Notably, EPA is authorized to issue a Section 5(e) (or Section 5(f)) order for any chemical substance "with respect to which notice is required by [Section 5(a)]," and that notice can be either a PMN under Section 5(a)(1)(A) or a SNUN under Section 5(a)(1)(B).⁶¹

In promulgating a SNUR, EPA must consider all relevant factors, including the four factors listed in the statute. Of the four statutory factors discussed above, the latter three appear to be especially relevant to ENM.⁶² EPA, however, is not restricted to the four statutory factors, and in fact "construes the statute to allow consideration of any other relevant factors."⁶³

The ABA SEER Paper also points out that EPA is not limited to issuing SNURs for individual ENM. Given the great diversity that reportedly characterizes these materials, EPA's authority to issue a SNUR for a category or categories of existing ENM is important, particularly as the criteria for qualifying as a category are broad and may mean merely being "in some . . . way suitable for classification as such for purposes of [TSCA]."⁶⁴

APPROPRIATENESS OF CERTAIN PMN EXEMPTIONS

The appropriateness of several of the PMN exemptions is also debated. ED, for example, has urged the EPA "not to apply mass-based, or other exemptions in the PMN program, unless the underlying scientific rationale is appropriate when applied to nanomaterials."⁶⁵ A key issue is the relevance of mass-based and volume-based criteria as applied to ENM, and whether these criteria could ever apply to ENM, which are in many cases unlikely to be produced in substantial quantities.

The appropriateness of the LVE in particular has been questioned on the grounds that the threshold level of 10,000 kilograms is too high, especially considering that few companies are expected in the near term to be producing ENM in amounts even approaching that level.⁶⁶ At first glance, the suitability of this PMN exemption may seem questionable, but a closer review may suggest otherwise. Because the exemption requires prior

EPA approval, EPA's consideration of any potential risks posed by the ENM at issue can be expected to be comprehensive. In fact, EPA's review of a PMN exemption for a carbon nanotube, originally submitted as a LVE, but later converted to a LoREX, took approximately one year and likely consumed considerable EPA resources and generated no small amount of deliberation and scrutiny.⁶⁷

Although the LVE allows certain new chemicals, including those falling into the category of ENM, to avoid the full panoply of PMN review, this does not mean EPA does not consider carefully the EHS implications of the candidate substance. Indeed, the level of scrutiny the EPA reportedly devoted to the LVE/LoREX application likely exceeded the degree of scrutiny typically reserved for conventional new chemicals reviewed under the PMN program.

APPROPRIATENESS OF REPORTING OBLIGATIONS UNDER TSCA SECTION 8

Whether certain TSCA information-gathering and reporting obligations, particularly Section 8(e), apply to ENM is another debated issue. EPA, however, has made it clear that the Section

8(e)'s substantial risk reporting obligation applies to all chemicals, including nanoscale materials consisting of chemical substances.⁶⁸ Hence, if a person learns that a nanoscale-sized version of an existing chemical substance poses hazards different from those associated with its bulk counterpart, and if that information reasonably supports the conclusion that the nanoscale-sized version presents a substantial risk of injury, then

TSCA Section 8(e) requires reporting.⁶⁹

Similarly, TSCA Section 8(c) reporting obligations apply to persons manufacturing, importing, processing, or distributing ENM in commerce. Such persons must maintain, and make available to the EPA for inspection, records of significant adverse reactions alleged to have been caused by the particular ENM. Under EPA's implementing regulations, this means that if anyone, including a company's employees, customers, or neighbors, makes a written or oral statement to the effect that an ENM caused a significant adverse effect, the company must maintain a record of that allegation.

EPA NANOTECHNOLOGY INITIATIVES TO DATE

EPA is to be commended for its leadership, vision, and energy in exploring early and creatively the application of TSCA to ENM. Two regulatory initiatives are worthy of discussion.

TSCA PMN Decision Logic—EPA's Office of Pollution Prevention and Toxics ("OPPT") developed a decision logic that its staff applies in assessing ENM submitted to EPA for PMN review under TSCA Section 5, or as part of PMN exemption applications. Use of the logic is resulting in EPA's identifica-

EPA nonetheless has broad authority under TSCA to consider any potential risks posed by nanoscale substances.

tion of specific areas of inquiry unique to ENM. Primary among these areas are potential routes of exposure to workers and potential environmental releases. EPA is assessing the adequacy of personal protective equipment to prevent potential exposures to ENM during the manufacturing, processing, and/or distribution and use of these materials. EPA's decision logic is believed to distinguish between true ENM, meaning those materials that meet the criteria set out by the NNI, and those materials that fall within the size range of 1-100 nanometers, but are not specifically engineered with the intent to enable novel, size-dependent properties. According to published sources, EPA has, as of August 2006, reviewed fifteen new chemicals that were deemed to fall within the nanoscale size range, one of which, a carbon nanotube, possessed properties deemed unique and resulted in EPA's approval of a LoREX application in 2005.⁷⁰

Now, the Inventory includes at least two new ENM. On June 9, 2006, and August 14, 2006, EPA issued *Federal Register* notices acknowledging the receipt of NOCs of siloxane-coated silica and siloxane-coated alumina nanoparticles.⁷¹

Nanoscale Materials Stewardship Program—In 2005, OPPT announced its interest in considering how best to obtain much-needed information on existing ENM, and convened a public meeting to discuss various options in June 2005.⁷² The discussion at the public meeting yielded a consensus that a voluntary program on existing ENM would have significant value. Shortly thereafter, EPA created an Interim *Ad Hoc* Work Group on Nanoscale Materials (“Work Group”) as part of the National Pollution Prevention and Toxics Advisory Committee (“NPP-TAC”), a federal advisory group tasked with advising OPPT on TSCA and pollution prevention matters.⁷³ On November 22, 2005, after the Work Group had met several times, NPPTAC submitted to the EPA Administrator its *Overview Document on Nanoscale Materials*, which outlined a framework for an EPA approach to a voluntary program for ENM and a complementary approach to new chemical nanoscale requirements under TSCA, and addressed various other issues pertinent to ENM.⁷⁴


On October 18, 2006, EPA Assistant Administrator James Gulliford sent a letter to stakeholders formally announcing the development of the Nanoscale Materials Stewardship Program (“NMSP”) and inviting stakeholder participation in it.⁷⁵ Several months later, EPA simultaneously published three *Federal Register* notices related to the NMSP.⁷⁶ The first notice solicited public comment on EPA's proposed Information Collection Request under the Paperwork Reduction Act, including a draft form that NMSP participants could use to submit data to EPA;⁷⁷ the second announced a public meeting on the NMSP;⁷⁸ and the third solicited public comment on two draft documents: the “Concept Paper for the Nanoscale Materials Stewardship Program under TSCA” (“NMSP Concept Paper”) and the “TSCA Inventory Status of Nanoscale Substances—General Approach” (“TSCA Inventory Paper”).⁷⁹

The draft NMSP Concept Paper outlined EPA's “initial thinking on the design and development” of the NMSP and explained that the program, in keeping with the Work Group's recommendations, would consist of two parts, a “Basic Program” and an “In-Depth Program.”⁸⁰ The draft TSCA Inventory Paper “inform[ed] the public of the approach EPA has historically taken under TSCA in evaluating whether chemical substances are new, and further inform[ed] the public of EPA's intention to follow [the same] approach for nanomaterials that are chemical substances.”⁸¹ In the draft TSCA Inventory Paper, EPA explained that if a particular ENM has the same molecular identity as a non-nanoscale (*i.e.*, macro) substance that is listed on the TSCA Inventory, then the ENM is an existing chemical irrespective of its particle size and physical/chemical properties.⁸² Thus, the TSCA Inventory Paper runs counter to the view expressed by ED, NRDC, and others, that nanoscale versions of Inventory-listed chemicals should be deemed new for purposes of TSCA Section 5.

The comment period for the NMSP documents closed on September 10, 2007, and EPA is now reviewing the various comments submitted.⁸³ It is clear that EPA intends to proceed with the NMSP, and EPA hopes to launch the program by the end of 2007. EPA has indicated that regulatory efforts under TSCA are unlikely to happen until after the NMSP is well underway, but a TSCA Section 8(a) information-gathering rule is possible, and perhaps even likely.

CONCLUSION

The debate over TSCA's application to ENM will continue for some time. The discussion above demonstrates that EPA has broad authority under TSCA, and that new legislation intended to address any potential risks that ENM might pose is unnecessary. EPA can review ENM under TSCA Section 5(a), either as new chemicals or as significant new uses of existing chemicals. EPA can conduct a comprehensive review of the exemptions from the PMN requirement. EPA can also collect information on and compel and enforce reporting obligations with respect to ENM.

EPA's stated commitment to issue final guidance on these issues will greatly assist the regulated community in understanding EPA's expectations regarding the submission of PMN and exemption applications for ENM and thus better prepare industry to undertake its TSCA compliance obligations consistently. In the interim, chemical manufacturers would be wise to consider carefully their TSCA compliance obligations, obtain legal advice when necessary, and seek EPA's thoughts early and often regarding the regulatory status of ENM believed to consist of Inventory-listed substances. 

Endnotes: TSCA and Engineered Nanoscale Substances
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ENVIRONMENTAL STANDARDS IN U.S. FREE TRADE AGREEMENTS: LESSONS FROM CHAPTER 11

by Hena Schommer*

The U.S. bipartisan trade compromise, concluded on May 10, 2007, was the first to create enforceable labor and environmental standards to be applied to the pending Free Trade Agreements (“FTAs”) with Peru, Panama, Colombia, and Korea.¹ In 1994, the North American Free Trade Agreement (“NAFTA”), signed by the United States, Mexico, and Canada, broke new ground with the mention of sustainable development in its preamble.² NAFTA was the first multilateral trade agreement to include environmental protection.³ While breaking new ground NAFTA also included a problematic clause, Chapter 11, which provides a “right of action to a foreign investor against the government of the country in which it invested, for a broad range of actions taken” by the government.⁴ This right of action, included in the new FTAs, proved to be without a proper mechanism to guard against claims brought against countries for passing legislation to protect the environment, which might affect the future profits of a company.

Many governments and environmentalists have found Chapter 11 actions problematic in relation to governments’ attempts to pass environmental laws and regulations. Indeed, the right of an investor claim can be important for the fair treatment of corporations doing business in a foreign country. However, merely allowing the actions to go forward without a mechanism to evaluate the merits of the claim can strain governmental decision-making powers. In some cases, the threat of a claim may deter a government from establishing environmental protections. *Methanex v. United States* is one example of an action that may chill future government regulations. Methanex brought a claim against California for banning the import of a toxic fuel additive that leaked into groundwater and affected the health of the population.⁵ Another example is *Sunbelt Water v. Canada*. Sunbelt brought a claim against Canada for the loss of potential future earnings from bottled water exports, due to a change in Canadian government policy regarding water resource exports.⁶ Claims of this kind could ultimately deter a country from passing legislation to protect natural resources.

The latest wave of FTAs create new enforceable environmental standards while inheriting many of the controversial clauses from NAFTA. There is a concern regarding the ability of developing countries to use or manage natural resources without fear of actions being filed against them under these clauses. The case of *Bayview Irrigation District v. Mexico*⁷ illustrates the difficult position a country may find itself in while attempting to manage natural resources. Sixteen U.S. irrigation districts along with twenty-eight individuals brought suit against the Mexican government for the diversion of water into Mexican farmlands,

claiming that this deprived claimants of their water rights.⁸ The arbitration tribunal in June of this year decided that it had no jurisdiction over these claims and thus the parties had no claim under NAFTA Chapter 11.⁹ The Mexican government had to cover the costs and expend resources for two years to defend itself in international arbitration for which there was no jurisdiction.¹⁰ The potential expenditure of resources in international arbitration could prove to be a burden to developing countries and deter them from passing further environmental protections.

The emergence of environmental standards in international bilateral and multilateral trade agreements is a decidedly positive evolution in the past fifteen years bringing environmental issues into spheres where it was historically precluded. However, the continued inclusion of clauses in the recent FTAs similar to Chapter 11 could deter both developed and developing countries from passing necessary environmental regulation to protect their natural resources in the future. The discouragement of countries to act on behalf of protecting their land could have drastic environmental costs in developing countries, which often lack adequate environmental protections.

Thus, a preliminary mechanism to determine the validity of a company’s claim under Chapter 11 before litigation would be a step to allay the concerns of countries that may hesitate to enact protections due to a threat of litigation under trade rules. This mechanism will potentially alleviate the excessive costs and other burdens a developing country faces while defending itself against a claim that is interfering with its right to protect the environment.



¹ See U.S. Dep’t of State, International Information Programs, *Free Trade Pacts Might Gain Congressional Support* (June 28, 2007), available at <http://usinfo.state.gov/xarchives/display.html?p=washfile-english&y=2007&m=June&x=20070628130953saikceinawz0.8419306> (last visited Nov. 17, 2007).

² See Stephen P. Mumme, *NAFTA and Environment*, FOREIGN POL’Y IN FOCUS, Oct. 1999, available at <http://www.fpif.org/briefs/vol4/v4n26nafta.html> (last visited Nov. 17, 2007).

³ Mumme, *id.*

⁴ Madeline Stone, *NAFTA Article 1010: Environmental friend or foe?*, 15 GEO. INT’L ENVTL. L. REV. 763 (2003).

⁵ U.S. Dep’t of State, Office of the Legal Advisor, *Methanex Corp. v. United States*, available at <http://www.state.gov/s/l/c5818.htm> (last visited Nov. 17, 2007).

Endnotes: Environmental Standards in U.S. Free Trade Agreements
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MINNEAPOLIS BRIDGE COLLAPSE:

MOTIVATION TO BE SMARTER ON INFRASTRUCTURE OR LATEST IN A TREND?

by Mary Bortscheller*

The August 3, 2007 bridge collapse in Minneapolis, Minnesota focused the nation's attention once more on the grave state of aging infrastructure in the United States. Built in 1967, the Interstate 35W ("I-35W") bridge was ranked "deficient" as of 2006 by the National Bridge Inspection Program.¹ Nationwide nearly twenty-five percent of bridges are deficient; in fourteen states more than thirty percent of bridges are deficient.² While a deficient rating does not necessarily imply impending collapse or breakdown, it does mean that elements of a bridge need to be monitored and/or repaired.³ Notwithstanding this definition, the disaster and the statistics beg the question: is the Minneapolis bridge collapse an ominous sign of problems to come for U.S. infrastructure, or a catalyst for a refreshed governmental approach to transportation infrastructure?

Investigation is still ongoing as to the precise cause of the summer bridge collapse in Minnesota. Whatever the final determination comes out to be, plans are moving forward for a replacement bridge to span the Mississippi River in downtown Minneapolis. The new I-35W bridge will be funded by the federal and Minnesota state governments. The stated goals of the City of Minneapolis, which is involved in planning for the new bridge, include "improved vehicle capacity and . . . transit capacity," that the new bridge design "incorporate options for future transit improvements" and that it "be built to meet all current environmental standards."⁴

Within these goals, there is the potential for Minnesota to lead by example and take infrastructure construction in a more sustainable direction. In the same vein as the U.S. Building Council's Leadership in Energy and Environmental Design ("LEED") green building criteria, sustainable bridge building practices would incorporate heightened environmental concerns into the usual considerations of cost and aesthetics. Although currently no equivalent to the LEED criteria exists for sustainable bridge design, there are various elements that bridge planners in Minnesota and elsewhere could consider with an eye towards sustainability.⁵

A bridge that lasts longer without needing extensive repair or a complete overhaul is by definition more sustainable. High performance construction materials would help to create a bridge that remains solid and useable for generations. Aluminum and high performance concrete are two examples. Aluminum is substantially lighter than concrete, requiring fewer welds be made during construction and less overall weight-bearing supports. High performance concrete provides better long-term performance and reduced life-cycle costs than traditional concrete.⁶ The technology exists to allow construction of transpor-

tation infrastructure that is durable and ultimately safer for everyone.

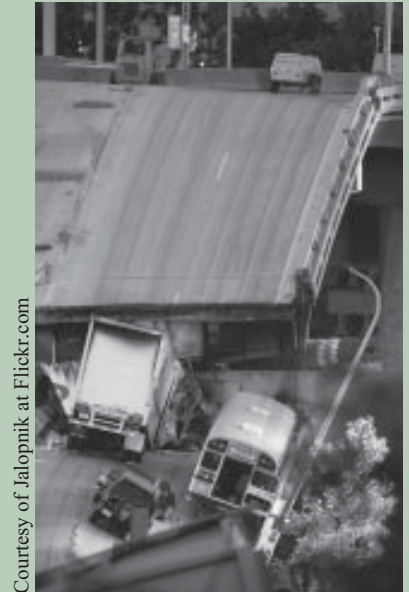
Prior to the collapse, the I-35W bridge had eight lanes for motor vehicle use only. A new bridge constructed with an eye towards sustainability would incorporate a mixed use approach, creating a transit corridor for motor vehicles, high occupancy vehicles, and light rail. Carrying higher volumes of people over a single structure increases the general efficiency of infrastructure, minimizing the need for future resource and time expenditures in future expansion.

Sustainable design practices in transportation systems are not yet widely used. Bridges are expensive, and the design that serves the purpose at the lowest cost is the one usually chosen in a transportation plan.⁷ Incorporating innovative materials and special lanes inevitably adds to the upfront economic cost of a conventional bridge. But if long-term usability, safety, and environmental impact of a bridge are considered, then the greater initial cost becomes an investment in the future. Federal and state funds together pay for the bridges, tunnels, roads, and transit arteries that keep people and goods moving throughout the United States.⁸ The government must place a greater priority, through increased funding targeted at sustainability, on the planning, construction, and maintenance of transportation infrastructure.

The passage of the 1956 Highway Revenue Act provided for the interstate highway system of which the I-35W bridge was a part. In 2006 that Act marked its fiftieth year.⁹ In the wake of the Minneapolis bridge collapse and other infrastructure failures around the country, it is vital for the federal and state governments to take a new look at the way the United States plans and constructs its transportation network.

Endnotes: Minneapolis Bridge Collapse *continued on page 84*

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Courtesy of Jalopnik at Flickr.com

I-35W bridge collapse

A ROAD MAP TO A BETTER NEPA:

WHY ENVIRONMENTAL RISK ASSESSMENTS SHOULD BE USED TO ANALYZE THE ENVIRONMENTAL CONSEQUENCES OF COMPLEX FEDERAL ACTIONS

by Sonja Klopff, Nada Wolff Culver, & Pete Morton*

INTRODUCTION

Over thirty-five years have passed since the enactment of the National Environmental Policy Act (“NEPA”), the “basic national charter for protection of the environment,” and one of the most important environmental laws passed by the U.S. Congress.¹ The provisions of NEPA were intended to help public officials make decisions with an “understanding of environmental consequences, and take actions that protect, restore, and enhance the environment.”² NEPA also provides the basis for Environmental Impact Statements (“EISs”), the environmental review process that requires agencies to take a “hard look” at the potential environmental consequences of proposed federal actions.³

As early as the 1970s, however, NEPA began to weather considerable criticism from some in the scientific community. Instead of producing environmental analyses of high technical quality, scientists concluded that NEPA assessments contained “massive amounts of incomplete, descriptive, and often, uninterpreted data.”⁴ The Council on Environmental Quality (“CEQ”) more recently found that even when there was more than enough data to make a responsible decision, the EIS lacked analysis.⁵

Our first thesis is that problems with inadequate data and science intensify when dealing with NEPA assessments of complex federal actions: large-scale programs, policies, or projects. We maintain that in the face of scientific uncertainty and data limitations, the risk of harm to ecological systems increases as the scale of proposed development increases. For example, during the Bush Administration, the speed and scale of oil and gas leasing and drilling on public lands throughout the West has increased dramatically.⁶ Between 2001 and 2006, more than 17,000 gas and oil wells were drilled on public land in the Rockies. In contrast, fewer than 9,500 wells were drilled between 1995 and 2000 during the Clinton Administration.⁷ A recent analysis conducted by The Wilderness Society found that the Bureau of Land Management (“BLM”) is in the process of approving more than 126,000 wells to be drilled in the Rocky

Mountain West over the next fifteen to twenty years, despite the more than 77,000 wells already producing on the public lands.⁸

Studying the effects of this trend, the Government Accountability Office (“GAO”) issued a report in June of 2005 entitled “Oil and Gas Development—Increased Drilling Permit Activity Has Lessened BLM’s Ability to Meet Its Environmental Protection Responsibilities.”⁹ As the title indicates, the GAO found that the increased volume of permits to drill, and the mandates to focus on processing them, has resulted in more BLM staff resources devoted to issuing permits—with less attention being paid to monitoring and enforcing compliance with environmen-

tal standards that apply to the activities conducted under the permits.

In the Rocky Mountain West, the scale of oil and gas development is larger and the pace of decisions is faster than in the past, but there is less attention paid to considering or addressing the cumulative environmental risks. The Energy Policy Act of 2005 included five new categorical exclusions from NEPA analysis for oil and gas development activities, and both the BLM and the U.S. Forest

Service have implemented additional categorical exclusions in the past year.¹⁰ A recent study concluded that the rapid pace and large scale of oil and gas drilling and leasing that has occurred greatly increases the risk to the environment as well as the uncertainty regarding the ultimate effects of this large-scale policy.¹¹

Our second thesis is that the potential cumulative ecological impacts associated with federal efforts of large scale, such as the Bush Administration’s national energy policy, would be better analyzed through the use of Ecological Risk Assessments

The Energy Policy Act of 2005 included five new categorical exclusions from NEPA analysis for oil and gas development activities.

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(“ERAs”), often within a Programmatic EIS. ERAs provide a conceptual and methodological framework to improve EISs, and they are designed to explicitly address uncertainty and risk when analyzing environmental impacts.¹² This scientific framework could rectify some of the continuing weaknesses of EISs, as well as better analyze the cumulative impacts and natural increases in risk and uncertainty stemming from these large, programmatic projects.

This Article will argue that, in order to adequately fulfill NEPA’s requirement of taking a hard look at potential environmental impacts of national policy initiatives and large-scale projects, ERAs should be an essential component of NEPA analysis. We begin by defining ERAs and providing background information on their use. The next section details the many common elements of ERAs and EISs, including the similar purposes and structures of the two processes, which make them so compatible. The Article will next discuss how ERAs can improve the NEPA process by improving analysis, assessing cumulative impacts, dealing more effectively with uncertainty, and separating assessment from management decisions. We end with discussion and recommendations, based on the information presented in the Article, that ERAs should be conducted for Programmatic or large-scale EISs—such as the Administration’s policy of increases in oil and gas drilling, or tar sands and oil shale development—in order to adequately fulfill NEPA’s requirements.

BACKGROUND ON ECOLOGICAL RISK ASSESSMENTS

Risk can be simply defined as circumstances that pose danger to people or what they value.¹³ Risk is more formally expressed as the relationship between the magnitude of an undesired effect and the probability of the undesired effect occurring.¹⁴ Risk results from the existence of a hazard and uncertainty about its expression.¹⁵ Ecological risk assessments attempt to transform scientific data into meaningful information about the undesired effects of human activities on the environment and combine it with an evaluation of the consequences.¹⁶ Risk assessment identifies hazards such as the release of drilling fluids into surface waters that support fisheries and communities, and it uses measurement, testing, and statistical methods to quantify the relationship between initiating events and the effects.¹⁷

DEVELOPMENT OF ECOLOGICAL RISK ASSESSMENTS

ERAs have been performed for more than twenty years and have a long history that began with pollution investigation.¹⁸ The EPA published its *Framework for Ecological Risk Assessment* in 1992, therein establishing the basic process that is widely used today. It then added further detail in the 1998 *Guidelines for Ecological Risk Assessment*. In addition, the EPA continues to develop a “bookshelf” of documents for guidance on conducting

ERAs on more specific topics.¹⁹ Public lands agencies, such as the U.S. Forest Service, have begun to develop new models for ERAs for use in making land management decisions.²⁰

EPA GUIDELINES FOR ECOLOGICAL RISK ASSESSMENTS

According to the EPA, ERA is “a process that evaluates the likelihood that adverse ecological effects may occur or are occurring as a result of exposure to one or more stressors.”²¹ ERAs “systematically evaluate and organize data, information, assumptions, and uncertainties in order to help understand and predict the relationships . . . in a way that is useful for environmental decision making.”²² Put more simply, ERAs try to answer three basic questions: “What can go wrong? How likely is it to happen? And, so what if it does?”²³

The EPA 1998 Guidelines provide a clear framework that includes three distinct steps for conducting ERAs. The first step is the problem formulation phase where the scope and scale of the ERA is decided upon and a full analysis plan is developed. The second phase is the actual analysis where exposure to stressors and the relationship between stressor levels and ecological effects is determined. For instance, if the risk assessor were

trying to determine the effect of road building on a watershed, one stressor could be the increased sediment in the stream caused by the road construction, while the corresponding ecological effect could be reduced salmon spawning numbers in the river. The analysis would include a determination of how much sediment increases and what effect that increase would have on the numbers of spawning salmon. The third and final

part of the process is where assessors estimate and describe the risk and prepare a report, which includes their overall degree of confidence in their conclusions.²⁴

COMMON ELEMENTS OF ERAs AND EISs

There are many common elements of ERAs and EISs, including similar purposes and structures, which make ERAs a useful tool for informing the NEPA process. The basic goal of both ERAs and EISs is to provide a structure for collecting and analyzing information without requiring a specific result, based on the premise that better information leads to less uncertainty in decision making. Through the NEPA process, an agency must prepare a “coherent and comprehensive up-front environmental analysis to ensure informed decision making to the end that ‘the agency will not act on incomplete information, only to regret its decision after it is too late to correct.’”²⁵ A NEPA document is legally sufficient only if its “form, content and preparation . . . foster both informed decision-making and informed public participation.”²⁶

COMMON PURPOSES OF ERAs AND EISs

One of the most important common elements of EISs and

NEPA specifically encourages adapting and changing methods of analysis as science and knowledge about ecosystems improve.

ERAs are their purpose. The purpose of NEPA, according to the Council for Environmental Quality's NEPA regulations, is to "facilitate the evaluation of management decisions and the environmental effects of proposed federal agency actions." ERAs have a similar purpose: "[e]cological risk assessments are designed and conducted to provide information to risk managers about the potential adverse effects of different management decisions."²⁷ These two processes not only have the same goals, but also complement each other. ERAs provide information to risk managers about different management decisions and EIS's evaluate the environmental effects of different management decisions.

COMMON STRUCTURES OF ERAS AND EISS

These similarities continue with the general structures of the EIS and ERA. The NEPA process begins with the scoping phase where the agency formally announces its intention to prepare an EIS. The agency requests comments from interested parties and the public in order to help focus its environmental review on potentially significant environmental issues. Likewise, the first step in conducting an ERA is problem formulation, when risk assessors, risk managers, and any other interested parties help focus the assessment and identify the important issues. At this time, risk assessors should also evaluate goals, select assessment endpoints, prepare a conceptual model, and develop an analysis plan. Although the initial phases of the ERA and EIS have different labels—and ERAs require more specific planning—both processes include the input of interested parties in order to determine the scope of the analysis. In this context, the scope of the environmental analysis to be performed under NEPA must be commensurate with the scope of the proposed action and its potential impacts.²⁸ Similarly, in order to determine the scope of an ERA,

[r]isk managers and risk assessors consider the nature of the decision (e.g., national policy, local impact), available resources, opportunities for increasing the resource base (e.g., partnering, new data collection, alternative analytical tools), potential characteristics of the risk assessment team, and the output that will provide the best information for the required decisions.²⁹

The NEPA process continues with the development and writing of the EIS, where the agency staff conducts an objective analysis of the environmental impacts that could occur as a result of the proposed action, whether it is a policy, program, or project. The EIS also includes analysis of possible alternatives to the proposed project and recommendations on how to lessen or avoid environmental consequences. The second step of the ERA process is risk characterization, when assessors estimate the risk through integration of exposure and stressor-response profiles.³⁰ At the end of this phase there should be summary profiles that describe the exposure and the stressor-response relationships.³¹ According to the EPA, these results should be written "clearly, articulate major assumptions and uncertainties, identify reasonable alternative interpretations, and separate scientific conclusions from policy judgments."³² The risk manager can then use the risk assessment results, along with other factors such as pub-

lic opinion, economic, or legal concerns in making management decisions.³³

COMMON REQUIREMENTS FOR PUBLIC DISCLOSURE

Both processes make the information contained in the EIS or ERA public. The EIS is published and mailed to federal, state, and local government agencies and elected officials, as well as environmental and public interest groups, other interested parties, affected landowners, Native American tribes, newspapers, and local libraries. The purpose is to inform the public of the proposed actions, show how decisions were made, make the decision-making process clear and open to further scrutiny, and keep the agency accountable for its actions and decisions.

The EPA recommends a number of additional public disclosures, including explicitly defined endpoints, being open about the strengths and limitations of the conceptual model, identifying and describing the rationale for key assumptions, and describing data limitations. The purpose of disclosing these details is to keep the ERA process clear and open to further scrutiny and peer review. Instead of relying on conclusory statements, these required details allow those who were not involved in the process to independently evaluate the validity of the assessment.

Similarly, NEPA's hard look at environmental consequences must be based on "accurate scientific information" of "high quality."³⁴ Essentially, NEPA "ensures that the agency, in reaching its decision, will have available and will carefully consider detailed information concerning significant environmental impacts."³⁵ The Data Quality Act and BLM's interpreting guidance expand on this obligation, requiring that influential scientific information use the "best available science and supporting studies conducted in accordance with sound and objective scientific practices."³⁶ NEPA also requires agencies to disclose where information is incomplete or unavailable.³⁷

Once again the purposes of EISs and ERAs mirror each other. However, because ERAs generally require disclosure of specific information regarding the analysis, uncertainty, and data limitations, the ERA reporting process can make the EIS more informative and useful to a broader number of people.

HOW ERAS WILL IMPROVE THE NEPA PROCESS

Although ERAs cannot fulfill all NEPA requirements by themselves, they can help agencies effectively analyze the potential environmental impacts resulting from proposed federal actions and their possible alternatives.³⁸ Because the ERA process has a more defined scientific framework than the EIS and has historically incorporated more scientific data, merging the two processes actually facilitates better analyses when an ERA is used as part of an EIS. ERAs can also help focus taxpayer resources, both on what data needs to be collected and on where, when, and to what extent federal projects should occur.

FULFILLING NEPA REQUIREMENTS AND IMPROVING ANALYSIS

As discussed above, there have been continuing problems with inadequate NEPA documents including incomplete, descriptive and uninterpreted data, and a lack of clear analysis. In 1997, the CEQ conducted a study of the effectiveness

of NEPA twenty-five years after its implementation. Among a number of conclusions, the CEQ found that “NEPA practitioners need to analyze existing information more effectively. . . ” and “[w]hat is often lacking in EISs is. . . a comparison of the potential impacts of choosing particular alternatives at particular locations expressed in clear, concise language. . . .”³⁹

The purpose of an EIS is to take a hard look at environmental effects, analyzing a number of different options in order to better protect the environment. NEPA specifically encourages adapting and changing methods of analysis as science and knowledge about ecosystems improve. NEPA states that, “. . . it is the continuing policy of the Federal Government. . . to use *all practicable means and measures*. . . to create and maintain conditions under which man and nature can exist in productive harmony.”⁴⁰ ERAs provide available means and measures to incorporate an accepted, consistent, science-based framework that public land agencies already frequently use to focus and improve their decisions. Completing ERAs as part of an EIS and following the EPA’s Guidelines will address long-term weaknesses and enable federal agencies to fulfill more completely the purposes of NEPA.

ASSESSING CUMULATIVE IMPACTS

ERAs can help to address the difficulties in adequately assessing cumulative impacts that can plague EIS’s. NEPA requires that agencies assess the “direct, indirect, or cumulative” environmental impacts of a proposed action.⁴¹ Cumulative impacts are defined as:

the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.⁴²

As the scale and pace of these large-scale developments increases, the need to examine the potential cumulative impacts increases as well. Agencies are required by NEPA and the courts to provide “some quantified or detailed information; . . . [g]eneral statements about possible effects and some risk do not constitute a hard look. . . absent a justification regarding why more definitive information could not be provided.”⁴³ Agencies can fail to properly analyze these cumulative impacts, especially when dealing with large-scale projects; the Ninth Circuit complained in *Ocean Advocates v. U.S. Army Corps of Engineers* that the agency’s “findings about cumulative impacts were perfunctory and conclusory and d[id] not provide a helpful analysis of past, present, and future projects.”⁴⁴ Similar concerns have motivated courts to require programmatic EISs to ensure that the likely environmental consequences of policy initiatives are adequately assessed.⁴⁵

The conceptual and methodological framework for ERAs outlined by the EPA allows for a consistent and comprehensive approach for land managers to follow when making decisions. Each ERA should include—as well as document for the

public—the stages of problem formulation, exposure analysis, effects assessment, and risk characterization.⁴⁶ Requiring each of these components should, in turn, improve methods of sampling and analysis, interpretations of data, and quality assurances.⁴⁷ In this way, cumulative impacts can be dealt with consistently and comprehensively, avoiding the lack of analysis and conclusory findings that often occur in EIS.⁴⁸

DEALING EFFECTIVELY WITH UNCERTAINTY

Uncertainty is a constant when dealing with the effect of land management actions upon the environment, but using ERAs can help to consistently recognize where uncertainty lies, how uncertainty can be reduced, and where more data may be needed to make an effective evaluation. Unfortunately, in the history of EIS, uncertainty has been largely “ignored, omitted, described in qualitative terms, or merely [made] implicit in the assessment.”⁴⁹

Where there is incomplete or unavailable scientific information concerning significant adverse environmental impacts, NEPA requires the disclosure and analysis of the costs of uncertainty and the costs of proceeding without more and better information.⁵⁰ However, agencies may not address, explain, or satisfactorily reduce uncertainty in their decisionmaking process, even when it is brought to their attention. For example, the Ninth Circuit found an EIS inadequate because it “did not address in any meaningful way the various uncertainties surrounding the scientific evidence.”⁵¹ Courts have also concluded that agencies “need not undertake further scientific study, [to reduce uncertainty. . . but the agency] must explain in the EIS why such an undertaking is not necessary or feasible.”⁵²

The ERA process helps to address this problem by calling for an explicit determination of the impacts of uncertainty on the overall quality and utility of the ERA. First, the EPA Guidelines prescribe better planning to eliminate as many sources of uncertainty as possible. When uncertainty is thus reduced, the EPA recommends that the ERA openly and explicitly describe the strengths and limitations of the model as well as identify and describe rationales for any assumptions made. Finally, risk assessors should describe data limitations. In this way, if there is missing data or uncertain results, these problems are not simply ignored or swept aside, but they become an intricate part of the analysis.

SEPARATING ASSESSMENT AND MANAGEMENT

Agencies and land managers are subject to substantial pressure from various interested parties and groups when it comes to making land management decisions. There is pressure to develop, pressure to keep pristine, and pressures for all different kinds of access. In addition, there are economic and legal implications that must be taken into account. There is no question that these pressures, as well as personal biases, can and do have an impact on land management decisions.⁵³ However, these reasons and pressures are often not clearly separated from the scientific analysis in NEPA documents, making it unclear where the science ends and where the policy-based planning begins.

The EPA framework clearly defines these different roles

and encourages their separation in order to prevent personal or institutional bias that typically “color” the scientific evaluation. Therefore, ERAs begin with the risk assessment, a scientific process, which involves the evaluation of the likelihood of adverse effects. When this process is finished, the risk characterization process involves the selection of a course of action based on other factors including social, legal, political, economic, as well as the risk assessment results.⁵⁴ Following this framework should help to separate the scientific conclusions from policy decisions, leading to more clearly defined discussions with the public about the effects of different courses of action as well as better management decisions.

DISCUSSION AND RECOMMENDATIONS

NEPA requires federal agencies to consider the direct, indirect, and cumulative impacts of “major federal actions significantly affecting the quality of the human environment.”⁵⁵ Major federal actions include: “new and continuing activities, including projects and programs entirely or partly financed, assisted, conducted, regulated, or approved by federal agencies; new or revised agency rules, regulations, plans, policies, or procedures; and legislative proposals.”⁵⁶ In addition to oil and gas drilling, we have identified a number of major federal actions related to energy of sufficient scale, scope, and uncertainty to merit the use of ERAs.

The BLM assessed the development of wind energy on Western public lands managed by the agency, utilizing a programmatic EIS in order to evaluate the cumulative impacts of this program.⁵⁷ The final programmatic EIS identifies places that wind energy development would be appropriate on public lands, establishes policies and best management practices concerning right-of-way authorizations, and amends fifty-two separate BLM land use plans.⁵⁸

The BLM is currently conducting programmatic NEPA analysis of the effects of oil shale and tar sands development on public lands in Colorado, Utah, and Wyoming.⁵⁹ The uncertainty of this project is significant because the scale of development is very large (and encompasses three states) and both oil shale and tar sands energy development involve new, commercially unproven processes with unknown risks to the environment.⁶⁰

The BLM and the U.S. Forest Service are preparing a joint programmatic EIS to analyze and expedite the leasing of lands with high potential for renewable geothermal resources in eleven Western states and Alaska.⁶¹ Neither agency has a robust geothermal leasing program, as a result there is a substantial amount of uncertainty about the effects on public lands, while at the same time there is a desire to begin leasing at a greater speed and scope.

The oil and gas energy policy established by the Bush Administration is also a major federal action significantly affecting the quality of the human environment. This policy has

required federal agencies to prioritize and accelerate approval of energy development projects while reducing the amount of environmental analysis that will be conducted.⁶² Unlike wind and geothermal energy development, where a programmatic EIS is involved, no NEPA analysis of the Bush Administration oil and gas energy policy has been conducted despite requests to do so.⁶³ The direct, indirect, and cumulative effects of the energy policy must be considered through a comprehensive, programmatic EIS, much as the agencies have proceeded with other large-scale energy development initiatives.⁶⁴ By completing a programmatic EIS of the Bush Administration’s energy policy, the BLM would be able to examine “an entire policy initiative rather than performing a piecemeal analysis.”⁶⁵ Because the Bush Administration has made unmistakable and public efforts to increase oil and gas development throughout the West, the cumulative impacts of this regional increase are more than reasonably foreseeable and must be taken into account in a thorough NEPA analyses.

The effects of broad program or policy initiatives include large-scale habitat fragmentation, cumulative air quality, water quantity and quality, human health impacts, wildlife, loss of recreation opportunities, and damage to the habitat of sensitive, threatened and endangered species. In order to effectively consider such impacts, the structured and scientific approach of

ERAs will be invaluable. The environmental consequences of these truly major federal actions need to be analyzed at an equally broad scale through a programmatic EIS that includes an ERA. For the Bush Administration’s energy policy, which has not yet been subjected to a programmatic NEPA analysis, a

programmatic EIS and ERA should be prepared immediately.

CONCLUSION

Both EISs and ERAs are premised on the principle that thorough consideration of accurate, relevant data will yield the most responsible decisions. Both EISs and ERAs set out processes that are intended to ensure that decisions are made based on the most complete and accurate information available and take uncertainty into account. Both EISs and ERAs are tools that are being used by federal agencies, but they can be used more effectively and consistently, especially if they are used in concert.

ERAs have already been used in public land management decisions that range from estimating risks from wildfire and other natural disasters, to implementation of vegetation projects. The use of ERAs should be expanded, however, to broad land management decisions where the large scale and scope of the analyses to be completed in an EIS makes a complete analysis more difficult. The EPA framework for ERAs outlines a consistent, science-based framework to improve the analysis of cumulative impacts and deal with uncertainty. ERAs can be an essential element of large, programmatic EISs and should be used in order to more effectively fulfill NEPA’s purpose and requirements.

The purpose of an EIS is to take a hard look at environmental effects.

Federal agencies have recognized the importance of conducting NEPA analysis on a programmatic scale when the scope of a federal action is a policy or program that can have wide-ranging impacts on resources and values. Programmatic EISs have been or are in the process of being used to assess the development of wind energy, geothermal energy, tar sands, and oil shale resources on public lands. NEPA's mandate to analyze direct, indirect, and cumulative environmental consequences,

consider measures to avoid or mitigate those impacts, and evaluate management alternatives at this scale can be effectively fulfilled via ERAs, which provide a rigorous scientific framework. Moreover, ERAs will ensure that the analysis of risks is completed separate from and prior to the ultimate management decisions, which often involve different, non-scientific considerations, facilitating informed and science-based decision-making—which we believe to be better decision-making.



Endnotes: A Road Map to a Better NEPA

¹ 40 C.F.R. § 1500.1(a) (2007).

² 40 C.F.R. § 1500.1(c).

³ 42 U.S.C. § 4321, *et seq.* (2007); *see* Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 333 (1989); Ecology Ctr., Inc. v. Austin, 430 F.3d 1057, 1065 (9th Cir. 2005); Seattle Audubon Soc'y v. Espy, 998 F.2d 699, 704 (9th Cir. 1993) (“The EIS did not address in any meaningful way the various uncertainties surrounding the scientific evidence. . . . Even if the Forest Service concludes that it need not undertake further scientific study regarding owl viability and the impact of further habitat loss, the Service must explain in the EIS why such an undertaking is not necessary or feasible”). For a discussion of a “hard look” at “risks,” *see also* San Luis Obispo Mothers for Peace v. Nuclear Regulatory Comm'n, 449 F.3d 1016, 1032 (9th Cir. 2006) (“If the risk. . . is not insignificant, then NEPA obligates the NRC to take a ‘hard look’ at the environmental consequences of that risk.”)

⁴ D.W. Schindler, *The Impact Statement Boondoggle*, 192 SCIENCE 50 (1976); S.M. Bartell, *Ecology, Environmental Impact Statements, and Ecological Risk Assessment: A Brief Historical Perspective*, 4 HUMAN AND ECOLOGICAL RISK ASSESSMENT 843, 844 (1998).

⁵ COUNCIL ON ENVIRONMENTAL QUALITY, THE NATIONAL ENVIRONMENTAL POLICY ACT, A STUDY OF ITS EFFECTIVENESS AFTER TWENTY-FIVE YEARS 28 (Jan. 1997), available at <http://ceq.eh.doe.gov/nepa/nepa25fn.pdf> (last visited Nov. 7, 2007).

⁶ Craig Welch, *For Good or Ill, Bush Clears Path for Energy Development*, SEATTLE TIMES, Sept. 26, 2004 at A22 (claiming that Cheney's Energy Task Force made forty recommendations to speed production, including a call to reconsider public lands previously withdrawn from energy drilling).

⁷ M. HAEFELE, P. MORTON & N. CULVER, THE WILDERNESS SOCIETY, NATURAL DIVIDENDS: WILDLAND PROTECTION AND THE CHANGING ECONOMY OF THE ROCKY MOUNTAIN WEST, available at <http://www.wilderness.org/Library/Documents/upload/Natural-Dividends-Wildland-Protection-and-the-Changing-Economy-of-the-Rocky-Mountain-West.pdf> (last visited Oct. 31, 2007).

⁸ The Wilderness Society's BLM Action Center conducted a preliminary analysis of land use plans and large-scale projects approved, or in the process of approval, in the states of Colorado, Montana, New Mexico, Utah, and Wyoming in order to estimate the number of new oil and gas wells likely to be approved for drilling over the next fifteen to twenty years. Results were issued in October 2007. *See* THE WILDERNESS SOCIETY, PRELIMINARY ANALYSIS OF CURRENT FEDERAL ACTIONS AUTHORIZING DRILLING OF NEW WELLS (Aug. 2007), available at <http://www.wilderness.org/Library/Documents/upload/WellCount-Overview-Update2007.pdf> (last visited Nov. 7, 2007).

⁹ U.S. GOVERNMENT ACCOUNTABILITY OFFICE, OIL AND GAS DEVELOPMENT: INCREASED PERMITTING ACTIVITY HAS LESSENED BLM'S ABILITY TO MEET ITS ENVIRONMENTAL PROTECTION RESPONSIBILITIES (June 2005), available at <http://www.gao.gov/new.items/d05418.pdf> (last visited Nov. 7, 2007).

¹⁰ Pub. L. No. 109–58, § 390, 42 U.S.C. § 15942; 72 Fed. Reg. 45504–45542 (Aug. 14, 2007); 72 Fed. Reg. 7391–7402 (Feb. 15, 2007).

¹¹ P. Morton, C. Weller, J. Thomson, M. Haeefe, & N. Culver, THE WILDERNESS SOCIETY, DRILLING IN THE ROCKY MOUNTAINS: HOW MUCH AND AT WHAT COST? (Mar. 2004), available at http://www.wilderness.org/Library/Documents/upload/Drilling_in_the_Rocky_Mountains_March_2007.pdf (last visited Nov. 7, 2007).

¹² Bartell, *supra* note 4, at 848.

¹³ NATIONAL RESEARCH COUNCIL, BARRIERS TO SCIENCE: TECHNICAL MANAGEMENT OF THE DEPARTMENT OF ENERGY'S ENVIRONMENTAL REMEDIATION PROGRAM (National Academy Press 1996).

¹⁴ GW SUTER II, ECOLOGICAL RISK ASSESSMENT (Lewis Publishers 1993).

¹⁵ NATIONAL RESEARCH COUNCIL, *supra* note 13; Suter, *supra* note 14.

¹⁶ Bartell, *supra* note 4.

¹⁷ SUTER, *supra* note 14.

¹⁸ *See, e.g.*, NATIONAL SCIENCE AND TECHNOLOGY COUNCIL, ECOLOGICAL RISK ASSESSMENT IN THE FEDERAL GOVERNMENT (May 1999), available at <http://yosemite.epa.gov/SAB/sabcvpess.nsf/e1853c0b6014d36585256dbf005c5b71/b882baf473df807185256de4006a39a5!OpenDocument> (last visited Nov. 7, 2007).

¹⁹ Virginia Dale, Remarks on State of Science in Ecological Risk Assessment at the Advances in Threat Assessment and Their Application to Forest and Rangeland Management Conference (July 18–20, 2006).

²⁰ *See* ForestEncyclopedia.net, Advances in Threat Assessment and Their Application to Forest and Rangeland Management Conference, www.threatsforencyclopedia.net (last visited Nov. 1, 2007).

²¹ EPA, GUIDELINES FOR ECOLOGICAL RISK ASSESSMENT B-3 (May 14, 1998), available at <http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=12460> (last visited Nov. 7 2007) [hereinafter GUIDELINES FOR ECOLOGICAL RISK ASSESSMENT].

²² GUIDELINES FOR ECOLOGICAL RISK ASSESSMENT, *id.* at 1.

²³ Bartell, *supra* note 4, at 845.

²⁴ GUIDELINES FOR ECOLOGICAL RISK ASSESSMENT, *supra* note 21, at 8.

²⁵ Blue Mountains Biodiversity Project v. Blackwood, 161 F.3d 1208, 1216 (9th Cir. 1998); *see also* Marsh v. Oregon Natural Res. Council, 490 U.S. 360, 371 (1989).

²⁶ Colorado Env'tl. Coalition v. Dombeck, 185 F.3d 1162, 1172 (10th Cir. 1999); *see* Oregon Env'tl. Council v. Kunzman, 817 F.2d 484, 492 (9th Cir. 1987); *see also* Found. on Econ. Trends v. Heckler, 756 F.2d 143, 157 (D.C. Cir. 1985) (“The NEPA duty is more than a technicality; it is an extremely important statutory requirement to serve the public and the agency before major federal actions occur.”)

²⁷ GUIDELINES FOR ECOLOGICAL RISK ASSESSMENT, *supra* note 21, at 23.

²⁸ Kern v. U.S. Bureau of Land Mgmt., 284 F.3d 1062, 1072 (9th Cir. 2002) (stating agency must analyze environmental consequences of specific timber sales on spread of root fungus in broader area); 40 C.F.R. § 1508.25 (requiring a federal agency must consider the impacts of not only the proposed action, but connected, cumulative and similar actions).

²⁹ GUIDELINES FOR ECOLOGICAL RISK ASSESSMENT, *supra* note 21, at 19–20.

³⁰ GUIDELINES FOR ECOLOGICAL RISK ASSESSMENT, *supra* note 21, at 8. This phase of the process includes a number of specific objectives including: describing risk by discussing lines of evidence and determining ecological adversity; prepare a report; estimate ecological effects; indicate the overall degree of confidence in the risk estimates; cite evidence supporting the risk estimates; and, interpret the adversity of ecological effects.

³¹ GUIDELINES FOR ECOLOGICAL RISK ASSESSMENT, *supra* note 21, at 8.

³² GUIDELINES FOR ECOLOGICAL RISK ASSESSMENT, *supra* note 21, at 8.

³³ GUIDELINES FOR ECOLOGICAL RISK ASSESSMENT, *supra* note 21, at 8.

WESTERN POLITICS AND WILDLIFE POLICY:

THE CASE OF THE GRAY WOLF

by John Shackelford*

Battle lines were drawn this fall when Defenders of Wildlife posted a video online about Alaska's use of aircraft to kill wolves. The ten-minute film features statements by biologists, hunters, and a former Lieutenant Governor along with archival footage depicting aerial assaults on fleeing wolves.¹ The video's release coincided with a proposal by California Congressman George Miller to prohibit such aerial hunting. Alaska Governor Sarah Palin defended her state's practice, insisting that Alaska's "science-driven and abundance-based predator management system" serves an entirely different purpose than hunting and that the Congressman's bill "threatened the very foundations of federalism."²

Wildlife conservation groups contend that the real threat lies in Alaska's exploitation of a loophole in the federal Airborne Hunting Act ("AHA"), which outlawed shooting or harassing wildlife from aircraft over thirty years ago.³ The law grants an exception to any person operating under state or federal authority in the administration or protection of natural resources.⁴ The video argues that Alaska has issued permits to private individuals seeking trophies under the guise of wildlife management and that killing predators to increase game animal populations violates Congress' intent when it created the management exception in the AHA. Defenders of Wildlife contends that Congressman Miller's Protect America's Wildlife Act ("PAW")⁵ is needed to explicitly proscribe the use of aerial hunting for the manipulation of predator and prey populations and restrict the use of other variations of aerial hunting such as the "land-and-shoot" method to government officials only.⁶

The debate over lethal predator control methods is an old one in Alaska but its effects will grow increasingly significant as the U.S. Fish and Wildlife Service ("FWS") inches closer to removing federal protection of the gray wolves in the Northern Rocky Mountain Region. Wolves were eradicated from Idaho, Montana, and Wyoming in the 1930s and their reintroduction to Central Idaho and the Greater Yellowstone Area in 1995 ignited a rancorous debate that stirs passions about conservation, state sovereignty, and the heritage of the Old West.⁷ In February of 2007, the Department of Interior released its proposal to remove the Rocky Mountain wolf population from the Endangered Species Act's list of endangered wildlife.⁸ The proposal indicated that, by 2006, the federal government's recovery goals for the



Courtesy of Derek Bakken

Gray Wolf

"nonessential experimental" wolf population had been achieved and surpassed for seven consecutive years and that it had already approved Idaho and Montana's management plans. According to FWS, the long-awaited de-listing has been delayed only because Wyoming's management plan is scientifically inadequate and legally inconsistent, and it poses a threat to the survival of the species in that state.⁹

Wyoming's reluctance to adopt an adequate wolf management program may seem incongruent with its neighbors' desire to exercise sovereignty over their natural resources, but it demonstrates the difficulty in drafting sound wildlife policy when traditions—ranching and hunting in this case—seem threatened. Idaho Governor Otter personified this political climate when he proclaimed from the steps of the State Capitol in front of a gathering of pro-hunting demonstrators that he supported a plan to reduce the Idaho wolf population to the federal minimum and that he would be the first to bid for a \$26.50 wolf-hunting permit.¹⁰

It is this kind of political bravado that preserved some form of aerial hunting in Alaska after the passage of the AHA¹¹ and reinstated it as a predator control method four years ago.¹² Alas-

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kan voters passed a ballot initiative that banned “same-day-airborne” hunting¹³—the most conservative way to hunt with a plane—but the State Legislature overturned the initiative and overruled the Governor’s subsequent veto just three years later.¹⁴

After the legislature opened aerial wolf hunting to private individuals, voters responded with Proposition 6, which restricted its use to Department of Fish and Game officials.¹⁵ Although the initiative was again overturned by the legislature, the issue has garnered enough opposition among Alaskans to make its way onto next year’s ballot.¹⁶


Despite Governor Palin’s claims that predator control is only necessary for “Alaskans to put healthy food on their families’ dinner tables,” many conservation advocates fear that Alaska’s pro-ungulate program will filter down to the lower forty-eight where wolves have only recently reestablished themselves.¹⁷ The de-listing of the gray wolf in Idaho, Montana, and Wyoming will allow for the reduction of wolf numbers within each state to a hundred, providing that there are at least ten

Science, not politics, needs to determine U.S. policy toward wildlife.

breeding pairs within each group.¹⁸ Considering that there was a combined total of over 1,243 wolves and eighty-nine breeding pairs in 2006, it comes as little surprise that Defenders of Wildlife President Rodger Schlickeisen described the Idaho and

Wyoming’s management plans, which skirt the federal minimum as “geared toward wolf eradication, not wolf conservation.”¹⁹

The debate over the aerial hunting of wolves and the legal acrobatics that have kept it alive present a challenge to environmental policy-making. Passionate opposing viewpoints

can swing the conservation pendulum wildly on the state and local levels, and it seems likely that federal authorities are better positioned to draft more objective, science-based policy. When moral, cultural, and environmental concerns are at odds, it may be difficult not to hand over responsibility to the people who feel their lifestyles are being threatened. If maintaining healthy ecosystems is the underlying goal, however, then science, not politics, needs to determine U.S. policy toward wildlife. 

Endnotes:

¹ *The Truth About Aerial Hunting of Wolves in Alaska* (Sept. 19, 2007), available at http://www.youtube.com/watch?v=9Mu_rqmFpL8 (last visited Nov. 14, 2007).

² Letter from Alaska Governor Sarah Palin to Congressman George Miller (Sept. 27, 2007), available at <http://www.gov.state.ak.us/news.php?id=642> (last visited Oct. 15, 2007).

³ DEFENDERS OF WILDLIFE, THE PROTECT AMERICA’S WILDLIFE (PAW) Act, available at http://www.defenders.org/resources/publications/policy_and_legislation/paw_act_fact_sheet.pdf?ht= (last visited Nov. 10, 2007).

⁴ Airborne Hunting Act 16 U.S.C. §742j-1 (1971).

⁵ H.R. 3663, 110th Cong. (2007).

⁶ DEFENDERS OF WILDLIFE, *supra* note 3.

⁷ Endangered and Threatened Wildlife and Plants; Designating the Northern Rocky Mountain Population of Gray Wolf as a Distinct Population Segment and Removing This Distinct Population Segment From the Federal List of Endangered and Threatened Wildlife, 72 Fed. Reg. 6106 (Feb. 8, 2007) (to be codified at 50 C.F.R. pt. 17).

⁸ Endangered and Threatened Wildlife and Plants *id.*

⁹ Endangered and Threatened Wildlife and Plants, *id.*

¹⁰ Patrick O’Driscoll, *Gray Wolf to Lose Some Protection*, USA TODAY (Jan. 1, 2007), available at http://www.usatoday.com/news/nation/2007-01-29-gray-wolves_x.htm (last visited Nov. 11, 2007).

¹¹ Wayne L. Regelin, Alaska Department of Fish and Game, *Wolf Management With a Historic Perspective* (Mar. 2002), available at http://www.wc.adfg.state.ak.us/index.cfm?adfg=wolf_wolf_mgt (last visited Nov. 11, 2007).

¹² Rocky Barker, *Wolves & Elk: The Overriding Issue in Delisting*, THE IDAHO STATESMAN (Mar. 21, 2007), available at <http://www.idahostatesman.com/environment/story/80724.html> (last visited Nov. 11, 2007).

¹³ Regelin, *supra* note 11.

¹⁴ Defenders of Wildlife, *Brief History of Wolf Control in Alaska*, available at <http://www.defenders.org/resources/publications/> (enter search terms “Wolf control in Alaska,” then click first result) (last visited Nov. 10, 2007) [hereinafter *Brief History of Wolf Control in Alaska*].

¹⁵ *Brief History of Wolf Control in Alaska*, *id.*

¹⁶ *Brief History of Wolf Control in Alaska*, *id.*

¹⁷ Governor Sarah Palin, *supra* note 2.

¹⁸ Endangered and Threatened Wildlife and Plants; Designating the Northern Rocky Mountain Population of Gray Wolf as a Distinct Population Segment and Removing This Distinct Population Segment From the Federal List of Endangered and Threatened Wildlife, 72 Fed. Reg. 6107 (Feb. 8, 2007) (to be codified at 50 C.F.R. pt. 17).

¹⁹ Press Release, Defenders of Wildlife, Gray Wolf to Be Removed From Endangered Species List (Jan. 29, 2007), available at http://www.defenders.org/newsroom/press_releases_folder/2007/01_29_2007_gray_wolf_to_be_removed_from_endangered_species_list.php (last visited Nov. 11, 2007).

THE FUTURE OF THE POLAR BEAR RESTS ON THIN ICE: LISTING UNDER THE ESA AND ITS IMPACTS

by Justin Olsson*

Satellite imagery revealed that the Arctic sea ice cover fell to its lowest level in recorded history during the 2007 melting season, opening up the Northwest Passage.¹ As the ice cover diminishes, the long sought wish of trade is becoming a reality—a shortened global shipping route through the northern waters. Polar bears depend on this same ice for their habitat, access to food, and breeding sites.² Experts predict that two-thirds of the world's polar bears will disappear by 2050.³

In an effort to protect the species, Greenpeace, the National Resources Defense Council, and the Center for Biological Diversity filed a lawsuit in December 2006 after the Bush Administration ignored a petition to list the polar bear as a threatened species.⁴ In January 2007, in response to the lawsuit, the U.S. Fish and Wildlife Service (“FWS”) proposed listing the polar bear as a threatened species under the protection of the Endangered Species Act (“ESA”).⁵ Consequently, the U.S. Geological Survey (“USGS”) generated new scientific data and models on polar bears and their sea ice habitats. The USGS issued a final report on the status of the polar bear on September 7, 2007.⁶

There are an estimated 20,000–25,000 polar bears worldwide.⁷ The polar bears facing the greatest risk of extirpation, or local extinction, are the bears located in the Seasonal Ice and Polar Basin Divergent ecoregions.⁸ The USGS models predict a forty two percent loss of optimal polar bear habitat by the middle of the century.⁹ Scientists characterize their findings as conservative because even they believe that the best available models underestimate the actual decline in Arctic ice.

Scientists predict that even if stringent greenhouse gas (“GHG”) emissions reductions are globally put into place, the sea ice in the Arctic will continue to rapidly decrease for the next fifty years.¹⁰ As the ice cover thins, more open ocean patches become exposed to sunlight, which in turn melts more ice in a process referred to as sea ice-albedo feedback.¹¹ This feedback cycle is a critical threat¹² to the sea ice habitat of polar bears and GHG emissions must be reduced to slow this cycle.

The increasing possibility of a seasonally ice-free Arctic also opens the question of territorial jurisdictional claims for its resources and control over its use as a shipping route. Reports

indicate the world's militaries are lining up to protect their economic “rights” in the Arctic and sovereignty over the land is being asserted by a number of countries.¹³ The influx of military and possibly commercial activity into the Arctic region further threatens the polar bear and its habitat. Even in a best-case scenario without an oil spill, increased traffic in the region presents a danger to the polar bear.

The FWS decision of whether to list the polar bear as threatened is expected by the end of January 2008. Listing a species entitles it to a host of protections. Specifically, the consultation clause of the ESA places a procedural obligation on federal government to evaluate its actions and policies on the species

and consult with the FWS so that its actions avoid jeopardizing a threatened species.¹⁴ Most importantly, listing the species would prevent private and state takings.¹⁵ “Taking” has been interpreted to bar habitat modification of the species where there is a showing of actual injury to wildlife.¹⁶ Additionally, listing the species would require permits for activities that result in incidental takings, the designation of a critical habitat zone,

and the preparation of a recovery plan.¹⁷

Listing the polar bear may be an effective tool to require the federal government to require a reduction in GHG emissions that threaten the polar bear's habitat. If GHG emissions are considered a “taking” of the species, it raises a legal question of whether the government can compel U.S. companies to reduce their emissions to prevent such takings. It is also uncertain how such a listing would interact with international Arctic conservation treaties, such as the Polar Bear Treaty.

U.S. courts may soon face the question of whether the ESA can be used as a mechanism to enact change in U.S. climate policy. Listing the polar bear as threatened under the ESA is only the first of many necessary steps to slow and eventually reverse the impacts of climate change.



Endnotes: The Future of the Polar Bear Rests on Thin Ice
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THE EU ADOPTS AN INTEGRATED MARITIME POLICY AND ACTION PLAN: IS THE U.S. FAR BEHIND OR AHEAD?

by Joan M. Bondareff*

INTRODUCTION

On October 10, 2007, the European Commission (“Commission”) announced that they had adopted a new Integrated Maritime Policy for the European Union.¹ The announcement completes a one-year period of extensive public consultation on a proposed policy called the Green Paper.² The Integrated Maritime Policy is accompanied by a detailed action plan setting out implementation mechanisms over the next few years. This Article reviews the key elements of the action plan and compares it, briefly, to the present state of U.S. policy and law on the oceans and coasts.

PURPOSE OF THE INTEGRATED MARITIME POLICY AND EUROPEAN CONTEXT

In adopting a new integrated maritime policy, the Commission noted that “Europe is intimately linked to the seas and oceans that surround it. It is not just the shipping or fisheries industries and their related activities. It is also shipbuilding and ports, marine equipment and offshore energy, maritime and coastal tourism, aquaculture, submarine telecommunications, blue biotech and the protection of the marine environment.” The Commission not only intends to pursue the development of sea-related industries, but it recognizes that the use “needs to be sustainable as the marine environment is the base resource for all maritime economic activities.” In sum, the EU policy calls for “good governance and an integrated approach...that joins up sectoral policies for maritime activities and environmental policy relating to Europe’s seas.”

A review and comparison of European maritime policy and American policy should also start with a comparison of the underlying legal regimes. For instance, the treaty that created the EU gives explicit competence to the EU only in the policy areas of transportation, fisheries, and the environment.³ All other aspects of maritime policy remain within the jurisdiction of Member States. In the case of the United States, we have a history of over 200 years of sorting out the division of authority between the federal and state governments. This starts, of course, with the early decision by the Supreme Court in *Gibbons v. Ogden* (state regulation of steamboat licenses is preempted)⁴ to the more recent decision in *U.S. v. Locke* (state regulation of tankering preempted by federal regulations).⁵ The EU will need many more years to sort out this division of responsibility.

SUMMARY OF THE KEY ELEMENTS OF THE EU MARITIME POLICY

With these objectives in mind, the Commission is proposing the following actions, described further below:

- A European Maritime Transport Space without barriers;
- A European Strategy for Marine Research;
- National integrated maritime policies to be developed by EU Member States;
- An integrated network for maritime surveillance;
- A roadmap towards marine spatial planning by Member States;
- Elimination of pirate fishing and destructive high seas bottom trawling;
- Promotion of a European network of maritime clusters;
- A review of EU labor law exemptions for the shipping and fishing sectors;
- A European Marine Observation and Data Network; and
- A strategy to mitigate the effects of climate change on coastal regions.

EUROPEAN MARITIME TRANSPORT SPACE AND SUSTAINABLE SHIPPING AND PORT POLICIES

The Commission noted that maritime transportation is vital for Europe’s trade because almost ninety percent of its external trade and over forty percent of its internal trade goes by sea. Internally, there are barriers to marine transport because voyages by ship from a port of one EU Member State to another are always considered international even when the cargo transported is comprised of internal market-cleared goods. Consequently, the Commission will launch a consultation of stakeholders on the concept of a European Space for Maritime Transport without barriers and offer options for its implementation. The aim of the consultation is to adopt a proposal before the end of 2008. The Commission also referenced its draft guidelines on the application of EC competition rules to liner and tramp shipping conferences that had been published for comment in September 2007, and stated that its final guidelines will be adopted before October 2008.⁶

SHIP DISMANTLING

The Commission is developing a new EU strategy to be presented as a Communication for ship dismantling in mid-2008. The Communication will possibly contain technical assistance to developing countries to improve their ship dismantling facilities.

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ties, promoting voluntary industry action on clean ship dismantling, e.g., by distribution of information on green facilities, and promoting research on ship dismantling. The Commission will continue, in a parallel manner, to work with the International Maritime Organization (“IMO”) on a Ship Recycling Convention scheduled for adoption in 2009, and in the work of the Basel Convention on the same subject.⁷

AIR POLLUTION

The Commission is closely following the IMO discussions on the revision of MARPOL Annex VI (setting limits on air emissions from ships)⁸ and, if it concludes that the results are insufficient, it will consider alternative proposals for action.⁹ The Commission also plans to take action to further promote the use of shore-side electricity by ships at berth in EU ports, including the possible revision of a directive to allow total or partial exemptions from electricity taxes to ships using shore electricity from the harbor so that it is competitive with untaxed bunker fuel. Further, the Commission will evaluate various options for EU legislation to reduce greenhouse gas emissions from maritime transport and will consult with stakeholders on the proposed legislation.

PORTS

In October 2007, the Commission also adopted a new Communication on Ports containing a set of guidelines to bring more transparency and maintain a level playing field in the ports sector.¹⁰

EUROPEAN STRATEGY FOR MARINE RESEARCH

To provide the basis to underpin the EU Maritime Policy, the Commission announced that it would take action to develop a Maritime Research Strategy in consultation with Member States and with stakeholders in a European Marine Science Partnership. The Strategy itself will be proposed in a Communication in 2008.

INTEGRATED MARITIME POLICIES

The Commission has proposed that maritime functions be integrated across EU Member States and recommends that Member States integrate their own maritime policies. As noted above, the EU can only make recommendations in these areas which are left essentially to the purview of Member States. The Commission realizes that there are regulatory barriers to achieving an integrated EU maritime function, and therefore will issue in 2008 a set of guidelines on common principles and stakeholder involvement for maritime policies and report on the actions of Member States by 2009. To assist Member States to unify their maritime policies, the Commission will develop a more integrated network of surveillance systems for European waters, a program of marine spatial planning, and an EU Marine Observation and Data Network, described below.

INTEGRATED NETWORK OF MARITIME SURVEILLANCE

Building on earlier proposals, in February 2008, the Commission will adopt a Communication on a European Border Surveillance System (“EUROSUR”). This system will link existing surveillance systems at the Member State level and provide for a common information sharing environment for the maritime domain, covering initially the Mediterranean Sea and the Black Sea. This so-called “system of systems” is intended to increase EU security by preventing illegal immigration and trafficking of human beings, and also reduce the death toll at sea. The European GALILEO system will provide an advanced technological platform for the development of satellite-based surveillance applications.¹¹

In the second half of 2008, the Commission will announce in a Communication a detailed work plan for further steps towards the integration of all European maritime surveillance systems. Part of the creation of a European network for maritime surveillance will include improved cooperation between the coast guards of Member States. The EU may have preferred to establish a unified coast guard, as the United States has, but this certainly would infringe upon the jurisdiction and sovereignty of Member States.

MARINE SPATIAL PLANNING AND INTEGRATED COASTAL ZONE MANAGEMENT

An earlier Green Paper produced by the EU on Maritime Policy identified the increase in competing activities on coasts and seas as a source of potential conflict to be managed. Therefore, in 2008, the Commission

will propose a road map to facilitate and encourage the further development of marine spatial planning in Member States, and examine different options, including zoning, to make different maritime activities compatible, including the maintenance and strengthening of biodiversity. In 2009, the Commission will set up a system for the exchange of best practices in marine spatial planning and integrated coastal zone management.

As EU Commissioner Joe Borg stated in a February 22, 2007 speech in Sopot, Poland, “spatial planning,” or the coordination of maritime activities in European coastal regions and waters, can “help ensure the economically and environmentally sustainable development of coastal regions.”¹² At the same time, the Commissioner applauded the development by some Member States of pilot projects for implementing such spatial planning, notably Germany, the United Kingdom, Ireland, and the Netherlands.¹³

INCREASED FISHERY REGULATIONS AND REVIEW OF LABOR LAW EXCLUSIONS

The Commission observed that “the current situation of European fisheries cannot be deemed as satisfactory,” and

EU proposes to build on an existing system of maritime clusters to promote a European network of such clusters.

“efforts to achieve capacity reduction, and the conservation and restoration of fish stocks must go hand-in-hand with improving the social well-being of those active in the sector.”¹⁴ Consequently, the Commission announced that, in 2008, it will adopt a Communication on the overall application of the ecosystem approach to the Common Fisheries Policy. One of the top priorities for a Common Fisheries Policy will be the elimination of the dumping overboard of dead, unwanted fish as by-catch. The Commission is also preparing a draft regulation on combating illegal, unregulated, and unreported (“IUU”) fishing. Finally, the Commission will come forward with a legislative proposal to regulate destructive fishing practices on the high seas by EU fishing vessels, e.g., bottom trawling.

The Commission has agreed to undertake an assessment of the situation concerning the exclusion of maritime professions from EU social legislation and working conditions in a Communication to be launched later this month. Further, the Commission will work towards establishing a Certificate of Maritime Excellence to be endorsed on a voluntary basis with the aim of supplying highly knowledgeable personnel to the shipping industry.

PROMOTION OF A EUROPEAN NETWORK OF MARITIME CLUSTERS

The EU proposes to build on an existing system of maritime clusters to promote a European network of such clusters. A maritime cluster is a region within which maritime industries and related activities may be co-located.¹⁵

A EUROPEAN MARINE OBSERVATION AND DATA NETWORK

A new European Maritime Observation and Data Network (“Network”) will be proposed in 2009, on the basis of a road map to be published in 2008. According to Commissioner Borg, in an October 19, 2007 presentation to the Conference of Peripheral Maritime Regions of Europe, the Network will serve as a “genuine driver for the integrated governance of maritime affairs.”¹⁶ The Network also will provide opportunities for high-technology commercial companies in the maritime sector and improve the efficiency of marine observation and the management of marine resources and marine research. It will be integrated with the global initiative for a Group of Earth Observation System of Systems, called GEOSS, and the European contribution called Global Monitoring for Environment and Security, or GMES. On a related note, the Commission, in the second half of 2008, will propose a program for the development of mutually compatible and multi-dimensional mapping of seas in Member States’ waters.

A STRATEGY TO MITIGATE THE EFFECTS OF CLIMATE CHANGE ON COASTAL REGIONS

In 2008, the Commission will propose a Community strategy for disaster prevention and the development of a Strategy for Adaptation to Climate Change, with a focus on coastal regions. In particular, the Commission is examining the potential of new off-shore technologies such as carbon capture and geological storage to meet the EU’s climate change objectives. By the end

of this year, the Commission will propose a legal framework for carbon capture and storage, including the removal of obstacles to storage in sub-sea formations.¹⁷ The Commission recognizes that seabed storage will also require an international legal framework and cooperation. The transport of CO₂ to sub-sea sites also should be included, according to the Commission, in new marine spatial planning. Finally, “the technology used must ensure that the environmental gain from carbon storage is [not] offset by deterioration of the local marine environment.”¹⁸

PROMOTING EUROPE’S LEADERSHIP IN INTERNATIONAL MARITIME AFFAIRS

The Commission plans to take a higher profile in international maritime organizations and to encourage Member States to ratify international maritime conventions. On the international front, the Commission will produce, in 2008, a report on strategic issues for the EU relating to the Arctic Ocean. Further, the Commission, before the end of 2009, will put forward a strategy for the protection of high seas biodiversity through the designation of marine protected areas. Finally, the Commission will celebrate a European Maritime Day and create a European Atlas of the Seas.

A COMPARISON OF THE EU MARITIME POLICY TO U.S. OCEANS POLICY: REVIEW OF THE REPORTS OF TWO OCEAN COMMISSIONS

A starting point for comparing the work of the EU with that of the United States is to review the recommendations of two recent ocean policy commissions in the United States, the U.S. Commission on Ocean Policy and the Pew Oceans Commission. Both Commissions called for major reforms and restructuring of U.S. ocean law and policy.

In the first place, the U.S. Commission on Ocean Policy, established by the Oceans Act of 2000, consisted of Presidential appointees.¹⁹ The U.S. Commission on Ocean Policy issued its report, entitled *An Ocean Blueprint for the 21st Century*, on September 20, 2004.²⁰ In recognition of the fact that it has been thirty-five years since anyone had undertaken a comprehensive review of U.S. ocean policy, the Ocean Blueprint called for significant changes in the management of U.S. oceans, coasts and Great Lakes, and recommended the creation of an “effective national ocean policy that ensures sustainable use and protection of our oceans, coasts and Great Lakes for today and far into the future.”²¹

The Ocean Blueprint called for the reform of the management structure for ocean policy decision-making in the United States and strengthening of many ocean and coastal resource management policies. In brief, the Ocean Blueprint called for:

- A new National Ocean Policy Framework, including the establishment of a National Ocean Council within the Executive Office of the President;
- The establishment of regional ocean councils to coordinate ocean policy across state lines;
- Coordinated governance of offshore waters;
- An organic act for the National Oceanic and Atmospheric Administration (“NOAA”);

- Increased investment in science and exploration;
- The launch of an integrated ocean observing system;
- Reauthorization and strengthening of the Coastal Zone Management Act to enable states to incorporate a watershed focus;
- Guarding people and property against natural hazards;
- Conserving and restoring coastal habitat;
- Supporting marine commerce and transportation through the development of an integrated national freight transportation strategy;
- Addressing coastal water pollution and limiting pollution from vessels;
- Preventing the spread of invasive species;
- Achieving sustainable fisheries and setting a new course for sustainable marine aquaculture;
- Managing offshore energy and other mineral resources; and
- Establishing a dedicated Ocean Policy Trust Fund to carry out the Commission's recommendations.

A set of similar recommendations was adopted by the Pew Oceans Commission, a privately-funded commission which issued its report, entitled *America's Living Oceans: Charting a Course for Sea Change*, in 2003.²²

REACTION OF THE U.S. ADMINISTRATION AND CONGRESS TO THE COMMISSION REPORTS

The Bush Administration reacted to the report of the U.S. Ocean Commission by issuing an Executive Order on December 17, 2004, establishing an inter-agency Committee on Ocean Policy.²³ The Committee would be part of the Council on Environmental Quality ("CEQ"), and be chaired by the Chairman of CEQ. In addition, representatives of the Departments of State, Defense, the Interior, Agriculture, Health and Human Services, Commerce, Labor, Transportation, Energy, and Homeland Security, among others, would serve on the Committee.²⁴ The purpose of the Committee would be to coordinate the activities of departments and agencies regarding ocean-related matters in an integrated and effective manner to advance the environmental, economic, and security interests of present and future generations of Americans.²⁵

At the same time, the Bush Administration submitted to Congress its own Ocean Action Plan, responding to the recommendations of the U.S. Commission on Ocean Policy.²⁶ The Action Plan committed the Bush Administration to undertake the following priority tasks: (1) establish a new Cabinet-level Committee on Ocean Policy (completed, see above); (2) work with Regional Fisheries Councils to promote greater use of market-based systems for fisheries management; (3) build a Global Earth Observation Network, including a mechanism for integrated ocean observation; (4) develop an ocean research priorities plan and implementation strategy; (5) support accession to

the UN Convention on Law of the Sea; (6) implement coral reef local action strategies; (6) support a regional partnership in the Gulf of Mexico; (7) seek passage of an organic act for NOAA within the Department of Commerce; and (8) implement the Administration's National Freight Action Agenda.²⁷

The U.S. Congress conducted hearings on the Commissions' recommendations and has begun to implement some of the key recommendations.²⁸ How the Congress and Administration are doing in implementing these recommendations has become the focus of a new Joint Ocean Commission Initiative.²⁹ Admiral James D. Watkins and Mr. Leon Panetta, chairs of the U.S. Commission and Pew Commission, respectively, co-chair the Initiative. The Initiative has also issued a series of report cards on how Congress and the Administration are doing.³⁰ For example, in its 2006 report card, the Initiative noted that "progress on ocean policy reform has been uneven, and the modest progress that has been made is jeopardized by a lack of funding to support the implementation of promising initiatives and plans at all levels of government."³¹

Most of the grades issued by the Joint Task Force were below average. However, it widely credited the work of Congress and the Administration in passing the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006.³² This Act strengthened the role of science in CEQ decision-making and required an end to over-fishing.³³ It also contained new tools to eliminate IUU fishing.

It is beyond the scope of this Article to examine the report cards in greater detail except as they relate to an overall comparison of U.S. and European maritime policies, below.

THE EU'S CALL FOR AN INTEGRATED MARITIME POLICY COMPARED TO THE POLICY RECOMMENDATIONS OF THE U.S. OCEAN COMMISSION(S) AND IMPLEMENTATION

In a remarkably similar manner and within somewhat similar time frames, the EU and the United States have undertaken comprehensive reviews of their maritime policies and developed very similar recommendations. Both the EU and the U.S. Ocean Commissions call for increased attention to maritime and coastal issues in recognition that they have in many instances been neglected for years and there is a need for increased attention, resources, and new governance mechanisms.

On first examination, it appears that the EU's call for an Integrated Maritime Policy is far ahead of the U.S. Ocean Commission's call for an Ocean Blueprint for the 21st Century because the latter has not been implemented to any great degree in legislation or funding mechanisms. However, the United States in many respects is ahead of the EU in paying attention to coastal regions and has the advantage of a well-established system of federal environmental legislation to work with.

The United States has yet to ratify the UN Convention on the Law of the Sea.

The EU is a relatively new legal body and the European Commission's call for integrated action requires the cooperation of its Member States especially in the critical areas of marine spatial planning, the development of maritime clusters, and the creation of a unified coast guard.

In the area of marine spatial planning, the United States already has two important laws that call for such planning, one in coastal regions and one in offshore waters. The first is the Coastal Zone Management Act of 1972,³⁴ which calls for a nationwide program of integrated state coastal management programs for state-defined coastal regions with federal oversight, policy guidance and grants for their development and implementation.³⁵ In exchange for federal funds, states develop what would be the equivalent of spatial plans for their coastal regions.³⁶ Within these regions, the states must develop systems of conflict resolution and ensure that development will be sustainable.³⁷ The states also have the authority to extend their policies to offshore development through the use of the so-called federal consistency process.³⁸ If a state objects to an offshore development permit by the federal government, the project can not proceed unless the Secretary of Commerce overrides the state's objection.³⁹ To date, thirty-four coastal states have developed approved coastal management plans.⁴⁰

The United States also has an extensive system of marine spatial planning for special marine areas within the 200-mile Exclusive Economic Zone ("EEZ"), established by title III of the Marine Protection, Research and Sanctuaries Act.⁴¹ To date, the United States has established fourteen marine sanctuaries, including the Hawaiian Humpback Whale Sanctuary, the Channel Islands (California) Marine Sanctuary, and the Farallon Islands (California) Marine Sanctuary.⁴² This is a major piece of federal legislation that establishes a plan for conflict resolution and protection of unique resources, such as coral reefs, fisheries habitats, and whale calving areas, within extensive offshore marine areas.⁴³

Given the extensive legislative framework for marine spatial plans both within coastal zones and offshore marine areas in the EEZ, it can be said that the United States is substantially ahead of the EU in this particular area of promoting sustainable coastal development.

In other areas, the United States is lagging seriously behind the EU. For example, as of this writing, the United States has yet to ratify the UN Convention on the Law of the Sea although it was negotiated and approved by the UN some twenty-five years ago. As the *New York Times* editorialized on October 31, 2007, the debate over the Law of the Sea Treaty pits the Bush Administration, the environmental community, the military, the oil, shipping, and fishing industries, and the top Democratic and Republican members of the Senate Foreign Relations Committee against a "handful of cranky right-wingers."⁴⁴ The Senate held an important hearing on the subject, and recently, the Senate Foreign Relations Committee voted out a resolution on accession. The full Senate expects to take up the question of ratification in 2008. It is possible that before the end of 2008 the United States could become a party to this international agreement

which the United States itself took the lead in negotiating.⁴⁵

The United States is making progress in ending destructive fishing practices as the EU has begun to do as well. As noted above, in the last Congress, the United States enacted significant amendments to the Magnuson-Stevens Fishery Conservation and Management Act which called for an end to over-fishing, enhanced the role of science in fishery management, and strengthened the controls on IUU fishing.⁴⁶ The work of Congress in passing this law was lauded by the Joint Ocean Commission Initiative, as well.

The EU Maritime Policy calls for increased cooperation between the coast guards of Member States. The United States already has a unified federal Coast Guard which provides security for all waters within the EEZ, as well as further offshore as needed, to protect U.S. port state interests.⁴⁷ Moreover, if the U.S. Coast Guard promulgates regulations in an area of maritime safety, the federal regulations will preempt conflicting state laws and regulations.⁴⁸

With respect to sustainable shipping practices, the two proposals are close to a draw. For example, the United States is helping the IMO to negotiate a new convention on ship recycling.⁴⁹ The United States, however, has yet to ratify the Basel Convention, and it is unclear whether the United States agrees that ship scrapping is regulated under that Convention as a matter of law. A number of EU Member States are parties to the Basel Convention, but the practice of many States is to continue to send their old ships to third-world countries for disposal.⁵⁰

The EU has called for the development of a new integrated maritime surveillance system. The United States has taken significant steps to create and fund a new border surveillance initiative, called the Secure Border Initiative, or SBI-Net.⁵¹ The U.S. Coast Guard has undertaken new programs to monitor the maritime borders of the United States, too, called Maritime Domain Awareness.⁵² Recently, the U.S. Department of Homeland Security contracted with a team led by Boeing to establish SBI-Net. SBI-Net is a comprehensive plan by the U.S. Department of Homeland Security to gain operational control of the U.S. borders through the integration of increased staffing, international enforcement, detection, technology, and infrastructure.⁵³

The United States already has a unified marine transport space that allows all transportation between the fifty states to exist without any barriers. The EU is just beginning to create a European Transport Space without barriers. A similar system extends to transportation between the United States and Canada, on the one hand, and United States and Mexico, on the other, through the North American Free Trade Agreement.⁵⁴

The United States, however, like the EU, is just beginning to examine the question of establishing a new system of marine highways to divert trucks off highways and alleviate congestion and air pollution. The U.S. Maritime Administration has undertaken to support this initiative, called Short Sea Shipping.⁵⁵ Authority for a new Short Sea Shipping Program, to transport goods by waterways, was passed by the U.S. House of Representatives this year and included in a larger energy bill.⁵⁶ However, it remains to be seen if Congress will enact this bill this year.

Both the EU and the U.S. Ocean Commission called for an integrated program of maritime research. The Joint Commission Task Force gave the Congress and White House a failing grade of “F” in their last report card for failing to develop an integrated budget for federal ocean and coastal programs and a near-failing grade of “D+” for failing to address chronic under-funding of ocean science and education.⁵⁷ At the same time, the Task Force credited the Administration with developing an Ocean Research Priorities Plan and Implementation Strategy.⁵⁸ The EU has just begun its work on an integrated marine research program so it is too soon to evaluate the EU on this element of its work.

A final element of comparison is in the area of climate change. The EU Maritime Policy calls for the development of new sustainable strategies to protect coastal regions from the effects of global climate change and also specifically calls for the development of an innovative system of sub-sea disposal of carbon. The Joint Commission Initiative gave the Bush Administration and Congress the grade of “D+” last year for failing to recognize the ocean’s role in climate change, but has not endorsed sub-sea disposal of carbon as an option. While most European nations are signatories to the Kyoto Protocol, the United States is not. Therefore, the author concludes that the United States is lagging behind the EU in the areas of

recognizing the serious effects of global climate change and calling for specific actions to reduce greenhouse gas emissions.⁵⁹

CONCLUSION

The good news is that both the EU and the United States have finally come to recognize the importance of the sea and coasts to their future not only as economic zones of interest but also as zones that contain significant resources that must be protected, restored, and maintained if we are not to lose them and our way of living in the twenty-first century. If only it were a race to the finish to see who could protect these regions and resources the most, the EU or the United States, the marine regions of both continents and the populations living therein would all benefit. For now, I call it a draw, and as an interested bystander, I encourage both governments to do more to live up to their promises and commitments to create improved maritime policies and governance structures.



Endnotes: The EU Adopts an Integrated Maritime Policy

¹ See EUROPEAN COMMISSION, AN INTEGRATED MARITIME POLICY FOR THE EUROPEAN UNION (Oct. 2007), available at www.ec.europa.eu/maritimeaffairs (last visited Nov. 7, 2007) [hereinafter MARITIME POLICY].

² MARITIME POLICY, *Id.*

³ See Treaty on European Union, July 29, 1992, 1992 O.J. (C 191), available at <http://eur-lex.europa.eu/en/treaties/dat/11992M/htm/11992M.html#0001000001> (last visited Nov. 15, 2007).

⁴ *Gibbons v. Ogden*, 22 U.S. 1 (1824).

⁵ *U.S. v. Locke*, 529 U.S. 89 (2000).

⁶ *Draft Guidelines on the Application of Article 81 of the EC Treaty to Maritime Transport Services*, 2007 O.J. (C 215) 3, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2007:215:0003:01:EN:HTML> (last visited Nov. 14, 2007).

⁷ The United States has not ratified the Basel Convention and has not taken an official position whether the dismantling of ships is the cross-border transport of hazardous materials subject to the Basel Convention. See Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, Mar. 22, 1989, 1673 U.N.T.S. 57, available at www.basel.int (last visited Nov. 7, 2007).

⁸ See International Convention for the Prevention of Pollution from Ships (MARPOL 73/78), Nov. 2, 1973, 2 I.L.M. 1319 (1973), available at http://www.imo.org/Conventions/mainframe.asp?topic_id=258&doc_id=678 (last visited Nov. 5, 2007).

⁹ Legislation is pending in the U.S. Congress to ratify MARPOL Annex VI (H.R. 802, passed the House on March 26, 2007). At the same time, there is some movement afoot to implement stronger emission requirements. See American Association of Port Authorities, *Port Association Applauds House Passage of Bill to Reduce Pollution From Ships* (Mar. 27, 2007), <http://www.aapa-ports.org/Press/PRdetail.cfm?itemnumber=2455> (last visited Nov. 14, 2007).

¹⁰ ESPO NEWS, *Commission Announces Environmental Guidelines for Port Development* (Oct. 10, 2007), available at <http://www.espo.be/pages/ezine.aspx?newsletter=766> (last visited Nov. 14, 2007).

¹¹ ESA.int, Galileo Navigation, www.esa.int/esaNA/galileo.html (last visited Nov. 14, 2007).

¹² See Joseph Borg, Comm’r, European Comm’n Responsible for Fisheries & Mar. Affairs, Address at the International Consultation Conference From Education to Employment—How to Create a Successful Image of Seafaring in Europe: Role of the Future EU Maritime Policy in Shaping New Standards of Maritime Education and Employment (Feb. 22, 2007), available at http://ec.europa.eu/maritimeaffairs/speeches/speech220207_en.html (last visited Nov. 15, 2007).

¹³ Borg, *id.*

¹⁴ *Commission Working Document on An Integrated Maritime Policy for the European Union*, at 18, COM (2007) 574 final (Oct. 10, 2007), available at http://ec.europa.eu/maritimeaffairs/pdf/ActionPaper/EN_Action_plan_final.pdf (last visited Nov. 15, 2007) [hereinafter *Maritime Policy for the EU*].

¹⁵ ENMC, European Network of Maritime Clusters, www.european-network-of-maritime-clusters.eu (last visited Nov. 5, 2007) [hereinafter *Maritime Clusters*] (describing the existing network of maritime clusters).

¹⁶ *Maritime Clusters, id.*

¹⁷ France for many years has supported a program of sub-seabed disposal of high-level radioactive waste. See Nuclear Energy Agency, Index to Unrestricted Radioactive Waste Management Committee Documents for 2002, available at www.nea.fr/html/rwm/docs/2002 (last visited Nov. 7, 2007).

¹⁸ *Maritime Policy for the EU, supra* note 14, at 26.

¹⁹ Oceans Act of 2000, 33 U.S.C. § 857-19 (2007).

²⁰ See U.S. COMMISSION ON OCEAN POLICY, FINAL REPORT: AN OCEAN BLUEPRINT FOR THE 21ST CENTURY (Sept. 20, 2004), available at http://www.oceancommission.gov/documents/full_color_rpt/welcome.html (last visited Nov. 7, 2007) [hereinafter *BLUEPRINT*].

²¹ *BLUEPRINT, id.* at 1.

Endnotes: The EU Adopts an Integrated Maritime Policy
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SUBSIDIES FOR CORN-DERIVED ETHANOL MAY LEAVE US THIRSTY

by Michael W. Lore*

A new report from the National Research Council (“NRC”) indicates that ethanol from corn production may have a substantial negative impact on the U.S. water supply.¹ The U.S. ethanol subsidy program, \$0.51 per gallon, is designed to help wean domestic dependence on foreign oil. However, subsidies for corn-derived ethanol may accelerate a domestic and global water crisis² without establishing national energy independence. Congress should eliminate inefficient subsidies for corn-derived ethanol in the upcoming Energy Bill because the over-production of corn for corn-derived ethanol will likely accelerate the depletion of U.S. water quality and quantity.

According to NASA and the World Health Organization, severe water shortages will affect four billion people by 2050 and southwestern states in the U.S. will face severe freshwater shortages by 2025.³ U.S. corn production has several externalities that contribute to freshwater scarcity and environmental degradation. For instance, it creates more soil erosion and uses more herbicides and insecticides than any other U.S. crop.⁴ These inputs become residues in well water.⁵ These pesticides are arguably the cause of the Gulf of Mexico “dead zone,” an ever-increasing seasonal phenomenon where nutrient runoff causes oxygen depletion in an area the size of Massachusetts, causing harmful impacts on marine and coastal fish populations.⁶ Moreover, ethanol itself is likely to leak into ground water and cause harm to our drinking supply because ethanol will mainly be stored underground and there have been over 400,000 reports of leaks in the last few decades.⁷ The NRC has taken alarm to statistics like these and undertook an extensive study to find answers to potential water concerns related to corn-derived ethanol. The NRC suggests alternative subsidies to reduce impacts of biofuels production on water use and quality, policies to encourage best agricultural practices and policies to encourage biofuels produced from some cellulosic alternatives rather than from corn.⁸

The perfect storm of high oil prices and record-breaking U.S. corn yields has allowed the powerful corn lobby to dictate many policies in the renewable energy debate. The Energy Policy Act of 2005 established the Renewable Fuel Standard (“RFS”) that requires the use of 7.5 billion gallons of renewable fuels by

2012, with most of the renewable fuel originating from subsidized corn ethanol.⁹ President Bush suggested a thirty-five billion gallon domestic ethanol target during his 2007 State of the Union Address.¹⁰ Last June, the Senate voted 65-27 to expand the production of renewable fuels to thirty-six billion gallons by 2022, with fifteen billion to come from corn-derived ethanol.¹¹ The U.S. House of Representatives is in the process of negotiating an Energy Bill but House and Senate Democratic leaders intend to avoid the conference committee process and instead plan to bounce versions of their bills back and forth.¹² Therefore, critical debate over the impact of corn-derived ethanol subsidies on water supplies must occur immediately.

Critical debate over the impact of corn-derived ethanol subsidies on water supplies must occur immediately.

The ethanol debate is complex and it is perpetually evolving because new environmental externalities periodically emerge and prices of energy and food commodities perpetually change. Congress has the duty to include all future costs associated with ethanol in their energy and environmental impact analysis when developing federal policy related to subsidies that promote corn ethanol production. Over-farming to produce ethanol from corn will significantly erode drinkable water quantity and overused pesticides, herbicides, and fertilizers will eventually ruin the general quality of our water. Only a diligent analysis of all environmental factors and wise policy choices in the Energy Bill can supply the United States with its greatest needs while reflecting the country’s highest values.

produce ethanol from corn will significantly erode drinkable water quantity and overused pesticides, herbicides, and fertilizers will eventually ruin the general quality of our water. Only a diligent analysis of all environmental factors and wise policy choices in the Energy Bill can supply the United States with its greatest needs while reflecting the country’s highest values.

Endnotes:

¹ *Water Implications of Biofuels Production in the United States (Prepublication Copy)*, Nation Resources Defense Council, Oct. 10, 2007 (explaining how corn ethanol production can harm the U.S. water supply), available at http://books.nap.edu/openbook.php?record_id=12039&page=R1 (last visited Nov. 20, 2007).

² See generally Sara Hughes et al., *The Development of Biofuels Within the Context of the Global Water Crisis*, SUSTAINABLE DEV. L. & POL’Y, Spring 2007, at 58.

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DEFENDING STATE'S RIGHTS UNDER THE COASTAL ZONE MANAGEMENT ACT— *STATE OF CALIFORNIA V. NORTON*

by Linda Krop*

INTRODUCTION

The 2002 decision in *State of California v. Norton*¹ provides a unique insight into the history and evolution of the Coastal Zone Management Act (“CZMA”),² a powerful and as yet underutilized federal environmental law. This case also reveals the respective roles of the legislative, judicial, and executive branches in coastal protection and governance. As this Article will discuss, the debate centers on the respective roles of the federal government and coastal states in addressing coastal resources and activities. In *State of California v. Norton*, the Ninth Circuit upheld the broad role of states in reviewing activities that may affect their coastal zones, even though such activities are under the direct authority of the federal government.³

HISTORY AND BACKGROUND OF THE CZMA

The CZMA came about as the federal government and coastal states were engaged in a decades-long struggle over offshore regulatory authority, including matters regarding offshore oil and gas development. Both the federal government and the states sought exclusive control over offshore areas, in order

to regulate and protect these areas, but also to ensure ownership of (and thus economic interest in) mineral and other resources.

Beginning in the 1930s, both Congress and California attempted to assert jurisdiction over offshore energy resources.⁴ In 1945, President Truman concurred with Congress and claimed federal authority over all offshore resources.⁵ In 1947, the Supreme Court confirmed the validity of federal jurisdiction over all offshore resources.⁶ Thus, all three branches of the federal government agreed that areas offshore were to be regulated at a national level. However, coastal states continued to assert tremendous pressure in favor of shared offshore jurisdiction and, in 1952, Congress voted to move federal jurisdiction to three miles offshore. President Truman vetoed the bill, but his opponent in the presidential race, Dwight Eisenhower, promised to support the bill and the expanded role of coastal states. Eisenhower was elected President and supported new legislation in 1953 that established state jurisdiction out to three nautical

miles offshore. This law is known as the Submerged Lands Act.⁷ Federal oversight of oil and gas development activities beyond three nautical miles from shore was ensured later that same year when Congress passed the Outer Continental Shelf Lands Act (“OCSLA”).⁸

Despite Congress’s attempt to resolve these disputes, coastal states remained dissatisfied with the compromise and the federal assertion of jurisdiction off their borders. Activities beyond three miles from shore could still have a substantial effect on a state’s coastline, as so prominently demonstrated by the 1969 Santa Barbara oil spill.⁹ This spill—“the spill heard around the world”—occurred after a blowout at Platform A, a

Union Oil Company (“Union”) drilling platform located in federal waters approximately six miles from the California coast.¹⁰ The U.S. Geological Survey (“USGS”) had waived the requirement for casing in the wells drilled from the platform,¹¹ even though casing helps to prevent oil and gas from escaping the well.¹² The USGS agreed to allow Union to install casing to a depth of 239 feet instead of the federal and state standard of 880 feet.¹³ As a result of the lack of casing throughout the depth

of the drilling wells, a blowout occurred and over three million gallons of oil released into coastal waters, blackening over 35 miles of pristine beaches.¹⁴ This spill heightened the concerns of not only Californians, but other coastal states as well, which were vulnerable to the environmental consequences of decisions made by the federal government.¹⁵

THE COASTAL ZONE MANAGEMENT ACT

The CZMA represented Congress’s next attempt to address the ongoing concerns of coastal states. Although the CZMA did not change the jurisdictional boundaries already set forth in the Submerged Lands Act and OCSLA, it offered states an enhanced role in federal planning and permitting decisions that affect their

The intent of the CZMA was to ensure proper “coordination and cooperation” between the federal government and coastal states.

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coasts.¹⁶ The intent of the CZMA was to ensure proper “coordination and cooperation” between the federal government and coastal states.¹⁷ The key to ensuring this coordination and cooperation was the requirement for consistency review. Pursuant to this provision, activities carried out or approved by the federal government that affect a state’s coastal zone must comply with the state’s coastal laws and policies.¹⁸

The CZMA provides a two-step process towards securing federal-state coordination and cooperation. First, states are encouraged to prepare coastal management programs that will manage, protect, and conserve coastal resources.¹⁹ The CZMA sets forth several areas of national concern that must be addressed in a state’s coastal program. These include, for example, protection of natural resources and water quality.²⁰ The state’s program must be approved by the National Oceanic and Atmospheric Administration (“NOAA”), a branch of the U.S. Department of Commerce.²¹

Once NOAA certifies a state’s program, the CZMA requires that activities carried out or approved by the federal government must be consistent with the state’s approval program.²² There are three types of activities subject to state consistency review: (1) activities proposed by federal agencies; (2) private activities that require federal approval; and (3) offshore oil exploration, development, and production plans that are submitted for federal approval under OCSLA.²³

Federal agency activities include those activities proposed and carried out by the federal government. The CZMA requires that such activities “shall be carried out in a manner which is consistent to the maximum extent practicable with the enforceable policies of approved State management programs.”²⁴ Under this provision of the CZMA, the federal agency makes a “consistency determination” and submits it to the state for review.²⁵

Private applicants seeking a license or permit from a federal agency are also subject to the consistency requirement of the CZMA.²⁶ The Act provides that an application for a federal license or permit must include “a certification that the proposed activity complies with the enforceable policies of the state’s approved program and that such activity will be conducted in a manner consistent with the program.”²⁷ The state then has the ability to review the application for consistency with its coastal management program. A state may concur with, or object to, the consistency certification.²⁸

Similarly, an application for approval of an offshore oil and gas exploration or development and production plan must also include a certification that the activity will be carried out in a manner consistent with the state’s approved coastal management program.²⁹ As with private licenses and permits, the state may concur with, or object to, a consistency certification.³⁰

There are two key differences between consistency review

of federal agency activities (i.e., those activities carried out by a federal agency) and private activities that must be approved by federal agencies. First, unlike privately proposed actions, which must be conducted in a manner consistent with a state’s coastal program, a federal agency activity need only be “carried out in a manner which is consistent to the maximum extent practicable” with a state’s program.³¹ The difference in language allows the federal government some relief from the consistency requirement; private activities, by contrast, must be found strictly consistent with a state’s coastal program. Second, the CZMA provides that federal agencies may proceed with a proposed activity even if a state finds the activity to be inconsistent with its approved coastal program, whereas a state’s objection to a private application precludes the federal government from issuing a license or permit.³² These distinctions demonstrate that although Congress was willing to encourage federal-state coordination and cooperation, it was not willing to give states veto authority over the actions or proposals of federal agencies.³³

INTERPRETING CZMA

SECRETARY OF THE INTERIOR V. CALIFORNIA: A NARROW READING OF THE CZMA

In 1981, the State of California and several environmental groups sought consistency review of a federal oil and gas lease sale located in the Santa Maria Basin offshore Santa Barbara County (Lease Sale 53).³⁴ The sale was proposed by the U.S. Minerals Management Service (“MMS”), the federal agency responsible for administering oil and gas leasing and

development under OCSLA.³⁵ California and the other plaintiffs were concerned that the lease sale could result in an oil spill that would threaten the southern sea otter.³⁶ They asserted that this threat was inconsistent with the State’s coastal management program. The MMS, however, refused to allow the State to review the proposed lease sale for consistency review under the CZMA.³⁷

The district court and the Ninth Circuit Court of Appeals ruled in favor of the State of California, finding that the lease sale would affect the State’s coastal zone and therefore required consistency review by the State.³⁸ However, the U.S. Supreme Court reversed.³⁹ The Court placed great reliance on the fact that the CZMA required a “direct” effect on a state’s coastal zone in order to trigger the consistency requirement.⁴⁰ The Supreme Court found that because the sale of an oil lease only allows “very limited, ‘preliminary activities,’” and does not grant the right to “full-scale exploration, development or production,” it therefore could not result in a “direct” effect on the State’s coastal zone.⁴¹ Instead, the Court pointed out that under OCSLA, only the subsequent approval of a specific exploration plan (“EP”) or development and production plan (“DPP”) could result

In 1947, the Supreme Court confirmed the validity of federal jurisdiction over all offshore resources.

in a direct effect on a state's coastal resources. Accordingly, the Court noted that consistency review would be appropriate later, when specific exploration, development or production plans are submitted for federal approval.⁴²

This decision reinvigorated the controversy over offshore jurisdiction, and fractured the state-federal compromise that had been crafted in 1972. The coastal states turned to Congress again, and when the CZMA was reauthorized in 1990, Congress responded to *Secretary of the Interior v. California* by amending the Act to delete the requirement for a "direct" effect and by clarifying the legislature's intent for coastal states to be able to review *any activities* would affect their coastal zones, whether directly or indirectly. Congress specifically stated its intent that states should be allowed to review offshore oil and gas leases.⁴³

STATE OF CALIFORNIA V. NORTON: A BROAD APPLICATION OF CONSISTENCY REVIEW UNDER THE CZMA

There have been no further lease sales offshore California since the Supreme Court's ruling in *Secretary of the Interior v. California*. However, in 1999, 40 undeveloped leases located off the coast of Central California were set to expire unless "suspended" by MMS. Under OCSLA, an oil and gas lease is initially granted for five to ten years. If production does not commence within that time period, the oil lessee must request a "suspension," otherwise the lease will expire.⁴⁴ None of the leases in question had been produced; therefore they required suspensions to remain in existence. Because these leases were sold between 1968 and 1984, their initial sales escaped state consistency review.⁴⁵

The forty leases had been suspended previously for a variety of reasons, including a directed suspension from 1992 to 1999, during which time MMS conducted a study regarding the potential environmental and socioeconomic effects of development of the leases on the adjacent coastal communities of Santa Barbara, Ventura and San Luis Obispo Counties.⁴⁶ When the study was completed in 1999, MMS notified the lessees that the leases must be suspended or they would expire.

In response to MMS's notice, California Governor Gray Davis asked for a report from the California Coastal Commission ("Coastal Commission"), the agency responsible for consistency review under the CZMA, regarding the State's ability to respond to the proposed lease suspensions. The Coastal Commission staff scheduled a public hearing on the matter. In its report, the Commission staff explained that under *Secretary of the Interior v. California*, the state would have to wait for submittal of new proposed seismic surveys, EPs and DPPs before being allowed to review the leases for consistency with the State's coastal management plan.⁴⁷

In anticipation of the Coastal Commission hearing, a coalition of environmental groups hired the Environmental Defense Center ("EDC") to evaluate the State's role in responding to the proposed lease suspensions.⁴⁸ The EDC argued that the 1990 amendments to the CZMA should apply to the lease suspensions, and that the Coastal Commission should be allowed to review the suspensions for consistency with the State's coastal management program.

At the hearing in June 1999, the Coastal Commission agreed with the EDC and voted to send a letter to MMS, demanding the right to review the suspensions. The Commission noted a number of concerns with the leases, including the close proximity of the leases to the Monterey Bay and Channel Islands National Marine Sanctuaries, and changed environmental circumstances, including the expanded range of the southern sea otter, as well as more stringent air and water quality standards.⁴⁹

MMS rejected the Coastal Commission's request, and instead suspended the leases on November 12, 1999.⁵⁰ EDC urged the Commission to challenge the suspensions in court, under the CZMA. On November 18, 1999, the State of California, through the Governor, Attorney General and Coastal Commission, filed a lawsuit challenging not only the failure of MMS to allow the State to review the lease suspensions under the CZMA, but also the failure of MMS to conduct environmental review prior to suspending the leases.⁵¹ The oil lessees intervened on behalf of the federal government, and the three adjacent counties and ten environmental groups intervened on behalf of the State.⁵²

In their briefs, the state, environmentalists and counties argued that the lease suspensions should be reviewed by the state either under section 1456(c)(1) of the CZMA as a federal agency action, or under section 1456(c)(3)(A) as private licenses or permits requiring federal agency approval. The plaintiffs also argued that section 1456(c)(3)(B) of the CZMA, which pertained to EPs and DPPs, clearly did not apply to the lease suspensions. MMS claimed that CZMA and National Environmental Policy Act ("NEPA") review would happen later, when the oil companies submitted EPs and DPPs. MMS even made the "post hoc" argument that lease suspensions are categorically excluded from NEPA review.

The district court rejected MMS's arguments, ruling that (1) MMS had failed to explain during the environmental review process why lease suspensions are excluded from environmental review, and (2) the 1990 CZMA amendments gave the State the right to review the lease suspensions as a federal agency action under section 1456(c)(1) of the CZMA.⁵³ The decision placed significant reliance on the 1990 amendments to the CZMA, pointing out that the purpose of the 1990 amendments was to "to overrule *Secretary of the Interior*."⁵⁴ Judge Wilken noted that "Section 1456(c)(1)(A) was amended to delete the word 'directly' modifying 'affects,'" and that "Congress indicated in the legislative history that 'the term "affects" is to be construed broadly, including direct effects which are caused by the activity and occur at the same time and place, and indirect effects which may be caused by the activity and are later in time or farther removed in distance but are still reasonably foreseeable.'"⁵⁵ Finally, the decision cited Congress' statement that the 1990 amendments were intended "'to make clear' that the sale of oil and gas leases is subject to the CZMA;" and noted that all of the parties agreed that the 1990 amendment of the CZMA stated oil and gas lease sales constitute federal agency activities subject to state consistency review.⁵⁶ Therefore, the only question left was whether lease suspensions were also subject to state review.

Judge Wilken answered this question in the affirmative,

explaining that “MMS’s grant of the suspensions is a federal activity which it carries out in the exercise of its statutory duties.”⁵⁷ She concluded:

Therefore, because of Congress’s intent to require a federal agency to give the State consistency determinations at the time of the sale of the leases, which did not occur in this case, and because the MMS’s grant of these suspensions requires activities that affect the coastal zone, the Court finds that the MMS must provide the State with a determination that the lease suspensions are consistent with the State’s coastal management program, pursuant to CZMA § 1456(c)(1).⁵⁸

MMS and the oil companies appealed. In December 2002, the Ninth Circuit Court of Appeals affirmed Judge Wilken’s ruling.⁵⁹ In an unusually descriptive opinion, the court reviewed the background of oil and gas development offshore California, including a discussion of the 1969 Santa Barbara oil spill. The court recognized that “[s]ome would trace the current framework of environmental protections in substantial measure directly to the Santa Barbara spill.”⁶⁰ Moreover, the court noted that “[o]f particular relevance here, the federal Coastal Zone Management Act and California’s Coastal Act followed in the wake of the spill and both provided California substantial oversight authority for offshore oil drilling in federally controlled areas.”⁶¹

The court followed with an overview of the CZMA, OCSLA, and NEPA. The Court reiterated that Congress amended the CZMA in 1990 with the specific intent of overturning *Secretary of the Interior v. California*.⁶² The court then concluded that the CZMA required full review at the lease suspension stage.⁶³

As the court noted, the lease suspensions “represent a significant decision to extend the life of oil exploration and production off of California’s coast, with all of the far reaching effect and perils that go along with offshore oil production.”⁶⁴ The court rejected MMS’s argument that the State could wait until submittal of EPs and DPPs, pointing out that “[a]lthough a lease suspension is not identical to a lease sale, the very broad and long term effects of these suspensions more closely resemble the effects of a sale than they do the highly specific activities reviewed under section (c)(3).”⁶⁵ Therefore, “section (c)(1) review is available now for the broader effects implicated in suspending the leases. This phasing of review fits closely the expressed intent of Congress in subjecting the analogously broad implications of lease sales to (c)(1) review and specific plans to (c)(3) review.”⁶⁶

AFTERMATH OF *STATE OF CALIFORNIA V. NORTON*

As a result of these rulings, the leases were placed under a “directed suspension,” meaning that all activities on the leases were halted. In February 2005, MMS issued final Environmen-

tal Assessments and “Findings of No Significant Impact” under NEPA, again deferring review of future exploration and development activities until submittal of EPs and DPPs.⁶⁷ In March 2005, EDC and the Natural Resources Defense Council filed a lawsuit under NEPA on behalf of several environmental organizations.⁶⁸ In April 2005, MMS submitted proposed “consistency determinations” to the Coastal Commission pursuant to the CZMA. Although MMS claimed to address future activities that may occur on the leases, when the Coastal Commission requested more specific information and analysis of the effects of such activities, MMS again stated its refusal to conduct such an evaluation at this stage in the process.

The court hearing on the NEPA claim and the Coastal Commission hearing on the CZMA issue were scheduled one day apart in August 2005. In each case, the environmental groups argued that MMS should not be allowed to defer review of future activities that may occur on the leases. EDC pointed out that NEPA requires federal agencies to consider not just the “direct effects” of an action, but also the “indirect effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.”⁶⁹ Similarly, the

legislative history of the 1990 CZMA amendments supported the same standard for assuring timely review of activities that may affect the State’s coastal resources. The environmental groups noted that without the suspensions, the leases would expire. Therefore, they argued, the State should be allowed to consider the full range of impacts that may flow from such a decision.

On August 11, 2005, the Coastal Commission agreed that the scope of its review encom-

passed all future activities on the leases.⁷⁰ Accordingly, the Commission unanimously objected to the consistency determinations submitted by MMS. The next day Judge Wilken ruled from the bench that MMS “violated NEPA by failing to prepare environmental analyses of future exploration and development activities under the leases.”⁷¹ The Judge found not only that future development activities on the leases are reasonably foreseeable, but that the very purpose of the lease suspensions is to allow such activities. Accordingly, the Judge remanded the matter to MMS, ruling that the agency must complete adequate NEPA analyses of the lease suspensions. MMS appealed this decision and the case is currently pending before the Ninth Circuit Court of Appeals.

These decisions reflect the shared opinions of the legislative and judicial branches of the federal government that coastal states should be granted the right to review any federal agency activities that may have a direct or indirect effect on the State’s coastal zone. This perspective—so integral to Congress’s amend-

States should be granted the right to review any federal agency activities that may have a direct or indirect effect on the state’s coastal zone.

ments of the CZMA in 1990, and confirmed by the court's decision in *State of California v. Norton*—was further endorsed by the executive branch, under the Clinton Administration, when it published final revisions to the CZMA regulations.⁷² Although the purpose of the update was to allow a comprehensive review of the CZMA regulations, a critical component of the new regulations was focused on the need to comply with the 1990 amendments to the Act.

Thus, the three branches of government subscribed to the broad right of coastal states to review activities that may affect their coastal resources. Despite this unanimity, a change in the executive branch muddied the waters in 2002. Under the Bush Administration, the federal government proposed to revise the CZMA regulations again, less than two years after the comprehensive revisions were made in December 2000. The new regulations, which were finalized on January 5, 2006, appear to undermine both the Congressional intent in 1990 as well as the Ninth Circuit's ruling in 2002.⁷³ For example, the Federal Register notice announcing the new regulations characterizes OCS lease suspensions as "interim or preliminary" and states that "in all foreseeable instances, lease suspensions would not be subject to federal consistency review since (1) in general, they do not authorize activities with coastal effects; and (2) if they did

contain activities with coastal effects, the activities and coastal effects would be covered in a State's review of a previous lease sale, an EP or a DPP."⁷⁴ This language appears to conflict with the 1990 CZMA amendments, which provide for early review, similar to NEPA, so that even future, indirect effects shall be considered in the context of a proposed federal activity.

CONCLUSION

As the courts have stated, the CZMA must be applied on a case-by-case basis. There are no exclusions from state consistency review; if the facts of a particular case indicate that the proposed activity may result in a direct or indirect effect on a state's coastal zone, a consistency determination or certification must be submitted to the state for review. Any limitations set forth in the CZMA regulations must be implemented consistent with the intent of the Act itself. Thus, if the current or any future administration attempts to rely on the 2006 regulations to limit state review, the judicial branch may be brought into the fray again to determine whether Congress's intent is being undermined. In the meantime, California and other coastal states should follow the 1990 amendments to the CZMA and the court's interpretation of such amendments, as set forth in *State of California v. Norton*.



Endnotes: Defending State's Rights

¹ *California v. Norton*, 311 F.3d 1162 (9th Cir. 2002).

² Coastal Zone Management Act, 16 U.S.C. § 1451 *et seq.*

³ *Norton*, 311 F.3d at 1173.

⁴ See generally ROBERT SOLLEN, AN OCEAN OF OIL: A CENTURY OF POLITICAL STRUGGLE OVER PETROLEUM OFF THE CALIFORNIA COAST (Denali Press, 1998) (providing an excellent history of the conflicts between state and federal regulation over offshore oil and gas development).

⁵ Proclamation No. 2667, 10 Fed. Reg. 12,303 (Sept. 28, 1945) (proclaiming that the United States "regards the natural resources of the subsoil and sea bed of the continental shelf beneath the high seas but contiguous to the coasts of the United States as appertaining to the United States, subject to its jurisdiction and control").

⁶ *United States v. California*, 332 U.S. 19, 38-39 (1947).

⁷ Submerged Lands Act, 43 U.S.C. §§ 1301-1315 (1952).

⁸ Outer Continental Shelf Lands Act, 43 U.S.C. §§ 1331-1356 (1952).

⁹ Keith C. Clarke & Jeffrey J. Hemphill, *The Santa Barbara Oil Spill: A Retrospective*, in YEARBOOK OF THE ASSOCIATION OF PACIFIC COAST GEOGRAPHERS, VOL. 64, 157-162, available at <http://www.geog.ucsb.edu/~kclarke/Papers/SBOilSpill1969.pdf> (last visited Nov. 4, 2007); see also ROBERT EASTON, BLACK TIDE: THE SANTA BARBARA OIL SPILL AND ITS CONSEQUENCES (Delacorte, 1972).

¹⁰ Clarke & Hemphill, *supra* note 9; see also Miles Corwin, *The Oil Spill Heard 'Round the Country!*, L.A. TIMES, Jan. 28, 1989, at A1.

¹¹ See generally County of Santa Barbara Energy Division, Blowout at Union Oil's Platform A, <http://www.countyofsb.org/energy/information/1969blowout.asp> (last visited Nov. 14, 2007).

¹² Clarke & Hemphill, *supra* note 9.

¹³ Clarke & Hemphill, *supra* note 9.

¹⁴ Clarke & Hemphill, *supra* note 9.

¹⁵ Clarke & Hemphill, *supra* note 9 (noting that the Santa Barbara oil spill led to the enactment of the National Environmental Policy Act of 1969 ("NEPA"), 42 U.S.C. §§ 4321 *et seq.* and the creation of the Environmental Protection Agency ("EPA")).

¹⁶ The CZMA defines the coastal zone as waters seaward of state title and ownership under the Submerged Lands Act, as well as Great Lakes waters. See 16 U.S.C. § 1453(l) (2007).

¹⁷ 16 U.S.C. § 1456(a).

¹⁸ 16 U.S.C. § 1456(c).

¹⁹ See 16 U.S.C. § 1452. Pursuant to 16 U.S.C. § 1455, the federal government offered funding to help states prepare their coastal management programs.

²⁰ 16 U.S.C. § 1452.

²¹ Legislation, NOAA Office of Legislative Affairs website, <http://www.legislative.noaa.gov/Legislation/czma.html> (last visited Nov. 4, 2007).

²² 16 U.S.C. § 1456(c) (2007). See also *Exxon Corp. v. Fischer*, 807 F.2d 842, 844 (9th Cir. 1987) (defining CZMA as "a mechanism for resolving conflicts between state coastal zone plans and federally-approved activities").

²³ 16 U.S.C. § 1456(c).

²⁴ 16 U.S.C. § 1456(c)(1)(A).

²⁵ 16 U.S.C. § 1456(c)(1)(C).

²⁶ 16 U.S.C. § 1456(c)(3)(A).

²⁷ 16 U.S.C. § 1456(c)(3)(A).

²⁸ 16 U.S.C. § 1456(c)(3)(A).

²⁹ 16 U.S.C. § 1456(c)(3)(B).

³⁰ 16 U.S.C. § 1456(c)(3)(B)(ii).

³¹ 16 U.S.C. § 1456(c)(1)(A) (emphasis added).

CATEGORY 3 WAKE-UP CALL:

RECOGNIZING THE IMPORTANCE OF MISSISSIPPI DELTA RESTORATION

by Matt Irwin*

Louisiana is losing its coastal wetlands and barrier islands at the fastest rate of any U.S. state: the Gulf of Mexico has claimed an area roughly the size of Delaware since the 1930s.¹ The main cause of wetland loss is human activity, specifically isolating the Mississippi River from the Mississippi Deltaic Plain (“MDP”) by building levees to control natural flooding and canals.² Congress and the Louisiana legislature have increased efforts to restore the MDP in the wake of the destruction caused to the Gulf Coast by Hurricanes Katrina and Rita.³

MDP restoration can have both indirect and direct positive effects in dampening flooding caused by future storms. Indirectly, the main cause of sediment loss to the MDP and flooding after Hurricane Katrina was the 15,000 km of canals dredged in the MDP.⁴ The canals, built since the 1950s, have “sliced the wetlands into a giant jigsaw puzzle, increasing erosion and allowing lethal doses of salt water to infiltrate brackish and freshwater marshes.”⁵ Computer models suggest that these same canals, mostly the Mississippi River Gulf Outlet canal (“MRGO”), helped channel the storm surge from Hurricanes Katrina and Rita into the sub-sea level parishes in the New Orleans area.⁶

Thus, it would seem that proposed efforts to reconstruct the MDP wetlands by reconnecting the Mississippi River to the MDP through backfilling canals and the MRGO would cut off the very channels that brought flood waters into New Orleans during Hurricanes Katrina and Rita.⁷

Restoration of the MDP can also have a more direct effect on decreasing the volume of flood waters that threaten the Louisiana coast during hurricanes and other tropical storms. There is no exact measurement of the amount of protection that wetlands provide against a hurricane’s storm surge.⁸ Data collected after Hurricane Andrew demonstrates that a kilometer of coastal wetland decreases storm surge by 5 cm.⁹ Computer models simulating a Category 3 hurricane hitting south-central Louisiana estimate that the past 40 years of wetlands decline results in a 2.5 to 3 meter increase in the height of storm surge.¹⁰ Although wetland restoration alone will not provide much protection from Gulf Coast hurricanes,¹¹ the buffer effect of wetlands combined

with restoration efforts that close sediment robbing canals might provide an environmentally sustainable complement to levees that can protect New Orleans and the surrounding parishes from flood damage on the level seen after Hurricanes Katrina and Rita.¹²

Perhaps the most important reason for Louisiana’s wetlands restoration is the abundance of natural resources provided by the MDP wetlands. Louisiana’s wetlands provide a third of the nation’s oil and a quarter of its natural gas,¹³ and the MDP provides habitats for \$3 billion worth of oysters, shrimp, and fish.¹⁴ This same area is also a priceless wildlife habitat.¹⁵ Congressional and state spending on wetlands restoration after Hurricanes Katrina and Rita also furthers other national priorities.

Congress first recognized the need to restore the MDP in 1990 with the Coastal Wetlands, Planning, Protection, and Restoration Act (“CWPPRA”). The CWPPRA provided \$50 million per year to the U.S. Army Corps of Engineers to implement projects to restore the MDP.¹⁶ In 1998 Congress recognized that restoration efforts must be increased and commissioned the Coast 2050—Toward a Sustainable Coastal Louisiana Plan and the associated U.S. Army Corps of Engineers Louisiana Coastal

Perhaps the most important reason for Louisiana’s wetlands restoration is the abundance of natural resources provided by the MDP wetland.

Area Ecosystem Restoration Study (“LCA Study”).¹⁷ The LCA Study stated that various restoration efforts to achieve ecosystem benefits would cost from \$5 billion to \$17 billion.¹⁸ The Office of Management and Budget instructed the Army Corps of Engineers to scale back this plan. However, the Army requested only \$1.12 billion from Congress in the Water Resources Development Act (“WRDA”) in 2005.¹⁹ The WRDA has recently been the subject of the first override of a President G.W. Bush veto. On November 6, 2007 Congress overrode President Bush’s veto of the WRDA, appropriating \$23 billion for over 900 water supply, flood control, navigation, and environmental restoration projects.²⁰ The WRDA includes billions of dollars to restore the Louisiana coast.²¹

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State level efforts to prepare the Louisiana Gulf Coast after Hurricanes Katrina and Rita will have a mixed effect on MDP restoration. The Louisiana Coastal Protection and Restoration Project (“LCPRP”), directed by both Congress and the state of Louisiana, has thus far only dealt with manmade hurricane protection barriers, such as levees and floodgates, which could pose a threat to the sustainability of the MDP.²² At the same time, however, Louisiana has dedicated its share of newly opened oil and gas tracts provided by the federal Gulf of Mexico Energy Security Act (“GMESA”) to coastal restoration and protection.²³ It therefore remains to be seen how the money appropriated under the GMESA will coexist with the hurricane protection efforts proposed under the LCPRP.

Science, not politics, needs to determine U.S. policy toward wildlife.

There are several factors that justify restoration of the MDP, including storm protection, natural resource extraction, and natural habitat. Whatever motivation exists for MDP restoration, the monetary cost will be one so large that it will require a resolute federal government to provide funding. One can only hope that Hurricanes Katrina and Rita brought enough awareness to the issue of MDP restoration that politics will subside to sound scientific analysis and action.

The recent efforts by Congress to override a presidential veto and pass the WRDA is only a first step to a more comprehensive and sustainable approach to MDP restoration and development.



Endnotes:

¹ Joel K. Bourne, Jr., *Gone with the Water*, Nat’l Geographic, Oct. 2004, available at <http://magma.nationalgeographic.com/ngm/0410/feature5/index.html> (last visited Nov. 20, 2007).

² John W. Day, Jr., et al., *Restoration of the Mississippi Delta: Lessons from Hurricanes Katrina and Rita*, SCIENCE, Mar. 23, 2007, at 1679, 1680.

³ Jeffrey A. Zinn, *Coastal Louisiana Ecosystem Restoration After Hurricanes Katrina and Rita* (CRS Report, Report No. RS22276, 2006), available at <http://www.nationalaglawcenter.org/assets/crs/RS22276.pdf> (last visited Nov. 20, 2007) [hereinafter *Coastal Louisiana*].

⁴ Day, *supra* note 2, at 1680.

⁵ Bourne, *supra* note 1.

⁶ Erik Stokstad, *After Katrina: Louisiana’s Wetlands Struggle for Survival*, SCIENCE, Nov. 25, 2005, at 1264, 1265.

⁷ Day, *supra* note 2, at 1681.

⁸ Stokstad, *supra* note 6, at 1266.

⁹ Stokstad, *supra* note 6, at 1266.

¹⁰ Stokstad, *supra* note 6, at 1266.

¹¹ Stokstad, *supra* note 6, at 1266. See generally *Coastal Louisiana*, *supra* note 3.

¹² Day, *supra* note 2, at 1681.

¹³ Bourne, *supra* note 1.

¹⁴ Stokstad, *supra* note 6, at 1266.

¹⁵ Bourne, *supra* note 1.

¹⁶ Day, *supra* note 2, at 1682.

¹⁷ Day, *supra* note 2, at 1683.

¹⁸ Day, *supra* note 2, at 1683.

¹⁹ Day, *supra* note 2, at 1683.

²⁰ Environmental News Service, *Congress Overrides Bush Veto of Water Resources Development Act* (Nov. 8, 2007), available at <http://www.ens-news-wire.com/ens/nov2007/2007-11-08-02.asp> (last visited Nov. 20, 2007) [hereinafter *Congress Overrides Bush*].

²¹ *Congress Overrides Bush*, *id.*

²² Day, *supra* note 2, at 1683.

²³ Day, *supra* note 2, at 1683.

PREPARING FOR THE DAY AFTER TOMORROW:

FRAMEWORKS FOR CLIMATE CHANGE ADAPTATION

by Ira R. Feldman & Joshua H. Kahan*

INTRODUCTION

To date, the international community has dealt with climate change, the quintessential sustainability issue of our time, principally by promoting the mitigation of greenhouse gases (“GHGs”). The rationale for such mitigation efforts, simply stated, is that if GHG concentrations are stabilized or reduced, ultimately the severity of climate change can be alleviated. While there is no doubt that mitigation activities are necessary to the long-term well-being and stability of the global environment, the level of attention paid to mitigation-oriented science, technology, methodology, and policy serves to obscure the pressing need to seriously address the inevitable question of adaptation to climate change.

The overwhelming focus on GHG mitigation overshadows the adaptation half of the climate change equation. The reality is that, even if the most optimistic mitigation plans are adopted and all GHGs are stabilized immediately, residual GHG concentrations within the atmosphere will continue to create adverse consequences well into the future. The challenge is not successfully “managing a transition from one equilibrium to another,” as mitigation does, “but rather, adapting to a far more uncertain climatic future.”¹ At best, mitigation of anthropogenic sources of GHGs can attempt to minimize long-term climate change impacts, but cannot halt or avoid all impacts. Therefore, adapting to the adverse impacts of climate change is a reality, and in some instances the need is immediate.

The Intergovernmental Panel on Climate Change (“IPCC”) defines climate change adaptation as “an adjustment in ecological, social, or economic systems in response to actual or expected climatic stimuli and their effects or impacts.”² Adaptive measures are needed because adverse consequences are expected to occur globally on unprecedented levels. The IPCC states with high confidence³ that many natural systems are being affected by regional climate changes, particularly temperature increases. Global data assessments show that it is likely⁴ that anthropogenic warming impacts many physical and biological systems, and other effects of regional climate change on natural and human environments are emerging.⁵ The current knowledge of climate change associated impacts has led the global community to the conclusion that “adaptation will be necessary to address impacts from the warming which is already unavoidable due to past emissions.”⁶

Because climate change is an immediate threat it is imperative to develop and implement strategies for climate change adaptation. This Article explores the concepts behind climate change adaptation, discusses accomplishments to date and

addresses the next step of how to implement adaptation strategies in an effective and sustainable manner. This Article outlines the international commitment to address climate change adaptation, introduces the concepts central to an adaptation framework, and details recent domestic developments in adaptation policy and planning.

CLIMATE CHANGE ADAPTATION IN IPCC AND KYOTO PROCESSES

UNFCCC/ KYOTO PROCESSES

Although the Kyoto Protocol is largely directed towards mitigation, adaptation is recognized as part of the Kyoto framework. The United Nations Framework Convention on Climate Change (“UNFCCC”)⁷ makes direct reference to adaptation measures in a number of key Articles.⁸ In all, ten provisions discuss climate change adaptation, “with particular attention having been given to issues relating to Article 4.8⁹ and Article 4.9¹⁰, and to scientific and technical aspects under the relevant Subsidiary Body for Scientific and Technological Advice agenda item on adaptation.”¹¹

The Kyoto process recognizes that adaptation is integral through the Adaptation Fund. While this fund is not currently operational, it “will fund concrete adaptation measures, to be financed from a share of proceeds from the clean development mechanism and other voluntary sources.”¹² The Adaptation Fund will support and promote measures such as vulnerability and adaptation assessment, capacity building, technical training and technology transfer, pilot programs, and strengthening and developing early warning systems for extreme weather events.¹³

At the UNFCCC Third Conference of the Parties held in Kyoto, Japan, it was requested that the Convention Secretariat “continue its work on the synthesis and dissemination of information on environmentally sound technologies and know-how conducive to mitigating, and adapting to, climate change.”¹⁴ In response, the UNFCCC Secretariat in 1999 released a report organizing the technical and theoretical knowledge on adaptation based on the sector model approach to vulnerability and discussing the options and tools available to evaluate and imple-

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ment adaptation schemes.¹⁵ In 2005, the UNFCCC released the revised final draft report retaining the primary goal of conveying available adaptation tools and methods without the use of a sector-based approach for data organization.¹⁶ The data was reorganized in a more efficient manner without recommending any specific tools or methods.

IPCC AND ADAPTATION

The IPCC also is active in basic adaptation research and discussions. The IPCC published a series of reports that includes discussions on adaptation.¹⁷ The most recent IPCC report, *Climate Change 2007: Impacts, Adaptation, and Vulnerability* re-emphasizes that climate change and adverse impacts are likely, and discusses the urgency and need to enhance the consideration of adaptive measures. The report notes that adaptation will be necessary to address impacts resulting from warming unavoidable from banked GHG concentrations and that a portfolio of adaptation and mitigation measures can diminish the risks associated with climate change.¹⁸ The IPCC details a wide array of adaptation options (see Table 1), however, the IPCC noted that more adaptation is necessary to reduce vulnerability of future climate change.

TABLE 1
POTENTIAL ADAPTATION RESPONSES AND EXAMPLES¹⁹

Utilizing known technologies	i.e. Sea defenses
Behavioral modifications	i.e. Altered food and recreational choices
Managerial modifications	i.e. Altered farm practices
Policy development	i.e. Planning regulations

BASIC ADAPTATION CONCEPTS: VULNERABILITY AND SUSTAINABILITY

VULNERABILITY ANALYSIS

Vulnerability is a central concept for climate change adaptation policy and planning, and can be seen as the connecting thread that links all the adaptation modalities. Climate change vulnerability can be defined as “the degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and adaptive capacity.”²⁰ Vulnerability is multi-disciplinary in nature, because social, economic, and environmental systems can all be vulnerable to climate change.

Vulnerability is associated both with the state of a system prior to a hazardous event, and the system’s ability to effectively handle the hazardous event.²¹ Vulnerability analysis is defined in terms of impact, with a focus on physical hazard, exposure, and a system’s sensitivity to hazard.²² Climate change vulnerability is distinguished through hazard exposure, represented in biophysical vulnerability, and coping with a hazard, represented in social vulnerability.²³ Climate change vulnerability occurs at the intersection of social and biophysical vulnerability, where one is a function of the other.

Although vulnerability is site-specific, there are certain char-

acteristics that can generally influence vulnerability, regardless of geographical and socio-political contexts. Such characteristics are called “generic determinants of vulnerability” and are primarily developmental focused, including: poverty, health status, economic inequality and elements of governance, technology, education, infrastructure, and dependence on agriculture.²⁴ Generic determinants of vulnerability are associated with adaptive capacity, which refers to “the ability or capacity of a system to modify or change its characteristics or behavior so as to cope better with existing or anticipated external stresses.”²⁵ Adaptive capacity is a determining factor of vulnerability because, given the generic determinants of vulnerability in addition to site-specific vulnerabilities, adaptive capacity is represented in terms of a system’s ability and/or capacity to potentially adapt.

Generic determinants of vulnerability can be found globally in both developed and developing nations, however, due to developing nations’ circumstances of transition, all developing nations possess some form of generic vulnerabilities.²⁶ The acknowledgment that developing nations are substantially more vulnerable raises issues of equity and fairness on a number of levels.²⁷ While issues and questions continue to accumulate and answers are slow to surface due to a recent sense of urgency, interest, and concern, the relationship of vulnerability, adaptation, and developing nations generates considerable attention. The global community has begun to recognize how vulnerability and adaptation are closely linked, and vulnerability is becoming the focus of research, analysis, and discussion for future adaptation considerations.

ALIGNING ADAPTATION AND SUSTAINABILITY

Due to the varying scope and scale at which adaptive measures will be required, effective policy implementation presents the challenge of “linking climate change policy to policy normally seen as outside the scope of climate change, including livelihood enhancement, poverty alleviation, education, and improved institutional arrangements.”²⁸ Fortunately, integrating the goals of sustainability and climate change adaptation presents an effective avenue of integrating diverse policy goals. Adaptation and sustainability are complementary and “can yield synergistic efficiencies and benefits that advance the goals of both agendas . . . for a society that is made more climate resilient through proactive adaptation to climate variations, extremes and changes is one in which development achievements and prospects are less threatened by climate hazards and therefore more sustainable.”²⁹ For the integration to occur, adaptation must be included and considered in the process of “policy formulation, planning, program management, project design, and project implementation.”³⁰ Aligning adaptation with sustainability is a policy option that could be used in both developed and developing nations to create win-win scenarios that foster sustainable development and strengthen climate resilience.

Policy decision-makers at varying scales face the challenge of pursuing and achieving multiple goals with limited resources requiring tradeoffs to achieve priority goals. However, by integrating sustainable development and adaptation, a tradeoff does not have to occur, for development will achieve its policy goals

while reinforcing the adaptation infrastructure. More so, several goals of sustainable development are complementary to adaptation, including: development that targets highly vulnerable populations, diversifies economic activities, provides for livelihoods that are less climate sensitive, improves natural resource management, directs development away from highly hazardous locations towards less hazardous ones, and invests in expanding knowledge and creating technology that is relevant to reducing climate risks.³¹

The integrated process can foster a top-down and a bottom-up strategy. A top-down strategy implies action taken at larger scales, such as national and regional levels, to foster sustainable development and adaptation at the smaller scales, such as the community and local levels. For instance, national, regional, and state governments can “create incentives, enforce regulations, assist with capital financing and implement large projects that go beyond the means of the local authorities to create a climate proof society.”³² National, regional, and state level support would create a number of beneficial outcomes, such as fostering development away from at-risk locations, constructing homes that can withstand climate variabilities, provide insurance, encourage and implement better land use, and construct infrastructure to help adapt to climate variability.³³

DEVELOPMENTS IN ADAPTATION

Because GHG mitigation has been the focal point of most climate change research and discussions, early adaptation research was geared towards informing mitigation policy.³⁴ Such considerations are viewed as first generation adaptation assessments and attempted “to understand how climate might change and what would be the likely impacts based on models and climate scenario methods.”³⁵ In contrast, second generation assessments examine the relationship of vulnerability, adaptive capacity, and climate change to identify where and what adaptive measures are needed, and ultimately integrate such considerations into associated decision making processes and policy goals.

The first generation assessments typically followed a seven step approach: (1) define the problem; (2) select the method of assessments most appropriate to the problems; (3) test methods/ conduct sensitivity analysis; (4) select and apply climate change scenarios; (5) assess biophysical and socioeconomic impacts; (6) assess autonomous adjustments; and (7) evaluate adaptation strategies.³⁶ This approach proved largely ineffective because it analyzed climate change from a big picture perspective. However adaptation is site specific and each location has different needs and situations. First generation assessments assume adaptation can be implemented with a broad stroke and paid little attention to implementation challenges, including social, behavioral, or cultural obstacles.³⁷ Moreover, stakeholders were typi-

cally not involved and a top-down approach was used. Since adaptation needs are site specific, local knowledge and customs are invaluable tools in developing effective and sustainable adaptation projects.³⁸ The shortfalls of first generation adaptation assessments prompted the global community to re-evaluate the adaptation approach.

While the second generation adaptation assessments are works in progress, certain parameters can already be discerned. New assessment methods present a restructured approach that is solely focused on adaptation, places vulnerability and adaptation in the center of the assessment, engages stakeholders in the process, and attempts to strengthen country-level information and data to promote informed policy decisions. Such assessments attempt to determine the relationship of vulnerability and climate change by posing certain research questions: “how and why vulnerabilities differ for different populations within a region, and how vulnerabilities may change over time as a result of climate changes and other factors.”³⁹

CLIMATE CHANGE ADAPTATION INITIATIVES AT THE INTERNATIONAL LEVEL

ADAPTATION IN THE USCSP PROGRAM

Prior to the Earth Summit in Rio de Janeiro in 1992, the United States announced the formation of the U.S. Country Studies Program (“USCSP”). This program, no longer in existence, was coordinated with the Global Environment Facility (“GEF”), IPCC, the Subsidiary Bodies to the FCCC, and other international organizations, to expand upon initial IPCC

reports published in the early 1990’s.⁴⁰ The goal of the program was to assist developing countries and economies in transition in assessing their climate change sensitive sector vulnerability and explore opportunities for adaptation.⁴¹ Participating nations were required to develop and list adaptation needs and vulnerabilities, take inventories of greenhouse gas emissions, formulate climate change action plans, and assess technological capabilities. The USCSP was intended to support the goals of the UNFCCC by compiling general baseline data to initiate discussion and potential action within the international community.

The USCSP’s primary contribution was capacity building in developing countries to assess potential climate impacts.⁴² However, there is a need for caution in drawing sweeping conclusions about the vulnerability of developing and transition countries to climate change.⁴³ Consistent with first generation projects, the USCSP studies tended to focus on identifying system sensitivities and adaptability was assessed mainly for coastal resources.⁴⁴ However, it is difficult to draw firm conclusions without also thoroughly considering underlying socioeconomic changes, integrated impacts, and adaptability in all sensitive sectors.⁴⁵

Vulnerability is becoming the focus of research, analysis, and discussion for future adaptation considerations.

NATIONAL ADAPTATION PROGRAMS OF ACTION

The guidelines for National Adaptation Programs of Action (“NAPA”) strategies were set forth by the UNFCCC at the seventh Conference of the Parties held in Marrakech, Morocco in 2001. The principal goal of the program is to assist the least developed countries (“LDCs”) in identifying activities to respond to urgent climate change adaptation needs and fund them through the LDC Fund, in the order of priority while considering urgency and cost-effectiveness. The program is not a structured framework of assessment or implementation. Instead, the NAPA process creates a document that identifies priority adaptation actions.⁴⁶

For instance, Tuvalu, a small island nation confronting rising sea levels, submitted a NAPA in May 2007 identifying key adaptation areas. These areas include *inter alia*, coastal zones, which are vulnerable to sea level rise and sea temperature change; soils, which are vulnerable to saltwater intrusion and salinization; water resources, which are impacted by sea level rise and salinization; agriculture, which is impacted by sea level rise and intrusion; and public health.⁴⁷ The report identifies seven priority projects, with desired outcomes and activities within each key adaptation area. One project will seek to increase the resilience of coastal areas and settlement to climate change through activities such as training local Kaupule people and government personnel on constructing coastal defenses such as channel breakers, planting a green belt, and increasing public awareness.⁴⁸ Another project in Tuvalu would introduce a salt-tolerant pulaka species, thus increasing the production of a native locally-grown nutritious root that has been damaged by salinity intrusion into local soil.⁴⁹

Generally, the NAPA strategies prepared to date utilize a bottom-up approach relying on grassroots, local knowledge to lay the groundwork for site-specific adaptation priorities and solutions.⁵⁰ Such a process is fostered through community-level support, recognizing that grassroots communities are the main stakeholders. A majority of the data used and analyzed is extrapolated from established local social and environmental systems to ultimately identify gaps in adaptive capacity. This approach represents a change in methodology utilizing local knowledge, moving away from a reliance on scenario based modeling⁵¹ to assess future vulnerability and long term policy at the state level. For instance, the Sudanese NAPA utilized stakeholder consultations to reveal a number of actions and decisions that should be undertaken by relevant authorities, along with some policy reform suggestions.⁵²

The overall effectiveness of NAPAs has yet to be determined, however a new report discusses the lessons learned in preparing NAPAs in Eastern and Southern Africa and concludes that there is a need for increased funding sources.⁵³ The same study suggested that the momentum generated from the NAPA process must be used to make the transition to implementing substantive adaptation projects.⁵⁴

ASSESSMENTS OF IMPACTS AND ADAPTATIONS TO CLIMATE CHANGE

The Assessments of Impacts and Adaptations to Climate Change (“AIACC”) program was developed in collaboration with the IPCC as an assessment tool designed to build an information base for developing countries adapting to climate change. The program had three specific mandates: (1) advancing scientific understanding of climate change impacts, adaptations and vulnerabilities in developing country regions; (2) building and enhancing scientific and technical capacity in developing countries; and (3) generating and communicating information useful for adaptation planning and action.⁵⁵

The AIACC approach was largely research driven and produced numerous country and regional reports. AIACC took the stakeholder engagement process a step further by encouraging scientists, academics, and students within the host countries to participate in, and continue, the research and conclusions generated by the country reports. In total, 235 developing country scientists and more than 60 graduate and undergraduate students participated in the studies.⁵⁶

UNDPs ADAPTATION POLICY FRAMEWORK

The Adaptation Policy Framework (“APF”) is intended to integrate climate change adaptation into developing countries policies. The United Nations Development Programme (“UNDP”) and the Global Environment Facility (“GEF”) developed the APF with support from the Swiss, Canadian, and Dutch governments.

APF is a structured approach to creating strategies, policies, and measures for climate change adaptation.⁵⁷ The APF framework is considered a roadmap to assess, plan, and implement climate change adaptation supporting sustainable development.⁵⁸ This framework is consistent with other second generation projects and assessments, in that APF places adaptation in the center of the framework, strengthens local knowledge, and promotes a local, bottom-up information gathering and use. Importantly, APF focuses on practice rather than theory to more effectively inform the policy making process. This framework makes use of the vulnerability information that countries have to initiate a shift in the way risk, vulnerability and climate change are viewed. By utilizing synergies and intersecting themes, the APF approach can ultimately lead to a more informed policy-making process.⁵⁹

LINKING CLIMATE ADAPTATION PROJECT

The Linking Climate Adaptation (“LCA”) project was intended to “ensure that poor people benefit from adaptation processes, rather than bearing burdens by, for example, having the risks caused by climate change shift in their direction.”⁶⁰ The research focused on policy and institutional frameworks that could help support community-led adaptation, in addition to laying out the long-term research agenda and questions for community-led adaptation. The research drew upon a variety of sources including the Fourth Assessment of the IPCC and the UNFCCC Conference of Parties meetings and ‘side events,’ in addition to the views of the stakeholders from various sec-

tors. Thus far, the project has resulted in “the establishment of the LCA Network which aims to link geographically dispersed communities undertaking adaptation at the local level with each other as well as with those engaged in formal scientific and policy responses to climate change.”⁶¹

The project has generated useful research questions, including: (1) Who is vulnerable and how do sources of vulnerability change over time in response to multiple stressors? (2) What are the costs and benefits of adaptation to climate change? (3) How can climate change adaptation be integrated into development/disaster risk reduction at multiple levels of governance?⁶² Nonetheless, the LCA laments the lack of a “coherent body of policy-relevant knowledge about the changing dimensions and sources of vulnerability and the effectiveness of systemic approaches to vulnerability reduction.”⁶³

UNITED KINGDOM CLIMATE IMPACTS PROGRAMME

The United Kingdom Climate Impacts Program (“UKCIP”) was established in 1997 and published the report titled *Climate adaptation: Risk, uncertainty and decision-making*⁶⁴ in conjunction with the UK Climate Impacts Program, Department for Environment Food and Rural Affairs, and the Environment Agency. The report focuses on guiding, managing, and improving the decision-makers ability to judge associated climate change risks, when compared to other risks, to make informed adaptive choices. However, the UKCIP differs from previously discussed assessment tools in that it is not solely intended for developing countries. It is a framework that can be utilized by any governing body facing a myriad of choices and uncertainty, regardless of scale or focus.

CLIMATE CHANGE ADAPTATION ACTION IN THE UNITED STATES

ADAPTATION AT THE STATE LEVEL

Until recently GHG mitigation has dominated climate change discussions and planning considerations at the state level in the United States mirroring national and international developments. However, several U.S. state governments are expressing an awareness of adaptation and are in the early phases of identifying vulnerabilities. Specifically, states are creating adaptation commissions or committees with the intent to complement mitigation efforts and integrating adaptation into state climate action plans, which largely address the reducing and eliminating GHG emissions.⁶⁵ Presently, thirty five states have or are in the process of creating climate action plans and fourteen additional plans are anticipated in late-2007 or 2008.⁶⁶ Of those thirty five states, a number incorporate adaptation considerations into the scope of their climate action plan including Alaska, Arkansas, Arizona, California, Colorado, Hawaii, Illinois, Maryland, Minnesota, North Carolina, New Hampshire, Oregon, Vermont, and

Washington. Only a handful of states have developed plans, commissions, and/or reports to specifically address adaptation considerations, including Alaska, Arizona, California, Maryland, Oregon, and Washington.⁶⁷

U.S. LOCAL INITIATIVES

At the U.S. local level, climate change adaptation activities have received a boost from recent initiatives by International Council on Local Environmental Initiatives -Local Governments for Sustainability (“ICLEI”). In 2005, ICLEI initiated the adaptation-focused Climate Resilient Communities Program, with funding from the National Oceanic and Atmospheric Administration (“NOAA”), to assist local governments throughout the United States in identifying and assessing vulnerabilities, while improving their resiliency to associated climate change impacts. Early partners in this program included localities as diverse as Keene, New Hampshire; Fort Collins, Colorado; Anchorage, Alaska; and Miami-Dade County, Florida.

In 2007, ICLEI in conjunction with King County, Washington, published *Preparing for Climate Change: A Guidebook for Local, Regional, and State Governments*, a guidebook offering a detailed description of the methods and concepts needed to

assist localities in implementing, updating, and evaluating climate change preparedness measures.⁶⁸ The guidebook offers a useful five-part checklist for governments to better prepare for climate change. The checklist is divided into milestones involving: (1) conducting a climate resiliency study and securing political and institutional support to prepare for

climate change and building a climate preparedness team; (2) identifying and prioritizing planning areas for action through conducting and interpreting a climate resiliency study, climate change vulnerability assessment, and climate change risk assessment; (3) setting preparedness goals and plan, establishing a vision and guiding principles for a climate resilient community, and developing, selecting and prioritizing preparedness actions; (4) implementing the preparedness plan, and ensuring the right implementation tools; and (5) measuring progress and updating the plan.⁶⁹

Regional adaptation activities—with concomitant trans-boundary legal, regulatory, and economic implications—will likely grow in importance since ecosystems rather than political boundaries will define the scope of such initiatives. Early evidence of this regional orientation is emerging. For instance, a conference entitled *Climate Change in the Great Lakes Region: Decision Making Under Uncertainty* was convened by Michigan State University in March 2007 to explore the relationship of climate change, the Great Lakes region, decision making under uncertainty, and adaptation. The conference recognized that dealing with climate change presents complex challenges and instills a sense of uncertainty when dealing with the vari-

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ous effects of climate change on vital elements of ecosystems, infrastructure and economy in the Great Lakes region. In response, Michigan State’s Environmental Science and Policy Program and the National Science Foundation (“NSF”) will initiate “a process that will help identify the kinds of research that needs to be done and the best ways to provide the results so they are as useful as possible to decision makers.”⁷⁰

U.S. FEDERAL GOVERNMENT ADAPTATION ACTION

While the states have led the way in climate change adaptation considerations, adaptation has begun to appear on the U.S. federal government’s radar in a substantive manner. Federal-level discussions and considerations are preliminary, however, collectively they do represent a much needed first step in implementing adaptation on the national scale. For instance, in May 2007, the House Appropriations Subcommittee on Interior, Environment, and Related Agencies approved increasing EPA’s fiscal year budget to \$8.1 billion for a temporary commission on adaptation and mitigation to review scientific questions on how to best adapt to a “warming planet” and identify the scientific investment needed to address this reality.⁷¹ The commission would include officials from EPA, NOAA, the NSF, the Department of Energy, and the Forest Service, and would be responsible for the allocation of funds to governmental agencies to conduct adaptation research. Depending on the temporary commission’s findings, the EPA would allocate \$45 million to itself and other agencies over the next two years.⁷²

The commission has yet to be officially created however the bill’s framework has two potential far reaching implications: (1) “the call for significant funding on adaptation could represent a new direction for EPA and other agencies to address the impacts of climate change, by going beyond the science of global warming or studies on policies to control [GHGs];”⁷³ and (2) The commission’s ability to “direct specific amounts of money toward a problem, rather than only making general recommendations” enables research “to begin immediately without having to wait for another appropriations cycle.”⁷⁴

While the formation of the commission and its potential implications on adaptation research is promising, more consistent and widespread action is required. A 2007 Government Accountability Office (“GAO”) report confirms this: the report concludes that

federal agencies that manage the nation’s parks, forests, oceans, and monuments are unprepared to deal with climate change. . . resource managers within the Agriculture, Interior, and Commerce departments have limited guidance about whether or how to address climate change-without such guidance, their ability to address climate change and effectively manage resources is constrained.⁷⁵

The report elaborates on the evidence that climate change impacts “600 million acres of public lands and 150,000 square miles of waters managed by federal agencies—ranging from melting glaciers in Glacier National Park to rising sea levels in the Florida Keys.”⁷⁶

The GAO report as issued includes responses from several federal departments as appendices; the Agriculture, Interior, and Commerce departments submitted comments on the GAO conclusions and recommendations. The federal agencies “generally agreed with the [GAO] recommendations,” noted the importance of climate change consideration and additionally highlighted climate change programs, initiatives, plans, and/or policies that the GAO report omitted.⁷⁷ The comments from all three agencies indirectly reaffirm the GAO conclusions: although climate change considerations may be an identified priority, there is an overall lack of consistent site-specific implementation guidance.

For instance, the Department of Agriculture agrees that the adaptation plan for Chugach National Forest, discussed in the GAO report, does not specifically address the effects of climate change on programs and resources, but noted that the

GAO report did not accurately represent the activities that are being pursued. The department notes that the “examination of one national forest. . . is inadequate as a proxy for an agency that manages diverse ecosystem across 193 million acres for multiple objectives. . . where a broader evaluation would have revealed [twelve] National Forest Plans specifically consider

the effects of climate change on existing programs and local resource values.”⁷⁸ However, the comments do not address if, or the extent to which, the National Forest Plans discuss site-specific adaptation concerns.

The Department of Interior recently initiated a task force to take “affirmative steps to assess the effects on our public lands arising from climate change and develop a process for anticipating and addressing these effects.”⁷⁹ However, as noted in the comments, the department is currently exploring how new science can be focused to provide targeted information that its resource managers need.

The Department of Commerce noted their involvement in the effort to “expand both observation systems and modeling capabilities” within ocean and coastal monitoring systems, integrated drought systems, and regional ecosystem planning. In addition, the department is expecting to release a *Preliminary Review of Adaptation Options for Climate Sensitive Ecosystems and Resources* by the end of 2007.⁸⁰

U.S. ENVIRONMENTAL PROTECTION AGENCY

In 2004 the EPA, in collaboration with other federal agencies,⁸¹ initiated a process for the *Preliminary Review of Adapta-*

Early adaptation research was geared towards informing mitigation policy.

tion Options for Climate-Sensitive Ecosystems and Resources to “review management options for adapting to climate variability and change in the United States, and to identify characteristics of ecosystems and adaptation responses that promote successful implementation and meet resource managers’ needs.”⁸² The report is being completed in response to SAP 4.4⁸³ of *The Strategic Plan of the U.S. Climate Change Science Program* (“CCSP”), which calls for the completion of “21 synthesis and assessment products to support policy making and adaptation decisions across the range of issues addressed by the CCSP,” to ultimately provide NGOs, individuals, federal, state, and local governments and agencies with adaptation options and information.⁸⁴ The assessment will focus primarily on climate sensitive ecosystem and resources located within federally protected and managed areas, including: national parks, national wildlife refuges, wild and scenic rivers, marine protected areas, national forest systems, and the national estuary program.

Consistent with the second generation assessments being conducted globally, the EPA project is implementing a process that is open to the public and engages stakeholders to provide valuable information about local systems. With diverse, multi-disciplinary participation, the assessment is posing the following questions: (1) What are the management goals in the selected systems, upon what ecosystem characteristics do these goals depend, what are the stressors of concern, what are the management methods currently being used to address those stresses, and how could climate variability and change affect attainment of management goals? (2) For selected case studies, what is the current state of knowledge about management options that could be used to adapt to the potential impacts of climate variability and change? (3) Looking across the case studies, what are the factors that affect the successful implementation of management actions to address impacts from climate variability and change? (4) For each case study, how should we define and measure the environmental outcomes of management actions and their effect on the resilience of ecosystems to climate variability and change?⁸⁵ The report is expected in December 2007, and has the potential to lay the groundwork for future action by federal agencies, and will perhaps address concerns raised by the 2007 GAO report.

In March 2007, the EPA launched “an effort to assess and respond to the effects of global warming on water resources and regulators’ ability to meet requirements of numerous water related laws,” while specifically focusing on “development strategies to adapt to climate change, rather than on plans for limiting resources.”⁸⁶ This new effort will be primarily adaptation—focused within the context of water resources and the ability to meet Clean Water Act Requirements “in a changing environment.” Implementation will be fostered through a Cli-

mate Change Workgroup and plan, expected to be released by the end of 2007.⁸⁷ The plan will emphasize that “despite uncertainty on the scope and timing of climate change effects, EPA’s water program and its partners should take prudent steps now to assess emerging information, evaluate potential impacts of climate change on water programs, and to identify appropriate response actions.”⁸⁸

NEXT STEPS: IMPLEMENTING ADAPTATION

Thus far, climate change adaptation efforts have been primarily focused on gathering and synthesizing data to lay the groundwork for further studies and future implementation. Most initiatives are serving in a catalyst capacity—they are attempting to stimulate research, collaboration, discussion, and awareness. While excellent work has been done to identify vulnerabilities along with research and adaptive capacity gaps, little action has been taken based on the results of the reports. It is now imperative to move to the next step of the transition, an operational phase to implement adaptation considerations as a policy response.

A BALANCE OF REACTIVE AND PROACTIVE ADAPTATION

The various vulnerability assessments conducted are intended to locate vulnerabilities to implement action. Such actions represent sound political will and good intentions. However, transitioning from the research and information gathering phase to the implementation phase presents complex political and economic dilemmas that are familiar to climate change discussions. Particularly, the idea of allocating present resources

to long term contextual conditions to anticipate and prevent potential future impacts versus waiting for impacts to occur and reacting to the situation.

Conceptually, the difference between the two policy responses is represented in reactive and proactive adaptation. Reactive adaptation is the “ability to react to and deal with climate change” after an event and impacts have occurred, and is represented in the act of coping.⁸⁹ Proactive adaptation is represented in the act of anticipation, taking action to prevent and/or reduce future impacts. Choosing between the two in terms of policy responses presents complex challenges; however, we believe that elements of both proactive and reactive adaptation responses are necessary to effectively address adaptation to climate change.

Historically, policy choices tended to lean towards reactive adaptation to climatic events, for in practice, “policy decisions are often easier to implement once a crisis has occurred than in anticipation of a crisis.”⁹⁰ Reactive adaptation uses present resources to cope with events at the time they occur, however, such “coping may not be sufficient to fully restore the status quo because of irreversibilities.”⁹¹ For instance, “losses that are technically impossible to restore (such as sceneries, irrevers-

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implement adaptation
strategies as a complement
to mitigation efforts.*

ible biodiversity losses or disappearance of unique cultural artifacts) or economically too costly to restore...can be referred to as 'remaining ultimate damages.'"⁹² In addition, it is noted that reactive responses, when used without proactive measures, tend to have higher long term costs because the low costs of preventive action, or anticipative adaptation, are likely to dominate the higher costs of deferred action, or reactive adaptation, appropriately discounted.⁹³

Although it is known that climate change impacts will happen and studies have estimated and located vulnerabilities, the details of future scenarios, in terms of timing, scale, and severity, cannot be known with certainty. The "degree of uncertainty" argument has typically been used as a barrier to proactive adaptation, emphasizing the need to delay action until more certain data can be developed. However, even without precise knowledge of future events, proactive policy planning for climate change adaptation improves the overall preparedness by integrating adaptation considerations into the decision making process. More so, "experience suggests that, typically, proactive adaptation requires a greater initial investment but is more effective at reducing future risk and cost."⁹⁴

Proactive and reactive adaptation should be viewed as complements and not conflicting options. For example, "rapid response teams need to be constituted, trained, and set up in advance (proactive adaptation) so that they can be deployed when an extreme weather event occurs (reactive adaptation)."⁹⁵ In other contexts, proactive adaptation can occur through the construction of dikes and levees, irrigation systems, the building of more resilient homes in 'at risk' locations, and the construction of buffer zones, with reactive adaptation dealing with the remaining variabilities that proactive action did not effectively manage.

The key here is that proactive and reactive actions will not eliminate all associated impacts, but rather an optimal mix will attempt to minimize impacts wherever possible. It is necessary to implement the most educated proactive action, and to react and adapt to the variabilities. Decision makers must realize that adaptation to climate change is a manifestation of systems thinking and a process of active learning; we need to appreciate both proactive and reactive responses as we learn the new rules of game.

UTILIZE AND EXPAND EXISTING METHODS

Adaptation considerations do not need to be developed from scratch. A large body of management procedures, processes, and applications exist in many different capacities and scales, both in developed and developing nations. It is necessary to evaluate how populations currently manage climate risks and hazards, and build and expand upon existing measures where possible. The need for action is especially acute in developing nations, since the scale at which climate change will impact the vulner-

able populations is unprecedented, and traditional methods of adaptation lack the necessary scale and capacity. In many developed countries, stakeholder participation is a common practice where the lines of communication are open for local communities to voice their opinions across governmental scales, and be somewhat included in the decision process. On the other hand, many developing countries lack the political infrastructure to implement such a process; in the absence of developed political regimes, many second generation projects and programs are providing the means for local communities to be included in the adaptation and development process by sharing their knowledge and revealing their developmental and adaptation gaps.

Adaptation to climate change is not only a concern for developing countries. Developed economies and societies are hardly immune to the anticipated impacts of climate change. While adaptation to climate change in developed countries will be facilitated because some of the infrastructure and basic tools are in place to deal with climate variabilities and associated hazards, there will clearly be a need to expand and build upon the preexisting management tools to deal with new hazards on varying scales. Such expanded considerations include: (1) with the threat of new disease and health risks, greater investment in

health care systems; (2) enhancement of hazard forecasting systems; (3) creation of networks to facilitate participation of local organizations in the development of plans to identify and manage the impacts of climate change on communities; (4) worse case contingency planning by businesses and municipalities; and (5) improving communications

between communities and government regarding the impacts of climate change on livelihoods.⁹⁶ Pervasive adjustments in policy and regulation, as well as the emergence of new processes and institutions for governance, should be anticipated as we adapt to climate change.

CONCLUSION

It is clearly necessary to continue to pursue GHG mitigation strategies as aggressively as possible, but we must begin to implement adaptation strategies as a complement to mitigation efforts. Fortunately a dialogue on an adaptation and mitigation mix or "portfolio" has begun. For example, the *IPCC Fourth Assessment Report-Climate Change 2007: Impacts, Adaptation, and Vulnerability* suggests "a portfolio of adaptation and migration can diminish the risks associated with climate change."⁹⁷ The report recommends that a portfolio of strategies should include mitigation, adaptation, technological development, and research. This portfolio could combine policies with incentive-based approaches, and actions at multiple scales, from the individual to national governments and international organizations.⁹⁸

Researchers and scholars are beginning to explore, given the limited resources in terms of funding, time, and manpower,

Another project in Tuvalu would introduce a salt-tolerant pulaka species.

the contents of an adaptation portfolio “that is justifiable from a social, environmental, and economic perspective.”⁹⁹ But this is no longer an academic question. More enlightened business leaders already understand that the climate change equation includes both mitigation and adaptation components. As James E. Rogers, Duke Energy’s CEO and Chairman, stated in August

2007, “mitigation of climate change is not going to happen fast enough. That is the reality. We need to think in a broad sense about both adaptation [to climate change] and mitigation [of it].”¹⁰⁰ Adaptation and mitigation are complementary and ought to be inextricably linked as we plan for a carbon-constrained future.



TABLE 2
STATES PURSUING SEPARATE ADAPTATION PLANS

Alaska	The Climate Impact Assessment Commission is responsible for developing adaptation considerations. The commission is a legislative body that is “tackling adaptation issues, specifically associated with the protection or relocation of villages in the state at risk from coastal erosion and wave surges or flooding.” ¹⁰¹ The commission is currently analyzing the relationship of climate change and adaptation to a variety of multi-disciplinary issues, including communities, infrastructure, fish, wildlife, forests, agriculture, disease, pests, and financing. A rural relocation report is expected to be completed by the end of 2007.
Arizona	Arizona developed a Climate Change Adaptation Strategy, which recommends that the Governor “appoint a task force or advisory group to develop recommendations for the state climate change adaptation strategy. Moreover, the Governor should direct state agencies and other appropriate institutions to identify and characterize potential current and future risks in Arizona to human, natural, and economic systems, including potential risks to water resources, temperature sensitive populations and systems, energy systems, transportation systems, vital infrastructure and public facilities, and natural lands (e.g., forests, rangelands, and farmland).” ¹⁰²
California	The California Energy Commission published a statewide assessment of climate change impacts and adaptation measures in the 2005 report <i>Climate Change Impacts and Adaptation in California</i> . In addition, the California Climate Change Center has been conducting ongoing impact and adaptation studies within three main areas: (1) agriculture and forestry- including identification and analysis of vulnerable species; (2) Water resources- with particular attention placed upon stressors such as growing population and development; and (3) Public health- with the acknowledgment that increased frequency of extreme weather events will impact human health. ¹⁰³
Maryland	The Maryland Commission on Climate Change formed the Adaptation and Response Working Group, which will recommend strategies for reducing Maryland’s climate change vulnerability, with attention paid to public health and the most vulnerable population segments. ¹⁰⁴ An updated plan of action, preliminary recommendations, implementation time tables, and draft legislation is expected in November 2007.
Washington	The Washington State Department of Ecology formed the Preparation/Adaptation Working Groups with a primary task to make recommendations to the Governor on how Washington can prepare and adapt to climate change impacts with respect to five sectors: Agriculture, Forestry Resources, Human Health, Water Resources & Quality, and Coastal Infrastructure. Additionally, the working groups will identify vulnerabilities, recommend adaptive strategies, and note areas requiring additional research. ¹⁰⁵
Oregon	The Climate Change Integration Group will prepare a preliminary report on adaptation to the impacts of climate change with initial recommendations to the Governor by the end of the year 2007. ¹⁰⁶

Endnotes: Preparing for the Day After Tomorrow
continued on page 87

SOLAR POWER IN THE SOUTHWEST:

FROM CHILE RISTRAS TO SOLAR ROOFS

by Matthew Padilla*

For hundreds of years the people of the southwestern United States have hung chile ristras, bunches of red chile, from their homes and used the power of the sun to dry the chiles for cooking during the winter months. While the traditions of the past still hold sway, solar panels have found their way to the homes of native southwesterners. State governments are encouraging harnessing the sun a method of energy production in New Mexico, Arizona, and California.¹

The southwestern United States may not be nutrient or water rich, but it does have latent solar resources that have only begun to be exploited.² Satellite measurements have confirmed that the solar energy available for exploitation in the U.S. southwest is second to none in the world.³ As the threats of energy security⁴ and global warming⁵ have become more prescient, the appeal of solar energy has increased. The federal, state, and local governments are reacting by promoting solar technologies through incentives and partnerships for both individuals and corporations.⁶

At the federal level, however, the amount of incentives available to individuals and corporations that use solar energy has been relatively small. The Energy Policy Act of 2005 established a tax incentive of up to two thousand dollars for individual residents who install a solar electric system or water heating system.⁷ The goal of this program is to encourage consumers to install their own solar systems, but it is set to expire in 2008.⁸

New Mexico, Arizona, and California have passed legislation to supplement the two thousand dollar federal tax incentive and have added their own incentives and programs in addition to the federal tax incentive. State programs vary from greater tax incentives for individual homeowners in New Mexico to the creation of a multi-million dollar state-wide solar home program in California to tax breaks to businesses for installation and development of solar infrastructure in Arizona.⁹

In New Mexico, Governor Bill Richardson declared that the state “must move our economy from limited oil resources to the unlimited resources of wind, biomass, geothermal, and solar.”¹⁰ In response, the New Mexico legislature recently passed legislation which added \$9,000 dollars of potential tax credits for individual residents in addition to the federal credit.¹¹ Arizona enacted a thousand dollar tax credit,¹² while in California incentives are given on a performance based formula which rewards high output renewable energy systems.¹³

New Mexico and California have also been strong proponents of making access to solar power a right for homeowners. California made access to latent solar energy a right for homeowners in the Solar Rights Act of 1978. It was originally written

to bar homeowners associations from enacting rules that would prevent owners from installing solar power units. It was subsequently amended in 2003 and 2004 to prevent public entities from doing the same.¹⁴ The New Mexico Solar Rights Act of 1978 was also amended in 2007 to clarify the definitions of solar collectors and to prohibit homeowners associations and public entities from restricting use of solar collectors, with the exception of historical districts.¹⁵

Governor Richardson of New Mexico and Governor Schwarzenegger of California both pledged to increase clean energy by 30,000 megawatts, and to increase energy efficiency in their states by twenty percent.¹⁶ Governor Schwarzenegger has also made it a stated goal to have a “million solar roofs” in the state of California and has matched this rhetoric by spearheading the creation of a \$400 million dollar program within the California Energy Commission called the New Solar Homes Partnership.¹⁷ The New Solar Homes Partnership systemizes and creates a process for how energy efficiency is measured, breaking available efficiency levels into two different tiers and rewarding those who create the most energy efficient buildings.¹⁸

While Arizona has arguably not promoted residential solar energy to the extent of New Mexico and California, it has created a roadmap towards promoting growth in the private sector specifically in regards to solar energy plants.¹⁹ One of the four largest “central station solar power” companies, Stirling Energy has been a benefactor of Arizona’s roadmap.²⁰ Stirling seeks to create large solar plants in the desert southwest and is an example of cross state growth in the solar industry. For example, New Mexico’s Sandia National Labs recently teamed with Stirling to create and expand new solar technologies.²¹

Despite solar power’s current marginal status as a source of energy, the future of it is bright if the political leadership at the state level continue to promote it. Although the federal government lags behind the promotion of solar energy in comparison to the southwestern states, the arrival of new solar technology and the growing individual interest in its use creates hope that solar energy can be capitalized to fruition in the solar rich southwest. It may, one day, become common to see both chile ristras and solar panels adorning the homes of southwesterners and if companies are able to create large solar plants in this region, they may soon join the large chile fields in harvesting the power of the sun.

Endnotes: Solar Power in the Southwest *continued on page 89*

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THE U.S. FEDERAL GREEN BUILDING POLICY

by Eunjung Park*

On January 24th, 2007, President George W. Bush signed Executive Order 13,423, “Strengthening Federal Environmental, Energy, and Transportation Management.”¹ The Executive Order requires federal agencies to meet the standards of green buildings, and “lead by example” in promoting green buildings in the United States.² The U.S. federal government, however, seems to have been “led by examples” of the states, industry, and the consumers.

In 2005, the State of Washington became the first state to adopt legislation requiring all state-funded buildings over 5,000 square feet to obtain the silver standard required by the Leadership Energy and Environmental Design (“LEED”) Green Building Rating System. LEED is the nationally accepted certificate for the design, construction, and operation of high performance green buildings. Many other states and cities have adopted similar legislation to require or encourage state-funded buildings to meet green building standards.³

In 2006, Washington D.C. became the first major U.S. city to require LEED compliance for private projects with D.C.’s Green Building Act of 2006.⁴

Despite LEED’s growth, the standard is not without its limitations. One current limitation is the LEED program’s inability to address whether the building is located in sustainable surroundings in rating the building. This phenomenon of having green buildings in an unsustainable context is called “green sprawl.”⁵ Green sprawl permits individual buildings to be certified as green buildings, yet overlooks the adjacent development pattern. In order to address the problem, the American Society of Landscape Architects recently announced its development of the Sustainable Sites Initiative, which will measure the sustainability of designed landscapes of public, commercial and residential projects. The U.S. Green Building Council is supporting the project and plans to incorporate the Sustainable Sites metrics into its LEED system.⁶

Given that many states are already enforcing green building requirements for federal and private buildings, the federal policy should take an affirmative step to require every state to adopt building standards for federal buildings. Also, the federal policy should equally promote certification programs other than the LEED, such as the Green Globe, for the purpose of fair competition. For example, even though Energy Star does not provide

certification system that encompasses all aspects of green buildings, Energy Star should be utilized to strengthen the energy conservation factor of green buildings.

The High Performance Buildings Act of 2007, introduced in February 2007, is yet to be passed.⁷ The Act would be one step forward for the federal green building policy, as it would create the Office of High Performance Green Buildings and require the Office to identify federal facility procedures that inhibit existing and new federal facilities from becoming green by meeting the LEED standard. Along with improving certification programs and technology, the federal government’s “lead by example” approach should be reinforced by affirmative implementation of green building policies and effective use of green certification programs.



Green sprawl permits individual buildings to be certified as green buildings, yet overlooks the adjacent development pattern.

Endnotes:

¹ Exec. Order No. 13,423, 72 Fed. Reg. 3919, 3923 (Jan. 26, 2007).

² Executive Order 13,423, *id.*

³ Alex Frangos, *Green Building Practices Are Required by States*, WALL STREET J. ONLINE (June 1, 2005), available at <http://www.realestatejournal.com/propertyreport/architecture/20050601-frangos.html?refresh=on> (last visited Nov. 27, 2007); John Ritter, *Building ‘green’ reaches a new level*, USA TODAY ONLINE (July 26, 2006), available at http://www.usatoday.com/news/nation/2006-07-26-green-construction_x.htm (last visited Nov. 27, 2007).

⁴ Emily A. Jones, *Washington, D.C. Enacts Green building Requirements for Private Projects*, Apr. 16, 2007, available at http://www.constructionweblinks.com/Resources/Industry_Reports__Newsletters/Apr_16_2007/wash.html (last visited Nov. 27, 2007)

⁵ Shari Shapiro, *Losing the Forest to Save a Few Trees: The Problems Behind Green Sprawl*, Sept. 6, 2007, available at http://greenerbuildings.com/news_detail.cfm?NewsID=35868 (last visited Nov. 27, 2007).

⁶ Sustainable Sites, Dexigner website, <http://www.dexigner.com/architecture/news-g12298.html>.

⁷ High-Performance Green Buildings Act of 2007, S. 506, 110th Cong. (1st Sess. 2007).

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LITIGATION UPDATE

GREEN MOUNTAIN CHRYSLER PLYMOUTH DODGE JEEP V. CROMBIE

by Addie Haughey*

INTRODUCTION

On September 12, 2007 the U.S. District Court for the District of Vermont upheld a Vermont plan to adopt greenhouse gas (“GHG”) emission regulations for new motor vehicles sold in the state. Several motor vehicle industry parties filed the suit against George Crombie, Secretary of the Vermont Agency of Natural Resources, to challenge the validity of Vermont’s regulations, which are based on the California’s GHG emission standards.¹

LEGAL BACKGROUND AND ARGUMENTS

At the trial in April and May of 2007, plaintiffs argued that Vermont could not adopt California’s GHG standards because the federal government’s right to regulate GHG emission preempted Vermont regulations. Plaintiffs alleged three types of preemption: (1) preemption under the Clean Air Act (“CAA”); (2) preemption under the Environmental Protection and Conservation Act (“EPCA”); and (3) foreign policy preemption.²

Section 209(a) of the CAA prevents states from preemptively establishing their own motor vehicle emission standards, delegating that responsibility to the Environmental Protection Agency (“EPA”).³ Section 209(b), however, does give California the opportunity to develop its own standards so long as it is given a waiver by EPA. California was given this exception so the state could better manage their unique severe air pollution problems.⁴ The CAA further allows for another state to adopt Californian, instead of federal, standards as long as an EPA waiver has been issued to California and that state notifies the administrator.⁵

California passed its own set of GHG emission standards in 2004. Vermont, in the action that prompted this litigation, adopted those standards in 2005.⁶ EPA has yet to give California the necessary waiver and California Governor Arnold Schwarzenegger has threatened to file suit if they do not answer the waiver request before October 2007.⁷

Section 509(a) of EPCA prevents states from making laws related to fuel economy standards for new vehicles and delegates that responsibility to the Department of Transportation (“DOT”). The corporate average fuel economy (“CAFE”) standards are determined by considering technological feasibility,

economic practicability, the need to conserve energy, and other federal motor vehicle standards.⁸

In *Massachusetts v. EPA*, earlier this year, the Supreme Court held that the EPA is responsible for regulating GHG emissions because the broad definition of “air pollutant” in the CAA includes GHGs—an idea EPA previously rejected.⁹ The court also reasoned that though fuel economy regulations are the responsibility of DOT and such regulations are a key part of GHG emission control, the overlap of fuel economy and pollution prevention does not diminish EPA’s duty to control pollution.¹⁰

While the *Massachusetts* case dealt with whether the EPA must regulate GHGs, the Vermont case dealt with a state’s right to adopt its own GHG standards under the California exemption of the CAA. The *Massachusetts* case was vital in the *Green Mountain Chrysler* decision because factual findings regarding the reality of global warming and the legitimacy of deeming GHGs as pollutants under the CAA—the same act under which Vermont’s new regulations were developed—bolstered Vermont’s defense in this case.¹¹

Plaintiffs also alleged that Vermont’s GHG regulation “intrude[d] upon the foreign policy of the United States and the foreign affairs prerogatives of the President and Congress of the United States.”¹² Specifically, the authority to pursue multilateral GHG agreements. The regulations would also, according to the Plaintiffs, “interfere[] with the ability of the United States to speak with one voice upon matters of global climate change.”¹³

HOLDINGS

Assuming that EPA will grant California’s waiver request and providing that, if EPA does not grant the waiver, its decision would become moot,¹⁴ the Court dismissed all three arguments of preemption. The California exemption and the ability for other states to qualify for that exemption extinguished any violation of the CAA preemption clause.

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Separation of EPCA responsibilities for fuel economy from the CAA pollution regulation under the *Massachusetts* decision made the EPCA preemption clause irrelevant in this case. California CAA standards, as soon as they are sanctioned by EPA, are to be considered “other Federal motor vehicle standards” under EPCA criteria for fuel economy.¹⁵

The argument of foreign policy preemption was denied because Vermont’s GHG regulations do not “impair the effective exercise of the Nations foreign policy,” the necessary threshold for preemption when federal policy does not expressly prohibit a state’s actions.¹⁶ Though GHG emissions represent a wide body of foreign policy initiatives, those initiatives actually encourage action to curb GHG emissions, even on the state level, making Vermont’s regulations complementary, not conflicting, to foreign policy.¹⁷

The court found the auto industries’ scientific expert testimony unconvincing, calling their baseline assumptions “unsupported by the evidence.”¹⁸ Because that testimony served as the basis for many of the industries’ arguments, those arguments were equally unconvincing. Multiple motions throughout the trial attempted to discredit Vermont’s expert witnesses, but the court accepted their testimony as “simply more credible” regarding climate change and its impacts on the state of Vermont, the ability of Vermont’s regulations to curb impacts, and the feasibility for the auto industry to meet regulatory requirements.¹⁹

CONCLUSION

The court was “unconvinced [that] automakers [could] not meet the challenges of Vermont and California’s GHG regulations.”²⁰ While time will prove the accuracy of this statement, this case may serve as a powerful legal tool in the growing body of case law on global warming. California’s waiver from EPA depends on the feasibility of the regulations—something this case clearly supports. David Doniger of the Natural Resources Defense Council said the ruling in this case will “put a lot more pressure on EPA to grant the waiver.”²¹

The eleven other states that joined Vermont in adopting the California standards now have a strongly persuasive precedent that legitimizes their regulations and protects them from similar suits by automakers. Richard J. Lazarus of Georgetown University proclaimed that “[t]he district court’s opinion is a sweeping rejection of the auto industry’s claim that California and other states” lack authority to regulate GHGs.²²

On October 6, 2007, automakers appealed the *Green Mountain Chrysler* decision to the United States Court of Appeals for the Second Circuit.²³ “I would have been shocked if they had not appealed,” said Vermont Attorney General William H. Sorrell, “I’d rather be arguing our side than theirs.”²⁴

Certainly, other states will face similar aggressive challenges to their GHG regulations. In fact, a case like *Green Mountain Chrysler* is pending in Rhode Island. Another suit in California began on October 22nd of this year.²⁵ Nonetheless, Sorrell called this “a big win” and a cause for celebration “for those concerned about a healthier environment and . . . global warming.”²⁶

¹ See *Green Mountain Chrysler Plymouth Dodge Jeep v. Crombie*, No. 2:05-cv-302, 2007 WL 2669444 (D.Vt. Sept. 12, 2007), available at <http://www.atg.state.vt.us/display.php?pubsec=4&curdoc=1358> (last visited Oct. 31, 2007) [hereinafter *Green Mountain Chrysler*].

² *Green Mountain Chrysler*, *id.* at 1.

³ *Green Mountain Chrysler*, *id.* at 12.

⁴ *Green Mountain Chrysler*, *supra* note 1, at 4.

⁵ *Green Mountain Chrysler*, *supra* note 1, at 12 (citing 42 U.S.C. § 7543(a), 7521(a), 7501).

⁶ *Green Mountain Chrysler*, *supra* note 1, at 4.

⁷ Bob Egelko, *Federal Judge Gives Boost to States on Limiting Vehicle Emissions*, S.F. CHRON., Sept. 13, 2007, available at <http://www.sfgate.com/cgi-bin/article.cgi?file=/c/a/2007/09/13/MNK2S4PLM.DTL> (last visited Oct. 12, 2007).

⁸ *Green Mountain Chrysler*, *supra* note 1, at 14.

⁹ *Green Mountain Chrysler*, *supra* note 1, at 21-22.

¹⁰ *Green Mountain Chrysler*, *supra* note 1, at 22.

¹¹ *Green Mountain Chrysler*, *supra* note 1, at 17-18.

¹² *Green Mountain Chrysler*, *supra* note 1, at 226.

¹³ *Green Mountain Chrysler*, *supra* note 1, at 222.

¹⁴ *Green Mountain Chrysler*, *supra* note 1, at 235.

¹⁵ *Green Mountain Chrysler*, *supra* note 1, at 237.

¹⁶ *Green Mountain Chrysler*, *supra* note 1, at 223.

¹⁷ *Green Mountain Chrysler*, *supra* note 1, at 226.

¹⁸ *Green Mountain Chrysler*, *supra* note 1, at 155.

¹⁹ *Green Mountain Chrysler*, *supra* note 1, at 192.

²⁰ *Green Mountain Chrysler*, *supra* note 1, at 239.

²¹ Felicity Barringer, *Automakers Lose Bid to Stop State Emission Curbs*, N.Y. TIMES, Sept. 13, 2007, available at <http://www.nytimes.com/2007/09/13/us/13end-emissions.html?hp> (last visited Oct. 12, 2007).

²² Barringer, *id.*

²³ Candance Page, *Automakers Appeal Vermont Emissions Decision*, BURLINGTON FREE PRESS, Oct. 6, 2007, available at <http://www.burlingtonfreepress.com/apps/pbcs.dll/article?AID=/20071006/NEWS01/710060304/1009/NEWS05> (last visited Oct. 12, 2007).

²⁴ Page, *id.*

²⁵ Dave Gram, *Judge Rejects Carmakers’ Emission Suit*, AP, Sept. 12, 2007, available at <http://www.washingtonpost.com/wp-dyn/content/article/2007/09/12/AR2007091201377.html> (last visited Oct. 12, 2007).

²⁶ Press Release, Office of the Attorney General, *Court Upholds Vermont’s Greenhouse Gas Emissions Standards For New Motor Vehicles* (Sept. 12, 2007), available at <http://www.atg.state.vt.us/display.php?pubsec=4&curdoc=1358> (last visited Oct. 31, 2007).

BOOK REVIEW

GLOBAL CLIMATE CHANGE AND U.S. LAW

Michael B. Gerrard, Ed.

Reviewed by Erin Overturf*

Because the U.S. has not ratified the Kyoto Protocol, many may see the title *Global Climate Change and U.S. Law* as an oxymoron. Yet, despite the political stubbornness of the U.S. in the international arena, the law of climate change in the U.S. is vast and fast-changing. This diverse body of law is thoroughly catalogued in *Global Climate Change and U.S. Law*, edited by Michael B. Gerrard on behalf of the American Bar Association's Section of Environment, Energy, and Resources. This book provides an overview of all legal regimes and instruments which directly regulate or can be used to regulate greenhouse gas emissions and climate change.

This volume serves as a comprehensive desk reference of legal issues related to climate change, which any lawyer or policymaker in the environmental field would find useful and informative. The book provides an outstanding overview of the field, particularly helpful for individuals seeking an introduction to climate change law. Kyle W. Danish's chapter *The International Regime* offers a concise, approachable, nuts-and-bolts introduction to the U.N. Framework Convention on Climate Change and the Kyoto Protocol, while John C. Dernbach's chapter *U.S. Policy* and Johnathan S. Martel and Kerry L. Stelcen's chapter *Clean Air Regulation* detail the directly relevant national climate change regulation.

Recognizing that the U.S. federal policy has largely been centered around inaction, the volume takes a broad look at the regional, state and local laws that have emerged to fill the void. Both David Hodas in *State Initiatives* and J. Kevin Healy in *Local Initiatives* discuss the types of approaches governments have taken and their relative benefits and drawbacks. The volume also contains an invaluable survey of State actions responding to climate change compiled by the Pace Law School Center

for Environmental Studies. This section of the book would be extremely helpful for state and local government officials and environmentalists working to address greenhouse gas emissions at the local level.

Gary S. Guzy's chapter *Insurance and Climate Change* would also be of particular interest to policymakers. This chapter examines the structure of the insurance industry and its response to the increased risk of natural disasters, such as Hurricane Katrina, caused by climate change. The scope and nature of coverage offered by the industry will necessarily define the responsibilities of the public sector for responding to the financial and human costs of climate change, making insurance law an increasingly important field of study for public servants involved in emergency response and prevention.

Dennis Hirsch, Andrew Bergman, and Michael Heintz provide an accessible analysis of carbon trading schemes in their chapter *Emissions Trading—Practical Aspects*. Carbon trading has succeeded in capturing the public imagination more than nearly any other aspect of the field and this chapter clearly explores these technical and,

oftentimes, dauntingly complex programs from a lawyer's perspective.

While this meticulous overview is helpful in orienting readers, the volume's real contribution is its thorough, creative compilation of U.S. laws which, although not specifically related to greenhouse gas emissions, may be somehow implicated by climate change. Bradford C. Mank's chapter *Civil Remedies* examines issues that may arise when a private party brings suit against a government or private entity for climate change

Ultimately this volume serves as a clear and comprehensive overview of the intersection between issues of climate change and the U.S. legal system as a whole.

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related injuries. Mank examines difficulties plaintiffs may face in establishing Article III standing and goes on to discuss various case theories for addressing climate change injures, such as the National Environmental Policy Act, the Endangered Species Act, international human rights instruments, and the Alien Tort Claims Act.

However, this volume goes beyond litigation logistics in assessing the potential applicability of other U.S. laws. One particularly interesting example is a discussion by Jeffrey A. Smith and Matthew Morreale of the potential for Federal Trade Regulation oversight of “green” claims made by notoriously environmentally unfriendly industries in the chapter *Disclosure Issues*. While commercial speech may not immediately spring to mind when assessing legal aspects of climate change, it will certainly be interesting to

see how these two fast-changing areas of law will intersect in an age of social marketing.

Ultimately this volume serves as a clear and comprehensive overview of the intersection between issues of climate change and the U.S. legal system as a whole. But, as with any attempt

to pinpoint a fast-changing area of law, it is difficult for this kind of volume to be fully up-to-date. It is notable that this volume went to press before the groundbreaking Supreme Court decision in *Massachusetts v. EPA*. However, the ABA is compiling updates to the volume which are available online and extend the volume’s usefulness. This publication would be useful for

environmental lawyers, corporate counsel, government officials, policymakers, and anyone else interested in incorporating climate change issues into their existing practice.



This volume serves as a comprehensive desk reference of legal issues related to climate change.



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WORLD NEWS

by Addie Haughey, Sarah Melikian & Marcel De Armas*

AFRICA

The South African government recently announced legislation that will end canned hunting, the practice of breeding animals in captivity and then releasing them into an enclosed area to be hunted, virtually guaranteeing a successful hunt.¹ Over 50,000 animals were hunted by nearly 7,000 tourists in the 2003–04 season.² In South Africa, the industry generates an estimated half a billion dollars annually.³ While environmentalists allege the legislation does not do enough, breeders say the law will destroy the hunting industry and they will be forced to slaughter many of the 5,000 captive lions in South Africa, as they can't afford to feed the lions and there is not enough room for them in the wild.⁴

The South African Environment Minister Marthinus van Shalkwyk characterized the legislation as “putting an end, once and for all, to the reprehensible practice of canned hunting.”⁵ The legislation was initially to take effect June 1, 2007, but is now postponed until February 1, 2008.⁶ The new laws require that lions roam free for a minimum of two years before they are hunted, bans hunting from vehicles, and prohibit using a bow and arrow to kill thick skinned animals and big predators.⁷

AMERICAS

U.S. environmental organizations have petitioned the government to raise the status of the loggerhead sea turtle from “threatened” to “endangered” under the Endangered Species Act (“ESA”). The ESA requires National Oceanic and Atmospheric Administration’s National Marine Fisheries Service to examine the scientific evidence presented by the petitioners and decide if it is compelling enough to take action.⁸ Loggerhead populations in Florida have declined by fifty percent in a decade, and experts cite a barrage of causes for sea turtle declines occurring all over the country.⁹ The turtles get caught in commercial fishing gear, like lines, nets, and dredges, and coastal development impedes on loggerhead breeding grounds.¹⁰ Climate change may also stress turtle populations due to rising sea levels, which can damage beaches and change ocean temperatures, impacting the ratio of male to female hatchlings.¹¹

The Center for Biological Diversity and Oceana are two groups petitioning on behalf of the loggerhead sea turtles that live on the east coast, which are behaviorally and genetically distinct from loggerheads on the west coast, where the Turtle Island Restoration Network is pushing for an ESA status change.¹² The

groups are petitioning simultaneously, though the government could decide on the western and eastern subspecies of loggerhead sea turtles separately.¹³ If the sea turtles ESA listing is heightened to endangered, increased protections of the species and its habitat will be put into place.¹⁴

Representatives of the fishing industry claim that they are taking steps to decrease turtle deaths through their fishing practices, and also argue that many loggerheads are killed off the coasts of other countries, like Mexico, where the ESA will have no impact.¹⁵ Government officials have ninety days from the filing of the petition to make their decision.¹⁶

ASIA

The use of unregulated chemicals in Punjab, India’s most intensively farmed state, are causing health problems, including cancer.¹⁷ According to an environmental report by the small state’s government, the people, water, animals, and agriculture are all afflicted.¹⁸ The report points to sources of the problem, such as improper chemical applications due to disregarding instructions and the success of the agricultural green revolution of the 1960s and 1970s, which increased dependency on fertilizers and pesticides.¹⁹ In Punjab, food grain production has grown almost ten-fold in the last forty years.²⁰ However, growth rates are now slowing, and the report attributes an overall reduction in the soil’s fertility and soil erosion to the overuse of nitrogenous fertilizers.²¹

In China, a different kind of toxin is causing health and environmental problems: used electronics sent to China for dismantling.²² Skin rashes and respiratory problems are blamed on chemicals like mercury, barium, and cobalt that are either in the waste or used in processing the waste.²³ The environmental group Basel Action Network reports that in one e-waste town, the lead in the river sediment is double European safety levels.²⁴ According Greenpeace in Beijing, China produces more than a million tons of e-waste each year, including five million television sets, five million computers, and ten million cell phones.²⁵ Although many U.S. states require that disposed electronics be sent to recycling centers, because Congress has yet to ratify the Basel Convention, those recycling centers can send their waste abroad.²⁶ However, while most of the Chinese e-waste is imported, domestic e-waste is on the rise.²⁷

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EUROPE

With concerns over declining fish stocks environmentalists, fishermen, and politicians are realizing and seeking out the benefits of marine reserves.²⁸ Surprisingly, fishermen, such as those from the Northwestern Spanish town of Lira, are requesting marine reserves in order to protect their livelihood.²⁹

Marine reserves usually set aside a part of the ocean and prohibit fishing for all or part of the year, in order to allow a sanctuary for fish to grow, reproduce, and spill over into areas where fishing is allowed.³⁰ Marine reserves in other parts of the globe have proven successful in recovering strained fisheries. For example, in St. Lucia and Florida, marine reserves have increased adjacent fish catches by fifty percent, while a reserve in Sicily, Italy increased the fish catch “by a factor of 27 in only five years.”³¹

POLAR REGIONS

A team of scientists monitoring the Arctic Ocean’s circulation detected a change in the circulation from 2002 to 2006.³² The Arctic Ocean’s circulation reverted to the clockwise pattern exhibited prior to 1990, from the counterclockwise pattern that dominated the 1990s.³³ This finding suggests that some of the recent dramatic changes in the Arctic’s climate are not solely caused by climate change.³⁴

The scientists attributed the change in circulation to “weakened Arctic Oscillation, a major atmospheric circulation pattern in the northern hemisphere.”³⁵ Prior to 1970, the Arctic Oscilla-

tion was reasonably stable, and since then it has varied approximately on a ten year scale.³⁶ This variation seemed to have ended in the late 1990s, a time when the Arctic environment noticeably changed.³⁷ However, the recent reversal may be short lived as the scientists predict the Arctic Ocean is ready to swing back the circulation pattern of the 1990s.³⁸ While the shifts in the Arctic Ocean’s circulation do not appear to be directly connected to climate change, “the events of the 1990s may well be a preview of how the Arctic will respond over longer periods of time in a warming world.”³⁹

SOUTH PACIFIC

The ten-member Association of Southeast Asian Nations (“ASEAN”) came together at its thirteenth ASEAN Summit in Singapore, joined by six other Asian countries, including China and Japan.⁴⁰ While the crisis in Myanmar and the passage of an ASEAN legal charter topped the summit agenda, climate change was also addressed by a pact that sets the stage for a series of UN meetings on climate change to begin in December.⁴¹ While the pact fell short of setting numerical goals for emission cuts due to objection from poorer Asian countries, Australia’s Foreign Minister Alexander Downer said “there has been a turning of the tide in China and India’s position—they’re saying ‘yes, we need to do something to stabilize emissions.’”⁴²

Despite the lack of clear numbers on emissions in the pact, Japan did offer \$1.8 billion in loans to fund environmental projects in Asia, and the group pledged to plant 37.5 million acres of trees by 2020.⁴³



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- ³⁴ See S. Rep. No. 94-698, at 19 (1976) (“If a new use of an existing substance has been specified by the Administrator in accordance with this subsection [Section 5(a)(2)], all of the premarket notification procedures and authority during the premarket notification period apply to such new use of an existing substance.”)
- ³⁵ See 40 C.F.R. § 720.22.
- ³⁶ 15 U.S.C. § 2604(a)(2).
- ³⁷ See EPA, EPA AUTHORITIES UNDER TSCA 14 (July 11, 2005), available at <http://www.epa.gov/oppt/npptac/pubs/tscauthorities71105.pdf> (last visited Oct. 14, 2007) [hereinafter EPA AUTHORITIES UNDER TSCA].
- ³⁸ See 15 U.S.C. § 2625(c)(1).
- ³⁹ 15 U.S.C. § 2625(c)(2)(A).
- ⁴⁰ See 15 U.S.C. § 2607(a).
- ⁴¹ See 15 U.S.C. § 2607(d).
- ⁴² 40 C.F.R. § 717.3(a).
- ⁴³ 40 C.F.R. § 717.17(a)-(b).
- ⁴⁴ 15 U.S.C. § 2607(e).
- ⁴⁵ See Press Release, EPA, EPA Settles PFOA Case Against DuPont for Largest Environmental Administrative Penalty in Agency History (Dec. 14, 2005), available at <http://yosemite.epa.gov/opa/admpress.nsf/d9bf8d9315e942578525701c005e573c/fdcb2f665cacc66bb852570d7005d6665!OpenDocument> (last visited Oct. 14, 2007).
- ⁴⁶ See Letter from Richard A. Denison & Karen Florini, Environmental Defense, to Susan B. Hazen, Acting Assistant Administrator, Office of Prevention, Pesticides & Toxic Substances, EPA (Sept. 2, 2004) [hereinafter Sept. 2004 ED Letter] (attached to Letter from Richard A. Denison & Karen Florini, Environmental Defense, to Ann R. Klee, General Counsel Environmental Protection Agency (May 22, 2006) [hereinafter May 22, 2006 ED Letter]), available at http://www.environmentaldefense.org/documents/5265_Status_ofNMsUnderTSCA.pdf (last visited Oct. 14, 2007). Comment from Natural Resources Defense Council et al., in response to EPA Proposal to Regulate Nanomaterials Through a Voluntary Pilot Program 11-12 (July 5, 2005), available at <http://www.regulations.gov> (Select “Search For Dockets” and select EPA as “Agency” and enter “EPA-HQ-OPPT-2004-0122” as “Docket ID” for a link to the document “EPA-HQ-OPPT-2004-0122-0013”) (last visited Oct. 23, 2007).
- ⁴⁷ May 22, 2006 ED Letter *supra*, note 46 at 1 (emphasis in original).
- ⁴⁸ See *id.*
- ⁴⁹ See *id.* at 3-4.
- ⁵⁰ See *id.* at 1; see generally American Chemistry Council, Nanotechnology Panel, http://www.americanchemistry.com/s_acc/sec_statistics.asp?CID=654&DID=2564 (provides information about the Panel’s goals, views, etc.) (last visited Oct. 14, 2007).
- ⁵¹ See generally 40 C.F.R. § 710.3.
- ⁵² See TSCA Inventory Nomenclature for Enzymes and Proteins, 69 Fed. Reg. 65565, 65567 (Nov. 15, 2004) (stating “the only way to determine if a substance is new or existing is by consulting the TSCA Inventory”).
- ⁵³ ABA SEER PAPER, *supra* note 33, at 8.
- ⁵⁴ ABA SEER PAPER, *supra* note 33, at 8.
- ⁵⁵ ABA SEER PAPER, *supra* note 33, at 9.
- ⁵⁶ ABA SEER PAPER, *supra* note 33, at 12-13.
- ⁵⁷ See 15 U.S.C. § 2604(a)(1)-(2).
- ⁵⁸ See 15 U.S.C. § 2604(a)(1)(B)-(2).
- ⁵⁹ See 40 C.F.R. §§ 720.40(a)(2)721.25(a) (regulating PMN and SNUN).
- ⁶⁰ EPA AUTHORITIES UNDER TSCA, *supra* note 37, at 12.
- ⁶¹ 15 U.S.C. § 2604(e)(1)(A)(i), (f)(1).
- ⁶² 15 U.S.C. § 2604(a)(2)(B)-(D).
- ⁶³ Perfluoroalkyl Sulfonates; Proposed Significant New Use Rule, 71 Fed. Reg. 12311, 12314 (Mar. 10, 2006) (to be codified at 40 C.F.R. §721.9582).
- ⁶⁴ 15 U.S.C. § 2625(c)(2)(A); see ABA SEER PAPER, *supra* note 33, at 16.
- ⁶⁵ See Karen Florini et al., *Nanotechnology: Getting It Right the First Time*, SUSTAINABLE DEV. L. & POL’Y, Spring 2006, at 51.
- ⁶⁶ ED Letter, *supra* note 46, at 4-4.
- ⁶⁷ See Pat Phibbs, *Manufacture of New Carbon Nanotube Approved by EPA Under an Exemption*, BNA DAILY ENV’T REP., Oct. 21, 2005, at A-1.
- ⁶⁸ See James Alwood, EPA, Presentation at American Chemistry Council/SOCMA Global Chemical Regulations Conference (Mar. 22, 2005) (noting that Section 8(e) reporting applies to nanoscale materials) (unpublished); see also EPA, CONCEPT PAPER FOR THE NANOSCALE MATERIALS STEWARDSHIP PROGRAM UNDER TSCA, Annex C, (including discussion of Section 8(e)), available at <http://www.regulations.gov/fdmspublic/component/main?main=DocumentDetail&d=EPA-HQ-OPPT-2004-0122-0058> (last visited Nov. 1, 2007) [hereinafter CONCEPT PAPER].
- ⁶⁹ To date, EPA has received at least one Section 8(e) submission (8EHQ-0403-15319 (Apr. 10, 2003)) addressing an engineered nanoscale material, although it is not clear from the submission whether the nanoscale material was existing or new. See generally OPPT Accomplishments Report, New Nanotechnology Products available at http://www.epa.gov/oppt/ar/20052006/managing/new_nano.htm (last visited Nov. 1, 2007).
- ⁷⁰ See Pat Phibbs-Rizzuto, *EPA Reviews 15 New Nanoscale Chemicals, But Finds Only One With Unique Properties*, BNA DAILY ENV’T REP., Aug. 16, 2006, at A-7.
- ⁷¹ Notice of Certain New Chemicals, Receipt & Status Information, 71 Fed. Reg. 33449, 33451 (June 9, 2006); Notice of Certain New Chemicals, Receipt & Status Information, 71 Fed. Reg. 46475, 46480 (Aug. 14, 2006).
- ⁷² See Meeting Notice, 70 Fed. Reg. 24574 (May 10, 2005).
- ⁷³ See NAT’L POLLUTION PREVENTION & TOXICS ADVISORY COMM., OVERVIEW DOCUMENT ON NANOSCALE MATERIALS (Nov. 22, 2005) (acknowledging the formation of the Ad Hoc Work Group prior to the Oct. 2005 meeting), available at <http://www.epa.gov/opptintr/npptac/pubs/nanowgoverviewdocument20051125.pdf> (last visited Nov. 1, 2007) [hereinafter NPPTAC OVERVIEW DOCUMENT].
- ⁷⁴ *Id.*
- ⁷⁵ Letter from James B. Gulliford, Assistant Administrator for Prevention, Pesticides & Toxic Substances, to Stakeholders (Oct. 18, 2006) (laying out EPA’s goal “to implement TSCA in a way that enables responsible development of nanotechnology and realizes its potential environmental benefits, while applying sound science to assess and, where appropriate, manage potential risks to human health and the environment presented by nanoscale materials”), available at <http://www.epa.gov/oppt/nano/nano-letter.pdf> (last visited Oct. 14, 2007).
- ⁷⁶ See Nanoscale Materials Stewardship Program, 72 Fed. Reg. 38079-38081, 38083-38085 4 (July 12, 2007), available at <http://www.epa.gov/opptintr/nano/nmspfr.htm> (last visited Oct. 14, 2007).
- ⁷⁷ Information Collection Activities on Nanoscale Materials Stewardship Program, 72 Fed. Reg. 38079 (July 12, 2007).

⁷⁸ Meeting Notice, 72 Fed. Reg. 38081 (July 12, 2007).

⁷⁹ Comment Notice, Nanoscale Materials Stewardship Program & Inventory Status of Nanoscale Substances under TSCA, 72 Fed. Reg. 38083 (July 12, 2007).

⁸⁰ CONCEPT PAPER, *supra* note 68, at 3.

⁸¹ EPA, TSCA INVENTORY STATUS OF NANOSCALE SUBSTANCES at 2, available at <http://www.regulations.gov/fdmspublic/component/>

main?main=DocumentDetail&d=EPA-HQ-OPPT-2004-0122-0057 (last visited Oct. 14, 2007) [hereinafter TSCA INVENTORY PAPER].

⁸² See TSCA INVENTORY PAPER, *id.* at 6.

⁸³ See Comment Notice, Nanoscale Materials Stewardship Program & Inventory Status of Nanoscale Substances under TSCA, 72 Fed. Reg. 38083 (July 12, 2007).

ENDNOTES: ENVIRONMENTAL STANDARDS IN U.S. FREE TRADE AGREEMENTS *continued from page 36*

⁶ *Sun Belt Water, Inc. v. Canada*, Notice of Claim and Demand for Arbitration (Oct. 12, 1999), available at <http://naftaclaims.com/Disputes/Canada/Sunbelt/SunBeltNoticeClaimDemandArbitration.pdf> (last visited Nov. 19, 2007).

⁷ U.S. Dep't of State, Office of the Legal Advisor, *Bayview Irrigation Dist. v. Mexico*, available at <http://www.state.gov/s/l/c20028.htm> (last visited Oct. 17, 2007) [hereinafter *Bayview*].

⁸ *Bayview, id.*

⁹ See *Bayview Irrigation Dist. v. Mexico* (U.S. v. Mex.), ICSID ARB(AF)/05/1, Award (June 21, 2007), available at http://www.naftaclaims.com/Disputes/Mexico/Texas/Bayview_Jurisdictional_Award_19-05-07.pdf (last visited Nov. 19, 2007) [hereinafter *Bayview award*].

¹⁰ See *Bayview award, id.*

ENDNOTES: MINNEAPOLIS BRIDGE COLLAPSE *continued from page 37*

¹ U.S. Dep't of Transp. Office of Public Affairs, *I-35W Bridge Collapse, Minneapolis, MN*, <http://www.dot.gov/affairs/factsheet080207.htm> (last visited Oct. 18, 2007) [hereinafter *I-35W Bridge Collapse*].

² Reason Foundation, State-by-State Ranking of Deficient Bridges, available at http://www.reason.org/news/deficient_bridges_by_state_080307.shtml (last visited Oct. 18, 2007).

³ *I-35W Bridge Collapse, supra* note 1.

⁴ Minneapolis I-35W Bridge Collapse Information, *Vision for a New Bridge*, <http://www.ci.minneapolis.mn.us/minneapolisrebuilds/vision.asp> (last visited Oct. 18, 2007).

⁵ Lauren R. Hunt, Development of a Rating System for Sustainable Bridges 6 (May 31, 2005) (unpublished M.S. thesis, Massachusetts Institute of Technology), available at <http://dspace.mit.edu/bitstream/1721.1/31115/1/61146095.pdf> (last visited Oct. 18, 2007).

⁶ U.S. Dep't of Transp. Federal Highway Administration, *High-Performance Materials: A Step Toward Sustainable Transportation*, <http://www.tfrc.gov/pubrds/spring97/high.htm> (last visited Oct. 18, 2007).

⁷ Hunt, *supra* note 5, at 8.

⁸ U.S. Dep't of Transp., Federal Highway Administration website, <http://www.fhwa.dot.gov/> (last visited Oct. 18, 2007).

⁹ U.S. Dep't of Transp. Federal Highway Administration, *Celebrating 50 Years: The Eisenhower Interstate Highway System*, <http://www.fhwa.dot.gov/interstate/homepage.cfm> (last visited Nov. 2, 2007).

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³⁴ 40 C.F.R. § 1500.1(b).

³⁵ *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989).

³⁶ Treasury and General Government Appropriations Act for Fiscal Year 2001, Pub.L.No. 106-554, § 515; see also BUREAU OF LAND MANAGEMENT, INFORMATION QUALITY GUIDELINES, available at http://www.blm.gov/nhp/efoia/data_quality/guidelines.pdf (last visited Nov. 3, 2007).

³⁷ 40 C.F.R. § 1502.22.

³⁸ The scope of an EIS is relatively wide and requires the agency to “discuss the purpose and need for the proposed action, environmental impacts resulting from the actions, unavoidable adverse environmental impacts, alternatives to the proposed action, the relationship between short-term uses and long-term productivity, and the amount of resources that must be devoted to the proposed action.” *Citizens’ Comm. to Save Our Canyons v. U.S. Forest Serv.*, 297 F.3d 1012, 1022 (10th Cir. 2002); 42 U.S.C. §4332(2)(C)(i)-(v); 40 C.F.R. § 1502.10.

³⁹ COUNCIL ON ENVIRONMENTAL QUALITY, *supra* note 5.

⁴⁰ National Environmental Policy Act, 42 U.S.C. § 4331(a) (2007).

⁴¹ 40 C.F.R. § 1508.8.

⁴² 40 C.F.R. § 1508.7.

⁴³ *Neighbors of Cuddy Mountain v. U.S. Forest Serv.*, 137 F.3d 1372, 1379-80 (9th Cir. 1998).

⁴⁴ See *Ocean Advocates v. U.S. Army Corps of Eng’rs*, 361 F.3d 1108, 1129 (9th Cir. 2004); *Muckleshoot Indian Tribe v. U.S. Forest Serv.*, 177 F.3d 800, 811 (9th Cir. 1999) (holding that the cumulative impact statements that are provided in the EIS are far too general and one-sided to meet the NEPA requirements); see also *High Sierra Hikers Ass’n v. Blackwell*, 390 F.3d 630, 645-46

(9th Cir. 2004); *Klamath-Siskiyou Wildlands Ctr. v. Bureau of Land Mgmt.*, 387 F.3d 989, 991-92 (9th Cir. 2004) (asserting that the analyses performed by the BLM do not sufficiently consider the cumulative impacts posed by the timber sales); *Wyoming Outdoor Council Powder River Basin Res. Council v. United States*, 351 F. Supp. 2d 1232, 1238 (D. Wyo. 2005); *Defenders of Wildlife v. Ballard*, 73 F. Supp. 2d 1094, 1114 (D. Ariz. 1999).

⁴⁵ See *Kleppe v. Sierra Club*, 427 U.S. 390, 410 (1976); *Northcoast Envtl. Ctr. v. Glickman*, 136 F.3d 660, 688 (9th Cir. 1998). (holding that the preparation of a programmatic EIS, will permit agency to assess the environmental consequences of “an entire policy initiative rather than performing a piecemeal analysis”).

⁴⁶ *Bartell, supra* note 4, at 848.

⁴⁷ *Bartell, supra* note 4, at 848.

⁴⁸ James L. Connaughton, *Modernizing the National Environmental Policy Act: Back to the Future*, 12 N.Y.U. ENVTL. L.J. 1, 9 (2003) (writing about the possibilities of using ERAs to improve the NEPA process, and saying, “[t]he question we must find an answer to now is how to pull environmental and risk assessments together in such a way to create a more programmatic view of planning and development”).

⁴⁹ *Bartell, supra* note 4, at 848.

⁵⁰ 40 C.F.R. § 1502.22.

⁵¹ *Seattle Audubon Soc’y v. Espy*, 998 F.2d 699, 704 (9th Cir. 1993).

⁵² *Seattle Audubon Soc’y, id.*; see also *Ecology Ctr., Inc. v. Austin*, 430 F.3d 1057, 1065 (9th Cir. 2005).

⁵³ Montana Wilderness Ass'n v. Fry, 408 F. Supp. 2d 1032 (D. Mont. 2006) (deciding to maintain jurisdiction until BLM submitted proof that it had completed an adequate NEPA analysis of oil and gas leases, a federal court in Montana cited the importance of ensuring that the NEPA process not be "reduced to a series of hurdles to be cleared en route to a predetermined result" and, in discussing the testimony from the BLM State Director, repeatedly emphasized its "concern over BLM's ability to fulfill its procedural obligations without favoring a predetermined outcome").

⁵⁴ GUIDELINES FOR ECOLOGICAL RISK ASSESSMENT, *supra* note 21, at 5.

⁵⁵ 42 U.S.C. § 4332(C).

⁵⁶ 40 C.F.R. § 1508.18(a).

⁵⁷ The eleven Western states are: California, Washington, Oregon, Idaho, Nevada, New Mexico, Utah, Colorado, Wyoming, Montana, and Arizona.

⁵⁸ BLM, WIND ENERGY DEVELOPMENT PROGRAMMATIC EIS INFORMATION CENTER, available at <http://windeis.anl.gov/> (last visited Nov. 1, 2007).

⁵⁹ BLM, OIL SHALE & TAR SANDS LEASING PROGRAMMATIC EIS, available at <http://ostseis.anl.gov/index.cfm> (last visited Nov. 3, 2007).

⁶⁰ OIL SHALE & TAR SANDS LEASING PROGRAMMATIC EIS, *id.*

⁶¹ BLM, GEOTHERMAL RESOURCES LEASING PROGRAMMATIC EIS, available at http://www.blm.gov/wo/st/en/prog/energy/geothermal/geothermal_nationwide.html (last visited Nov. 1, 2007).

⁶² The Cheney Energy Task Force released its recommendations for expediting oil and gas exploration and development while reassessing the use of protective lease stipulations or other measures. Executive Orders 13211 and 13212 were released at the same time directing federal agencies to follow these recommendations and to take actions to "accelerate the completion of energy-related projects." In 2003, the BLM issued Instruction Memoranda Nos. 2003-233 and 2003-234, which formalized a requirement for the BLM to manage its lands to expedite review, accelerate completion and impose the "least restrictive constraints" on oil and gas development. In addition to the new categorical exclusions discussed above, the Energy Policy Act of 2005 also prescribed shortened review periods for approving applications for permits to drill, provided an exemption from the Clean Water Act for certain oil and gas development activities, and established five pilot project offices to focus on processing applications for permits to drill. Pub. L. No. 109-58, § 366, 365 (Aug. 8, 2005).

⁶³ Morton, Weller, Thomson, Haefele, & Culver, *supra* note 11.

⁶⁴ See *Kleppe v. Sierra Club*, 427 U.S. 390, 410 (1976).

⁶⁵ *Northcoast Envtl. Ctr. v. Glickman*, 136 F.3d 660, 688 (9th Cir. 1998).

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¹ European Space Agency News, *Satellites witness lowest Arctic ice coverage in history* (Sept. 14, 2007), available at http://www.esa.int/esaCP/SEMYTC13J6F_index_0.html (last visited Nov. 17, 2007).

² See Laura Hansen & Christopher R. Pyke, *Climate Change and Federal Environmental Law*, SUSTAINABLE DEV. L. & POL'Y, Winter 2007, at 28.

³ John M. Broder & Andrew C. Revkin, N. Y. TIMES, *Warming May Wipe Out Most Polar Bears, Study Says* Sept. 8, 2007, at A 11, available at <http://www.nytimes.com/2007/09/08/science/earth/08polar.html> (last visited October 14, 2007).

⁴ Press Release, Center for Biological Diversity, Conservation Groups Advance Protections For Polar Bear from Global Warming (Dec. 27, 2006), available at <http://www.biologicaldiversity.org/swcbd/PRESS/polar-bear-12-27-2006.html> (last visited Nov. 17, 2007).

⁵ U.S. GEOLOGICAL SURVEY, USGS SCIENCE TO INFORM U.S. FISH & WILDLIFE SERVICE DECISION MAKING ON POLAR BEARS EXECUTIVE SUMMARY, available at http://www.usgs.gov/newsroom/special/polar_bears/docs/executive_summary.pdf (last visited Nov. 14, 2007) [hereinafter U.S. GEOLOGICAL SURVEY].

⁶ U.S. GEOLOGICAL SURVEY, *id.* at 1.

⁷ Jeffrey Kluger, *A Big Win for Polar Bears*, TIME, Dec. 27, 2006, available at <http://www.time.com/time/health/article/0,8599,1572970,00.html> (last visited Oct. 14, 2007).

⁸ U.S. GEOLOGICAL SURVEY, *supra* note 5, at 4.

⁹ Press Release, U.S. Geological Survey, Future Retreat of Arctic Sea Ice Will Lower Polar Bear Populations and Limit Their Distribution (Sept. 7, 2007), available at <http://www.usgs.gov/newsroom/article.asp?ID=1773> (last visited Nov. 17, 2007).

¹⁰ John M. Broder & Andrew C. Revkin, *supra* note 3.

¹¹ ERIC DEWEAVER, U.S. DEP'T OF INTERIOR, UNCERTAINTY IN CLIMATE MODEL PROJECTIONS OF ARCTIC SEA ICE DECLINE: AN EVALUATION RELEVANT TO POLAR BEARS (2007), available at http://www.usgs.gov/newsroom/special/polar_bears/docs/USGS_PolarBear_DeWeaver_GCM-Uncertainty.pdf (last visited Nov. 19, 2007).

¹² See Thomas Homer-Dixon, Op-Ed, *A Swiftly Melting Planet*, N.Y. TIMES, Oct. 4, 2007, at A29.

¹³ ABC NEWS, *Arctic Melting Leaves Countries Sparring* (Sept. 18, 2007) available at <http://www.abcnnews.go.com/WN/Story?id=3621021> (last visited Nov. 17, 2007).

¹⁴ See generally 16 U.S.C. § 1536 (2007) (requiring interagency cooperation).

¹⁵ 16 U.S.C. § 1532 (2007) (defining "taking" under the ESA as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct").

¹⁶ See *Babbitt v. Sweethome Chapter of Communities for a Great Oregon*, 515 U.S. 687 (1995) (interpreting the term take to include significant habitat modification or degradation that actually kills or injures wildlife).

¹⁷ Kluger, *supra* note 7.

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²² See PEW CHARITABLE TRUSTS, AMERICA'S LIVING OCEANS: CHARTING A COURSE FOR SEA CHANGE (June 2, 2003), available at http://www.pewtrusts.org/our_work_ektid30009.aspx (last visited Nov. 5, 2007).

²³ Exec. Order No. 13,366, 69 Fed. Reg. 76,591 (Dec. 17, 2004).

²⁴ Exec. Order No. 13,366, *id.*

²⁵ Exec. Order No. 13,366, *id.*

²⁶ See generally COUNCIL ON ENVIRONMENTAL QUALITY COMMITTEE ON OCEAN POLICY, OCEAN ACTION PLAN, www.ocean.ceq.gov (follow "Ocean Action Plan" link on bottom of page) (last visited Nov. 5, 2007) [hereinafter OCEAN ACTION PLAN].

²⁷ OCEAN ACTION PLAN, *id.*

²⁸ See, e.g., *Hearing before the U.S. Sen. Comm. on Commerce, Science, and Transp.*, 108th Cong. (Apr. 22, 2004) (testimony of James D. Watkins, Chairman, U.S. Comm'n on Ocean Policy), available at http://www.oceancommission.gov/newsnotices/prelim_testimony.html (last visited Nov. 5, 2007).

²⁹ About Us, Joint Ocean Commission Initiative, www.jointoceancommission.org/about-us.html (last visited Nov. 14, 2007).

³⁰ U.S. Ocean Policy Report Card, 2006, Joint Ocean Commission Initiative, http://64.233.167.104/custom?q=cache:_gGkJ45VPCMJ:www.jointoceancommission.org/images/report-card-06.pdf+report+card&hl=en&ct=clnk&cd=1&gl=us&client=google-coop-np (last visited Nov. 15, 2007).

³¹ Report Card, *id.*

³² 16 U.S.C. § 1851 *et seq.* (2007).

³³ U.S. Sen. Comm. on Commerce, Science & Transp., *Ocean Policy Report Card Praises Fisheries Conservation Efforts Led by Stevens and Inouye* (Jan. 30, 2007), available at http://commerce.senate.gov/public/index.cfm?FuseAction=PressReleases.Detail&PressRelease_id=248728&Month=1&Year=2007 (last visited Nov. 14, 2007).

³⁴ 6 U.S.C. § 1451-65.

³⁵ 16 U.S.C. § 1452.

³⁶ 16 U.S.C. § 1455. However, no zoning map is required. *American Petroleum Inst. v. Knecht*, 456 F. Supp. 889 (C.D. Cal. 1978), *aff'd* 609 F.2d 1036 (9th Cir. 1979).

³⁷ 16 U.S.C. § 1456b.

³⁸ 16 U.S.C. § 1465.

³⁹ 16 U.S.C. § 1465.

⁴⁰ About, Coastal Zone Management Act, National Oceanic and Atmospheric Administration website, www.coastalmanagement.noaa.gov/czm/czm_act.html (last visited Nov. 7, 2007).

⁴¹ 16 U.S.C. § 1431 *et seq.*

⁴² About NOAA National Marine Sanctuaries, National Oceanic and Atmospheric Administration website, www.sanctuaries.noaa.gov (last visited Nov. 7, 2007).

⁴³ About NOAA National Marine Sanctuaries, *Id.*

⁴⁴ Editorial, *Twenty-Five Years and Counting*, N.Y. TIMES, Oct. 31, 2007, available at <http://www.nytimes.com/2007/10/31/opinion/31wed3.html> (last visited Nov. 15, 2007) [hereinafter *Twenty-Five Years and Counting*].

⁴⁵ *Convention on the Law of the Sea: Hearing Before the Sen. Comm. on Foreign Relations on Convention on the Law of the Sea* 110th Cong. (Oct. 4, 2007), available at <http://www.senate.gov/~foreign/hearings/2007/hr0711004a.html> (last visited Nov. 7, 2007).

⁴⁶ 16 U.S.C. § 1851 *et seq.* (2007)

⁴⁷ 14 U.S.C. § 2 (2007).

⁴⁸ Exec. Order No. 13,366, *supra* note 23.

⁴⁹ See generally About IMO, International Maritime Organization website, www.imo.org/Safety/mainframe.asp (last visited Nov. 5, 2007).

⁵⁰ *Commission, Green Paper on Better Ship Dismantling* (2006), available at www.endseuropedaily.com/docs/70201a.doc (last visited Nov. 7, 2007)

⁵¹ About CBP, U.S. Border and Customs Protection website, <http://www.cbp.gov/xp/cgov/toolbox/about/> (last visited Nov. 7, 2007).

⁵² Maritime Domain Awareness, U.S. Coast Guard Acquisition Directorate website, www.uscg.mil/nais/mda.asp (last visited Nov. 7, 2007).

⁵³ Secure Border Initiative, Boeing Integrated Defense Systems website, www.boeing.com/defense-space/sbinet/index.html (last visited Nov. 7, 2007).

⁵⁴ North American Free Trade Agreement, USDA Foreign Agricultural Service (FAS) website, www.fas.usda.gov/itp/Policy/NAFTA/nafta.asp (last visited Nov. 7, 2007).

⁵⁵ Short Sea Shipping Initiative, MARAD website, www.marad.dot.gov/Programs/shortseashipping.html (last visited Nov. 7, 2007).

⁵⁶ H.R. 2701 was introduced by Rep. Jim Oberstar (D-MN) and its provisions on short sea shipping were included in H.R. 6, the House-passed CLEAN Energy Act of 2007, presently in Conference.

⁵⁷ Exec. Order No. 13,366, *supra* note 23.

⁵⁸ Exec. Order No. 13,366, *supra* note 23.

⁵⁹ A caveat to this conclusion is to acknowledge the work of Senators Lieberman (IND-Conn) and Warner (R-VA) who recently introduced S. 2191, America's Climate Security Act of 2007, a bill to reduce U.S. greenhouse gas emissions substantially between 2007 and 2050.

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⁴ David Pimentel, *Ethanol Fuels: Energy Balance, Economics and Environmental Impacts are Negative*, 12 NATURAL RES., 127 (2003), available at <http://www.ethanol-gec.org/netenergy/neypimentel.pdf> (last visited Nov. 20, 2007).

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¹⁰ President George W. Bush, *2007 State of the Union Address*, Jan. 23, 2007, available at <http://www.whitehouse.gov/news/releases/2007/01/20070123-2.html> (last visited Oct. 14, 2007).

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³² Compare 16 U.S.C. § 1456(c)(1)(B), with § 1456(c)(3)(A). For a federal agency activity, the state must file a legal challenge if the agency decides to proceed with an action over the state's objection.

³³ The President may also exempt a federal agency activity from the CZMA if the President determines that the activity is "in the paramount interest of the United States." 16 U.S.C. § 1456(c)(1)(B). For a privately proposed activity, including oil exploration or development, the Secretary of Commerce may override a state's objection by finding that the activity is consistent with the objectives of the CZMA or "is otherwise necessary in the interest of national security." 16 U.S.C. § 1456(c)(3)(A), (B)(iii).

³⁴ See *Sec'y of the Interior v. California*, 464 U.S. 312, 319 (1984), *superseded by statute*, Act of Nov. 5, 1990, as amended by § 2205(13) of Act Nov. 4, 1992, Pub. L. No. 102-587.

³⁵ Minerals Management Service website, <http://www.mms.gov/mmshome.htm> (last visited Nov. 4, 2007)

³⁶ *California*, 464 U.S. at 319.

³⁷ *California*, *id.* at 318.

³⁸ *California v. Norton*, 150 F. Supp. 2d 1046 (N.D. Cal. 2001), *aff'd*, 311 F.3d 1162 (9th Cir. 2002).

³⁹ *California*, 464 U.S. 312.

⁴⁰ *California*, *id.* at 315-18.

⁴¹ *California*, *id.* at 342-43.

⁴² *California*, *id.*

⁴³ Act Nov. 5, 1990, as amended by § 2205(13) of Act Nov. 4, 1992, Pub. L. No. 102-587. Congress' specific attack on *Sec'y of the Interior v. California* was apparent in the statements of the legislature, including the notation that "the 'directly affecting' standard which was the central feature of the Court's decision has been struck and replaced with a new triggering standard: 'affecting any natural resources, land uses, or water uses in the coastal zone.'" Congress also stated that "the interpretation that an OCS lease sale is not subject to subsection (c)(1) because it is not an activity 'conducted or supported' by a federal agency is addressed by striking those words." 136 CONG. REC. H8068, H8076 (1990).

⁴⁴ Essentially, MMS is asked to suspend the expiration of the lease, so that the lessee may continue to pursue production of the lease.

⁴⁵ Some of the leases were part of Lease Sale 53, the sale that was challenged in *Sec’y of the Interior v. California*.

⁴⁶ MMS, FINAL CALIFORNIA OFFSHORE OIL AND GAS ENERGY RESOURCES (“COOGER”) STUDY, OCS Report MMS 99-0043, Jan. 26, 2000, available at <http://www.mms.gov/itd/abstracts/95-0059a.html> (last visited Nov. 10, 2007).

⁴⁷ See generally CAL. COASTAL COMM’N, CAL. OFFSHORE OIL & GAS LEASING AND DEV. STATUS REPORT (1999), available at <http://www.coastal.ca.gov/pubs.html> (last visited Nov. 10, 2007).

⁴⁸ The EDC is a non-profit public interest environmental law firm headquartered in Santa Barbara, California; see www.EDCnet.org for more information.

⁴⁹ See Letter from Sara J. Wan, Chair of the Coastal Commission, to Bruce Babbitt, Secretary of the Interior and Walt Rosenbusch, Director of MMS (July 27, 1999), available at <http://www.coastal.ca.gov/energy/ocs/8-2005-Th5j-exhibits.pdf> (last visited Nov. 10, 2007).

⁵⁰ See Letter from Bruce Babbitt, Secretary of the Interior, to Sara J. Wan, Chair of the California Coastal Commission (Aug. 13, 1999) (explaining that in August 1999, the federal government allowed four of the leases to expire, leaving 36 leases that were suspended in November, 1999). Subsequently, it was discovered that an additional partial lease was included in the suspensions, bringing the total number of suspended leases to 37.

⁵¹ *California v. Norton*, *supra* note 38.

⁵² EDC represented the Sierra Club, Friends of the Sea Otter, CALPIRG, California Coastkeeper, Santa Barbara Channelkeeper, Santa Monica Baykeeper, Get Oil Out!, and Citizens Planning Association of Santa Barbara County, and the Natural Resources Defense Council represented itself and the League for Coastal Protection.

⁵³ *Norton*, 150 F. Supp. 2d at 1053, *aff’d*, 311 F.3d 1162 (9th Cir. 2002).

⁵⁴ *Norton*, *id.* at 1052.

⁵⁵ *Norton*, *id.* (citing H.R. Rep. No. 101-964 at 2675).

⁵⁶ *Norton*, *id.*

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⁶² *Norton*, *id.* at 1172-73.

⁶³ *Norton*, 311 F. 3d at 1173.

⁶⁴ *Norton*, *id.*

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⁶⁸ *League for Coastal Prot. v. Norton*, 2005 U.S. Dist. LEXIS 32379 (N.D. Cal. Aug. 31, 2005).

⁶⁹ *E.g.*, *Norton*, *id.* at *10 (citing 40 C.F.R. §1508.8).

⁷⁰ CAL. COASTAL COMM’N, STAFF REPORT & RECOMMENDATION ON CONSISTENCY DETERMINATION, CD-050-05: MMS OCS LEASE SUSPENSIONS 11-14 (Aug. 11, 2005), available at www.coastal.ca.gov/energy/ocs/8-2005-Th5i.pdf (last visited Nov. 10, 2007).

⁷¹ *Norton*, 2005 U.S. Dist. LEXIS 32379 at *14 (“NEPA is not designed to postpone analysis of an environmental consequence to the last possible moment. Rather, it is designed to require such analysis as soon as it can reasonably be done.”) (citing *Kern v. U.S. Bureau of Land Mgmt.*, 284 F.3d 1062, 1072 (9th Cir. 2002)).

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⁷³ Coastal Zone Management Act Federal Consistency Regulations, Final Rule, 71 Fed. Reg. 788 (Jan. 5, 2006).

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⁴ IPCC 2007, *id.* at 5 (citing a sixty six to ninety percent probability).

⁵ IPCC 2007, *id.* at 5.

⁶ IPCC 2007, *id.* at 19.

⁷ See United Nations Framework Convention on Climate Change, May 9, 1992, 31 I.L.M. 849, available at http://unfccc.int/essential_background/convention/background/items/2853.php (last visited Nov. 1, 2007) [hereinafter UNFCCC].

⁸ UNFCCC commitments include, *inter alia*, art. 2 (“Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change”); art. 4.1(b) (“Formulate, implement, publish and regularly update national and, where appropriate, regional programs concerning...measures to facilitate adequate adaptation to climate change”); art. 4.1(3) (“Cooperate in preparing for adaptation to the impacts of climate change”); art. 4.1(f) (“Take climate change considerations into account, to the extent feasible, in their relevant social, economic and environmental policies and actions, and employ appropriate methods, for example. . . measures undertaken by them to

mitigate or adapt to climate change”); art. 4.4 (Requiring the developed country parties and other developed parties included in Annex II to also assist the developing country parties that are particularly vulnerable to the adverse effects of climate change in meeting costs of adaptation to those adverse effects).

⁹ UNFCCC website, Adaptation, available at http://unfccc.int/adaptation/adverse_effects_and_response_measures_art_48/items/2535.php (last visited Oct. 29, 2007) [hereinafter UNFCCC website] (stating art. 4.8 of the Convention calls on Parties to “consider actions, including those related to funding, insurance and the transfer of technology, to meet the specific needs and concerns of developing countries in this regard, listing categories of countries (e.g., small island countries and countries whose economies are highly dependent on fossil fuels) that may be particularly affected”).

¹⁰ UNFCCC website, *id.* (stating “Article 4.9 of the Convention refers specifically to the specific needs and special situations of the least developed countries (LDCs) concerning funding and transfer of technology”).

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- ²⁰ IPCC 2001, *supra* note 2, at 2.4.
- ²¹ Nick Brooks, *Vulnerability, risk and adaptation: A conceptual framework*, Tyndall Centre for Climate Research, Working Paper 38, at 4 (Nov. 2003), available at http://www.tyndall.ac.uk/publications/working_papers/wp38.pdf (last visited Nov. 1, 2007).
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