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SUSTAINABLE DEVELOPMENT LAW & POLICY



EXPLORING ENVIRONMENTAL LAW & POLICY ISSUES AROUND THE GLOBE

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EDITOR'S NOTE

North America experienced the largest power outage in history this past summer. From New York to Detroit, people gazed into the starry night - unobstructed by light pollution - wondering what could have caused such a huge failure. The problem was traced back to a few downed power lines in Ohio and an overburdened and increasingly interconnected transmission grid. Almost immediately, politicians and civic leaders were calling for the heads of those responsible. Unfortunately, the blame was placed almost exclusively on the nation's aging transmission grid rather than on the nation's gluttonous over-consumption of power.

With the blackout's root cause misleadingly diagnosed, most of the proposed solutions have been extremely limited and, in some cases, wrongheaded. The Bush Administration and the electric industry insist that the answer to our energy woes is increased supply – in this case, spending billions of dollars of ratepayers' money upgrading and modernizing the nation's power grid. In a mantra that has become all too familiar from this Administration, no attention is paid to reducing the rate of consumption as a way of minimizing the stress on our existing energy infrastructure.

In fact, the Administration has consistently worked to undermine such efforts, whether by slashing funding for Energy Star – the program dedicated to increasing appliance efficiency – or by exempting over 17,000 energy facilities from compliance with the Clean Air Act. When asked whether Americans should cut back on energy consumption, Press Secretary Ari Fleischer summed up the Administration's position as follows: "That's a big no. The president believes that it's an American way of life...the American way of life is a blessed one. And we have a bounty of resources in this country."

To be sure, we must invest in upgrading our crumbling infrastructure. But, this is only part of the equation. We must also begin using and generating energy more wisely through greater efficiency and conservation and a greater reliance on renewable sources of energy. Especially important is the use of decentralized clean power sources like solar cells and wind turbines that can create power at or close to the point of consumption, thus avoiding reliance on the transmission grid altogether.

Before we commit to spending billions of dollars of ratepayers' money on merely expanding what we currently have, we must consider the alternatives. For example, by adjusting electricity rates according to the level of consumption – as California utilities began doing during the 2001 energy crisis – efficiency and conservation is rewarded by way of lower-than-ordinary rates for the power that is consumed. Myriad other practical examples exist for reducing energy demand: from more efficient building design to the use of power-saving lighting and appliances. As decreased demand lowers the stress on the existing infrastructure and the money required for maintaining the grid, more money can be made

available for tax credits and other incentives for renewable energy investments. This more sustainable energy path would not only prevent future catastrophic power failures, but would also lead to cleaner air, a healthier environment, and the development of new industries and jobs.



Dave Newman
Editor-in-Chief

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LITIGATION UPDATE

EPA's Administrative Compliance Orders Ruled Unconstitutional

By Mary Margaret McCleroy*

On June 24, 2003, the Eleventh Circuit Court of Appeals declared the Environmental Protection Agency's ("EPA") authority to issue legally binding administrative compliance orders ("ACOs") unconstitutional.¹ This decision could foreshadow a broader movement to weaken EPA's ability to enforce the broad range of environmental and public health statutes that it is responsible for implementing. While this decision undermines EPA's ability to enforce ACOs, it does not leave EPA completely helpless to enforce environmental laws.

When the EPA obtains information that an individual, business, or agency is violating a law, it has four options to enforce compliance.² First, the EPA can request the Attorney General to enforce a criminal prosecution.³ Second, the EPA can file suit in district court for injunctive relief to temporarily stop an action (or non-action) until a trial on the merits can be heard.⁴ Third, the EPA can adjudicate liability under the Administrative Procedures Act ("APA") and assess civil penalties against the violators.⁵ All of these actions are subject to judicial review and none of them are affected by the Eleventh Circuit's ruling.

The EPA's fourth option is to issue an ACO directing compliance.⁶ If the violator continues to ignore the law, then the EPA may assess fines and penalties against the violator.⁷ The Eleventh Circuit argues that ACOs are not a final agency action and are therefore not subject to judicial review.⁸ A violation of an ACO is its own violation, leading to fines and imprisonment.⁹ The Eleventh Circuit claims that ACOs, which in themselves have the status of law with their own civil fines and criminal penalties, are not subject to adjudication about any EPA violations, they therefore are unconstitutional.¹⁰ Because ACO receivers are not afforded an opportunity to represent themselves in a neutral tribunal, ACOs violate the violation of the Due Process Clause of the constitution.¹¹ Furthermore, because ACOs have the status of law and carry their own fines, civil penalties, and criminal punishment, ACOs furthermore violate the separation-of-power principal between the judicial branch and the executive branch in the EPA.¹²

Whether ACOs are truly unconstitutional is a subject for debate. In a separate case, the EPA filed a Supreme Court brief on July 16, 2003, in which the EPA claims that the Eleventh Circuit's reasoning for determining that ACOs are unconstitutional was flawed.¹³ First, the EPA claims that all

EPA orders, including ACOs, are subject to judicial review either on petition for review or in an action brought by the EPA to enforce the order in court.¹⁴ Secondly, the EPA claims that the Eleventh Circuit's understanding of the Due Process Clause was erroneous; the Due Process Clause does not require a formal evidentiary hearing in all circumstances.¹⁵

The Supreme Court will ultimately decide the constitutionality of EPA ACOs. However, even without ACOs the EPA still has three methods of enforcement at its disposal. The EPA will still be able to initiate criminal prosecutions, injunctive relief, assessment of liability, and civil penalties. If the Supreme Court deems that ACOs are unconstitutional, the EPA will expend more time, money, and court resources than would have been conserved during an informal ACO process. The absence of ACOs does not render the EPA defenseless or void; it still has the ultimate avenues of statutory enforcement available- the courts.

The Silvery Minnow: Rio Grande's Canary in the Coal Mine

In a highly anticipated ruling released on June 12, 2003, the 10th Circuit Court of Appeals in Denver, Colorado, upheld a New Mexico District Court's decision allowing the Bureau of Reclamation ("BOR") to release water from dams along the Middle Rio Grande River to preserve the endangered silvery minnow.¹ This case has become a "show-down in the West" between man's need for water versus animals', in this case a protected species under the Endangered Species Act ("ESA").² It set legal precedents for water rights in New Mexico and other arid areas of the United States and may have saved the endangered silvery minnow from extinction.³

The controversy at issue arose from two acts of Congress: The Sam Juan-Chama Project ("SJCP") and the Middle Rio Grande Project ("MRGP").⁴ The SJCP authorized the Secretary of the Interior, acting on behalf of the Bureau of Reclamation, to enter into a contract with the City of Albuquerque to furnish water for municipal, domestic, and industrial uses for which the city would pay the costs for constructing the Heron Dam, the enlargement of the El Vado Dam, and general water use for the city.⁵ The United States agreed to construct, operate, and maintain the MRGP Project works in exchange for their repayment of construction and maintenance costs.⁶ Both of these contracts ensure perpetual water deliveries to the city of Albuquerque, New Mexico, whose underground aquifer continues to shrink as its desert population

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continues to grow at unprecedented rates.⁷

The silvery minnow was listed as an endangered species in 1994.⁸ This once prosperous species, one of the last five native species left in the river, now occupies less than 5% of its historic range.⁹ The 10th Circuit Court of Appeals quoted Aletta Belin, attorney for Plaintiffs-Appellees, that the silvery minnow is the Rio Grande's equivalent of a canary in a coal mine; in effect, the silvery minnow is the litmus test for the health of the Rio Grande ecosystem.¹⁰

The main issue before the Court of Appeals was whether the BOR had the ability to negotiate the amount of water it supplies to New Mexico by complying with the ESA in releasing more water for the Rio Grande, the designated critical habitat for the silvery minnow.¹¹ The BOR maintained that because their contracts were enacted before 1973 and contain no express clause that permits the BOR to reduce deliveries of project water below their fixed amounts that they were unable to comply with the ESA.¹² BOR cited *Sierra Club v. Babbitt* to support this argument, which holds that Congress did not intend for section 7 of the ESA to apply to an agreement finalized before passage of the ESA where the federal agency lacks the discretion to influence private activity for the benefit of the protected species.¹³

The Court of Appeals distinguished the case from *Sierra Club* based on several distinctive clauses contained in the BOR contracts.¹⁴ BOR limited its liability in case of drought "or other causes" which might affect "the quantity of water available from the reservoir storage complex."¹⁵ The contract further recognizes that if the actual water supply is less than normal yield, that the non-federal parties will share what water is available.¹⁶ Therefore, the Court of Appeals held that the BOR retained discretion to determine the amount of available water that would be made, including diverting water in times of scarcity to protect the habitat of an endangered species.¹⁷

By affirming, the Court of Appeals also upheld and affirmed the landmark 1978 decision of *TV/A v. Hill*, placing endangered species at the highest level of priorities in our country. *TV/A v. Hill* prioritized the continued existence of the endangered snail darter above the economic benefits of a nearly-completed dam. The 10th Circuit Court of Appeals decision in this case sends a strong message to the United States to conserve and use our water and other natural resources in sustainable ways.

However, recent legislation proposed by Senator Pete Domenici (NM), may thwart any chances of survival that the silvery minnow won by its victory in court. Public opinion after the 10th Circuit's ruling coupled with an unprecedented drought in New Mexico prompted Senator Domenici to submit his bill as "an effort to stop any radical interpretation of the ESA on the Rio Grande," by mandating that the SJCP and the MRGP water contracts supercede the ESA.¹⁸ Although some environmentalists think that the Bush administration will encourage this bill, others feel that Domenici's bill is an

exaggerated and emotional reaction to the current conditions in New Mexico.¹⁹

If Domenici's bill passes, it could, in one fatal blow, effectively render the ESA moot after a thirty-year history of protecting and promoting endangered and threatened species. The destiny of the Rio Grande silvery minnow is not solely about the survival of one species of fish, but the larger problems our world is only beginning to face: overpopulation, scarce natural resources, urban sprawl, and sustainable development.

(EPA ACO Endnotes)

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¹ *TV/A v. Whitman*, 2003 U.S. App. LEXIS 12830, at *2 (11th Cir. June 24, 2003).

² *Id.* at *6.

³ Clean Air Act, 42 U.S.C. § 7413 (a)(3)(D), (c) (2003).

⁴ 42 U.S.C. § 7413 (b).

⁵ 42 U.S.C. § 7413 (d).

⁶ 42 U.S.C. § 7413 (a)(3)(B).

⁷ 42 U.S.C. § 7413 (a)(1).

⁸ *TV/A*, 2003 U.S. App. LEXIS 12830, at *8.

⁹ 42 U.S.C. § 7413 (d).

¹⁰ *TV/A*, 2003 U.S. App. LEXIS 12830, at *9, *10.

¹¹ *See Id.*

¹² 42 U.S.C. § 7413 (c)(1), (d); *TV/A*, 2003 U.S. App. LEXIS 12830 *10.

¹³ Respondent's Brief for the EPA at *12, *Alaska Dep't of Env't Conservation v. EPA* (No. 02-658).

¹⁴ Respondent's Brief at *19, *Alaska Dep't of Env't Conservation* (No. 02-658).

¹⁵ *See Id.*

(Silvery Minnow Endnotes)

¹ *Rio Grande Silvery Minnow v. Keys*, D.C. No. CIV-99-1320 JP/RLP, 2003 U.S. App. LEXIS 11672, at *5-6 (10th Cir. N.M. June 12, 2003).

² *See* Douglas Jehl, *Take City's Water or Let Minnow Die*, N.Y. Times, Jan. 19, 2003, at A1 (This case poses the most direct confrontation yet between the ESA...and the waters rights held by cities like Albuquerque in Western states where water is becoming increasingly scarce...).

³ Kate Nash, *City, Fish See Fates in Court*, Albuquerque Tribune, Jan. 13, 2003, available at: http://www.abqtrib.com/archives/news03/011303_news_fish.shtml.

⁴ *Rio Grande Silvery Minnow*, 2003 U.S. App. LEXIS 11672, at *31.

⁵ Colorado River Storage Project Act, 43 U.S.C. § 620 (2003).

⁶ Flood Control Acts of 1948 and 1950, 33 U.S.C. §§ 701(s), 701(f)-(2) (2003).

⁷ *See Rio Grande Silvery Minnow*, 2003 U.S. App. LEXIS 11672, at *31.

⁸ 50 C.F.R. § 17.11 (1999).

⁹ *Appellate Court Affirms Bureau of Reclamation's Responsibility to Conserve Rio Grande Ecosystem*, available at: <http://www.fguardians.org/news/pr030612.html>.

¹⁰ *See Id.*

¹¹ 50 C.F.R. 17.11; *See Rio Grande Silvery Minnow*, 2003 U.S. App. LEXIS 11672, at *5.

¹² *See Rio Grande Silvery Minnow*, 2003 U.S. App. LEXIS 11672, at *48-50.

¹³ *Id.*

¹⁴ *See Id.* at *55.

¹⁵ *Id.*

¹⁶ *Id.*

¹⁷ *Id.*

¹⁸ Thomas Hargrove, *Domenici Move in Minnow Case a Credible Threat to Endangered Species Act*, *Environ's Say*, ALBUQUERQUE TRIBUNE, June 20, 2003, available at: http://www.abqtrib.com/archives/news03/062103_news_minnow.shtml.

¹⁹ *See Id.*

FEATURE ARTICLE

EMPOWERING THE WIND: OVERCOMING OBSTACLES TO WIND ENERGY DEVELOPMENT IN THE UNITED STATES

By *Dave Newman* *

INTRODUCTION

Imagine a world in which power plants and automobiles produce zero pollution, where climate change becomes a manageable problem instead of a growing threat, where farmers and ranchers harvest energy crops alongside agricultural ones, and the Great Plains displaces the Middle East as the main source of energy in the United States. With a combination of policies, incentives, and market transformation, this dream could become a reality within many of our lifetimes.

Wind energy is poised to serve as the foundation of this new clean and sustainable energy economy. Energy derived from wind produces no pollution, very little environmental impact, and has become cost competitive with other commercial energy sources. Since 1995, wind energy has grown at about 30% throughout the world, faster than any other energy source.¹ Although this growth is encouraging, wind still only accounts for a tiny fraction of world energy supplies and many obstacles continue to block broader adoption of wind technologies.²

Tapping into this unlimited resource would also serve to stabilize U.S. energy supply and reduce dependence on foreign sources of energy. The continuous flow of wind power could serve as a hedge against the volatility of natural gas, oil and other world energy supplies. In addition, mining clean sources of domestic energy would reduce our dependence on countries that harbor or finance terrorist activities.

Abundant and cheap wind energy could also be used to electrolyze water to create hydrogen. This would serve as a clean and dependable source of fuel for clean-burning fuel cell engines that are expected to begin displacing internal combustion engines over the next two decades. As these new technologies develop, the United States ("U.S.") could utilize its vast wind resources to lead the world to a cleaner energy future.

This paper analyzes the development of the wind industry in the United States and the policies and programs that have been used to spur its growth. Section One discusses the economic and environmental benefits of wind energy today and tracks its recent growth within the U.S. and around the world. Section Two identifies and explains many of the obstacles to growth, including price distortions, discriminatory transmission policies, infrastructure limitations, and local opposition. Section Three includes a discussion of the federal and state incentives in place today and analyzes their impact on wind energy development throughout the country. Section Four provides case studies of several states that have led the

way in promoting and developing their wind energy resources. Finally, Section Five presents policy recommendations to maximize wind energy growth in the future.

I. ENVIRONMENTAL AND ECONOMIC BENEFITS TO WIND

A combination of energy efficiency programs and large-scale renewable energy development would significantly reduce a number of environmental and public health problems while spurring substantial economic growth. Improving energy efficiency is widely accepted as the cheapest, fastest, and most environmentally benign way to meet energy demand. Unfortunately, U.S. utilities have moved away from energy efficiency over the past decade, cutting efficiency programs by 45% from 1993 through 1998.³ The U.S. could produce the same amount of goods and services using 30% less energy by using energy as efficiently as the European Union.⁴

A. Environmental Dividends

Increasing the global share of wind and other renewables in the overall energy supply would significantly reduce the public health and environmental costs of fossil fuel and nuclear energy. Coal-burning power plants cause severe public health problems ranging from summer smog alerts to asthma, respiratory disease, and even death.⁵ Reliance on coal also creates enormous environmental impacts including acid rain and the pollution resulting from mining.⁶ Nuclear power presents a unique set of concerns, including waste disposal, radioactive exposure, and security.⁷

Wind energy produces no greenhouse gasses or other pollutants and could help the U.S. and other large polluters begin mitigating the potentially disastrous effects of climate change.⁸ Unless significant steps are taken to reduce greenhouse gasses, the United States could expect to lose up to 14,000 square miles of coastal land by the end of this century due to rising sea levels.⁹ The Bush Administration's most recent report to the United Nations Framework Convention on Climate Change anticipates the following impacts associated with human induced climate change: temperature rises of 5–9°F, ecosystem shifting, widespread water shortages, loss of forest services, exacerbated water and air pollution, and more volatile and disruptive storms.¹⁰

Wind is a clean, renewable, and domestic source of energy that could supply the entire U.S. with electricity.¹¹ If the U.S. replaced about 8600 Megawatts ("MW") of fossil fuel power with wind and other non-polluting energy sources over the next 10 years (about double U.S. installed capacity at the end of 2001), U.S. greenhouse gas emissions could be stabilized

at current levels.¹² The seven windiest states in the country have the potential to produce nearly 100 times that installed capacity.¹³ And when these goals are combined with improved energy efficiency and a cleaner burning automobile fleet, it is entirely possible to see how the U.S. could reduce its greenhouse gas emissions to well below what would have been required under the Kyoto Protocol.

B. Wind Energy Makes Economic Sense

In addition to its environmental benefits, wind energy has increasingly become a wise economic investment. Technology breakthroughs combined with beneficial government incentives has driven down costs from \$0.35/kWh in 1980 to about \$0.04/kWh today.¹⁴ The Department of Energy ("DOE") and the Electric Power Research Institute projects that continued technological advances will drive the price down to \$0.03/kWh by 2004 in high wind areas and between \$0.03-\$0.04/kWh at more moderate wind sites by 2007-2015.¹⁵

Several other factors account for the drop in the cost of utility-scale wind power. Improved wind mapping and turbine siting has enabled wind developers to take advantage of better wind conditions, which drives down costs exponentially. Relatively minor increases in average wind speed can dramatically boost output and lower costs. For example, a large power plant in an area that has an average of 7.15 mps wind produces energy at about double the cost of a wind farm with an average of 9.32 mps wind.¹⁶

Inexpensive computing technology has also contributed to reducing the cost of wind power over the past two decades. Such advanced technology has enabled designers to use extremely sophisticated models to improve machine designs, reduced and streamlined manufacturing costs while improving quality, and allowed operators the ability to remotely monitor and control turbines and more efficiently conduct routine preventative maintenance.¹⁷

In addition to wind speed, the size of the wind farm also affects the cost of the power generated. In general, a facility with more installed generating capacity will produce power more cheaply than a smaller facility. This results from the larger facility's ability to spread the cost of transmission, interconnection to the grid, and other fixed costs over a larger number of power producing turbines. The American Wind Energy Association estimates that a 51MW wind facility can generate electricity \$0.023/kWh cheaper than a 3MW facility.¹⁸ In most cases, that price differential is the difference between a particular project's commercial viability.

Another factor affecting the cost of electricity from wind is project financing. A wind power project's initial construction costs can be up to 40% cheaper when built and financed internally by a public utility as compared with a privately owned and financed independent power producer.¹⁹ This results in part from more restrictive financing terms for privately owned and financed projects. Such restrictions are not imposed when a utility is financing its own project.

Wind energy also makes economic sense for the communities in which it is harnessed. Farmers and ranchers, whose land might generate \$120 worth of grain or \$20 worth of beef per acre, can make \$2,000 or more by leasing their land to wind developers.²⁰ In addition, wind turbines can co-

exist with farming, ranching and other rural land-uses, using only about 5% of the landmass on which they are installed.²¹ As farmers and ranchers find it increasingly difficult to stay afloat, wind energy could become a clean cash crop that could help to revive sagging rural economies throughout the country. A recent study estimated that the 240 MW of wind power installed in Iowa from 1998-99 created 200 short-term construction jobs, 40 new permanent jobs, \$2 million in new local tax revenue, and \$640,000 annually in lease payments to landowners.²²

C. Recent Growth

The modern wind energy industry has matured significantly over the last decade. The industry had total sales of \$5.2 billion in 2001 and is expected to nearly double within the next 5 years.²³ Since 1990, worldwide wind energy has grown from just under 2000 MW installed capacity to nearly 30,000 MW, enough power to meet the demand of approximately 35 million people at typical consumption rates in economically developed countries.²⁴

Given the beneficial environmental and economic attributes of wind, it is not surprising that it has become the fastest growing energy source in the world today. In the mid-1990's Europe surpassed the U.S. as the global leader in wind energy production. Today, nearly three-quarters of the world's wind power is generated in the European Union ("E.U.").²⁵ After a lull in new wind generating capacity throughout the mid-1990's in the U.S., capacity expanded by more than 66% in 2001 to a total of 4260 MW.²⁶ Despite this huge jump in capacity, wind energy still only produces 0.3% of the nation's electricity supply.²⁷

A large reason why the U.S. is falling behind the E.U. in new wind energy development is their divergent policies on global warming. Despite being the world's top emitter of greenhouse gasses, the Bush Administration has withdrawn the United States from the Kyoto Protocol on Climate Change. Ignoring the fact that the U.S. has some of the most abundant untapped wind and solar resources in the world, current U.S. climate change policy instead follows a voluntary approach that does not strive for overall greenhouse gas reductions. In fact, the U.S. DOE currently projects a 17% increase in U.S. emissions by 2012, an average increase of 26.63 million metric tones per year.²⁸

In sharp contrast to the U.S., the E.U. and its member nations have ratified the Kyoto Protocol, with a commitment to reduce its greenhouse gas emissions by 8% below 1990 levels by 2008-12.²⁹ The European Climate Change Program has been created to coordinate the actions of its member nations and to establish an emissions trading system.³⁰ On September 27, 2001, the E.U. issued a renewable energy directive demonstrating its commitment to increasing its reliance on renewables as a way to combat climate change and to promote "the security and diversification of energy supply, environmental protection and social and economic cohesion."³¹

The U.S. has abundant sources of wind that, if harnessed, could more than supply the nation's energy needs. However, the windiest states in the country currently take little advantage of their vast wind resources. The windiest 7 states have nearly 68% of nation's wind potential but only produce 23% of the nation's wind power today.³² In contrast, the top 7 producing states have only 24% of the nation's wind energy

potential but currently produce almost 80% of the nation's wind energy.³³

II. OBSTACLES TO GROWTH

Modern wind energy development has been inconsistent in the U.S. over the past thirty years. Following the energy crises of the 1970's, the state of California single-handedly put large-scale wind power on the map. Favorable regulations and relatively high long-term electricity prices helped to sustain wind energy growth in California until the early 1990's.

In the 1990's, wind energy began to boom throughout the world due to technological improvements and lower costs. At the same time, development stalled in the U.S. because of the expiration of favorable long-term contracts and a plentiful supply of cheap fossil fuels. Ironically, the promising, clean technology that was pioneered in the U.S. was becoming big business overseas while the U.S. sat on the sidelines. By the end of the 1990's, a number of factors led to a revival in U.S. wind energy development. These included renewable energy provisions attached to electric deregulation legislation in many states, the effect of state and federal incentives, and a growing awareness of and concern over global warming.

Although wind energy has grown cost competitive with other more traditional sources of power over the past decade, several obstacles impede progress towards wind becoming a major component of the nation's energy portfolio. These obstacles include price distortion, discriminatory transmission policies, infrastructure limitations, and local opposition.

Removing these barriers would unleash powerful market forces and spur significant job creation, sustainable economic growth, dramatic reductions of smog, soot, and greenhouse gas emissions, and increased U.S. energy independence. Fortunately, the collective experiences of several of the nation's leading wind-producing states as well as the innovative policies of the European Union and some its member countries provide a blueprint for creating effective policies that create opportunities for growth.

A. Price Distortion: External Costs and Market-Skewing Subsidies

Even at near-competitive prices, the cost of wind energy remains artificially high because it does not reflect many of its beneficial environmental attributes. Every MW of power produced by wind reduces the environmental and societal cost of pollution from fossil or nuclear power plants. If these external costs were adequately reflected in the price of energy, the cost of wind energy would appear significantly cheaper than it does at currently calculated prices.

According to Lester Brown, director of the Earth Policy Institute, "the key to sustaining economic growth is telling the ecological truth."³⁴ Unfortunately, unbalanced subsidies combined with current accounting methods that externalize environmental and public health costs prevent energy markets from accurately reflecting the ecological truth in the cost of energy.³⁵ The disproportionate allocation of government support for non-renewable energy artificially lowers the market price of energy generated from these sources. This distorts the relative cost of energy from different sources and limits or expands the ability for certain technologies to develop commercially.

A study done by the Renewable Energy Policy Project found that fission-related nuclear power received subsidies amounting to \$15.30/kWh during the first 15 years (1947-61) of federal support, whereas wind received only \$0.46/kWh over the course of its first 15 years (1975-89).³⁶ These unbalanced subsidies have allowed a comparatively uneconomical nuclear energy source to defy market influences by artificially concealing its true cost. In 2002, fossil fuels received approximately ten times and nuclear power more than two and a half times the total amount of tax breaks and subsidies as renewable energy.³⁷ Notwithstanding the federal government's relative lack of support for wind energy, the technology and the markets have managed to develop to the point where wind is nearly economically competitive despite these market distortions.

Source: See Note 75

In addition to unbalanced subsidies, the external environmental and public health costs of polluting non-renewables are also not currently reflected in consumer prices. Examples of such externalities include: health care costs from increased respiratory disease, loss of productivity stemming from absenteeism at work and school, the loss of forest services do to acid rain and other pollutants, water pollution from fuel extraction, and the impact on fisheries from mercury and other airborne pollutants. If these costs were incorporated into the market price of energy, the cost of wind and other clean renewables would remain level while the cost of coal, oil and other polluting fuels would increase substantially.

B. Discriminatory Transmission Policies & Infrastructure Limitations

This section discusses how transmission issues impede progress towards more wind power development by considering the following: how certain transmission policies discriminate against wind power; how system inefficiencies limit the availability of transmission services; and the impact of limited transmission infrastructure near some of the nation's windiest sites.

1. Discriminatory Scheduling and Interconnection Policies

Perhaps the greatest impediment to the development of wind resources in the U.S. today is an outdated transmission interconnection policy that discriminates against intermittent power producers like wind and solar. This, in part, is the result of a regulatory framework that was created by and for monopoly-controlled utilities with traditional fossil and nuclear power plants in mind. Although deregulation has brought with it a promise of true competition and customer choice, progress has been slow towards realizing that goal.

a. Scheduling Penalties

The most difficult transmission obstacle for wind producers are scheduling penalties that charge generators whenever they deviate from pre-set delivery schedules. In 1996, the Federal Energy Regulatory Commission ("FERC") issued an Order requiring that utilities under their jurisdiction open their transmission lines to a wider range of wholesale customers.³⁸ The Order established rules for open access that favored traditional large fossil fuel and nuclear plants at the expense of wind, solar, and other intermittent resources. In order to ensure system stability, reliability, and predictability the Order established rules that severely penalize scheduling

deviations regardless of whether the result of intentional manipulation or due to the intermittence of the energy resource.³⁹

The American Wind Energy Association and others propose a variety of solutions that promote non-discriminatory scheduling policies while simultaneously ensuring overall system stability. These include real-time balancing markets, the elimination of scheduling penalties, and allowing electricity generators to schedule as close to real time as possible.⁴⁰ Real-time balancing markets charge or credit wholesalers for deviations based on the value of the energy at the time of the deviation. This allows for market based efficiencies to influence wholesalers' behavior and eliminates unfair and arbitrary penalties for those, like wind producers, who cannot control precisely when they will be generating power.⁴¹

b. Interconnection Fees & Agreements

Interconnection fees that are based on peak output as opposed to overall transmission usage severely limit wind power's access to the grid. Although such a fee structure makes sense in allocating charges to an energy producer that is sending a steady and constant flow of electricity at or close to peak capacity over the grid, it unfairly penalizes wind energy producers that rarely achieve peak output. These fees put wind at a competitive disadvantage with more traditional, polluting sources of power because they are forced to recover the cost of these fees over fewer kWh's than their competition.⁴²

Complex interconnection agreements often stand in the way of small-scale (less than 2 MW) power producers from developing their projects. Unless utilities are required to simplify the process of connecting to the grid with simpler, standardized contracts, they have little incentive to accommodate these small producers. Some states, like Minnesota, have successfully pressured utilities to adopt such standard interconnection agreements, which enable more small wind producers to come on line.⁴³

c. Embedded Costs

Another concern for wind power producers relying on the grid is the way in which the embedded costs required for construction and operation of the existing transmission infrastructure are distributed amongst users. In some parts of the country, transmission owners charge these embedded costs to generators based upon the distance between the generating facility and the nearest "load center."⁴⁴ Because wind generation often occurs in remote locations far from where the energy will ultimately be consumed, wind generators are disproportionately penalized by such cost allocations.

d. "Pancaking" (Duplicative) Fees

A fourth problem for wind energy is the current structure in use throughout most of the country whereby the access fees charged by transmission operators "pancake" on top of each other. This requires generators that are geographically distant from their customers to pay the cumulative fees charged by any transmission owner whose lines they are using instead of paying one fee relative to their overall use of the grid.⁴⁵

2. Availability of Limited Transmission Capacity for Wind

Another transmission obstacle to wind power is that existing transmission capacity is limited due to system inefficiencies and a lack of transmission infrastructure in many

of the country's windiest locations. In some states, limited interstate transmission capacity has not only dissuaded investments in wind power but has also led to strong industry opposition to adoption of state-wide incentives and programs to study and encourage wind energy development. For example, energy interests in South Dakota, an electricity exporting state with tremendous wind resources, have blocked efforts to increase wind energy development because they fear that it would compete with existing electricity exports generated mainly from coal.⁴⁶ As a result, the windiest state in the country currently produces only 3 MW of wind power.⁴⁷

Thermal, voltage, and system operating constraints stemming from outdated technology create inefficiencies that severely limit the amount of power that can safely be transmitted over the grid.⁴⁸ As wind generators and other power producers compete for an increasingly limited amount of transmission capacity, alleviation of these constraints will allow more power to flow over the grid and reduce the need for new transmission construction. Upgrading the transmission infrastructure to increase capacity is also cheaper than building new power lines.⁴⁹ Other improvements and upgrades such as replacing mechanical switching systems with fiber optics and integrated computer systems would allow system operators the ability to move more power more quickly without sacrificing quality or safety.⁵⁰ Such improvements could lead to an increase in productivity and efficiency of the energy system by at least 30%.⁵¹

3. Stringing Wires – Expanding the Grid

A common concern regarding transmission obstacles to new wind development is the need to string wires out to remote locations with the best wind resource availability. There are two major issues related to this concern: the environmental and social impact of new power lines and identifying who should be responsible for installing and managing these interstate regional routes.

The impacts of new power lines and transmission facilities, however, must be balanced against the impacts of existing polluting and fuel-intensive power plants. The environmental and public health costs of building new transmission infrastructure out to clean renewable energy sources is a tiny price to pay in relation to the benefits of reduced air and water pollution, decreased respiratory illness, and lower greenhouse gas emissions. The emphasis must not only be on increasing the overall amount of wind and other renewable energy that is generated, but also on dramatically increasing energy efficiency so that renewables become an increasing percentage of overall energy use.

C. Local Opposition

Despite economic and environmental benefits of wind power, some wind projects face local grassroots opposition to development. This opposition usually stems from environmental concerns such as wind turbines' impact on migratory bird flyways or fisheries (in the case of offshore turbines) and visual and noise disturbance.

Cape Cod has recently become a hotbed of local opposition to a proposed wind farm in Nantucket Sound. The \$500 million project would be the largest wind facility in the country: consisting of 170 turbines approximately 5 miles off shore that would stretch over 25 square miles and produce a peak output of 420 MW (enough to power over half of the Cape).⁵² The Alliance to Protect Nantucket Sound is organizing

opposition to the project claiming that it will create a “permanent industrial facility in a pristine natural environment.”⁵³ To assuage public concerns and minimize environmental impacts, wind energy projects must be subject to public participation.

Indeed, utility scale wind farms can have serious environmental impact if they are sited improperly. A common concern is the impact wind facilities have on birds. Although avian deaths continue to occur due to collisions and electrocution, the numbers are very small relative to avian mortality resulting from other human structures like vehicles and plate glass.⁵⁴ Even these deaths can be minimized, however, with careful siting of turbines, proper study of birds sight and flight patterns, and reducing the number of wind measurement towers.⁵⁵ It also should be kept in mind that the environmental impacts of wind facilities are extremely small when compared with those of fossil fuel and other traditional polluting plants, in addition to the impact caused extracting and transporting fuel and waste.

III. OPPORTUNITIES FOR GROWTH

Many of the obstacles discussed in the preceding section can be addressed by implementing and strengthening policies and incentives supporting wind energy. For example, mandates that require utilities to develop wind energy projects force those utilities to become strong advocates for ensuring that their regional transmission policy is favorable to wind. And once transmission policy is reformed, an increasing number of wind projects would become commercially viable independent of government mandates.

Myriad policy tools have been used throughout the country in an effort to spur this type of growth, although not often in an integrated and comprehensive fashion. While some states such as Minnesota, Texas and California have taken an active approach to encouraging renewables, others have done little. In addition, effective federal policies such as the Production Tax Credit have been enacted only for short periods, allowed to expire, and then reenacted for another short term. This inconsistent approach has created boom and bust cycles of investment rather than encouraging a stable and long-term investment environment that would best benefit the growth of these nascent renewable energy industries.

Support and incentives from federal programs are uniformly available throughout the country. However, state and local policies and incentives for wind are by no means uniform. In fact, much of the disparity in wind production between particular states can be attributed to the degree to which state incentives and programs actively promote the technology. Creating an appropriate, efficient, and effective governance structure is an essential step towards widespread and pervasive renewable energy development. Policymakers must choose wisely among a broad array of options by harmonizing the policies of different governmental entities and across competing energy industry sectors. These range from market based mechanisms such as ecological tax reform to regulatory approaches such as stricter pollution controls. Absent a more integrated and comprehensive approach, the enactment of disjointed and uncoordinated renewable energy policies runs the risk of redundancy, impotence, and a lack of popular support. The following is a discussion of a variety of renewable

energy policies that have been used within the United States and Europe. The list is not exhaustive.

A. Governmental Support for Market Stimulation & Commercialization

1. Research Development & Demonstration (RD&D)

The U.S. DOE's Wind Energy Program provides support for research and development of wind energy technologies and serves as a clearinghouse of important information for industry and government decision-makers, public interest organizations, and the general public. The program is run through the National Renewable Energy Laboratory's National Wind Technology Center in Golden, Colorado and the Sandia National Laboratories in Albuquerque, New Mexico. The Program is divided into three research areas: Applied Research, Turbine Research, and Cooperative Research and Testing.⁵⁶

The Applied Research division focuses on developing technological breakthroughs in turbine engineering and manufacturing. To accomplish this, they analyze wind dynamics, aerodynamic and structural design, and work to develop more sophisticated control systems and components.⁵⁷

The Turbine Research division develops public-private partnerships to research, design, build, test and refine commercial wind energy systems. Private partners are invited to participate based on a competitive solicitation process and, once chosen, share in part of the cost of the project.⁵⁸

The Cooperative Research division works to educate and involve the public to help foster broader market acceptance of wind energy. The division also works to help the electric industry integrate wind into the energy supply.⁵⁹

In total, the Wind Energy Program received \$40 million in FY2001 to carry out its work.⁶⁰ By contrast, federal R&D funding for coal was \$170 million in FY2001.⁶¹

2. Public Benefits Funds/System Benefits Charges

Public Benefits Funds (“PBF”) are typically used to ensure continual financial support for state renewable energy programs, energy efficiency programs, and low-income energy assistance. The funds are supported by small charges that are regularly assessed on electricity consumption in the state. Fifteen states currently have some sort of PBF in place and all but one (Maine) require mandatory charges.⁶²

Massachusetts established a Public Benefits Fund that will direct \$150 million over five years to renewable energy programs.⁶³ The fund's resources are currently being focused on development of green buildings, distributed renewable power, and a green power development program.⁶⁴ The fund also provides grant money for projects developing renewable power technologies and for the purchase of green power.⁶⁵

Oregon's Public Benefits Fund assesses a 3% surcharge on all electricity users in the state.⁶⁶ This raises \$60 million per year, 13% of which has been earmarked for renewable energy programs.⁶⁷

California leads the nation with its \$540 million renewable energy trust fund.⁶⁸ Of that amount, \$240 million will be spent on the development and maintenance of existing renewable projects and \$161 million on new projects.⁶⁹ As of the fall of 2001, funding made available under the program

has supported the development of over 900MW of new wind generating capacity in the state.⁷⁰

3. Government Green Power Purchases/ Aggregation

One of the most effective ways government entities can support growth in renewable energy markets is through Green Power Purchases whereby they commit to purchase large quantities of renewable energy over an extended period of time. By directing its purchases in this way, governments can dramatically increase demand for renewables, thereby helping to create economies of scale that reduce price and increase reliability. Directed government purchasing has been one of the most effective ways of establishing viable commercial markets for recycled paper and other materials.

The U.S. government is the largest single energy user in the country, spending over \$4 billion annually on electricity.⁷¹ Several federal pilot projects have begun where certain government agencies have agreed to purchase renewable energy. States and municipalities throughout the country have also agreed to such purchases. The city of Santa Monica, California became the first city in the country to switch over to 100% renewables in June 1999.⁷² The agreement calls for approximately 5MW of green power for which the city will pay a 5% premium.⁷³ The energy is provided by The Geysers – the world's largest geothermal resource.⁷⁴

B. Financial Policy

1. Production Tax Credits

Originally passed into law as part of the Energy Policy Act of 1992, the Renewable Energy Production Tax Credit ("PTC") allows wind energy producers a \$0.015/kWh credit for ten years after a qualified facility enters service.⁷⁵ Adjusted for inflation, the credit is worth \$0.018/kWh today. The availability of the PTC has served as an essential tool in enabling wind energy producers to secure financing for projects that otherwise may not have been available to them. Because the credit depends on production instead of a facility's rated capacity, it creates incentives for increased efficiency in design and operating productivity.

Although originally set to expire at the end of 2001, in March of 2002, Congress extended the credit for two years until the end of 2003.⁷⁶ Legislation currently pending would further extend the credit to the end of 2006.⁷⁷ The DOE's Energy Information Administration predicts that the availability of the extended tax credit would result in a 17.24% increase in the non-hydroelectric renewable share of the total U.S. electricity market by 2020.⁷⁸

The PTC has been one of the most important market drivers for wind energy over the past decade, enabling wind to compete economically with more traditional forms of subsidized energy like gas, coal, and nuclear. However, uncertainty surrounding the availability of the credit over the long-term has undermined some of its beneficial effect. Wind developers and their financial backers continually struggle to plan projects beyond the current deadline of the credit because they are unsure if the political environment will support yet another extension.

2. Production Incentives

Similar to the PTC, the Renewable Energy Production Incentive ("REPI") provides direct financial support for wind energy development. REPI is available to government-owned

wind production facilities as well as not-for-profit electric cooperatives. Instead of a tax credit, however, qualified facilities are eligible for annual incentive payments of \$0.018/kWh (inflation adjusted) for the first ten years of operation and payments are subject to the availability of annually appropriated funds. The program has paid out \$2,440,907 to wind energy producers from 1995 through 2001 for over 150 million kWh generated.⁷⁹

In addition to the federal production incentive (REPI), 13 states also currently provide some form of renewable energy production incentive.⁸⁰ Minnesota's "Wind Energy Generation Incentive" establishes a production payment of \$0.015/kWh for facilities under 2MW.⁸¹ The payment was implemented to help developers of small wind farms who may not have a large enough tax liability to take advantage of the federal tax credit. Qualifying renewable energy facilities in the state may receive the payment in addition to the \$0.018/kWh credit available at the federal level.⁸²

3. Electricity Feed Laws

Electricity Feed Laws ("EFL") mandate fixed payments by utilities for renewable energy generated by independent power producers. Germany, Denmark, and Spain have relied on such laws over the past decade to spur the development of well over half of the world's wind energy generating capacity within those countries.⁸³

Enacted in 1990, Germany's EFL specified rates that were calculated as a percentage of average electricity prices and were set differently depending on the source of the power.⁸⁴ By requiring utilities to purchase renewable energy from independent power producers at commercially attractive rates, the economic climate for renewable investments in Germany stabilized and became predictable, thereby ushering in an era of serious investment opportunities. As a result, Germany experienced a 5000-fold increase in wind energy capacity since 1990.⁸⁵

In 1997, Spain enacted energy legislation setting a goal of doubling the nation's renewable energy supply to 12% by 2010.⁸⁶ The law requires utilities to acquire all renewable energy from approved projects and mandates premium payments for renewable energy.⁸⁷ For example, electricity produced from wind or hydro power will receive a premium of approximately \$0.03/kWh until 2007.

4. Ecological Tax Reform / Carbon Tax

More comprehensive than production tax credits, feed laws, or subsidies, Ecological Tax Reform ("ETR") increases taxes on polluting energy sources while simultaneously reducing the tax burden on employment, thus reducing demand for polluting sources of energy and stimulating job creation. In 1999, Germany embarked on three-stage tax reform policy as a way of promoting employment and sustainable economic growth while also protecting natural resources. The policy's rationale is to shift the tax burden from employment to energy in order to spur efficiency, innovation, job creation.⁸⁸ The first stage imposed a new tax on electricity, fuels, heating oil, and natural gas.⁸⁹ Although the new tax policy does not distinguish between electricity from renewable sources and that from polluting sources, the expected revenue generated from the tax on renewable power will be diverted back into a green energy fund dedicated to promoting renewable energy investments.⁹⁰

Although the goals and overall policy of ETR in Germany are consistent with internalizing external environmental costs, the polluter pays principle, and sustainable development generally, some have argued that it does not go far enough and fails to harmonize with other inconsistent policy objectives being furthered in Germany. For example, the tax reform does not eliminate or even reduce subsidies currently being provided to the German coal industry due to pressure from coal miners in the Ruhr region.⁹¹ In addition, lower environmental tax rates have been built into the ETR for companies in the manufacturing, agricultural, and forestry sectors in order to limit the short-term economic burden on economic growth.⁹²

Despite these inefficiencies, the German Institute for Economic Research has concluded that the German ETR will result in a 2-3% reduction in CO₂ emissions in the medium term and create 250,000 new jobs by 2010.⁹³ Despite the employment benefits of the ETR, economists fear that the short term increase in energy prices imposed by the increase in taxes could create a drag on gross domestic product and economic expansion.⁹⁴ In response to this concern, some economists have advocated diverting a portion of the revenue generated by the tax into increased R & D for domestic industries.⁹⁵ One such study found that using 15% of new revenues for such purposes could ameliorate the negative drag on GDP without significantly reducing the benefits to employment growth and the reduction in CO₂ emissions.⁹⁶

5. Tax Deductions / Exemptions

States employ a variety of tax-based incentives to promote renewable energy investments. Over half provide some type of corporate income tax deduction, 28 states allow for property tax breaks for property with installed renewables, and 18 states cut or eliminate sales tax on renewable energy equipment.⁹⁷

Some states, like Massachusetts, allow a sales tax exemption on the sale of renewable equipment that will be used for residential purposes.⁹⁸ Others, like Minnesota, exempt sales tax for any purchaser of renewable equipment, commercial or residential.⁹⁹ States also differ in what type of equipment they will exempt from sales tax. Iowa, for example, allows for the total cost of the wind energy equipment as well as any materials used to manufacture that equipment.¹⁰⁰

A range of corporate tax credits and deductions are available that allow a corporation to deduct up to 35% of the cost of renewable energy equipment and/or the cost of installation of such equipment. Some states limit these incentives to facilities with installed generating capacity above or below a certain rated power threshold.¹⁰¹

C. Market Obligations / Renewable Portfolio Standards (RPS)

Renewable Portfolio Standards require that energy generators produce a specified portion of their electricity from renewable resources. Utilities can choose to generate the power themselves, purchase it from another producer, or secure the equivalent quantity through Renewable Energy Credits ("RECs"). Over time, the percentage of energy that must come from renewable sources increases as a percentage of the state's energy portfolio.

REC's represent a specified unit of renewable electricity that has been consumed in the state, regardless of

who actually produces the power. The credits enable utilities in areas without good wind resources to meet their renewable requirement by purchasing credits from power producers in windy areas. This encourages the most promising renewable resources to be developed by ensuring that there is a market for their energy product.

This is a hybrid approach that relies on both state mandates and market mechanisms to achieve its goal of increasing the percentage of renewables used in the state. Many of the ideas behind the trading system stem from the existing Clean Air Act permit system that has successfully reduced sulfur dioxide across the country. For an RPS to effectively increase the use of renewables, however, the definition of "renewable energy" included in the standard must be limited to resources that are truly renewable like wind, solar, and geothermal. By choosing what types of renewables will satisfy the RPS mandate, states can dictate their energy portfolios while relying on market forces to determine how the standards will be met. At the end of a specified period (usually every year), utilities and other electricity retailers must have a certain amount of REC's or must be forced to pay a penalty.

Fifteen states have adopted portfolio standards as a way of ensuring that renewables comprise an increasing portion of electricity consumed within the state.¹⁰² For example, Massachusetts created an RPS in its 1997 deregulation legislation that mandates 4.5% renewables by 2009 and then increases 1% per year thereafter.¹⁰³ Under the program, generators may purchase renewable energy credits from a corporation set up by the state's Renewable Energy Trust.¹⁰⁴ For 2003, a 1MW credit will cost \$50 (or \$0.05/kWh) which is expected to be more than the incremental cost of installing new renewable power sources.¹⁰⁵ This provides an incentive for utilities to support new renewable energy projects instead of simply purchasing more expensive credits in order to meet their obligations under the RPS.

Texas established its RPS and credit program through a rule issued by the state's Public Utilities Commission in December of 1999.¹⁰⁶ The program requires 2000MW of new renewable energy by 2009 and allocates each retailer a share based upon its share of the state's retail market.¹⁰⁷ Since the RPS was announced, Texas has added over 915MW of wind generating capacity, with immediate plans for at least 220 more.¹⁰⁸

In addition to statewide programs, momentum is building for the creation of a national RPS. Such a program would promote renewable energy evenly throughout the country, thereby encouraging the most efficient means of generating power. In addition, a national program would help to spur a regionally based approach to overcoming many of the transmission limitations impeding growth in wind energy development in the windiest locations like the Dakotas and Great Plains states. According to a report by the Union of Concerned Scientists, a National RPS requiring 20% renewables by 2020 would create \$80 billion in new capital investments, generate \$5 billion in new local tax revenues, and create \$1.2 billion in lease payments to farmers, ranchers and other rural landowners for wind energy.¹⁰⁹

D. Green Power Marketing

1. Green Power Pricing

Green power pricing strives to increase renewable energy development by allowing consumers to pay a premium

in exchange for an environmentally preferable energy product. Although 40 million American homes had been given this choice as of October 2001, only 350,000 have chosen to buy it. Consumer demand for green power amongst non-residential customers is even lower.¹¹⁰

Some states have required that energy providers give their customers a green power option. As of October 2001, electric utilities in Minnesota are required to provide a green power option and may charge a premium amount no more than the difference between the cost of the renewable energy and the same amount of nonrenewable energy.¹¹¹

Some have theorized that the market share of green power pricing will increase over time in much the same way that bottled water and organic foods have. The expectation is based on the idea that choosing an electricity provider is still foreign to many, but as consumers become more familiar with the concept and more knowledgeable of their options, more people will choose the green power option.¹¹²

The comparison between premium priced green power and organic food is incongruous, however, because the former depends on a minority of dedicated people to pay the added cost for benefits that are distributed broadly throughout society. By contrast, people choose to pay extra for organic food because they personally can reap the benefits. Green power, however, does not work this way. In many cases, the environmental benefits of the renewable facility being supported by increased rates may not be directly noticeable to that consumer.

Broad social benefits that are felt by all should not rely on the good will and foresight of a few exceptionally motivated individuals. The costs associated with such benefits should be as equally distributed as the benefits themselves.

In theory, green power pricing allows market forces to dictate which energy resources are utilized. Unfortunately, there are many practical problems that often prevent this theory from being realized. Relative costs and benefits of wind versus more polluting energy sources are not accurately reflected in the market price. When consumers are given a choice between \$0.03/kWh for coal power or \$0.045/kWh for wind, these prices do not account for health care costs for respiratory disease stemming from the coal plant's emissions or the value of coastal land swallowed up by rising sea levels. If these costs were internalized into the price of power for the consumer, there would be no need to market wind as an environmentally preferable choice, because it would simply be a cheaper option.

Despite these practical problems, in some cases green pricing programs have provided a hedge against the volatility of natural gas and other nonrenewable energy sources. For example, the city of Austin, Texas established a Green Choice Program in 2000 that offered consumers the option to pay a \$0.0285/kWh power charge replacing the current \$0.0268/kWh fossil charge to purchase their power from a newly installed 59 turbine 40MW wind farm. The higher green power charge was guaranteed to remain at that level for 10 years even if the cost of fossil energy rose above that. Within 10 months, the program was fully subscribed with 3075 participants. The addition of this wind power will raise the percentage of renewable power in the city of Austin from 0.5% to 2.5%.¹¹³

2. Green Energy Certificates

Green Energy Certificates ("GECs") represent the beneficial environmental attributes of power that is generated from a renewable energy source. Instead of paying a premium for green power, people who purchase green tags are paying for the environmental benefits of renewable energy investments occurring regionally or even across the country. GEC programs allow consumers to pay to help make up the increased cost of renewables in another state, region, or even country. They can help overcome some of the physical barriers to large-scale renewable generation in many locations, alleviate regional transmission limitations, and compensate for discriminatory market forces.

However, with these potential benefits, there are also many potential problems associated with GECs. Much of this stems from the fact that the certificates do not actually represent a physical commodity like a fixed amount of wind energy. Instead, they represent the *beneficial attributes* associated with the energy generation. In other words, the external environmental benefits of producing energy from clean, renewables are captured within the certificate. Creating markets for these certificates allows these benefits to be internalized by the marketplace. However, the abstract nature of the certificates and what they represent can create confusion amongst consumers and invite fraud amongst green marketers.¹¹⁴

In order to protect consumers against fraud, it is imperative to establish central registries that track issuances of renewable energy certificates. Some states, such as Texas, have already done so as part of their Renewable Portfolio Standard tracking system. In addition to tracking, sellers of REC's must be required to fully disclose what it is they are selling to ensure that consumers are not misled. This can be accomplished through labeling and mandatory disclosure requirements.¹¹⁵

PG&E's National Energy Group developed PureWind to market the environmental attributes of wind facilities in New York and California.¹¹⁶ PG&E's Madison, New York wind facility is located over a 120 acre privately owned farm and came on line at the end of 2000. The facility produces approximately 24,000 MWh annually, which flows directly into the New York Independent System Operator grid and is consumed throughout the state.¹¹⁷

Consumers may purchase PureWind Certificates for \$40 per MWh. Compared with polluting, non-renewable sources of energy, each PureWind certificate represents a savings of 5 lbs. sulfur dioxide, (SO₂), 2 lbs. nitrogen oxide, (NO_x), and 1000 lbs. carbon dioxide (CO₂) emissions.¹¹⁸ 3. Environmental Generation Disclosure

Environmental disclosure requirements force energy providers to disclose pertinent information to their customers regarding price, fuel mix, emissions data and other environmental costs by fuel type. As retail competition and consumer choice increases across the country mandatory disclosure requirements provide essential information to consumers. More than 20 states have enacted some sort of mandatory disclosure rule.¹¹⁹ The type of programs that have been adopted and the information that is required to be disclosed varies quite a bit from state to state.

For example, since 1998 electric retailers in Massachusetts are required to provide customers with a standard disclosure label every quarter. The label must include

information on price, fuel mix, emissions, and labor characteristics of generating facilities. The emissions data must be presented in a format that compares to the regional average for SO_x, NO₂, and CO₂. In addition, all advertisements must include a notice that such information is available upon request.¹²⁰

E. Reforming the Transmission System

1. FERC's Solution: Regional Transmission Organizations

The Federal Energy Regulatory Commission ("FERC") is responsible for regulating the transmission and wholesale sale of electricity in interstate commerce. In 1999, FERC began to establish a new policy that would "eliminate any residual discrimination in transmission services that can occur when the operation of the transmission service remains in the control of a vertically integrated utility."¹²¹

The new policy seeks to establish Regional Transmission Organizations ("RTOs") that would manage the transmission infrastructure as an entity independent of interested utilities and other wholesale electricity providers. In principle, RTO's are intended to encourage wholesale competition by removing transmission barriers for many wholesalers including intermittent power producers like wind. According to FERC, RTO's must have the following characteristics to be approved as such: independence from market participants; appropriate scope and characteristics; operational authority over transmission facilities within its region; and exclusive power to maintain short-term reliability.¹²² In order to achieve this role, RTO's would be responsible for the following: designing and administering its own tariff; managing congestion; taking primary responsibility for planning and expanding transmission infrastructure; and participating in inter-regional coordination and reliability practices.¹²³

Although many of the goals behind the RTO structure are sound in principal, FERC's plan still presents many potential problems. These include the voluntary nature of its membership, allowing for-profit transmission companies to serve as RTO's, the standardization of interconnection between RTO's throughout the country, and ensuring that consumer and environmental concerns are adequately represented in RTO decisions. FERC's "voluntary" approach may not effectively achieve these goals. The FERC Order defining the new policy ("Order 2000") simply required that all public utilities dealing in interstate commerce submit a plan describing how it would support the establishment of an RTO in its region. Once an RTO has been established and is approved by FERC, individual transmission owners and operators within the region retain the option of not joining the RTO.

Many of these problems are apparent in the December 2001 FERC Order approving the first RTO in the country in the Midwest. The new Midwest RTO is comprised of members with vested interests in the energy industry. Members pay an initial \$15,000 fee to join along with \$1,000 annual dues. Members elect a board of directors that is responsible for maintaining system reliability, ensuring open access to competing wholesalers, and planning and development of the transmission infrastructure. Although under the guise of an independent organization, the ability of local special interests to determine who sits on the board severely limits the ability of broader

consumer, environmental, and other public interests to affect the decisionmaking process.¹²⁴

FERC may also be organizationally unfit to implement and administer the transition to the transmission infrastructure as envisioned by its Order 2000. The GAO recently released a stinging appraisal of FERC's capacity to carry out its mission: "Absent an effective regulatory and oversight approach, FERC lacks assurance that today's energy markets are producing interstate wholesale electricity rates that are just and reasonable."¹²⁵ One of FERC's biggest weaknesses is its inability to issue meaningful civil penalties for non-compliance. In addition, FERC has no authority over many parts of the country that do not fall under its jurisdiction – either because they do not deal in interstate commerce like the Electricity Reliability Council of Texas ("ERCOT"), or because they are part of some independent federal entity like the Tennessee Valley Authority.

2. A Public Power Grid

Concerned about the efficacy of FERC's voluntary RTO policy, some have called for the development of a truly public power grid, owned and managed by electricity consumers. Public Citizen, a public interest watchdog group, advocates for a non-profit, consumer-owned transmission systems that would provide non-discriminatory open access to all energy generators.¹²⁶ The plan proposes developing non-profit transmission companies that would buy out current owners. Unlike RTO's, the board of directors would be comprised of consumer advocates, environmentalists, and other community stakeholders who would be charged with managing the transmission system in a way that minimizes cost and environmental impact.

3. Progress Towards Reform

Despite these institutional and regulatory shortcomings, however, progress is still being made in certain parts of the country to remove unfair interconnection policies. Several independent service operators ("ISOs") have begun addressing the discriminatory scheduling policies that inhibit wind facilities from efficiently (if at all) connecting to the grid. For example, on March 27, 2002 FERC strongly endorsed the California Independent Service Operator (Cal-ISO) scheduling tariff amendment.¹²⁷ Under the new rule, scheduling deviations from intermittent energy producers will be netted monthly and deviation penalties will be waived.¹²⁸ In addition, Cal-ISO will conduct near real-time forecasts of potential wind energy generation (paid for by a small fee on the wind generators) that will be used by wind generators to set their generation schedules.¹²⁹

Other ISO's around the country have also begun to adopt fairer scheduling policies. NY-ISO completely exempts all intermittent energy generators from scheduling penalties, ERCOT currently allows a 50% deviation from schedules for wind generators, and PJM-ISO (PA, NJ, and MD) has adopted the FERC Order 2000 proposal allowing all deviations to be settled at real-time prices without penalties.¹³⁰

F. Distributed Energy Incentives

The vast majority of all U.S. wind-generating capacity is currently located on centralized wind farms that connect one or more utility-scale turbine to the grid.¹³¹ Despite this, significant amounts of wind energy could be generated from

smaller distributed sources to be used for on-site consumption with excess energy fed back into the grid.

Distributed energy generation has many advantages over a centralized grid. Power loss along long-distance transmission lines is eliminated when power is produced where it is used. Distributing the energy-generating infrastructure also reduces opportunities for terrorists to disrupt the nation's power system by targeting centralized power plants. In addition, the aesthetic and environmental impacts of transmission lines, substations, and large-scale energy facilities are lessened as dependence on the grid decreases. Clean distributed generation can also reduce peak loads on the transmission infrastructure, thereby improving the system's overall reliability.

Many barriers stand in the way of increasing distributed generation capacity across the country. Kurt Yeager, president and chief executive officer of the industry-funded Electric Power Research Institute summarized many of these obstacles as follows:

One of the big problems with increasing "distributed generation" – is that you still need to interconnect with the utilities. Yet the utilities view you as competition. So it's hard to get interconnection agreements. They come up with ridiculous standby charges that make it uneconomic. We need to think of utilities like the automobile industry: It takes a law to make something happen. We didn't get seat belts, pollution control, or better mileage without laws.¹³²

1. Net Metering

Net metering allows consumers who generate their own renewable electricity on site to feed excess energy back into the utility at times of excess capacity. This energy is credited to their account by the utility and is used to offset power sold to them at times when their demand outstrips their generation capacity. Most states require utilities to offer a net metering option to all their customers (commercial, industrial, and residential), although the amount of distributed generating capacity that is allowed to be connected is usually capped at no more than 10-50 KW. Most net metering policies require that any excess energy credits that have accrued at the end of the year are granted back to the utility and not carried over for the next year.¹³³

2. Wind Easements and Access Laws

Wind easements and access laws allow those with available wind resources on their land to protect that resource from being obstructed or limited by projects or construction on neighboring parcels of land. Nebraska and Montana allow property owners to create wind easements that are conveyed with the transfer of real property ownership. In Wisconsin and Oregon, landowners may apply for special permits that prevent others from obstructing wind resources available on their land.¹³⁴

IV. CASE STUDIES: STATE SNAPSHOTS

A. Texas: The Lone Star State Leading the Nation

Texas is fast becoming the nation's leader in wind energy development, installing over 915 MW in 2001 (21.5% of the nation's total installed wind generation to date.)¹³⁵ Texas has a combination of factors working in its favor. First, Texas has great wind potential and many wide-open spaces. Texas ranks 2nd in the nation behind North Dakota as the windiest state, estimated to have the potential to produce 1,190 billion kWh's from wind energy alone.¹³⁶ To put this in perspective,

total electricity consumption throughout the country was 3,706 billion kWh's in 1999.¹³⁷

Second, the Texas legislature passed one of the most far-reaching RPS in the country in 1999, mandating 400MW of new renewables by 2003 and 2000MW by 2009.¹³⁸ The generation requirement mandates that electricity generators either produce a percentage of the state mandate themselves or purchase renewable energy credits to meet their requirement. The size of the RPS targets has been credited with providing long-term security to investors to finance large projects, thus creating economies of scale that have allowed many of these new facilities to deliver power at rates as cheap as \$0.03/kWh.¹³⁹

The law creating the state RPS was the result of years of coordinated and sophisticated efforts by a coalition of consumer, environmental, public health and religious groups.¹⁴⁰ The first step towards victory came with the results of a series of intensive polls taken by the state's utilities. The results shocked many in industry and government: 83% said that air pollution was a serious or very serious problem; 76% said that they were willing to pay \$5 or more per month for non-polluting, renewable energy; and 67% said that they wanted the Legislature to require power producers to reduce pollution.¹⁴¹

The coalition followed this demonstration of public support with a focused media campaign. They regularly released reports highlighting the problems associated with polluting energy and met with the editorial boards of the state's newspapers. The groups also worked to educate and organize the grassroots and hired top-named lobbyists to take their case to the highest levels of state policymaking.

The third factor contributing to the explosion in wind development in Texas in 2001 was the fact that the 10-year, \$0.018/kWh federal production tax credit for wind was set to expire at the end of the year. Unsure whether the tax credit would be extended, many developers rushed to bring facilities on-line. (The credit was extended in early 2002 for 2 years).

The fourth factor favoring wind energy in Texas is the fact that its transmission infrastructure is entirely within state regulatory jurisdiction. Unlike most of the rest of the country that is interconnected interstate and therefore under the regulatory authority of FERC, Texas oversees its own transmission system – the Electric Reliability Council of Texas ("ERCOT"). This has many short-term advantages allowing the state to synchronize transmission access regulations with its other mandates supporting renewable energy. For example, the state mandated non-discriminatory open-access prices and policies for wholesale generators as part of its electricity restructuring legislation in 1999. They replaced the old access fee which was calculated by the distance between the generator and consumer with a "postage stamp" policy that charges a flat fee to any generator accessing the transmission infrastructure.¹⁴²

In addition to fairer access fees for wholesale generators in the state, ERCOT also adopted rules that allow unplanned transmission access at a flat-rate of \$0.15/MWH.¹⁴³ This removes the concern over scheduling penalties that has inhibited wind power in other parts of the country. The final transmission policy favoring wind energy in Texas is the fact that the cost of new transmission construction is paid for by all users of the grid, not the particular generators who will rely on the infrastructure expansions.

The combination of great resource potential, a clear RPS mandate and credit trading program, the availability of a favorable production tax credit, and the adoption of non-discriminatory transmission prices and policies have enabled Texas to lead the nation in wind energy. By the end 2001, Texas had already installed 915 MW of new wind power, more than doubling the goal of 400 MW by the beginning of 2003 mandated under the state RPS.¹⁴⁴

This new wind development has mainly occurred in West Texas, across the state from most of the state's load centers. Although enough available transmission capacity has been "mined" to enable these projects to come on line, the existing transmission capacity has nearly reached its potential. In response, ERCOT is developing plans to expand the transmission system. Unfortunately, the timeframe for bringing new wind facilities on-line is much shorter (12-18 months) than the time it will take to plan and construct the transmission lines capable of delivering this power to market.¹⁴⁵

B. Oregon & Washington: Shaping the Wind with Water

Wind power development has also progressed in the Northwest. In April 2002, the largest wind farm in the Northwest, the Stateline Project, began generating enough power for more than 21,000 homes.¹⁴⁶ That same month, the world's largest wind turbine manufacturer, Vestas, announced plans to construct its largest manufacturing plant in Portland, OR.¹⁴⁷ Despite signs of progress, however, many obstacles continue to impede wind power development in the Northwest.

From early 2000 to mid-2001, skyrocketing wholesale energy prices and severe energy shortages in California and the Northwest made wind energy a comparatively cheaper option, thus overshadowing many of these obstacles. In an effort to stabilize wholesale supply and prices the Bonneville Power Administration (BPA) issued a request for proposals for at least 1000MW of new wind power. The response to the RFP was tremendous, with 25 proposals totaling over 2600 MW.¹⁴⁸ Unfortunately, as wholesale energy prices began to drop, so did BPA's interest in many of these new wind projects. From the original seven projects selected in July 2001 totaling 830 MW, three have been withdrawn by the developers. Although BPA still plans to go forward with remaining 4 projects (430MW), it is doing so on a relaxed timeframe.¹⁴⁹

As recent events illustrate, the growth of wind energy in the Northwest is extremely dependant on the policies and initiative of the BPA. BPA owns and or controls about 75% of the high-voltage transmission grid in the Pacific Northwest, providing service throughout Oregon, Washington, Idaho, Western Montana, and small portions of several other states.¹⁵⁰ Federal subsidies have enabled the BPA to deliver power to its customers at some of the cheapest rates in the country. Without a proactive commitment by the BPA to wind power that will not vacillate with short-term energy prices, wind energy growth could be extremely difficult in the region. Importantly, none of the states that serve as BPA's primary service territory have mandated Renewable Portfolio Standards that require utilities to deliver a percentage of renewable power. As a result, Northwest utilities and the BPA are under much less pressure to expedite the process of removing the obstacles that inhibit widespread wind power development.

Nonetheless, BPA and others in the region continue to advance a process that addresses and removes many of the

barriers. Their two greatest concerns are the total cost and power system impacts of additional wind resources.¹⁵¹

BPA's Generation Imbalance Service Rate has, like many other transmission policies throughout the country, severely limited wind's potential. The existing rules impose a penalty on power generators if delivery deviates more than 1.5% or 2MW (whichever is greater) from the schedule. The penalty, \$100/MWh is the difference between commercial viability for many wind operations. Under pressure from renewable energy advocates, BPA recently decided to exempt wind producers from the imbalance penalty. In place of the penalty, wind generators will only have to reimburse BPA for its costs in balancing the intermittency of wind power within the power grid.¹⁵² BPA explained that the exemption for wind was necessary because "wind generation resources are not able to accurately predict their generation output to avoid application of the penalty rate...so they are not able to respond to the rate as an incentive to accurately schedule generation output."¹⁵³

In addition to efforts by BPA, the state of Oregon has also implemented policies to encourage renewable energy. As part of its electric restructuring law, Oregon established a 3% public benefits charge on customers of the state's two largest utilities. The fund is being managed by the Energy Trust of Oregon and will go towards promoting energy efficiency and renewable projects. The newly formed Trust has set ambitious goals of reducing energy use by 300MW by 2012 and increasing the percentage of renewable energy to 15% by that date.¹⁵⁴

C. Minnesota: Encouraging Small and Large Scale Wind Projects

Minnesota is the 9th windiest state in the country and currently ranks 4th in installed wind capacity with 320MW.¹⁵⁵ Most of the growth can be attributed to a 1997 compromise with the owners of the Prairie Island nuclear facility requiring them to invest in renewables in exchange for allowances to store more nuclear waste on site. The mandate required 425MW of wind by 2002 and an additional 400MW by 2013.¹⁵⁶ XCEL energy, the current owner of Prairie Island, has already installed or contracted out more than enough wind power to meet the 2002 deadline.¹⁵⁷

In 2001, the state enacted a Renewable Energy Objective ("REO") and a mandatory green pricing program.¹⁵⁸ The REO is like a voluntary RPS that sets a goal of producing 10% of the state's energy from renewables by 2015. To meet the objective, MN would have to install roughly 3400MW of new renewables by that date.¹⁵⁹

The REO is non-binding and only requires that utilities make a "good-faith" effort to meet the goal.¹⁶⁰ Despite efforts by a coalition of environmental and consumer activists to adopt a mandatory RPS, utilities and other opponents defeated the proposal. The opponents instead pushed for green pricing programs that rely on consumer preference in order to drive new renewable development in the state. Unfortunately, this is likely to have a much more limited impact than a RPS would have.

Minnesota has been as active as any state in the country at promoting small-scale (less than 2MW) wind project development. It is currently the only state to have a Renewable Production Incentive that pays eligible developers \$0.015/kWh. This is on top of the Federal Production Tax Credit that may also be available for such projects. Qualifying facilities include

small businesses, tribal councils, non-profit corporations, or private projects that are owned and operated by the landowner.¹⁶¹

In addition to the production payment, small facilities also benefit from a standardized interconnection agreement and tariff. Unlike many other small wind developers throughout the country, developers in Minnesota do not have to negotiate unique agreements with utilities each time they want to connect to the grid. Instead, upon request, they are presented with a boilerplate agreement that they or their lawyers can easily review before signing. The agreement is simple and the interconnection fees are reasonably calculated.

D. California: Returning to its Roots

California gave birth to the modern wind energy industry in the early 1980's in response to the energy crisis of the prior decade. A combination of high long-term energy prices, generous fiscal incentives, and other aggressive state policies and programs helped to create an atmosphere that was ripe for adoption of the technology.

In addition to fiscal incentives for renewables, California also aggressively pursued increased renewable development in other ways. Under pressure from environmental groups and then Governor Jerry Brown, the state's Public Utilities Commission pressured the three largest utilities to implement recent changes in federal law requiring monopoly utilities to purchase power from independently owned renewable energy plants.¹⁶² The purchases were made through long-term contracts based on anticipated avoided costs of power, which were projected to be higher than they actually turned out to be.¹⁶³

The California Public Utilities Commission also helped to develop standard power purchase contracts ("standard offer contracts"). These standard contracts simplified the process of connecting to the grid and ensured reasonable charges for interconnection.¹⁶⁴

This combination of policies, programs and incentives led to an average growth of over 64% in wind energy production in California from 1983 to 1994.¹⁶⁵ Unfortunately, this impressive growth skidded to a sudden halt in the mid-1990's due to the expiration of favorable long-term contracts. Energy prices for natural gas and petroleum had fallen and were at levels unanticipated when many of the contracts were originally signed. As a result, the utilities' avoided costs also fell, meaning that long-term contracts being offered to independent wind energy producers were significantly lower than a decade earlier.

In 1996, California passed sweeping electricity deregulation legislation that promised competitive markets, cheaper rates, and consumer choice. Unfortunately, none of these promises were fulfilled. Instead, the stage was set for unprecedented wholesale price manipulation that led to skyrocketing wholesale energy prices that ultimately bankrupted one of the State's largest utilities. The ensuing energy crisis and the State's concern over meeting energy demand led Governor Davis to sign extremely expensive long-term energy contracts. Efforts are underway to re-negotiate these contracts with the State claiming that they should be invalidated because they were under duress when they signed them.

Despite these serious obstacles to renewable energy facing the state, the state has implemented several far-reaching

programs to promote the technology. Whether these programs are enough to overcome the obstacles is unclear.

Along with the 1996 deregulation, the State created several programs supporting renewable energy and other programs. The Public Interest Energy Research Program (PIER) annually awards up to \$62 million for a variety of programs related to bringing environmentally safe and affordable energy technologies to the marketplace.¹⁶⁶

The second program was the creation of the largest Public Benefits Fund in the country. The funds are collected from a fee on energy users throughout the state and are allocated to several different accounts. The New and Existing Renewable Resource Accounts provide qualifying projects with a production payment of up to \$0.015 kWh.¹⁶⁷ For residential and small business customers, the state has established a Buy-Down program that will pay \$4,500 per kW or 50% of the project (whichever is less) for wind turbines under 10 kW.¹⁶⁸

The State's Renewables Program also allocated funds to help develop green markets, although these programs have been suspended since September 2001, when the state suspended customer choice in response to the problems related to its flawed deregulation process.

Perhaps most significantly, on September 12, 2002, California adopted the most ambitious renewable portfolio standard in the country, requiring the state's utilities to produce at least 20% of their electricity from renewables by 2017.¹⁶⁹ Based upon the effectiveness of RPS policies in other states and California's pioneering experience with wind energy, the future of wind energy development in the state looks bright.

V. RECOMMENDATIONS

A. Leveling the Playing Field

1. Long-Term Initiatives

If the environmental costs of energy were reflected in the price rather than externalized, then wind energy would become a more economical option. The best way to accomplish this is by the elimination of disproportionately allocated subsidies and by shifting the tax burden to internalize environmental costs on the polluter. Phase out all energy subsidies over an extended period of time. This would allow companies and markets to slowly transition to reliance on the cheapest energy sources.

The most economically sound way to help promote more environmentally benign energy sources like wind is through comprehensive tax shifting. This would involve shifting the tax burden on society away from things that are beneficial, such as work and capital investment, and onto things that are detrimental, such as pollution and other unsustainable practices. This rewards those things that we want to encourage and penalizes those things that we want to discourage.

One way to accomplish this within the energy sector is to implement a carbon tax. The tax would add cost to every unit (BTU) of carbon consumed. Because wind and other non-polluting energy sources, consume no carbon, they would escape the tax altogether.

2. Short-Term Proposals

Comprehensive tax shifting and the elimination of all energy subsidies is not a realistic short-term goal due to the enormous political opposition garnered by these proposals. Fortunately, there are many short-term proposals that can realistically be pursued. They include:

- ◆ Extending the Renewable Energy Production Tax Credit indefinitely.
- ◆ Shifting energy subsidies away from fossil fuels and nuclear power towards renewables and energy efficiency.
- ◆ Creating a national RPS and national REC trading system modeled on successful state programs.
- ◆ Creating state RPS and REC programs in all 50 states. This would encourage renewable energy development more evenly throughout the country.
- ◆ Mandating federal, state, and local government purchases of renewable energy.
- ◆ Extending and harmonizing state tax credits and exemptions.

B. Helping Wind Get Grid Connected

The new “open-access” era must begin living up to its name. Despite FERC proclamations in support of non-discriminatory access to the grid for wind and other renewable energy, many policies continue to restrict fair access.

1. Reforming or Replacing FERC

Reforming or replacing FERC’s oversight of the interstate transmission system is central to the process of eliminating many of these obstacles. Such reforms should include the following:

- ◆ Authorizing FERC to issue meaningful penalties for non-compliance with its Orders.
- ◆ Consolidating the regulatory authority over transmission policy within the Bonneville Power Administration, the Tennessee Valley Authority, and those transmission organizations currently under FERC’s jurisdiction.
- ◆ Mandating uniform transmission policy throughout the country regarding connecting wind energy to the grid.
- ◆ Requiring that consumer and environmental concerns are fairly represented within the decision-making bodies of Regional Transmission Organizations and Independent Service Operators.

2. Adopting Non-Discriminatory Scheduling Policies

In addition to reforming or replacing FERC, the following policies should be adopted by the country’s various Transmission Operators:

- ◆ Eliminating scheduling penalties for intermittent energy generators.
- ◆ Allowing real-time balancing markets that settle payments or charges related to scheduling deviations based on real-time prices at the time of the deviation.
- ◆ Implementing a system for conducting and disseminating wind forecasting information to reduce scheduling deviations.
- ◆ Promoting geographical aggregation of wind facilities to help create a more reliable wholesale power product.

3. Adopting Equitable Interconnection Fees

- ◆ Basing the interconnection fee on monthly or annual average usage rather than on a facilities nameplate (peak) capacity.

- ◆ Standardizing and simplifying interconnection agreements and fees for small wind producers.
- ◆ Financing maintenance (embedded costs) and expansion of the transmission grid by fees paid by electricity consumers rather than by charges to energy generators.
- ◆ Adopting a “postage stamp” fee that charges a fixed interconnection fee regardless of how many transmission systems are used to deliver power to the end user.

4. Increasing Transmission Capacity Available for Wind

- ◆ Upgrading the transmission infrastructure to reduce thermal and voltage operating constraints.
- ◆ Replacing antiquated mechanical switches with a new integrated fiber-optic network.
- ◆ Ensuring that wind projects are fairly represented in decisions to expand the transmission infrastructure.

CONCLUSION

Electricity consumption has grown by 23.5% over the last decade in the U.S. with a continual over-reliance on fossil fuel and nuclear energy sources.¹⁷⁰ Our understanding of the causes and effects of climate change and other environmental consequences has also grown. Wind energy and other renewables, along with increased conservation and efficiency programs, could enable us to respond to these growing problems while also providing energy security for future generations.

Although quite possible, transitioning to a clean, renewable energy economy will not be easy. To date, a combination of innovative policymaking and entrepreneurial creativity has enabled wind energy to begin competing with traditional sources of energy in the commercial marketplace. Yet there remains an enormous untapped potential for wind energy in the U.S., one that will remain largely untapped without the introduction of more aggressive and consistent policies throughout the country.

(Endnotes)

- * J.D., expected 2004, American University’s Washington College of Law.
- ¹ BTM CONSULT APS, INT’L WIND ENERGY DEV.: WORLD MKT. UPDATE 2001, 3 (2002).
- ² In 2001, utility-scale wind turbines generated approximately 56 billion kW/h worldwide, which is 0.4% of the 13,934 billion kW/h total electricity produced that year. U.S. DEPT. OF ENERGY, ENERGY INFORMATION ADMINISTRATION, INTERNATIONAL ENERGY ANNUAL 2001; American Wind Energy Association, *Utility Scale Wind*, available at <http://www.awea.org/utilityscale.html>.
- ³ Union of Concerned Scientists, *Bush Administration Exploits Energy Issue to Assault Environment*, available at <http://www.ucsusa.org/releases/03-22-01.html>.
- ⁴ LESTER R. BROWN, ECO-ECONOMY: BLDG. AN ECONOMY FOR THE EARTH, at 100 (2001).
- ⁵ A recent Harvard School of Public Health study linked emissions from two coal-fired power plants in Massachusetts to more than 43,000 asthma attacks, nearly 300,000 incidents of upper respiratory symptoms, and 159 premature deaths per year. Harvard University Gazette, *Report Focuses on Impact of Power Plant Pollution*, at <http://www.news.harvard.edu/gazette/2000/05.11/air.html>.
- ⁶ Mountaintop mining – a process in which entire mountaintops are blown off and surrounding river valleys are filled with debris – continues to decimate the ranges of West Virginia and other states. In the process, ecosystems are buried and communities are put in jeopardy of being inundated by mudslides and other “natural” disasters.
- ⁷ Momentum is building to allow the shipment of nuclear waste through 44 states to a storage facility under Yucca Mountain, Nevada. This would require over 105,000 truckloads of radioactive waste across the country over

the next 40 years. In addition to the threat posed by terrorists targeting these moving nukes, the DOE estimates that over 300 of these shipments would be involved in accidents. U.S. PUB. INTEREST RESEARCH GROUP, RADIOACTIVE ROADS & RAILS: HAULING NUCLEAR WASTE THROUGH OUR NEIGHBORHOODS (June 2002).

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⁹ BROWN, *supra* note 4, at 35.

¹⁰ U.S. DEPT. OF STATE, U.S. CLIMATE ACTION REPORT 2002, at 89 (May 2002), available at <http://yosemite.epa.gov/OAR/globalwarming.nsf/content/ResourceCenterPublicationsUSClimateActionReport.html>.

¹¹ The three windiest states (North Dakota, Texas, and Kansas) alone could supply nearly enough electricity to meet U.S. demand. ENERGY INFO. ADMIN., U.S. DEPT. OF ENERGY, EIA ANNUAL ENERGY REVIEW 2000 - TABLE 8.1: ELEC. OVERVIEW 1949-2001 (total U.S. retail elec. sales for 1999 was 3,706 billion kWh), available at <http://www.eia.doe.gov/aer/txt/tab0801.htm>; see also D. L. ELLIOT, L. L. WENDELL, G. L. GOWER, PAC. NORTHWEST LAB., U.S. DEPT. OF ENERGY, AN ASSESSMENT OF THE AVAILABLE WINDY LAND AREA AND WIND ENERGY POTENTIAL IN THE CONTIGUOUS UNITED STATES (1991), (the combined total wind generating potential for ND, TX, and KS is 3,470 billion kWh) *microformed on* PNL-7789 DE91 018887.

¹² Am. Wind Energy Ass'n ("AWEA"), *Wind Energy & Climate Change: A Proposal for a Strategic Initiative* (every 10,000 MW of installed wind generating capacity reduces CO₂ emissions by about 31MMT), available at <http://www.awea.org/policy/ccwp.html>.

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¹⁴ STANLEY D. CALVERT AND SUSAN M. HOCK, NAT'L RENEWABLE ENERGY LAB., U.S. DEPT. OF ENERGY, UNITED STATES WIND ENERGY GROWTH AND POLICY FRAMEWORK, at 4 (July 2001).

¹⁵ *Id.*

¹⁶ AWEA, THE ECONOMICS OF WIND (March 2002).

¹⁷ Peter A. Gish, *Project Financing of Renewable Energy Projects in Europe*, 22 SUFFOLK TRANSNAT'L L. REV. 405, 411 (Summer 1999).

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²⁰ Lester R. Brown, Earth Policy Inst., U.S. *Farmers Double Cropping Corn and Wind Energy* (June 2000), available at <http://www.earth-policy.org/Alerts/Alert3.htm>.

²¹ Nat'l Renewable Energy Lab., Dept. of Energy, *Wind Energy*, available at http://www.nrel.gov/clean_energy/wind.html.

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²⁴ European Wind Energy Ass'n., *Wind Energy: Clean Power for Generations*, at 3, available at <http://www.ewea.org/doc/Wind%20Power%20-%20The%20New%20Global%20Energy%20Source.pdf>.

²⁵ AWEA, Briefing (Nov. 2002), available at <http://www.ewea.org/doc/20gw%20briefing.pdf>.

²⁶ AWEA, *Wind Energy Projects Throughout the United States*, available at <http://www.awea.org/projects/index.html>.

²⁷ NAT'L RENEWABLE ENERGY LAB., DEPT. OF ENERGY, WIND POWER TODAY: 2001 THE YEAR IN REVIEW (2001), <http://www.nrel.gov/docs/fy02osti/31583.pdf>.

²⁸ ENERGY INFO. ADMIN., U.S. DEPT. OF ENERGY, EIA EMISSIONS OF GREENHOUSE GASES IN THE U.S. 2000 DOE/EIA-0573 (2000) (1990 and 2000 greenhouse gas emissions were reported at 1677.9 and 1906.3 million metric tons, respectively, which is an average 1.3% annual increase. Projecting a 1.3% annual increase until 2012 amounts to 2225.89 MMT by 2012, which is a 17% increase from 2000 emissions), available at <http://www.eia.doe.gov/oiat/1605/ggprt/emission.html>.

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³⁷ JOINT COMMITTEE ON TAXATION, ESTIMATES OF FEDERAL TAX EXPENDITURES FOR FISCAL YEARS 2002-2006, JCS-1-02 (Jan. 17, 2002); see also OFFICE OF MANAGEMENT AND BUDGET, BUDGET OF THE U.S. FISCAL YEAR 2003, ANALYTICAL PERSPECTIVES (2002) (Combined Totals: renewable energy: \$80 million (tax breaks and credits) and \$396 million (total discretionary spending); fossil fuels: \$3760 million (tax breaks and credits) and \$582.7 million (total discretionary spending); and nuclear: \$20 million (tax breaks and credits) and between \$1278 and \$4412 million (total discretionary spending); see also Anthony Heyes and Catherine Liston-Heyes, Department of Economics, University of London, England, *Liability Capping and Financial Subsidy in North American Nuclear Power: Some Financial Results Based on Insurance Data* (estimating the cost of the federal insurance program for the nation's 106 civilian nuclear reactors (Price Anderson Act) at \$3.45 million/reactor/year), available at <http://www.akef.dk/som/pdf/som32/5heyas.pdf>; see also Jeffrey Dubin and Geoffrey Rothwell, *Subsidy to Nuclear Power Through Price Anderson Liability Limit*, CONTEMPORARY POLICY ISSUES (July 8, 1990) (estimating the cost of federal insurance at \$33 million/reactor/year).

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NEWS UPDATE

Multilateral Environmental Agreements & World Trade

By Melanie Nakagawa*

In September 2003, the Fifth Ministerial Conference of the World Trade Organization (“WTO”) will meet in Cancun, Mexico. Cancun may provide an opportunity to reconcile many tensions between trade and the environment, although it seems likely that environmental concerns will remain marginalized. NGOs, governments, and other environmental agencies are eagerly waiting to see what happens at Cancun.

At the Fourth WTO Ministerial Conference in Doha, Qatar, governments mandated the WTO to unilaterally clarify the relationship between trade rules and trade measures that enforce MEAs. The Doha mandate, however, established that the outcome of any negotiations “shall not diminish the rights and obligations of Members under existing WTO agreements,” thus continuing to subjugate environmental concerns to those of trade.¹ Many developing nations favor prioritizing economic development over complying with MEAs. They consider GATT Article XX, the list of exceptions, adequate for handling the MEA-WTO issue.² Other nations, mainly developed economic powers, support clarifying the MEA-WTO relationship.³

Two areas of potential progress are increased cooperation and information exchange, and laying out the legal framework for the relationship between MEAs and trade agreements. A major limiting factor, however, is the fact that the negotiations leading up to Cancun have largely excluded many environmental perspectives from the discussion. Currently the WTOs Committee on Trade and Environment meets with secretariats of MEAs once or twice a year to discuss trade-related provisions and dispute resolution mechanisms in MEAs.⁴ Thus, new negotiations could expand the existing cooperation between the WTO and trade-related MEAs.⁵

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PRACTITIONER'S CORNER

A Conversation With NRDC's Greg Wetstone

Interviewed by Dave Newman

Greg Wetstone is the Director of Programs for the Natural Resources Defense Council ("NRDC") and has been with NRDC since 1995. Before that he worked for Representative Henry Waxman, a California congressman.

SDLP: What does NRDC do?

Wetstone: We play a key role in the effort to grapple with our most serious environmental challenges. These days we are spending a lot of time trying to hold onto the very important bedrock structure that has worked since 1970. NRDC played a huge role in getting these laws into the books and now we are fighting like hell to hold onto them.

SDLP: EPA just released a state of the environment report which basically hails many of the victories of the last 30 years and attributes much of that success to the nation's environmental laws. It seems quite ironic that the Bush Administration simultaneously praises the efficacy of the nation's environmental laws as it works to weaken them. Are you surprised that there's not more of a backlash against Administration's environmental policies?

Wetstone: I think there will be. I think there has been. I think we're living in a time where the Administration is relying largely on distraction and almost recognizes that they have almost no real ability to make a public case with any sort of credible detail. I think there is right now a very systematic effort to try to undermine the very infrastructure that makes these laws work and it's a brazen disregard for science and a brazen disregard for law and a brazen disregard for public opinion. I think the truth will come out. History shows that these things tend to be cyclical and public attention will turn inward as I think it already has.

SDLP: One of the surprising things post 9-11 was the lack of discussion around the connection between our foreign policy and our dependence on unsustainable forms of energy. Do you see a more coherent foreign policy that incorporates environmental sustainability as one of the key components? Do you see that articulated in any context across the political social spectrum? Do you hear anyone speaking about that?

Wetstone: I think that there are a lot of people who are speaking to the importance of the connection between sustainable energy policy and national security because by

reducing our reliance on unstable regions of the world for energy, we are also reducing our reliance on an energy path that leads us to greater pollution, greater global warming - and that is not something we can sustain over the long term if we want to protect the planet's climate. You could point to John Kerry, Joe Lieberman, John McCain in the Senate. Henry Waxman and Sherry Boehlert in the House. A number of champions of provisions that reduce reliance on foreign oil over time. I think the country after 9-11 was looking to the President for leadership and had the President been willing to show leadership, to ask for sacrifice, to urge Americans to reduce reliance on imported oil, to take that provision to Congress, I think we'd have a law today that would help with these problems. Unfortunately, where we have been is a very different place, where, in many ways, the financial rewards for oil companies has been a more important factor than the long term public interest in either environment or security.

SDLP: Some people have said that 9-11 created an incredible moment and an opportunity to create a sea change in our nation's energy policy. Do you think there is still an opportunity to make those kind of grand sweeping changes and pull the country along from this point?

Wetstone: Yeah, I do. I think that we need leadership that shares the objective of reducing our reliance on foreign oil and I think that it is clear that there is a high price to pay including in human life for continuing to bolster instead of reduce our reliance on foreign oil. In the long term, if we want to leave a planet to our children that's better than the one we came into, we've got some work to do and this is an important part of it.

SDLP: On the domestic front, with all of the attacks that we are currently seeing on environmental laws and regulations, is it hard to keep moving forward trying to build upon the environmental successes of the past 30 years while you are playing such a defensive role?

Wetstone: That's one of the great tragedies of the time we're in. While it has never been more important to be moving forward, we are forced to devote tremendous attention and resources simply to keep from moving backward on programs that are broadly popular and broadly successful and that we should be building on. Instead we see constant efforts to undermine these programs. It is hard to keep moving forward, but we are looking at other places. For example, we have

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legislation in California on motor vehicles' contribution to global warming that's very important. We are looking for opportunities to change the dynamic and elevate this as an issue and really get focused on how to make progress.

SDLP: If you were a member of Congress, what would be the first piece of legislation that you would introduce?

Wetstone: I have the continual opportunity to work with members of Congress to get the kind of legislation that we need. We have good legislation in Congress, it just doesn't go anywhere. The issue is really the leadership in Congress and the leadership in the White House. We need the ability to move us forward on these issues. Drafting the bill and getting it out there isn't the hard part.

SDLP: How do you see the tactics used by most environmental organizations like NRDC evolving in the future to meet the growing opposition and sophistication of the tools used by the opposition?

Wetstone: I think we're doing a much better job than we ever had with the resources that we have. I think we're being more strategic, that we're relying on new tools that are bring us along. The Internet and the tremendous network of activists that we've developed in the last 5 years is something that we didn't have. More sophisticated message development and that kind of thing and much better collaboration amongst groups, but we're facing a lot more money, more than we ever have. I think the foxes have taken over the henhouse. We have people running the White House and running the Congress who are basically willing to do precisely the bidding of not just corporate polluters, but the absolute least responsible, worst elements on every issue, be it logging, air pollution, or global warming. That's the problem.

SDLP: Many economists have argued that we could do away with a lot of the regulation if we simply internalized the external costs of pollution into the costs of goods and services that we use. We have seen some encouraging results in some very limited cases that have taken this approach. But how do you popularize such a complex kind of explanation for raising prices on goods and services?

Wetstone: I think it becomes an academic discussion. Yes, it would be a more efficient system if we could internalize the costs, but what is the true cost? How much is a clear day worth? How much is it worth for your child to not have asthma? Where we have this kind of economic analysis playing a role we see tremendous data manipulation. We see that now at the White House, where their efforts to promote approaches

that devalue the lives of senior citizens, we see proposals that only look to the lost value in monetary terms and don't consider quality of life, don't consider what it's worth to protect wilderness, to have a clear day, what's it worth to have a bald eagle.

The problem with these theories is that they put you in a structure that can easily be manipulated and we have a system that has dramatically improved our quality of life, as EPA's Report seeks to document, in reducing the pollution in our cities, cleaning up our rivers, protecting animals on the verge of extinction, protecting the ozone layer. All of which, by the way, is at risk by proposals moving in the current Administration. We have a structure that has basically worked and we should build on it, rather than tear it down. That's the problem, we're looking to tear down the foundation that we should be building on, and when we build on that foundation, we can do it in economically efficient ways.

ARTICLE

THE CHICAGO CLIMATE EXCHANGE: CAN GREENHOUSE GASES BE REDUCED ABSENT GOVERNMENT MANDATES?

*By Angie Farleigh **

The Chicago Climate Exchange (“CCX”) is a voluntary tradable permit program for reducing greenhouse gas emissions. The program includes voluntary emissions reductions and trading for all six greenhouse gases. Trading in carbon dioxide is expected to generate the most interest. Member companies make a legally binding agreement to reduce their emissions of greenhouse gases by 4% below the average of their 1998-2001 emissions by 2006.¹ This figure was reached during the design phase, through consensus among the founding member companies. It was a goal that all of the companies felt they could reach, but CCX representatives note that it is possible this number will change once the program is up and running.² It is unclear whether this was a reduction that many of the companies were going to achieve through other means, regardless of their participation in the CCX.

CCX was initially funded by a \$347,600 Joyce foundation grant, administered by the Kellogg Graduate School of Management at Northwestern University. Environmental Financial Products, LLC performed the principle research for the study. The exchange will be regulated by the National Association of Securities Dealers (“NASD”) and N.M. Rothschild & Son Ltd. will provide investment banking services.

Program Structure

The program is presumably modeled after the U.S. acid rain (“SO₂”) trading program which CCX Chairman and CEO, Richard L. Sandor, helped design. Participants can receive credits by reducing emissions, or generate “offset” credits by engaging in offset projects.³ The market would consist of tradable commodities, in the form of a ton of carbon dioxide equivalent that could be bought and sold like shares of stock.⁴ The participants will use a web-based system regulated by the NASD to buy and sell the credits.⁵ Each participating company will have an account on the CCX registry containing tradable emission allowances based on the 1% per year reduction goals. Members will use the website to exchange bids and offers, but will not know counterparties’ identities until trades clear.⁶ Any member that achieves greater reductions than the stated goal would be granted a credit slip, which could be traded to companies that did not meet their goals. A participating company must surrender one allowance or offset for every ton of CO₂ emitted over its limit.

The exchange will be available to greenhouse gas emission sources, farm and forest carbon sinks, offset projects and liquidity providers in the United States, as well as to offset

providers in Brazil. Emission sources and offset projects in Canada and Mexico will also be integrated into the program after trading begins.⁷ The advisory board hopes to eventually expand the program to include other international sources.

The program will be run principally by the CCX Board of Directors, assisted by a small CCX staff. Richard Sandor will serve as CCX’s CEO and Chairman.⁸ Maurice Strong, former Chairman of the Earth Council, a Canadian NGO, will serve as a Vice-Chairman of CCX.⁹ Mr. Strong is also the former Under-Secretary General of the United Nations responsible for the 1992 Earth Summit in Rio de Janeiro, Brazil. The other Vice-Chairman of the exchange will be Les Rosenthal, a principal of the Chicago-based commodities and futures trading firm, Rosenthal Collins.¹⁰ Mr. Rosenthal is a former Chairman of the Chicago Board of Trade. Finally, former Illinois Governor James R. Thompson, current Chairman of Winston and Strawn, will serve as Director of CCX.¹¹

CCX will also have a “high level” advisory board consisting of a mixture of academics, scientists, policy experts, and industry representatives.¹² The role of the advisory board is to provide “input as needed.”¹³ As the name suggests, their function will be to give advice and not to participate in the decision-making process.

Program Governance

In order to be a member of CCX, participants must sign a contract promising to meet the stated emissions reductions and to trade only on the CCX exchange for the four-year pilot period.¹⁴ Like other commodity exchanges, the NASD will look to verify reductions and has worked with the CCX to devise compliance procedures for the program.¹⁵ The NASD will be in charge of enforcing the caps and ensuring that the credits traded in the exchange represent real, permanent emissions reductions.¹⁶ To accomplish this goal, CCX and the NASD have based much of the verification system on the Greenhouse Gas Protocol Initiative (“GHG Protocol”), which was developed by the World Resources Institute in 1998 in order to standardize and legitimize GHG emissions from companies around the world.¹⁷ The GHG Protocol helps companies calculate and report their GHG emissions by providing standards for accounting, setting reporting boundaries for the company, setting baseline emissions levels and reporting the emissions data.¹⁸ It also provides guidance to companies on calculating GHG emissions, managing their inventory quality

and verifying their GHG emissions data.¹⁹ The GHG protocol includes calculation tools that represent a “best practice” for emissions calculation.²⁰ In order to calculate its GHG emissions, a company must input data on its activities into an Excel spreadsheet and then select the appropriate emissions factors, based on the Protocol’s step-by-step guidance. Emission factors and calculation methods vary depending on the type of GHG, the type of industry, and other site-specific activity data.²¹

The GHG Protocol, although helpful in designing a verification system, was not a perfect fit for a trading program like CCX.²² CCX is in the final stages of developing a new protocol²³ that will be approximately eighty percent based on the GHG Protocol, and about twenty percent “custom fit” to the needs of the program and its members.²⁴ The result will be a standardized emission submission protocol that all members of the CCX must follow in order to participate in the exchange. Standardizing the data that is submitted to the CCX will ensure that all members are held to the same standard and will make it easier for the NASD to audit the submissions. Most of the initial member companies are large multinational corporations that have already been tracking their GHG emissions since 1990, either through the GHG Protocol or some other comparable means.²⁵ All of the companies participating in the CCX pilot program already have emissions inventories built up and will be able to meet the new CCX emission submission standards. Because CCX is still in the pilot phase, officials have yet to develop procedures for smaller companies that may want to join in the future, but do not have the systems in place to meet the CCX rules.²⁶

Once the protocol is in place, the NASD will verify compliance with the rules by auditing each of the member companies.²⁷ Auditors from the NASD will look at the underlying data and documents that support the baseline and emission numbers that the companies submit to the CCX. These documents will include invoices, deliveries, receipts and any other paperwork that the company used to establish its baseline number and emissions.²⁸

The NASD will also use its market surveillance technologies to monitor trading activity for fraud and manipulation.²⁹ CCX is the final arbiter of the treatment of the submitted data, not the NASD.³⁰ The NASD scores the submissions for accuracy and reports its findings to the CCX. Any violations, whether through fraud or negligence, will be policed by peer review under the same kind of enforcement provisions for defaults on the stock exchanges.³¹ Companies that fail to meet their commitments may face sanctions. Sandor says he expects peer review to be effective and does not anticipate the kind of market manipulation that has occurred in the energy markets.³² Apparently, NASD officials share Sandor’s faith in the honesty of the CCX members. One NASD representative stated that, although there is always a risk of falsifying documents, because most of the members of CCX are huge corporations, they didn’t have to worry about fraud as much as they would with smaller businesses.³³

The Current Market for CCX Credits

Like other commodities, the buyers and sellers will determine the price of the credits. Trading is expected to have begun early in the summer of 2003. A few companies have

already conducted a handful of bilateral trades for greenhouse gas emissions. CCX says that carbon trades have already surpassed \$100 million, and, with the start of CCX, annual trading could increase to the tens of billions.³⁴

Most of the participants seem to be companies who have experience with other pollution exchanges, either abroad³⁵ or with the U.S. SO₂ trade allowances. Some of these companies hope that participating in the CCX will allow them to learn better ways to meet mandates abroad.³⁶

One of the purposes of the exchange is to allow companies that are subject to mandatory emissions reductions in other jurisdictions, to take credit for the reductions made in the United States. To this end, the designers of CCX will create a registry of reductions claimed by each participant. They hope to make the registry sufficiently accurate/adequate to gain international credibility? a high enough quality that other programs in other countries will accept it.³⁷ However, acceptance will still be on a case-by-case basis.

For the immediate future, the program’s pollution credits will only be valid in parts of the U.S., Canada, Mexico³⁸ and, to a limited extent, Brazil.³⁹ None of these countries have mandatory GHG programs.

Incentives to Participate

There are currently no mandatory Federal laws requiring companies to reduce their greenhouse gas emissions. This raises the question of why the CCX members are participating in the program in the absence of a legal requirement to do so. There are several possible reasons. Companies may hope to develop a “green” reputation among stockholders and the general public (i.e. *potential* stockholders). Additionally, they may hope to reduce operating costs by reducing energy costs and raising productivity.

The most likely reason is that companies may want to get a head start in anticipation of any mandatory emissions programs that the Bush Administration may implement. Participation in the CCX; will not only reduce long-term costs of controlling emissions, but it will also build the members’ GHG management and trading skills thus putting them in a position to shape future policy debate.⁴⁰ CCX companies will also have strong grounds to ask U.S. lawmakers to recognize emissions credits retroactively in the event that mandatory reductions are ever implemented.⁴¹

Additionally, many multinational corporations might want to get involved in this program because they may already be feeling the effects of the Kyoto Protocol even though the U.S. has not adopted it. In today’s global society, corporations are increasingly interacting in foreign jurisdictions and are subject to the laws of those jurisdictions, namely the provisions set forth in the Kyoto Protocol.⁴² Therefore, many U.S.-based companies that are forced to reduce GHGs in a foreign jurisdiction could either buy additional credits in the foreign jurisdiction, or decrease production in the foreign jurisdiction or in the U.S.⁴³

However, the much-touted perks of the program may not be beneficial to all companies. For instance, TXU Corp. was one of the companies that participated in the design of the program, but has since decided not to participate in the trading because it was not sure if it would be financially

beneficial.⁴⁴

Evaluating the Effectiveness of the CCX Program

A. The General Theory of Tradable Permit Systems

There are two types of tradable permit systems. First, there is the cap-and-trade program where a total resource access limit is defined and then allocated among users. This is commonly thought to be the most effective program because the fixed upper limits guarantee that, even if there is an increase in pollution sources, there will not be an increase in pollution.⁴⁵ The second type of program is the tradable credit program, which establishes an individual baseline for each user, usually based on an existing technology-based standard.⁴⁶ This type of program is less effective because it only establishes a limit for each source of pollution without setting an overall limit.⁴⁷ Therefore, more sources can mean more pollution. CCX is more similar to a tradable credit program because each participating company has pledged to reduce their GHG emissions 4% below their original baseline. This approach makes the most sense given that CCX involves only a small percentage of the total U.S. emission sources. A cap and trade program would be more reasonable if the responsibility for meeting an overall GHG limit were divided amongst all sources in the U.S. Regardless of the type of system, because *no* emission source in the U.S. is currently required to reduce GHG emissions, *any* participation in voluntary programs such as CCX will result in increased environmental protection.

In theory, a tradable permit system can be an effective approach to dealing with many environmental problems. Market driven policies are advantageous because they can internalize the costs of compliance and lower the costs for governments.⁴⁸ In a perfectly competitive market, the permits or credits will flow toward their highest value.⁴⁹ A system such as CCX can optimize the value of the target resource—in this case, the resource would be a GHG-free atmosphere. Such permit systems will not achieve this goal if the market conditions are not right.⁵⁰ For instance, the system needs to be designed to minimize the possibilities for market power and the presence of high transaction costs or large uninternalized externalities.⁵¹ Furthermore, without government involvement there must be a reliable system of private sector independent audits and verification procedures in place.⁵²

In a report by the National Academies of Science entitled, *The Drama of the Commons*, Professor Elinor Ostrom recommends several factors by which to assess the effectiveness of such a system.⁵³ Ostrom suggests analyzing the feasibility of implementing the system, evaluating the environmental effects on the resource as well as other affected resources, and considering the economic effects on the regulated industry and those who use the resource.⁵⁴

B. Implementation Feasibility

No matter how lofty the goals of a trading program may be, it will not accomplish anything if it is not feasible to implement. To determine implementation feasibility, one must first analyze the method by which the resource is allocated

among the users. For instance, some systems use a “first come, first served” approach, while some allocate permits randomly like a lottery.⁵⁵ The most common method of allocating access rights is a method known as “grandfathering.” Grandfathering bases the initial allocation on historic emissions so that existing sources only have to purchase any additional credits they may need over and above the initial allocation.⁵⁶ Because the costs of implementing a tradable permits system are typically large, the grandfathering approach has commonly been a necessary ingredient in building the political support necessary to implement the system.⁵⁷ Accordingly, the CCX system allocates an emissions amount equal to 4% below historic emissions levels to participating companies. If they do not meet that 4% goal, they will have to purchase credits that will bring their emissions levels down to the 4% allocation.

The second factor in analyzing implementation feasibility is whether a system has sufficient monitoring and enforcement mechanisms. Insufficient monitoring and enforcement can lead to increased emissions because the aggregate limit could be breached, either on accident or purposely.⁵⁸ In order to increase compliance, many members of the academic community feel it is important that the regulated community have a substantial role in the “co-management” of environmental resources.⁵⁹ Some argue this is because the government is not efficient at verifying and monitoring such systems and should, therefore, let the private sector implement the system once the government has set the rules.⁶⁰ Despite their arguments, the most common form of governance in the U.S. today is a system of top-down management where the regulated community plays a small role.⁶¹ CCX, on the other hand, has no government input whatsoever and is run solely by “the regulated community.” Although CCX has an advisory board of non-industry representatives, it has no decision-making power. This raises obvious concerns over the credibility of the monitoring and enforcement of the CCX. It is unclear what incentives the designers of CCX have to ensure that the system is properly monitored and enforced and is otherwise free from fraudulent activities. The most likely incentive is that, if the CCX program is sufficiently credible, participants will be able to trade their credits on exchanges in foreign jurisdictions, or they can receive credit for them if the U.S. ever adopts mandatory GHG reductions.

Assuming CCX designers wanted to ensure sufficient monitoring and enforcement, they would first need to ensure there was a proper monitoring system in place. Every successful monitoring system must be able to identify the data needed to monitor the trading and operations of the program, but also gather, interpret and act on this information.⁶² The monitoring system for CCX was designed partly by experienced staff at the NASD, and was based in part on the widely-accepted GHG Protocol. It will also utilize the NASD’s state-of-the-art market surveillance technologies. Assuming that the final CCX emissions submission protocol does not differ too much from the GHG Protocol, it seems that CCX has an adequate system in place to properly monitor the program. However, another important component in a sufficient monitoring system is to have an integrated computer system where all users can access the trading system on a real-time basis.⁶³ The CCX will operate on a web-based system which will make monitoring easier. However, the system will only be open to registered members

of the exchange. The only information that will be publicly available on the website will be the price of the credits and other “nonproprietary” information.⁶⁴ This creates a weakness in the monitoring system as the companies are not under any public pressure to report accurate information. Public scrutiny is especially crucial in this case because it seems that both CCX and the NASD have placed a lot of trust in the honesty of these companies to report accurately. This seems unreasonable after such recent scandals as Enron and WorldCom.

The most problematic element of the CCX program is its enforcement mechanism. Even if the monitoring system was fail-proof and caught every mistake and deception, it is still unclear how the rules will be enforced. Member companies must sign a contract promising to abide by the rules, and may face sanctions if they violate the contract. It is unclear if these sanctions will ever be imposed. Even if the NASD finds that a company has purposely submitted false data, the final arbiter is the CCX itself. It is unclear how lenient the CCX will be on defaulting members.

C. Environmental Effects

In order to be effective, a tradable permit system must start by defining a sustainable target.⁶⁵ This target might not necessarily be efficient for many of the effected pollution sources. In many cases, it provides the only opportunity to achieve an environmentally beneficial outcome. The CCX members agreed to reduce their GHG emissions to 4% below the average of their 1998-2001 emissions. This is a modest goal considering that the framers of the Kyoto Protocol agreed that the world’s emission sources would need to reduce their GHG emissions by *at least* 7% below 1990 levels if there was any hope of curbing global warming.⁶⁶ The few members of the CCX, with their modest 4% goal, are not likely to reduce the world’s GHG emissions to a “sustainable” level. If run properly, the program can still produce positive environmental results.

Carbon dioxide and other GHGs are arguably the best pollutants for a credit trading program such as CCX.⁶⁷ Carbon dioxide is not toxic so it does not endanger the health of local communities if an emission source chooses to buy credits to emit more CO₂ at a specific plant. Furthermore, reductions made at local sources can make a difference worldwide. Even though the CCX is currently localized to a few companies, mostly in the U.S., any reductions that result from the exchange will have a positive effect on reducing global warming.

Trading programs such as CCX also give flexibility to companies on how they propose to meet their reduction goals. This flexibility makes it more likely that participants will actually meet their goal.⁶⁸ However, there is always the danger of uninternalized externalities, like protecting one resource at the expense of another.⁶⁹ For example, CCX would not be environmentally beneficial if the companies chose to reduce their GHG emissions by installing technologies that caused them to increase their nitrogen oxide emissions. However, this is unlikely in such a program because climate change programs tend to result in reductions of other pollutants as a side effect.⁷⁰

D. Economic Effects

In evaluating the effectiveness of a pollution prevention program, one must also evaluate the economic effects of the program. For the regulated industry (or in this case, the participating companies), there is a risk that the program will involve high transaction costs, making voluntary participation unlikely. Tradable permit programs, if adequately enforced, tend to “increase the value of the commons to which the permits apply.”⁷¹ Thus air pollution programs such as the CCX will probably make it cheaper to meet the pollution control targets.⁷²

There is also the possibility that such a program can become *too* economically beneficial for some sources, creating market power in a few companies.⁷³ The fact that the credits are transferable allows the opportunity for some groups to accumulate permits and to use them to gain economic power in other markets. Typically, other programs have protections against such activities and may put a limit on the amount of credits one source can accumulate.⁷⁴ Such programs are also typically reviewed by the Department of Justice (“DOJ”) to check for possible antitrust violations.⁷⁵ The CCX does not have any such limit on credit accumulation, nor has it ever been reviewed by the DOJ. This may cause problems once the trading actually begins.

Conclusion

In theory, the CCX is an admirable concept. It can help reduce GHG emissions from the U.S. immediately, even if the federal government does not adopt any GHG reduction measures. However, the CCX has some significant weaknesses that would need to be resolved in order for the program to be effective. The monitoring system appears adequate, but it is unclear how strictly violations will be enforced. Furthermore, although any reductions in GHG emissions would be beneficial, the program would need to significantly increase the 4% goal in order to reach a sustainable level of GHG emissions. Finally, the internal operations of the CCX seem to be hidden from the public view. The CCX will have to open its doors to public scrutiny if it hopes to receive respect from environmentalists and other critics. Despite a few necessary improvements, the CCX is an excellent learning tool. Overall, the CCX is more useful as a learning tool to help pave the way for a more comprehensive, mandatory emissions trading program.

(Endnotes)

* Angie Farleigh graduated from AU Law in 2003 and is currently an associate at the DC firm of Beveredge & Diamond.

¹ The timeline for reductions is: 1% from baseline in 2003; 2% in 2004; 3% in 2005; 4% in 2006.

² Telephone Interview with Rafael Marques, Economist, CCX (April 11, 2003) (noting that the CCX is in the process of developing a “rule book” which would cover the rules for such changes, but the rule book is not available to the public).

³ Examples of offset projects include: reforestation or renewable energy systems such as wind and solar; energy efficiency process innovations; carbon sequestration such as no-till farming, agricultural grass and tree plantings; switching to less greenhouse gas intensive fuels; recovery and use of agricultural and landfill methane; and vehicle fleet efficiency improvements.

⁴ *Smog for Dollars, Pilot Plan Uses Markets to Set Pollution's Price, Spur Cleanup*, DALLAS MORNING NEWS, Dec. 5, 2002.

⁵ *Chicago Climate Exchange to Trade Greenhouse gases; Opens in Spring*, ELECTRIC UTILITY WEEK, Jan. 20, 2003.

⁶ *Id.*

⁷ Telephone Interview with Rafael Marques, Economist, CCX (May 7, 2003)

⁸ Press Release, CCX, Leaders from Environment, Business and Government to Serve as Directors of New Exchange (April 15, 2003) available at <http://www.chicagoclimatex.com/html/CCXDirectors.pdf>.

⁹ *Id.*

¹⁰ *Id.*

¹¹ *Id.*

¹² The advisory board includes: Warren Batts, Adjunct Professor at the University of Chicago Graduate School of Business, and former CEO of Tupperware Corporation, Premark International and Mead; David L. Boren, President of the University of Oklahoma, former OK Governor and U.S. Senator; Ernst Brugger, Chairman of Brugger Hanser & Partner Ltd. in Switzerland, and a professor at the University of Zurich; Lucien Bronicki, chairman of Ormat International; Paula DiPerna, former President of the Joyce Foundation and Vice-President for International Affairs for The Cousteau Society; Elizabeth Dowdeswell, former Executive Director of the United Nations Environment Programme (UNEP); Jeffrey E. Garten, dean of the Yale School of Management, and former undersecretary of commerce for international trade in the first Clinton Administration; Donald P. Jacobs, former Dean of the Kellogg Graduate School of Management and former Chairman of the Board of Amtrak; Joseph P. Kennedy II is Chairman and President of Boston-based Citizens Energy Group, and former Congressman; Israel Klabin, president of the Brazilian Foundation for Sustainable Development, former chairman of Klabin, SA forestry company, and former mayor of Rio de Janeiro; Bill Kurtis, news anchor; Jonathan Lash, president of the World Resources Institute; Thomas E. Lovejoy, world-renowned tropical and conservation biologist; Dr. R.K. Pachauri, Director-General of the Tata Energy Research Institute (TERI) and Vice-Chairman of the Intergovernmental Panel on Climate Change; David Moran, vice president of ventures for the Electronic Publishing group of Dow Jones & Company and president of Dow Jones Indexes; Sir Brian Williamson, Chairman of the London International Financial Futures and Options Exchange (LIFFE); Robert K. Wilmouth, President and CEO of National Futures Association (NFA); Klaus Woltron, Vice President of the "Club of Vienna" think tank and former CEO of Simmering Graz Pauker (SGP) and General Manager of ABB Austria; Michael Zammit Cutajar, former Executive Secretary of the United Nations Framework Convention on Climate Change.

¹³ Telephone Interview with Rafael Marques, Economist, CCX (April 11, 2003).

¹⁴ CCX will not release copies of such contracts to the general public because it claims they are "intellectual property". Telephone Interview with Rafael Marques, Economist, CCX (April 11, 2003).

¹⁵ *Trading Hot Air*, THE ECONOMIST, Oct. 17, 2002.

¹⁶ *Id.*

¹⁷ GHG Protocol Initiative, *About the GHG Protocol Initiative*, at <http://www.ghgprotocol.org/> (last visited April 24, 2003).

¹⁸ GHG Protocol Initiative, *Corporate GHG Accounting and Reporting*, at <http://www.ghgprotocol.org/standard/index.htm> (last visited April 24, 2003).

¹⁹ GHG Protocol Initiative, *GHG Calculation Tools*, at <http://www.ghgprotocol.org/standard/tools.htm> (last visited April 24, 2003).

²⁰ *Id.*

²¹ *Id.*

²¹ Telephone Interview with Pierre McDonnaugh, Futures Policy Analyst, NASD (April 23, 2003).

²² Michael J. Walsh, Ph.D., at CCX and Pierre McDonnaugh, Futures Policy Analyst, at NASD, have been the two people most involved in the development of this verification system. *Id.*

²³ *Id.*

²⁴ *Id.* See also GHG Protocol Initiative, *Who's Using the GHG Protocol?*, at <http://www.ghgprotocol.org/standard/users.htm> (last visited April 24, 2003) (reporting that Ford Motor Company, Baxter Int'l, Int'l Paper, STMicroelectronics, and StoraEnso are already voluntarily using the GHG Protocol).

²⁵ *Id.*

²⁶ Telephone Interview with De'Ana Dow, Director and Chief Counsel for Futures Policy, NASD (April, 23, 2003).

²⁷ *Id.*

²⁸ Press Release, NASD, NASD and the Chicago Climate Exchange Reach Historic Agreement (Sept. 23, 2002) at http://www.nasdr.com/news/pr2002/release_02_046.html.

²⁹ Telephone Interview with Pierre McDonnaugh, Futures Policy Analyst, NASD (April 23, 2003).

³⁰ Morning Edition, NATIONAL PUBLIC RADIO, Jan. 17, 2003.

³¹ Megawatt Daily, Jan. 17, 2003.

³² Telephone Interview with De'Ana Dow, Director and Chief Counsel for Futures Policy, NASD (April, 23, 2003).

³³ *Smog for Dollars, Pilot Plan Uses Markets to Set Pollution's Price, Spur Cleanup*, DALLAS MORNING NEWS, Dec. 5, 2002.

³⁴ For example, Denmark and Britain have greenhouse gas markets and Canada is currently piloting one. *Trading Hot Air*, THE ECONOMIST, Oct. 17, 2002.

³⁵ Morning Edition, NATIONAL PUBLIC RADIO, Jan. 17, 2003.

³⁶ Telephone Interview with Rafael Marques, Economist, CCX (April 11, 2003).

³⁷ *Exchange in Pollution Credits Formed*, CHICAGO SUN-TIMES, Jan. 17, 2003.

³⁸ CCX members will initially work with the Brazilian Foundation for Sustainable Development to develop offset projects. *Thirteen Companies, Chicago Establish Greenhouse Gas Trading Exchange*, Energy Daily, Jan. 17, 2003.

³⁹ *Climate Change: Companies Launch GHG Trading System, Pledge to Cut Emissions*, GREENWIRE, Jan. 17, 2003.

⁴⁰ *Smog for Dollars, Pilot Plan Uses Markets to Set Pollution's Price, Spur Cleanup*, DALLAS MORNING NEWS, Dec. 5, 2002.

⁴¹ John F. Temple, *The Kyoto Protocol: Will It Sneak Up on the U.S.?*, 28 BROOK. J. INT'L L. 213, 245 (2002).

⁴² *Id.*, at 248.

⁴³ First last name of Author, *Smog for Dollars, Pilot Plan Uses Markets to Set Pollution's Price, Spur Cleanup*, DALLAS MORNING NEWS, Dec. 5, 2002.

⁴⁴ ELINOR OSTROM, ET AL., NATIONAL ACADEMY OF SCIENCES, THE DRAMA OF THE COMMONS 204 (2002).

⁴⁵ *Id.*

⁴⁶ *Id.*

⁴⁷ Bob Page, Address at the Earth Technologies Forum, Washington, DC (April 22, 2003).

⁴⁸ OSTROM, at 200.

⁴⁹ *Id.*

⁵⁰ *Id.* at 200-01.

⁵¹ Bob Page, Address at the Earth Technologies Forum, Washington, DC (April 22, 2003).

⁵² OSTROM, at 200.

⁵³ *Id.* at 216.

⁵⁴ *Id.* at 208.

⁵⁵ *Id.*

⁵⁶ *Id.* at 216 (explaining that the approach causes less disruptions from historical patterns and reduces the financial burden on parties).

⁵⁷ *Id.* at 212.

⁵⁸ *Id.* at 202 (explaining that in the U.S., there is more co-management in fisheries and water programs (where both parties stand to benefit from protecting the resource) than in air pollution programs (where only victims care how much pollution is being emitted)).

⁵⁹ Bob Page, Address at the Earth Technologies Forum, Washington, DC (April 22, 2003).

⁶⁰ OSTROM, at 202.

⁶¹ *Id.*

⁶² *Id.*

⁶³ Telephone Interview with Rafael Marques, Economist, CCX (May 7, 2003).

⁶⁴ OSTROM, at 206.

⁶⁵ DURWOOD ZAELEKE, ET AL., INTERNATIONAL ENVIRONMENTAL LAW AND POLICY 630 (Foundation Press 2d ed. 2002) (1998).

⁶⁶ Bob Page, Address at the Earth Technologies Forum, Washington, DC (April 22, 2003).

⁶⁷ OSTROM, at 218.

⁶⁸ *Id.* at 201.

⁶⁹ *Id.* at 220.

⁷⁰ *Id.*

⁷¹ *Id.*

⁷² *Id.* at 209.

⁷³ *Id.* at 210.

⁷⁴ *Id.* at 203.

BOOK REVIEW

DAVID, GOLIATH AND THE BEACH CLEANING MACHINE: HOW A SMALL CALIFORNIA TOWN FOUGHT AN OIL GIANT—AND WON!

Barbara Wolcott

Capital Books; 232 pg. \$25.00.

Reviewed By Matt Brown

What does a lawyer, two years out of law school, running on a dirty beach on the central coast of California have to do with a major lawsuit against an oil giant? That's the question that Barbara Wolcott answers in *David, Goliath and the Beach Cleaning Machine: How a Small California Town Fought an Oil Giant—And Won!*

Wolcott's book focuses on the small town of Avila Beach and how its citizens, upon learning that they were sitting on top of a large oil plume, fought to have Unocal, the company that had supported the town for so long, clean up the mess. At the center of the action are the lawyers and the bureaucrats who go up against the mighty corporation. The book describes how the environmental lawyers, the water experts, county and state politicians, state and county bureaucrats, the U.S. Army Corps of Engineers, the California Attorney General's Office among others gathered their forces and used the full legal and regulatory arsenal at their disposal to hold Unocal responsible. Unocal, as it could be imagined, using its mantra of "spend no dime before its time" fought these gathered forces tooth and nail not to be held responsible for the oil plume. They used money, paper work, obfuscation, public relations campaigns, political pressure and, of course, legal maneuvering all in attempt to thwart the tiny town's efforts to force the oil company to take responsibility. In the end, when all the data was collected and the all facts surrounding leaks in the company's oil pipelines were known, Unocal decided to settle and the lawyers, bureaucrats, and townspeople got what they wanted—an environmentally clean and safe Avila Beach.

Or did everyone get what they wanted? In the background are Avila Beach's citizens—a collection of the old and young, the working class and the professional, brought together in this experience. During the suit their homes lost value. Because Avila Beach was a "company town" the town was divided between those that worked and were loyal to Unocal and those opposed to the environmental hazards that the company had created. The citizens of Avila Beach also lived in fear for their health, as conflicting answers were given as to the possible affects of the pollution. This was only exacerbated by the arrival of Ed Masry and his sidekick Erin Brockovich (both of whom Wolcott criticizes harshly) who played on the fears of the residents of Avila Beach. For those that called Avila Beach home, the legal triumph was a disaster

as some lost their businesses and still others lost their homes. As a result of the settlement, Avila Beach's downtown had to be destroyed—a downtown that had been the focal point and heart of town life. Wolcott highlights this tragedy in the aftermath of the environmental catastrophe. As the town was slowly dismantled, the town celebrated its past and it said goodbye to its landmarks.

In Wolcott's exploration of Avila Beach's struggle, the book provides a great introduction to the ins and outs of what happens in an environmental lawsuit for the novice lawyer. In its chronicling Unocal's tactics, it provides the inexperienced lawyer with insight into the roadblocks that will be thrown in a plaintiff's way. Wolcott also grimly illustrates the sometimes harsh costs of winning—the destruction of the heart of a town, the loss of residents, businesses, and tourists, and in the case of Avila Beach—a bit of the "funkiness" that the town cherished. *David, Goliath and the Beach Cleaning Machine*, may not be as riveting or compelling a read as *A Civil Action*, but it stands on its own as a further exploration of how the law helps us bring about environmental justice.

WORLD NEWS BITS

By Roger Phillips

Americas

Amazon Deforestation Rate Jumps 40%

A group of environmental experts warned that four infrastructure projects in the Amazon have caused a rush of deforestation even before building has begun. The report on the world's largest tropical forest, by international environmental experts charged with advising Brazil and rich countries donating to a program which has channeled \$350 million to conserving the Amazon, came after data in June showed the Amazon deforestation rate jumped 40 percent last year. Profitable soy farming is seen as a special threat. Roughly 15 percent of the Amazon - an area larger than western Europe of continuous tropical forest that is home to up to 30 percent of the world's animal and plant species - has so far been cut down. Annual Amazon deforestation rose to 9,840 square miles last year, an area slightly smaller than Haiti, from 7,010 square miles in 2001. The report recommended that the projects be reconsidered to take into account long-term environmental impacts and urged that the wide-scale problem of illegal land deeds in the Amazon be formalized, which could make monitoring considerably easier for the government.¹

Ecuadorian Indians Sue Chevron Texaco

Ecuadorian Indians filed a billion dollar lawsuit demanding that ChevronTexaco clean-up Amazon jungle after allegedly dumping toxins that destroyed rivers and made people sick. Lawyers for the Indians filed the suit at the Superior Court in Lago Agrio, marking the first time the decade-old case will be heard in Ecuador after years of U.S. court battles over jurisdiction. Plaintiffs accuse subsidiary Texaco Petroleum Co. of dumping water laden with oil and metal salts like mercury and cadmium into Amazon rivers from 1972 to 1992 instead of reinjecting these waters into the ground. Indians also say Texaco dumped this oily wastewater into pits that seeped toxins into the soil, damaging crops, killing farm animals and causing cancer in local communities, according to a copy of the lawsuit provided by the plaintiffs. The case was first filed in the United States in 1993. But the U.S. Second Circuit Court of Appeals last year affirmed a ruling that Ecuador was a more appropriate venue. Lawyers, who say they represent 30,000 people, allege Texaco dumped roughly 18.5 billion gallons of oil-laden water during operations and demand that the company pay for a clean-up estimated \$1 billion.²

Africa

Beetles Save Money For Benin

Two species of beetle are credited with saving the economy of Benin in West Africa \$260 million over 20 years. Between them, they have overpowered an aquatic super-weed that kills fish, interferes with boats and changes the ecology of lakes. Floating mats of the water hyacinth can double in size in less than two weeks, with the sheer density of its foliage making fishing and boating all but impossible. In addition, it gives cover to crocodiles, making it hazardous for local people to collect water.

Harvesting of the weed has proved futile because it grows so fast. In the late 1980s, Nigeria spent \$1.75 million on machinery to chew up the plants, without making any impact. Pesticides are another option, but they pollute the water and kill other plants. The most effective weapons, though, have been the weevils *Nechetina eichhorniae* and *N. bruchi*, which eat water hyacinth and nothing else. Setting them onto the weed can cut coverage by up to 90 per cent. The beasts were first introduced to Sudan, but have now been deployed across Africa.³

Corporate Misfeasance Blamed For Starvation in Lesotho

As two million people in Lesotho are in need of international food aid to avoid starvation, a criminal conviction suggests that irresponsible corporate conduct may contribute to such development problems. Last May, a Maseru court sentenced the former head of the Lesotho Highlands Water Project, Mauspha Sole, to 18 years in prison for bribery. The court found Sole accepted \$3 million from Western companies in exchange for lucrative contracts on the massive dam scheme which was meant to provide electricity and water to South Africa downstream. Lesotho's hope is that by prosecuting the multinational construction and engineering conglomerates who paid the kickbacks will serve as a cautionary tale to Western contractors.⁴

Zambia Adopts Biosafety Measures

Seven months after Zambia rejected genetically modified foods and banned American transgenic food donations from entering its territory, the Zambian government has developed a National Biosafety and Biotechnology Strategy Plan. The five year plan, from 2003 to 2007, addresses the proliferation of genetically modified organisms (GMOs) in the country. It also sets the pace for Zambia to develop biosafety

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regulations to protect the country's unique biodiversity. The new biosafety and biotechnology framework identifies seven core program areas. These include environment and biodiversity, which aims at conserving the genetic diversity of Zambia's crops. Other program areas are livestock, fish, and the control of environmental pollution. The plan also aims at enacting legislation that will govern the research, development, and utilization of genetically modified organisms.⁵

Middle East

Bush Provides Immunity to Oil Industry Work in Iraq

A executive order signed by President Bush more than two months ago is raising concerns that U.S. oil companies may have been handed blanket immunity from lawsuits and criminal prosecution in connection with the sale of Iraqi oil. In countries such as Nigeria, law suits have been used to prevent oil companies from destroying the environment and using militias to quell local protest of corporate practice. However, if the language of the new executive order is given its plain meaning, it could completely shield oil companies from liability – even if it could be proved that they had committed human rights violations, bribed officials or caused great environmental damage in the course of their Iraqi-related business.⁶

Asia

Three Gorges Dam Resettles 1.3 Million

The 1.4 mile wide Three Gorges dam closed its gates in an effort to provide electricity and flood control for communities downstream. The Chinese government will resettle 1.3 million Chinese to make room for the expected 600 foot deep, 365 mile long lake. However, there remain significant criticisms of the project's ability to fulfill its purpose. Some criticize that it will become a slow-moving cesspool choked with sediment and toxic pollutants and that the rapid accumulation of silt will limit power production and flood control and reduce the dam's lifespan to just 50 years.⁷

Tokyo Warned of Power Shortage Without Nukes

Japan's trade and industry minister warned that the Tokyo area could suffer power shortages if Tokyo Electric Power Co Inc is unable to restart more nuclear reactors. TEPCO, the world's largest stock exchange-listed power utility, has been forced to successively close down its reactors for safety checks since last September after it acknowledged falsifying some data on past inspections. A large obstacle to TEPCO restarting its reactors is the Japanese public's concerns

about safety, which have been stoked by a series of accidents at nuclear plants. TEPCO has turned to thermal power plants to cover the void left by the loss of nuclear power, which typically accounts for a little over 40 percent of its power supply. TEPCO's reliance on thermal power has also forced a huge rise in the company's consumption of fossil fuels.⁸

(Endnotes)

¹ Axel Bugge, *Environmentalists Warn of Roads, Dams in Amazon*, REUTERS NEWS SERVICE available at <http://www.planetark.org/dailynewsstory.cfm/newsid/20708/story.htm>

² Amy Taxin, *Ecuador Indians Sue Texaco Over Polluted Water*, REUTERS NEWS SERVICE available at <http://www.planetark.org/dailynewsstory.cfm/newsid/20745/story.htm>.

³ James Randerson, *Weevils Save Lakes From Water Hyacinth*, NEW SCIENTIST, May 10, 2003, at 10.

⁴ Jason Beaubien, *Bribery Scandal in Lesotho*, MORNING EDITION NPR, May 19, 2003 available at 2003 WL 4857618.

⁵ Singy Hanyona, *Zambia Develops Biotechnology Strategy*, ENS NEWS SERVICE, April 29, 2003 available at <http://ens-news.com/ens/apr2003/2003-04-29-01.asp>.

⁶ Lisa Girion, *Immunity For Iraqi Oil Dealings Raises Alarm; Some Contend Bush's Order Grants U.S. Firms a Broad Exemption, A View The Government Rejects*, L.A. TIMES, August 7, 2003 available at WL 2425952.

⁷ Editorial, *Determined Disaster*, THE BALTIMORE SUN, June 4, 2003 available at 2003 WL 57161345.

⁸ Taiga Uranaka, *Rising Fuel Costs Bludgeon Tepco Profits*, THE JAPAN TIMES, May 21, 2003.

INTERNATIONAL CALENDAR

SEPTEMBER

2-5 - Brisbane, Australia

Sixth International River Symposium 2003

Web: <http://www.riverfestival.com/au/symposium>

5-7 - Cancun, Mexico

18th Session of the Global Biodiversity Forum: "Biodiversity, Trade and Sustainable Development"

Web: <http://www.gbif.ch>

6-9 - Muscat, Oman

International Conference on Waste Management & Pest & Rodent Control

Web: 4748@mctmnet.gov.om

8-17 - Durban, South Africa

The 5th World Parks Congress

<http://www.iucn.org/themes/wcpa/wpc2003/>

9-12 - Delft, the Netherlands

Sixth Water Information Summit

Web: <http://www.nieindia.org/conferences.htm>

9 - Cozumel, Mexico

High Level Ministerial Dialogue on Trade and Environment—closed meeting

Web: elendo@semarnat.gob.mx

10-11 - Prague

International Conference for a Sustainable Future

Web: <http://www.unesco.org/iau>

15-18 - St. Michielsgestel, The Netherlands

Information to Support Sustainable Water Management: from Local to Global Levels

Web: <http://www.mtm-conference.nl>

17-21 - Pantanal, Brazil

Interlinkages: Water Resources Management in the Pantanal Wetland

Web: <http://www.ias.unu.edu>

17-19 - Catania, Italy

Second International Conference on the Impact of Environmental Factors on Health

Web: <http://www.wessex.ac.uk/conferences/2003/healthrisk03/index.html>

21-28 - Quebec, Canada

12th World Forestry Congress

Web: <http://www.cfm2003.org>

21-23 - Porquerolles, France

International Workshop on Sustainable Fisheries and Biodiversity

Web: <http://iucn.org/places/medoffice/indexEN.htm>

23-30 - New Delhi, India

International Conference on Ecorestoration

Web: <http://www.nieindia.org/conferences.htm>

25 - Quebec City, Canada

Certification and World Forestry

Web: <http://www.CertificationWatchConference.org>

29 SEPT. - 3 OCT. - Moscow, Russian Federation

The Third World Conference on Climate Change

Web: <http://www.meteo.ru/wcc2003.econc.htm>

OCTOBER

2 - Toronto, Canada

Round Table: "An Unwelcomed Dimension of Trade: The Impact of Alien Invasive Species in North America"

Web: <http://www.ccc.org>

3 - 6 - Sydney, Australia

The 3rd International Conference on Wildland Fire and International Wildland Fire Summit

Web: <http://www.wildlandfire03.com/home.asp>

4 - 10 - Tsukuba, Japan

Forum on Biodiversity Information: Building Capacity in Asia and Oceania

E-mail: biodiv@ics-inc.co.jp

5 - 8 - Marburg, Germany

International Workshop "Biological Resources and Migration"

Web: <http://staff-www.uni0marburg.de/~werner>

5 - 9 - Madrid, Spain

XI World Water Congress - Water Resources Management the 21st Century

Web: http://www.cedex.es/iwracongress2003/en/hoja2_en.htm

6 - 10 - Japan

7th Governing Board Meeting of the Global Biodiversity Information

Web: <http://www.gbif.org>

INTERNATIONAL CALENDAR

6 - 10 - Vienna, Austria

International Symposium on Application of Gene-based Technologies for Improving Animal Production and Health in Developing Countries
Web: <http://www.fao.org/ag/age/d3/mtc/symposium2003.html>

14 - 15 - Dubrovnik, Croatia

Groups of Experts on Emerald Network and Pan-European Ecological Network
Web: http://www.coe.int/T/E/Cultural_Cooperation/Environment/

15 - Montreal, Canada

Indigenous Peoples' Contributions to Understanding Global Environmental Change
Web: <http://www.cine.mcgill.ca>

16 - 18 - Montreal, Canada

2003 Open Meeting of the Human Dimensions of Global Environmental Change Research Community
Web: <http://sedac.ciesin.columbia.edu/openmeeting>

16 - 17 - Dubrovnik, Croatia

4th International Symposium of the Pan-European Ecological Network on the theme: "Marine and Coastal Biological Diversity and Protected Areas"
Web: http://www.coe.int/T/E/Cultural_Cooperation/Environment/

20 - 24 - Geneva, Switzerland

Second Meeting of the Open-ended Working Group of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (OEWG 2)
Web: <http://www.basel.int>

22 - 24 - Christchurch, New Zealand

Greening the City: Bringing Biodiversity Back into the Urban Environment
Web: <http://www.rnzih.org.nz/pages/conference2003.htm>

25 - 28 - Ottawa, Canada

Symposium: Biodiversity and Health, Using and Sustaining Medicinal Resources
Web: <http://www.synapse.net/~tropical>

27 - 30 - Kiev, Ukraine

30th Pacem in Maribus. A Year after Johannesburg, Ocean Governance and Sustainable Development: Ocean and Coastas - a Glimpse into the Future
Web: <http://www.30pim.sevinfo.net>

28 - 29 - Geneva, Switzerland

WTO Committee on Trade and Environment
Web: <http://www.wto.org>

NOVEMBER

1 - 7 - Bangkok, Thailand

Fourth Session of the Intergovernmental Forum on Chemical Safety (IFCS)
Web: <http://www.ifcs.ch>

3 - 7 - Ft. Lauderdale, USA

Invasive Plants in Natural and Managed Systems: Linking Science and Management and 7th International Conference on the Ecology and Management of Alien Plant Invasions
Web: <http://esa.org/ipinams-emapi7/>

3 - 8 - Yokohama, Japan

35th Session of the International Tropical Timber Council
Web: <http://www.itto.or.jp>

4 - 7 - Rome, Italy

2nd Session of the Intergovernmental Working Group on Plant Genetic Resources for Food and Agriculture (ITWG/PGRA)
Web: <http://www.fao.org>

6 - 9 - Piura, Peru

First International Congress in Dry Forest
Web: <http://www.udep.edu/pe/upadi>

6 - 8 - Montreal, Canada

International Workshop on Forest Protected Areas
Web: <http://www.biodiv.org>

10 - 14 - Nairobi, Kenya

15th Meeting of the Parties to the Montreal Protocol
Web: <http://www.unep.org/ozone>

10 - 12 - Glasgow, UK

The BCPC International Congress - Crop Science & Technology 2003
Web: <http://www.bcpc.org/Congress2003/About/index.asp>

12 - 15 - Florence, Italy

Monitoring and Indicators of Forest Biodiversity in Europe
Web: http://www.efi.fi/events/2003/Monitoring_and_indicators/

INTERNATIONAL CALENDAR

12 - 14 - Paris, France

Global Conference on Oceans, Coasts and Islands: Mobilizing for Implementation of the Commitments made at the 2002 World Summit on Sustainable Development
Web: <http://www.unesco.org>

17 - 21 - Geneva, Switzerland

10th Intergovernmental Negotiating Committee (INC) for PIC Procedure for Certain Hazardous Chemicals and Pesticides in International Trade
Web: <http://www.pic.int>

17 - 21 - Rome, Italy

FAO/WHO Expert Consultation on Genetically Modified Animals (Fish)
Web: <http://www.fao.org>

23 - 26 - Banff, Canada

Banff Mountain Summit 2003 - Mountains as Water Towers
Web: <http://www.banffcentre.ca>

26 - 28 - Rome, Italy

Council of FAO (125th Council)
Web: <http://www.fao.org>

DECEMBER

1 - 5 - Queenstown, New Zealand

Deep Sea 2003 Conference
Web: <http://www.deepsea.govt.nz/index.aspx>

1 - 5 - Melbourne, Australia

13th International Symposium on the Biology of Actinomycetes
Web: <http://www.conferencestrategy.com.au>

1 - 4 - Stransbourg, France

22nd Meeting of the Standing Committee to the Convention on Conservation of European Wildlife and Natural Habitats
Web: http://www.coe.int/T/E/Cultural_Cooperation/Environment/

1 - 12 - Milan, Italy

9th Session of the Conference of the Parties to the UN Framework Convention on Climate Change plus COP-MOP Kyoto Protocol (Subject to entry into force)
Web: <http://unfccc.int>

1 - 14 - Málaga, Spain

Advanced Seminar on Protected Areas Management and Local Development in the Mediterranean Context
Web: <http://www.uicnmed.org>

1 - 4 - Berlin, Germany

Sustainable Use and Conservation of Biological Diversity: A Challenge for Society
Web: <http://www.biodiversity-symposium.de>

1 - 12 - Milan, Italy

19th Session of the Subsidiary Bodies (SBI and SBSTAS) UN Framework Convention on Climate Change.
Web: <http://unfccc.int>

8 - 12 - Kuala Lumpur, Malaysia

The International Conference on the Sustainable Development of the East Asian Seas: Towards a New Era of Regional Collaboration and Partnerships
Web: <http://way.to/seacongress>

10 - 13 - Kathamandu, Nepal

International Conference on Himalayan Biodiversity: "Conservation of Himalayan Biodiversity for Human Welfare"
Web: <http://hirinepal.com>

15 - 17 - Chennai, India

Third International Conference on Environment and Health
Web: <http://www.yorku.ca/bunchmj/ICEH/>

SOURCE: CONVENTION ON BIOLOGICAL DIVERSITY'S CALENDAR OF EVENTS
WWW.BIODIV.ORG/EVENTS

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