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ARTICLE

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Brett Buchheit

NOTE

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The purpose of the *Texas Environmental Law Journal* is to provide the members of the Environmental and Natural Resources Law Section of the State Bar of Texas and the public with legal articles and recent development columns on relevant environmental and natural resources law issues. The *Journal* also provides news of Section activities and other events pertaining to this area of law. The *Journal* is the leading source for articles on Texas environmental and natural resources law.

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The *Texas Environmental Law Journal* is an official publication of the Environmental and Natural Resources Law Section of the State Bar of Texas and is published jointly with the University of Texas School of Law's *Texas Environmental Law Journal*. In 1990, the Environmental and Natural Resources Law Section reached an agreement with this student organization at the University of Texas School of Law to co-produce the *Journal* as the *Texas Environmental Law Journal*. The students' involvement began with the summer issue in 1990.

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Due to the production demands of instituting a new format for the *Journal* and switching publishers, we will not publish Issue No. 4 for Volume 37 (Summer 2007).

If you are interested in becoming the Recent Developments Columnist for Casenotes – Federal or for Publications, please contact the Recent Developments Associate Editor, Lyn Clancy, or the Editor-in-Chief, Jimmy Alan Hall, whose contact information is listed above

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The *Journal* is soliciting articles from authors on environmental and natural resources subjects that will assist Texas environmental and natural resource law practioners and develop the advancement of environmental and natural resource law.

If you are interested in submitting an article, please contact:

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3. Editor-in-Chief (jahall@fbjah.com)

From The Editors

Dear Readers,

Welcome to Issue Number Two of the 2007-2008 publication year.

Our lead article is written by Brett Buccheit, who publishes regularly on environmental topics and is currently practicing with the Frankle Law Firm in Denver, Colorado. Responding to what is now incontrovertible evidence that humans are contributing to global climate change, Brett's article discusses the economic feasibility of renewable energy technologies. His paper takes an in depth look at all the major sources of renewable energy available today and discusses how the United States could limit the use of fossil fuels without suffering financial ruin.

This issue's student note is written by our own Note Editor, Bina Reddy. Bina has graduated in May 2008 from the University of Texas School of Law and will be working as an associate in the D.C. office of Beveridge & Diamond, PC. In her note, Bina discusses recent changes in NEPA reviews of highway projects in the context of the Trans Texas Corridor. Specifically she argues that the new streamlined procedures will undermine NEPA's goals by upsetting the delicate balance among state transportation agencies, the federal government, and private developers.

We hope you enjoy the issue.

Jimmy Alan Hall
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The Economics of Alternative Energy: Decisions Following the IPCC's Report on Climate Change

By Brett Buchheit

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Cassandra, of ancient Greek myth, was doomed to see the future, but to have no one believe her.

Brett Buchheit also sees the future, and it's not pretty: rapidly rising global temperatures, which will lead inexorably to rising ocean levels, environmental degradation, famine, pestilence and war. All of it caused by human activity. All of it preventable, using current technologies. And, too few people will believe him.

It is often noted that, with the advent of nuclear weapons sixty years ago, humanity first gained the power to destroy itself. Little did we know, however, that we had already created a more insidious means of self-destruction: the combustion of fossil fuels. Scientists have recognized this phenomenon for decades, but with the notable exception of Al Gore, few of us listened to them. We didn't want to hear what the scientists had to say. We didn't want to change our ways. And, anyway, how could they be so sure? Our reluctance was encouraged by those with vested interests: like the tobacco companies before them, many carbon-emitting industries did everything in their power to foment doubt and inaction. Many still do.

Now, however, the evidence is incontrovertible: carbon dioxide, along with other greenhouse emissions, is rapidly turning our planet's atmosphere into a Venus-like soup of heat-trapping gasses. Things are not very pleasant on Venus.

As I write these words, it is mid-December in the mountains of Central Appalachia. My office window is open. It is nearly 70 degrees outside.

Let's hope that Brett Buchheit has more luck than Cassandra.

– Stewart Harris, Associate Professor at the Appalachian School of Law

I. Introduction

In 2007 the United Nation's Intergovernmental Panel on Climate Change (IPCC) issued *Climate Change 2007: The Physical Science Basis*, a report that made headlines across the planet.[1] Considered the first major scientific study that established a firm, incontrovertible connection between climate change and man, the IPCC report stated that global warming is, without a doubt, created by human activity.[2] The report concluded that the impacts will be severe, will continue for centuries, and will create a far different planet in the next century than the one we know presently — one in which glaciers will melt causing sea-levels to rise and consume shore-based communities, and in which global temperatures may increase by as much as 4°C by 2100.[3] The IPCC warns that though mitigation efforts may be taken now to delay, reduce, or avoid these impacts, we may still experience them to some extent.[4]

Following on the heels of the IPCC report, the world's largest scientific society joined the alarm with a statement of their own. At its annual meeting, the American Association for the Advancement of Science (AAAS) declared, "The evidence is clear: Global climate change caused by human activities is occurring now and is a growing threat to society."[5]

In a statement about the IPCC report, AAAS President John Holdren stated, "In overwhelming proportions, this evidence has been in the direction of showing faster change, more danger, and greater confidence about the dominant role of carbon dioxide from fossil-fuel burning and tropical deforestation in causing the changes that are being observed."[6]

In the aftermath of the IPCC and AAAS reports, mountains of information began to appear in headlines across the world regarding the economics of renewable energy resources and their potential to avert the global warming disaster that the scientific community warns is concrete, incontrovertible, and definite. After the reports, significant debate began to center on economically-feasible alternatives to carbon-emitting

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1 Intergovernmental Panel on Climate Change, Fourth Assessment Report, Climate Change 2007: The Physical Science Basis (2007), http://www.ipcc.ch/ipccreports/ar4-wg1.htm [hereinafter IPCC Physical Science Basis].

2 Intergovernmental Panel on Climate Change, Fourth Assessment Report, Climate Change 2007: Synthesis Report, at Topic 6.1 (2007), http://www.ipcc.ch/ipccreports/ar4-syr.htm [hereinafter IPCC Synthesis Report].

3 *Id.*; IPCC Physical Science Basis, *supra* note 1, at 13.

4 IPCC Synthesis Report, *supra* note 2, at Topic 6.3.

5 Scientific Society Says Climate Change Is 'Growing Threat', Feb. 19, 2007, http://www.boston.com/news/nation/articles/2007/02/19/scientific_society_says_climate_change_is_growing_threat.

6 Am. Ass'n for the Advancement of Sci., New Archives, AAAS President: IPCC Report Underscores Need for Strong Action on Climate, http://www.aaas.org/news/releases/2007/0202ipcc.shtml [hereinafter AAAS President].

sources of energy. More specifically, is it possible some time in the near future that the U.S. could stop using fossil fuels — or begin to limit their use — without suffering financial ruin? What would be the financial consequences of such a switch? And, finally, what role does the global catastrophe warned of by the IPCC play in the equation, and does it create the need for a more expeditious move towards renewable energy sources?

Now, with the incontrovertible IPCC and AAAS predictions on the table, does reluctance to adopt these measurements move from merely uncharitable to a potentially deadly, cavalier attitude? Despite President Bush's declaration that the U.S. is "addicted to oil,"[7] both government and industry have been glacially slow to heed the decades-old warnings of scientists across the globe who cautioned about the impending disaster. What is the source of that reluctance, and will the new alarm force a change in the way we think about whether an alternative is truly viable? Does the impending global catastrophe suddenly make some alternatives more viable, regardless of their costs?

This article will investigate the economic potential of alternative energy resources. If America is "addicted to oil," what possible alternatives can be implemented to avoid what the AAAS has stated will be a "global climatic disruption"[8] in the very near future. This article will investigate industries that have already made the turn towards alternative and renewable energy resources, which at present constitute about 28 percent of the United States' primary energy supplies.[9] It will also discuss impediments to and successes of legislation, concerns from industry and investors, the "food v. fuel" debate with ethanol, and finally, the wealth of consumer choices reflecting a desire for lower carbon emissions.

Additionally, this article will serve to clarify the economics and environmental benefits of alternative and renewable energy. It will discuss current moves towards lower carbon emissions, both domestically and internationally. As the article will show, wise, economically viable alternatives are available, which will, hopefully, alleviate the catastrophic events the planet will face if we do not limit carbon emissions. Investors and governmental organizations are presently investigating and funding these alternatives. Some have already adopted the IPCC predictions as unequivocal events and have begun to provide alternatives to consumers. These alternatives, prudent in light of the given evidence, serve to add to domestic security for future U.S. energy needs.

This phenomenon is moving forward at break-neck speed, perhaps hastened by the IPCC and AAAS reports that state that we, as a planet, are at a point at which man's impact on climate change does not include the concept of "maybe." Technology

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7 President George W. Bush, Office of the Press Secretary, State of the Union Address (2006), http://www.whitehouse.gov/news/releases/2006/01/20060131-10.html [hereinafter State of the Union Address].

8 AAAS President, *supra* note 6.

9 *See* Rebecca Smith, *The New Math of Alternative Energy: Does Going Green Finally Make Economic Sense?*, WALL ST. J., Feb. 12, 2007, at R1 (This number reflects the percentage in the U.S. as of 2005 and breakdown of the percentage is 2.3 percent from renewable sources such as bio-mass and wind energy, 6.5 percent from hydroelectric power, and 19.3 percent nuclear power).

is making into reality things that were previously only theory. Changes are happening today that will hopefully save us from ourselves.

II. The Current Picture

According to the U.S. Department of Energy (DOE), the future energy concerns of the United States are directly linked to the simple notion of supply and demand.[10] This concept, according to the DOE, encompasses a variety of factors such as global stability, economic prosperity, and quality of life.[11] Confronting the difficulties behind supplying global consumer needs is a daunting task. According to the DOE, "Finding energy sources to satisfy the world's growing demand is one of society's foremost challenges for the next half-century."[12] Additionally, "The importance of this pervasive problem and the perplexing technical difficulty of solving it require a concerted national effort, marshalling our most advanced scientific and technological capabilities."[13]

To begin to understand larger notions in electricity and energy, one starts with the watt — the measuring block for electricity.[14] The watt is the production capacity of electrical generators and is usually measured in megawatts due the fact that one watt is a miniscule amount of power.[15] According to the DOE, "It would require nearly 750 watts to equal one horsepower. A kilowatt represents 1,000 watts. A kilowatthour (kWh) is equal to the energy of 1,000 watts working for one hour. The amount of electricity a power plant generates . . . is measured in kilowatthours (kWh)."[16]

DOE statistics report global energy expenditure is the equivalent of "a continuous power consumption of 13 trillion watts, or 13 terawatts (TW)."[17] In orders of magnitude, a megawatt is 10^6 watts, a gigawatt is 10^9 watts, and a terawatt is 10^{12} watts.[18]

The DOE measures U.S. energy consumption in quadrillion BTUs (BTU/q), where 1 watt is approximately 3.415 BTUs.[19] Statistics show U.S. energy consumption has risen from 54.02 quadrillion (in 1965) steadily throughout the years, measuring

10 U.S. Dep't of Energy, Energy Sources, http://www.energy.gov/energysources/index.htm (last visited Sep. 20, 2008).

11 U.S. Dep't of Energy, Energy Efficiency, http://www.energy.gov/energyefficiency/index.htm (last visited Sep. 20, 2008).

12 U.S. Dep't of Energy, Basic Research Needs for Solar Energy Utilization 3 (2005), http://www.sc.doe.gov/bes/reports/files/SEU_rpt.pdf [hereinafter DOE Solar Energy Utilization].

13 *Id.*

14 U.S. Dep't of Energy, Energy Kid's Page, http://www.eia.doe.gov/kids/energyfacts/sources/electricity.html (last visited Sep. 20, 2008).

15 *Id.*

16 *Id.*

17 DOE Solar Energy Utilization, *supra* note 12, at 3.

18 *Id.*

19 Eng'g Network, Metric Conversion Chart, Power (2008), http://www.engnetglobal.com/tips/convert.asp?catid=16.

72.00 in 1975, 76.50 in 1985, 91.17 in 1995, to 99.89 BTU/q in 2006.[20] This increase is approximately 85 percent increase over that 40-year span.

The DOE reports that the exponential rise in U.S. energy consumption will not decrease unless either supply or demand does so, in spite of attempts to use alternative means of energy.[21] The DOE states:

> Even with aggressive conservation and energy efficiency measures, an increase of the Earth's population to 9 billion people, accompanied by rapid technology development and economic growth world-wide, is projected to produce more than double the demand for energy (to 30 TW) by 2050, and more than triple the demand (to 46 TW) by the end of the century. The reserves of fossil fuels that currently power society will fall short of this demand over the long term, and their continued use produces harmful side effects such as pollution that threatens human health and greenhouse gases associated with climate change.[22]

In a recent statement before the U.S. Senate, Dr. Keith Collins, Chief Economist for the United States Department of Agriculture, cited the U.S. Energy Information Administration's 2007 statistical projections that placed U.S. energy consumption at 101 quadrillion Btus/q in 2006, eight times the level at the beginning of the last century.[23]

A. THE PRESENT US/FOREIGN POLITICAL CLIMATE REGARDING ENERGY SOURCES

At present, global consumption of energy focuses on three primary sources: coal, natural gas, and oil. Cumulatively, these sources provide for approximately "80% of the world's energy diet."[24] Along with international concerns regarding the clear impacts that carbon emissions have on climate change, the bulk of these source materials are located in places that have strained diplomatic relations with the United States. Although the U.S. has an abundance of domestic coal, the largest deposits of oil and gas are "found in volatile regions such as the Middle East, Africa and states of the former Soviet Union."[25] As a result, the U.S. is forced to direct diplomatic energy and efforts toward regions of the world that have proven to be hostile towards American overtures. As reported in the *Washington Post*, recent criticisms about the U.S.'s involvement in Iraq and the Middle East have hinged on the "war for oil" concept.[26]

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20 U.S. Dep't of Energy, Table 1.1 Energy Overview 1949-2006, http://www.eia.doe.gov/emeu/aer/txt/ptb0101.html.

21 DOE SOLAR ENERGY UTILIZATION, *supra* note 12, at 3.

22 *Id.*

23 Statement of Keith Collins, Chief Economist U.S. Dep't of Agriculture, Before the U.S. S. Comm. on Agriculture, Nutrition and Forestry, Jan. 10, 2007, at 2, http://www.usda.gov/oce/newsroom/congressional_testimony/Collins_011007.pdf [hereinafter Testimony of Keith Collins].

24 David Gauthier-Villars, *Trials of Nuclear Rebuilding*, WALL ST. J., Mar. 6, 2007, at A6.

25 *Id.*

26 Dan Morgan & David B. Ottaway, *In Iraqi War Scenario Oil is Key Issue*, WASH. POST, Sept. 15, 2002, at A01, http://www.washingtonpost.com/ac2/wp-dyn?pagename=

Despite the presence of domestically produced alternative sources of energy (many of which have few or no harmful environmental impacts), the United States continues to pursue energy sources overseas in relatively hostile, faraway places such as the Middle East, Africa, and Russia, and in nations closer to home. Venezuela, the fifth largest exporter of oil to the U.S., has inimical diplomatic relations with the United States.[27] Focusing on these strained relations, in a September 2006 speech to the United Nations, Venezuelan President Hugo Chavez made his opinion about President Bush clear, referring to Bush as "the devil."[28] Chavez, seeming to recognize that oil is a commodity with limits, stated both that as a planet, "we are facing an unprecedented energy crisis" and "oil is starting to become exhausted."[29]

Paradoxically, rather than focusing on domestic resources, the U.S. is turning a large amount of its attention to sources outside its borders. This approach has led nations to state that the U.S.'s assertion of authority and influence is unwanted. Yet despite pressure from the international community, the U.S. continues to seek out energy in places that are increasingly hostile towards our presence. As this article will discuss, the vast resources present in the U.S. suggest the U.S. has alternatives to depleting foreign-held assets. Rather than fighting politically and militarily, we can use the bountiful alternative energy sources within our own borders. The cry of "No More War for Oil" might become nomenclature of the past.

III. Types of Alternative Energy Sources

Alternatives to present energy sources encompass numerous technologies, all of which have experienced growth in recent years as their economic advantages become apparent. Several recent measures by the U.S. government have increased funding to alternative energy programs, and some measures have even created "prizes" for industries who reach certain goals. Additionally, U.S. government subsidies and guaranteed loan programs for industry further add to the economic advantages of turning towards alternative and renewable energy sources. By advancing technology in these sectors, eventually theories on paper become actual, fiscally-solid practice.

Wind, oceanic waves, solar, nuclear, hydrogen, geothermal, biomass, and biofuel have all been harnessed to produce energy with little or no carbon emissions. As companies show profits and production of these facilities increases, economic interest in them follows. Investors are beginning to move toward these technologies, mirroring the political pressure that has begun to force governments to rethink their use of oil, natural gas, and coal. The move to carbon-neutral systems is rapidly increasing.

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article&contentId=A18841-2002Sep14

27 *Venezuela's Oil Policy Has Risk Premium*, Forbes Online, Jun. 16, 2006, http://www.forbes.com/business/2006/06/15/venezuela-oil-chavez-cx_0616oxford.html.

28 *Chavez: Bush 'devil'; U.S. 'on the Way Down'*, CNN.com, Sept. 21, 2006, http://www.cnn.com/2006/WORLD/americas/09/20/chavez.un/index.html.

29 *President Chavez's Speech to the United Nations*, Venezuelaanalysis.com, Sept. 16, 2005, http://www.venezuelanalysis.com/articles.php?artno=1555.

A. BIOMASS

Biomass refers to energy production through the use of biological material, either living or recently living.[30] "Biomass," in the energy industry, generally refers to the use of cellulose material or wastes that biodegrade and produce fuel.[31] Biomass does not involve the use of chemicals for energy production, which generally falls under the category of "biofuel."[32] When cellulosic or biodegradable materials are allowed to decay in a controlled environment, they produce heat that can then be used directly at the site or at nearby facilities.[33] The term biomass also encompasses the containment and burning of these materials for heat.[34] For example, biomass energy can be produced by capturing methane from sources like cow manure and burning it. Not only is this process renewable, but it also prevents methane from entering the atmosphere and "methane is 21 times as damaging as carbon dioxide when it comes to global warming."[35]

The use of biomass has already been tapped as a leading source of energy, despite the fact it does not receive as much public attention as other sources.[36] As a recent *Wall Street Journal* article notes, "Biomass is the biggest source of renewable electricity in the U.S. today — producing more electricity than wind, solar and geothermal sources combined."[37] Gathering and burning landfill gas also produces a significant amount of electricity.[38]

1. BIG MONEY IN BIOMASS

Dr. Keith Collins, Chief Economist for the United States Department of Agriculture, in his January 10, 2007 comments before the U.S. Senate, stated, "U.S. consumers want an adequate, clean and affordable supply of energy. Renewable energy can help achieve that goal by utilizing naturally occurring sources such as . . . biomass. Renewable energy can reduce our dependence on fossil fuels, diversify energy sources, improve the trade balance, reduce environmental impacts, and generate income for farmers, ranchers, rural areas and others who harness these natural sources of energy."[39]

Dr. Collins stated that U.S. governmental involvement in biomass programs is key to the programs' success, through "technical assistance, loan and loan guarantee programs, and competitive grants." He cites as an example, Section 9006 of the 2002 Farm Bill, the Renewable Energy Systems and Energy Efficiency Improvements Program, which provided $73 million in grants and loans from 2003 to 2006. "This program makes loans, loan guarantees, and grants to farmers, ranchers and small

30 *See* U.S. Dep't of Energy, Biomass Program, Biomass FAQs, http://www1.eere.energy.gov/biomass/biomass_basics_faqs.html (last visited Sep. 20, 2008) [hereinafter Biomass FAQs].

31 *See id.*

32 *See* Smith, *supra* note 9, at R1.

33 *Id.*

34 *Id.*

35 TerraPass, Farm Energy Projects from TerraPass, http://www.terrapass.com/projects/formpower.html (last visited Sep. 20, 2008) [hereinafter Form Energy Projects].

36 *See* Smith, *supra* note 9, at R1.

37 *Id.*

38 *Id.*

39 Testimony of Keith Collins, *supra* note 23, at 1.

rural businesses to purchase renewable energy systems and make energy efficiency improvements."[40]

Not all incentives, however, are small-scale. Following the statements of Dr. Collins, USDA Secretary Mike Johanns released the Administration's proposal for reauthorization of the Farm Bill, highlighted by the Biomass Research and Development Act Initiative's $150 million allocation of funding, and a Renewable Energy System and Energy Efficiency Grant of $500 million.[41] The USDA proposal includes several expanded energy programs and would increase funding to approximately $70 million per year for grants and guaranteed loans and grants.[42]

According to a press release, the USDA "listened closely to producers and stakeholders all across the country and took a reform-minded and fiscally responsible approach to making farm policy more equitable, predictable and protected from challenge."[43] "We started with the 2002 Farm Bill and propose[d] to improve it by bolstering support for emerging priorities and focusing on a market-oriented approach."[44]

Some have criticized the allocation of funding in the Farm Bill as too meager. According to Farm Energy Online's Environmental Law and Policy Center, the proposed increase of $70 million a year for guaranteed loans is "far less than other proposals to increase the program to at least $250 million a year by 2012."[45] Funding "does not keep pace with grant requests for *this* year, let alone in future years as the industry grows."[46] The organization criticized the USDA proposal, stating it shows the rank of various environmental programs "among the Administration's priorities."[47] Farm Energy stated the USDA prioritized water enhancement and wetlands reserve programs over their funding needs.[48]

At present, several organizations are developing biomass facilities, such as International Paper Co., Weyerhaeuser Co., Koch Industries' Georgia-Pacific Corp., the California Biomass Collaborative study, and Terrapass.[49]

2. Problems with Biomass

One of the economic downsides of biomass is its limited output, given the size of facilities. The *Wall Street Journal* explains,

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40 *Id.*

41 U.S. Dep't of Agriculture, Farm Bill News Release, *Johanns Unveils 2007 Farm Bill Proposals*, Jan. 31, 2007, http://www.usda.gov/wps/portal/!ut/p/_s.7_0_A/7_0_1UH?contentidonly=true&contentid=2007/01/0020.xml [hereinafter Farm Bill Proposal].

42 Farm Energy Online, Envtl. Law and Policy Ctr., *USDA Releases Administration Farm Bill Reauthorization Proposal*, http://www.farmenergy.org/newsitem.php?item_id=197 [hereinafter Farm Energy Online].

43 Farm Bill Proposal, *supra* note 41.

44 *Id.*

45 Farm Energy Online, *supra* note 42.

46 *Id.*

47 *Id.*

48 *Id.*

49 Smith, *supra* note 9, at R1.

> Because biomass plants typically are small — usually less than 50 megawatts in capacity, or one-tenth the size of a conventional fossil-fuel power plant — equipment costs are high relative to the amount of power produced. That, in turn, makes generating costs somewhat high — currently, about 5 cents to 10 cents a kilowatt hour without subsidies.[50]

Additional economic difficulties with biomass should improve with governmental involvement. According to Dr. Collins, "Harvesting, bailing, storing, and transportation of biomass are expensive compared with corn. Research and investment capital are now being directed at overcoming these barriers."[51]

B. BIOFUELS

A biofuel is any fuel that is created from biomass material.[52] The main difference between biomass and biofuel is that biomass does not involve the addition of any chemicals to the mixture, whereas biofuels require the addition of a solvent (such as glycerin), which then enhances fuel potential by removing unwanted materials.[53] The creation of biofuel involves "converting organic-based matter into burnable fuel as a replacement for fossil fuel."[54] The most prevalent of these biofuels are ethanol and biodiesel.[55] Biofuel is the technology that could someday enable Joe Consumer to wander down to the local fish-fry, pick up the restaurant's waste grease, dump it into a home-conversion kit, and pump out fuel into his diesel engine.

Due to soaring gasoline prices, biofuels have recently jumped into public view. Organizations, such as the New Orleans Biofuel Initiative (NOBI), are presently at work on a cooperative in which consumers would pay a fee to have "greasoline" available to them.[56] "The Big Easy loves its fried food, producing hundreds of thousands of gallons of waste vegetable oil each year," and NOBI would put it all to good use, offering consumers the option of "running vehicles on B100 or even Straight Vegetable Oil (SVO)."[57] NOBI has recently begun to gather support for a coop facility that would produce 10,000 gallons of biodiesel a year.[58]

According to Eileen Beall of NOBI, using biofuels has potential additional incentives. She explains,

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50 *Id.*
51 Testimony of Keith Collins, *supra* note 23, at 13.
52 Biomass FAQs, *supra* note 30.
53 *Id.*
54 Free Energy News, Biofuel, http://www.freeenergynews.com/Directory/Biofuel.
55 Biomass FAQs, *supra* note 30.
56 New Orleans Biodiesel Initiative, Common Ground Relief, http://www.commongroundrelief.org/node/157 (last visited Sep. 20, 2008).
57 *Id.*
58 *Id.*

> We are still trying to sort out whether or not we can get any federal tax break on 100% biodiesel, or if it must be blended with petroleum to get the credit - even 1% counts, but requires getting petroleum blending and storage permits. Even so, the credit is $1 for agri-biodiesel (really $.01 per percentage of biodiesel) but only $.50 (or $.005 per percentage) for waste-oil biodiesel.[59]

At present, dozens of companies in the U.S. are mirroring NOBI's efforts. These organizations are presently selling biofuel home conversion kits that allow consumers the option of mixing fuels at home. Companies such as "Greasecar" and "Greasel" offer "everything you need to run your diesel car on 100% vegetable oil."[60] The conversion kits prepare a standard diesel engine for biofuel use. A side-industry has also sprung up in which companies will convert vehicle engines into "greasoline-capable" engines. Los Angeles-based Lovecraft Biofuels boasts that it has "converted close to 2,000 vehicles to run on vegetable oil," and they "have customers from around the world successfully running on [their] conversions."[61]

Converted public buses, which run on biodiesel, are already prevalent across the U.S., and their efficiency is as high as it would be if running normal diesel. According to a joint EPA and DOE report, "the production processes for biodiesel and petroleum diesel are almost identical in their efficiency of converting a raw energy source into a fuel product. The difference between these two fuels is in the ability of biodiesel to utilize a renewable energy source."[62]

Sizable interest lies in the field of biofuels, as reflected by Dr. Collins' comments before the Senate. Dr. Collins stated that "biofuels from agricultural crops are a rapidly growing source of renewable energy, with exciting prospects for the future."[63]

According to USDA figures, the use of biofuels has expanded exponentially. "In 2000, about 1.6 billion gallons of ethanol were produced in the United States, with ethanol utilizing about 6 percent of the 2000 corn harvest. In 2006, an estimated 5 billion gallons of ethanol were produced, and ethanol accounted for 20 percent of the 2006 corn harvest."[64]

As the use of biofuels increases, ethanol plants are being constructed across America. The USDA states, "Renewable Fuels Association data indicates there are now 110 ethanol plants with total capacity of 5.4 billion gallons and another 73 ethanol plants under construction and another 8 facilities expanding."[65]

Considering the increases in oil prices and the accompanying expansion of technology behind biofuels, it is anticipated that biofuel plants will soon create higher

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59 Email from Eileen Beall, New Orleans Biodiesel Initiative, to Brett Buchheit (Mar. 15, 2007, 11:43 CST) (on file with author) [hereinafter NOBI Email].

60 Greasecar, Vegetable Fuel Systems, http://www.greasecar.com/products.cfm (last visited Sep. 20, 2008).

61 Lovecraft Biofuels, http://www.lovecraftbiofuels.com (last visited Sep. 20, 2008).

62 U.S. Dep't of Agriculture & U.S. Dep't of Energy, Life Cycle Inventory of Biodiesel and Petroleum Diesel for Use in an Urban Bus v (1998), http://www.nrel.gov/docs/legosti/fy98/24089.pdf.

63 Testimony of Keith Collins, *supra* note 23, at 1.

64 *Id.* at 2.

65 *Id.*

outputs with smaller units. As a result, future production of biofuels is expected to increase. According to Dr. Collins, "When construction and expansion are completed, ethanol capacity in the United States will be 11.4 billion gallons per year, which is likely to occur during 2008-09. To provide an indication of how rapidly this expansion is occurring, in August 2006 [. . .] the capacity of known plants and those under construction and expansion was 7.4 billion gallons," which he notes is some 4 billion less than estimates of the current capacity.[66]

Rebecca Smith, of the *Wall Street Journal*, writes,

> Interest in alternative transportation fuels—mostly ethanol—soared following President Bush's declaration a year ago that the U.S. is 'addicted to oil.' Many potential fuels are being discussed, from biodiesel to hydrogen. Most of the buzz is around what's already by far the biggest alternative transportation fuel in the U.S.: ethanol made from corn.[67]

The United States, as evidenced by the large funding programs coming from the USDA, has suddenly jumped on the biofuel-bandwagon. The *New York Times* tracks the use of words during the Presidential State of the Union addresses and compares them with the occurrence of the word in previous years. In his most recent address, President Bush mentioned "alternative fuels" twice, after having never used the phrase once in previous years.[68]

According to Smith, "There's lots of talk about the possibility of using ethanol as a standalone fuel to power cars, but virtually all the ethanol consumed in the U.S. today is used in a less-sexy way: It's blended into normal gasoline."[69]

1. BIOFUEL PROBLEMS

Ross Douthat of the *Atlantic* commented, "Like most alternative fuels, ethanol has problems on both the demand and supply sides of the equation. Fuels that consist primarily of ethanol — like E85, which contains only 15 percent gasoline — cost about as much as regular gas and deliver fewer miles per gallon."[70] Douthat continued, "If demand were high for such a fuel, there wouldn't be enough to go around. The industry is capable of producing about 4.8 billion gallons of ethanol a year; the United States consumes roughly 140 billion gallons of gasoline annually."[71]

According to Eileen Beall of the NOBI, "The most important challenge for any biofuel in the next several years will be finding a sustainable feedstock source. Since current large-scale intensive agricultural practices are extremely unsustainable, a fuel

66 *Id.* at 2–3.

67 Smith, *supra* note 9, at R1.

68 *The Words that Were Used, The State of the Union Address 2007*, N.Y. TIMES ONLINE, http://www.nytimes.com/ref/washington/20070123_STATEOFUNION.html?initialWord=energy [hereinafter Words that Were Used].

69 Smith, *supra* note 9, at R1.

70 Ross Douthat, *The God of Small Things*, THE ATLANTIC, Jan.–Feb. 2007, at 122, http://www.theatlantic.com/doc/200701/douthat-venter.

71 *Id.*

that requires increasing our agricultural output will only exacerbate this problem."[72] Beall added,

> It should be noted that waste oil will never meet more than a fraction of the total diesel demand in America [. . . .] Biodiesel from waste oil should be considered one of a "portfolio" of many sources, which together fulfill the demand in a sustainable manner. Even better would be to reduce the demand in the first place - *i.e.,* design walkable cities, encourage biking, etc.[73]

If Beall is right, then why all the excitement over ethanol? Douthat explains, "The answer isn't in corn kernels, but in the stalks, roots, and leaves of corn and other plants—'cellulosic' material that's historically been difficult to break down into sugars efficiently, but that now might be only a few breakthroughs away from becoming the source that makes ethanol available on the cheap."[74]

C. Geothermal Power

Geothermal power involves locating areas below the surface of the Earth that contain geothermic pressure and then "tapping" their pressurized steam and water by use of turbines that spin and generate electricity. Although not technically a "renewable" energy resource (due to the fact the geothermal pressure, when released, is depleted), this area is an expanding alternative energy field, with perhaps greater prospects than any other sources.

Rebecca Smith of the *Wall Street Journal* explained the process behind harnessing geothermal heat.

> "Geothermal heat is turned into electricity through a number of methods. In general, producers drill into the ground to release steam and water that have been naturally heated, and until then, trapped. These are used to power a turbine and generator, making electricity. Liquids are reinjected into the ground to keep the process running."[75]

"Geothermal energy" Smith posits "may have more potential, and less impact to society, than any of the other alternative resources."[76] A 2007 study on geothermal energy from an interdisciplinary team at the Massachusetts Institute of Technology (M.I.T.) supports Smith's conclusions, finding that "geothermal energy could produce 10% of the nation's electricity by 2050 at prices that would be competitive with fossil fuels."[77] The same study determined that this enormous energy source could be har-

72 NOBI Email, *supra* note 59.
73 *Id.*
74 Douthat, *supra* note 70, at 122.
75 Smith, *supra* note 9, at R1.
76 *Id.*
77 Mass. Inst. of Tech., News Office, *MIT-led Panel Backs 'Heat Mining' as Key U.S. Energy Source*, http://web.mit.edu/newsoffice/2007/geothermal.html [hereinafter MIT News Office].

nessed "with minimal environmental impact."[78] M.I.T.'s Tester stated, "This environmental advantage is due to low emissions and the small overall footprint of the entire geothermal system, which results because energy capture and extraction is contained entirely underground, and the surface equipment needed for conversion to electricity is relatively compact."[79]

M.I.T.-led, and DOE-sponsored study, *The Future of Geothermal Energy*, was the first of its kind in almost 3 decades on the subject. It focused on economic viability and environmental aspects behind enhanced geothermal system (EGS) technology.[80] The study found that,

> [a]lthough geothermal energy is produced commercially today, and the United States is the world's biggest producer, existing U.S. plants have focused on the high-grade geothermal systems primarily located in isolated regions of the west. This new study takes a more ambitious look at this resource and evaluates its potential for much larger-scale deployment.[81]

Jefferson W. Tester, Professor of Chemical Engineering at M.I.T. and the panel's head, stated,

> We've determined that heat mining can be economical in the short term, based on a global analysis of existing geothermal systems, an assessment of the total U.S. resource and continuing improvements in deep-drilling and reservoir stimulation technology. EGS technology has already been proven to work in the few areas where underground heat has been successfully extracted. And further technological improvements can be expected.[82]

According to REN21, Renewable Energy Policy Network for the 21st Century, whose members span the globe from Morocco to the United States, geothermal energy usage has increased dramatically. It cites an increase in the U.S. of 0.5 gigawatts and a global increase of 9 percent.[83] Additionally, 7 percent of the $38 billion invested in alternative energy development since 2005 has gone into geothermal energy facilities.[84]

Currently, the energy company Calpine Corporation, a recent recipient of the Outstanding Lease and Facility Maintenance award, is at work on a program known as The Geysers, a 20 megawatt project that taps geothermal pressure and converts it into

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78 *Id.*

79 *Id.*

80 MASS. INST. OF TECH., THE FUTURE OF GEOTHERMAL ENERGY: IMPACT OF ENHANCED GEOTHERMAL SYSTEMS [EGS] ON THE UNITED STATES IN THE 21ST CENTURY (2006), http://geothermal.inel.gov/publications/future_of_geothermal_energy.pdf.

81 MIT News Office, *supra* note 77.

82 *Id.*

83 RENEWABLE ENERGY POLICY NETWORK FOR THE 21ST CENTURY, RENEWABLES GLOBAL STATUS REPORT 2006 UPDATE 4, 17 (2006), http://www.ren21.net/globalstatusreport/download/RE_GSR_2006_Update.pdf [hereinafter RENEWABLE GLOBAL STATUS REPORT].

84 *Id.* at 6.

energy for consumers. Calpine operates 90 domestic power plants and is beginning to purchase more plants that use geothermal pressure.[85]

Since 1989, Calpine has played a role in the development of the resource, becoming, according to a recent press release, "the world's largest private producer of electricity derived from geothermal resources."[86] Calpine plans on developing the resource "through wastewater recharge projects whereby clean reclaimed wastewater from local municipalities is recycled into the geothermal reservoir where it is converted into steam for electricity production. This 'win-win' situation provides an environmentally sound wastewater discharge solution for neighboring cities while increasing the productivity and extending the life of the geothermal operation."[87]

Given that geothermic pressures are naturally occurring and do not release any harmful emissions (they only contain water) geothermal energy is an incredibly viable alternative source of energy. At present, U.S. government subsidy programs support development of these facilities, but private organizations like Calpine are rapidly expanding into the field, adding to the economic viability of this unconventional source of power. Using REN21's figures, geothermal power saw global annual investments of over $2.5 billion.[88]

D. Nuclear Power

Nuclear power involves harnessing the energy from nuclear reactions in controlled settings. Though an incredibly complicated process is involved, generally energy is created when a fissile material is concentrated to such a degree that a chain reaction occurs and incredible amounts of heat are released.[89] This energy can then be used in the form of electricity or heat.

The discussion of whether nuclear power is a "wise" alternative is outside the purview of this article, but needless to say, the use of these facilities is prevalent both domestically and globally. According to the U.S. Nuclear Regulatory Commission, nuclear-based electric energy produced a total of 780 billion kilowatthours in 2005.[90]

1. Efficiency

Nuclear power is one of the most efficient forms of energy. According to the NRC's 2006-2007 Information Digest, "In 2004, production expenses averaged $18.26 per megawatthour for nuclear reactors and $23.85 per megawatthour for fossil fuel plants."[91]

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85 *See* Calpine, Press Release, Calpine Signs Long-Term 110-Megawatt California Power Sales Agreement, (Jan. 7, 2008), http://phx.corporate-ir.net/phoenix.zhtml?c=103361&p=irol-newsArticle&ID=368113&highlight.

86 *Id.*

87 *Id.*

88 Renewable Global Status Report, *supra* note 83, at 6 (7 percent of $38 billion).

89 Fissile, Wikipedia.org, http://en.wikipedia.org/wiki/Fissile.

90 Office of the Chief Fin. Officer, Div. of Planning, Budget, and Analysis, United States Nuclear Regulatory Commission 2006-2007 Information Digest 21 (2006), http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1350/v18/sr1350v18.pdf [hereinafter NRC Information Digest].

91 *Id.*, at 14.

According to Jay Brister, Senior Business Manager for Business Development at Entergy Corporation's Entergy Nuclear, Inc., nuclear energy is efficient for several reasons. Brister, while speaking at a March, 2007 environmental law conference at Tulane University School of Law, stated the economics behind nuclear power encompass several factors: the world needs more energy, the supply of oil and gas is finite, the security of the U.S. requires diversity in energy options, and the 90.5 percent capacity factor of nuclear reactors means nuclear power is the "most reliable form of energy production," citing the Nuclear Energy Institute's 2004 figures.[92]

According to the NRC, the term "capacity factor" is "the ratio of electricity generated to the amount of energy that could have been generated."[93] The NRC states, "In 2005, net nuclear-based energy generation in the United States produced a total of 780 billion kilowatt-hours. In 2004, the average U.S. net capacity factor [of these reactors] was 91 percent."[94]

2. Brief History of the U.S. Nuclear Regulatory Commission

The U.S. Nuclear Regulatory Commission (NRC) was formed by The Energy Reorganization Act of 1974 and began operations in 1975.[95] Along with its regulatory duties, the Commission conducts extensive research program to provide independent information and expertise to support its safety decision making and to assess potential technical issues.[96] The NRC's main duties involve, primarily, the supervision of ongoing regulation of commercial nuclear power plants that generate electricity by formulating policies, and secondarily, developing regulations "governing nuclear reactor and nuclear material safety."[97]

The NRC, in conjunction with the Atomic Energy Commission, publishes standards "intended to provide an ample margin of safety from radiation that was generated by the activities of its licensees."[98] The NRC is also engaged in the decommissioning of nuclear facilities, an activity that entails removing "a facility or site safely from service" as well as reducing "residual radioactivity to a level that permits release of the property for unrestricted use and termination of the license."[99]

NRC's annual budget of $917 million allows it to maintain safety regulations and provide supervision of over the 104 licensed commercial nuclear power plants in the United States — either pressurized water reactors (PWRs) and Boiling Water Reactors

92 Jay Brister, Jr., Senior Business Manager for Business Development at Entergy Corp.'s Entergy Nuclear, Inc., Environmental Law Conference at Tulane University School of Law, Presentation (Mar. 10, 2007).

93 NRC INFORMATION DIGEST, *supra* note 90, at 21.

94 *Id.*

95 U.S. Nuclear Regulatory Comm'n, Our History, http://www.nrc.gov/about-nrc/history.html (last visited Sep. 20, 2008) [hereinafter NRC History].

96 *Id.*

97 U.S. Nuclear Regulatory Comm'n, The Commission, http://www.nrc.gov/about-nrc/organization/commfuncdesc.html (last visited Sep. 20, 2008).

98 NRC History, *supra* note 95.

99 U.S. Nuclear Regulatory Comm'n, Decommissioning of Nuclear Facilities, http://www.nrc.gov/about-nrc/regulatory/decommissioning.html (last visited Sep. 20, 2008).

(BWRs).[100] At present, these 104 plants are comprised of 69 PWRs and 35 BWRs.[101] The NRC states "U.S. electrical generating capability totaled approximately 963 gigawatts in 2004. Nuclear energy accounted for approximately 10 percent of this capability. U.S. net electric generation totaled approximately 4,038 billion kilowatt-hours in 2005. Nuclear energy accounted for approximately 19% of this generation."[102] In 2005, NRC statistics state, "444 operating reactors in 33 countries has a maximum dependable capacity of 371,942 megawatts electric (MWe)," with approximately 30 percent of that net amount being produced in the United States.[103]

According to the International Energy Agency's 2006 Key World Energy Statistics, the global use of nuclear energy has expanded exponentially since the 1970s. In 1971, global use of nuclear power was approximately 100 Twh (terawatts/hour).[104] It has increased to 2,500 Twh as of 2004, providing energy resources that have increased from 1.3 percent in 1971 to 11 percent in 2004, though most recent facilities have been in developing nations.[105]

Needless to say, nuclear reactors provide an enormous amount of the energy needed by the global community. With their previously mentioned superior efficiency and their carbon-emissions being close to nil, use of nuclear energy appears to be a savior for the planet's energy needs. That having been said, the opposition to nuclear energy is immense, well-researched, and very vocal.

3. Enormous Difficulties

Globally, nuclear power has seen a decline in usage over the years. David Gauthier-Villars of the *Wall Street Journal* writes, "Nuclear power . . . accounts for 6.5% of global energy supply. But that share is expected to decline to 4.7% by 2030, according to International Energy Agency forecasts, as overall demand outpaces the addition of fresh nuclear capacity — unless the industry can seize the moment to repair its safety reputation and start expanding again."[106]

One of the main problems with nuclear power facilities is that they are incredibly costly to build because of the extremely complicated materials they use. Seemingly miniscule hindrances or infinitesimally small mistakes can halt new construction or prevent a reactor from operating safely. In a recent *Wall Street Journal* article discussing the difficulties of building reactors, a "two-millimeter welding oversight is one of the many setbacks plaguing the construction of a . . . $4 billion nuclear-power reactor" in Finland.[107]

Despite the fact that nuclear energy is in wide use presently, it may not continue to be so, considering the global shortage of skilled laborers qualified to build reactors,

100 U.S. Nuclear Regulatory Comm'n, Power Reactors, http://www.nrc.gov/reactors/power.html (last visited Sep. 20, 2008).

101 *Id.*

102 NRC Information Digest, *supra* note 90, at 14.

103 *Id.* at 24.

104 Int'l Energy Agency, Key World Energy Statistics 16 (2006), http://www.iea.org/dbtw-wpd/Textbase/nppdf/free/2006/key2006.pdf.

105 *Id.* at 7.

106 Gauthier-Villars, *supra* note 24, at A6.

107 *Id.*

as well as a lack of facilities that can produce the sophisticated materials needed in their construction. "Another problem at [the previously mentioned Finish facility] . . . is procuring heavy forgings. These crucial parts can be supplied only by a handful of factories, mainly in Japan and France. Forgings are used to make the enormous steel pot that host the nuclear chain reaction, as well as in making pressurizers, steam generators and complex pipes."[108]

Despite the presence of 104 nuclear reactors currently operating in the U.S., DOE projections on future energy possibilities state nuclear power is considered to be only a "conceptually viable option," requiring the construction and operation of new reactors on a staggering scale, while using resources that are rapidly depleting.[109] The DOE states, "Producing 10TW of nuclear power would require construction of a new one-gigawatt-electric (1-GWe) nuclear fission plant somewhere in the world every other day for the next 50 years."[110]

According to Paul Gunther, an author on nuclear energy and a professor at Tulane University, it does not make any sense economically to continue to focus resources towards nuclear energy. "Eighty-six percent of all energy consumed today is fossil-related. Frankly, building more reactors is not the answer."[111] Citing an M.I.T. study, entitled *The Future of Nuclear Power*, Gunther notes, "there will be the need for between 1,500 and 2,000 new reactors between 2010 and 2030 to generate power for future global needs."[112]

Given the presently known availability of nuclear materials, these materials would be depleted entirely if more reactors were constructed. According to the DOE, "Once [the previously mentioned level] of deployment was reached, the terrestrial uranium resource base would be exhausted in 10 years."[113] To overcome this depletion of readily available materials, "the required fuel would then have to be mined from seawater (requiring processing seawater at a rate equivalent to more than 1,000 Niagara Falls), or else breeder reactor technology would have to be developed and disseminated to countries wishing to meet their additional energy demand in this way."[114]

4. THE FAILED PROMISES OF NUCLEAR POWER

Despite the vast solutions nuclear power once seemed to offer, it has systematically failed to meet promises at almost every turn. According to distinguished nuclear energy expert Vaclav Smil, the original predictions have proven false. Smil states, the United States Army Environmental Command's "1974 forecast had 1.2 TW of nuclear capacity installed in the U.S. in the year 2000: the actual 2000 total was 81.5 GW, less than 7% of the original forecast."[115] Smil explains that nuclear power was better con-

108 *Id.*

109 DOE SOLAR ENERGY UTILIZATION, *supra* note 12, at 9.

110 *Id.*

111 Paul Gunther, Professor at Tulane University School of Law, Environmental Law Conference at Tulane University School of Law, Presentation (Mar. 10, 2007).

112 *Id.*

113 DOE SOLAR ENERGY UTILIZATION, *supra* note 12, at 9.

114 *Id.*

115 Vaclav Smil, Energy at the Crossroads, Notes for Presentation at Global Science Forum Conference on Scientific Challenges for Energy Research, at 4, http://www.oecd.org/

ceptually than it was in practice, likely due to the fact it seemed to offer the promise of capabilities that, ultimately, it could not actually deliver. Smil comments, "Nuclear fission keeps paying the price for its rushed post-1945 development . . . only some 25 years elapsed between the first sustained chain reaction that took place . . . on December 2, 1942 and the exponential rise in orders of new nuclear power plant[s] after 1965."[116] According to Smil, the charge was to provide commercial energy generation, based on the initial advent of nuclear energy, "[t]his rush led the expert consensus of the early 1970s to envisage the worldwide electricity generation in the year 2000 dominated by inexpensive fission. Instead, the industry has experienced stagnation and retreat."[117] Needless to say, expectations have not been met.

5. Economics behind nuclear

Even though no one has built any new reactors in the United States since 1982 (and no one ordered any new reactors after 1972), the debate continues as to whether nuclear power is a viable option to supply U.S. consumer needs. Despite the contentions of Mr. Brister from Entergy that nuclear energy is the only way for the U.S. to address its future energy needs, the U.S. DOE seems to think it is not. Professor Smil's comments reflect the same conclusion.

Granted, nuclear power, when operational, is less costly than using coal. According to Michael L. Corradini, Chair of Engineering Physics and Wisconsin Distinguished Professor of Nuclear Engineering and Engineering Physics at the University of Wisconsin-Madison, "nuclear power stations now run at more than 90% capacitance factor [measure of the amount of electric power stored for a given electrical potential], with costs of around 2.5 cents/kWh (coal is 4 cents/kWh) in part because the plants are older."[118] Without new plants coming online, this capacitance fact is likely only to decrease as reactors age.

According to Smil, the problems run deeper than the potential output of reactors, partially because no new reactors have come online in almost three decades, and partially because of inadequate research and design. Getting reactors built at the projected costs and according to the projected deadlines has proven almost impossible. Smil states, "In 1967, the U.S. demonstration reactor was proposed for 1975 completion at a cost $100 million; by 1972 the completion date advanced to 1982, and cost estimates reached $675 million. The entire project was abandoned in 1983."[119]

6. Safety Issues

Safety with nuclear reactors has always been a concern. In 1979, a facility on the Susquehanna River known as Three Mile Island suffered a meltdown. According to the NRC, despite the fact that half of the reactor core was destroyed, the meltdown

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dataoecd/52/25/36760950.pdf#search=%22worldwide%20consumption%20of%20energy%2013%20TW%20smil%22.

116 *Id.* at 15–16.

117 *Id.* at 16.

118 Michael L. Corradini, Chair of Engineering and Physics and Wisconsin Distinguished Professor of Nuclear Engineering and Engineering Physics at the University of Wisconsin-Madison, Emerging Energy Technology Summit 2007, Presentation (Feb. 9-10, 2007).

119 Smil, *supra* note 115, at 17.

did not result in "a major release of dangerous forms of radiation or a need to order a general evacuation."[120] Following the incident, the NRC "placed much greater emphasis on operator training and 'human factors' in plant performance," as well as "emergency planning, plant operating histories, and other matters."[121] Although according to Jay Brister of Entergy, it is important to remember no deaths have occurred in the U.S. because of nuclear energy, that statement is not true from the global perspective.[122]

Following the 1986 total meltdown at Chernobyl, serious issues and a wealth of inquiries into the wisdom of the use of nuclear energy were raised. A publication from International Physicians for the Prevention of Nuclear War (IPPNW), *Health Effects of Chernobyl – 20 Years After the Reactor Disaster*, cites scientific studies, expert estimates, and state-generated data that found that, "50,000 to 100,000 liquidators (clean-up workers) died in the years up to 2006. Between 540,000 and 900,000 liquidators have become invalids." [123] Additionally, the study found an immense amount of uncertainty about the impact of the Chernobyl incident. "Congenital defects found in the children of liquidators and people from the contaminated areas could affect future generations to an extent that cannot yet be estimated. Infant mortality has risen significantly in several European countries . . . [and the studies indicate] the number of fatalities amongst infants in Europe to be about 5,000."[124]

IPPNW stated, "In Belarus alone, over 10,000 people developed thyroid cancer since the catastrophe." In one specific region of Belarus, "more than 50,000 children will develop thyroid cancer during their lives." Additionally, "If one adds together all age groups, then about 100,000 cases of thyroid cancer have to be reckoned with," just in that region of Belarus.[125] Also, the studies indicated "the number of Chernobyl related cases of thyroid cancer to be expected in Europe (outside the borders of the former Soviet Union) is between 10,000 and 20,000. In more contaminated areas of Southern Germany a significant cluster of very rare tumors has been found amongst children, so-called neuroblastomies."[126] Finally, "[i]n Germany, Greece, Scotland and Romania, there has been a significant increase in cases of leukemia."[127]

Although, as Mr. Brister correctly points out, no domestic deaths have occurred because of nuclear accidents, the same cannot be said for the rest of the world. In addition to the human impacts, entire swaths of Europe were forced to review environmental impacts on agricultural crops and livestock for decades after Chernobyl. Ac-

120 NRC History, *supra* note 95.
121 *Id.*
122 Brister, *supra* note 92.
123 Int'l Physicians for the Prevention of Nuclear War, Press Release, *Only 50 Deaths Caused by Chernobyl?*, http://www.ippnw-students.org/chernobyl/research.html.
124 *Id.*
125 *Id.*
126 *Id.*
127 *Id.*

cording the United Kingdom's Food Standards Agency, the impact of radiation from Chernobyl on sheep livestock alone is still not defined, twenty-one years later.[128]

7. Nuclear Waste and Caselaw

Needless to say, the "nuclear option" is still one greatly debated. The potential safety risks of reactors, along with the costs of building and maintaining reactors decrease their economic viability. Despite the NRC's rules on safety and standards, nuclear material, once processed, remains highly radioactive. Plans to store this material in Nevada's Yucca Mountain Range have been on the books for decades. The recent Supreme Court holding in *Nuclear Energy Institute, Inc. v. EPA* centered on the radioactive waste and these NRC safety regulations.[129] In reviewing EPA and NRC safety standards for the Yucca Mountain Repository, the EPA's safety requirement projected impacts only for 10,000 (10^4) years.[130] The Court thought these figures were far too low, and commented, "human history has been recorded for only 5,000 years."[131] The Court, noted the National Academy of Science's recommendations that Yucca Mountain should have project safety standards for one million years, and acknowledged that several of the materials to be deposited had a half-life of as many as 17 million years.[132] Materials as volatile as these continue to impact the economic discussion as to the viability of nuclear power.

The debate over these radioactive materials has recently been waged in the court system using novel methods such as the potential for a terrorist attack on a facility and the implications of the National Environmental Policy Act (NEPA). In *Tri-Valley Cares, v. DOE*, the Ninth Circuit Court of Appeals addressed the issue of whether people who lived near the proposed site of a biological weapons research laboratory outside of San Francisco could challenge a "finding of no significant impact" (FONSI) under NEPA.[133] Challengers said the FONSI did not mention the potential of terrorist attack on the facility.[134] The court held that consideration of effects of terrorist attack was required in the environmental assessment of the proposed facility, and the failure of Department of Energy (DOE) to consider those effects warranted remand.[135]

The *Tri-Valley Cares* holding mirrored the Ninth Circuit's ruling in the case of *San Luis Obispo Mothers for Peace v. NRC*, in which the Court of Appeals held, "that an Environmental Assessment that does not consider the possibility of a terrorist attack

128 U.K. Food Standards Agency, Post-Chernobyl Monitoring and Controls Survey Reports U.K. Overview 1 (2006), http://www.food.gov.uk/multimedia/pdfs/Chernobyluk06.pdf.
129 Nuclear Energy Inst. v. Envtl. Protection Agency, 373 F.3d 1251, 1260 (D.C. Cir. 2004).
130 *Id.* at 1257–1260.
131 *Id.* at 1260.
132 *Id.* at 1258, 1267.
133 Tri-Valley Cares v. Dep't of Energy, 203 F. App'x 105, 106 (9th Cir. 2006).
134 *Id.* at 106.
135 *Id.* at 107.

is inadequate."[136] In *Tri-Valley*, as in *San Luis Obispo*, the court cautioned "that there 'remain open to the agency a wide variety of actions it may take on remand [and] . . . [w]e do not prejudge those alternatives.'"[137]

Despite the projections that nuclear energy would provide for the world's energy needs, ultimately these predictions were overly generous. The cost of construction, the lack of sophisticated labor and materials, the failure to meet promised outputs, and the volatility of nuclear waste all lend themselves to the discussion of the economic viability. The wisdom behind the decision to use nuclear power as an alternative energy source has been challenged. As Professor Gunther states, "Nuclear power is not a better option, and it offers insurmountable risks with catastrophic results."[138]

E. SOLAR

According to the DOE, "Sunlight provides by far the largest of all carbon-neutral energy sources. More energy from sunlight strikes the Earth in one hour (4.3×10^{20} J) than all the energy consumed on the planet in a year (4.1×10^{20} J)."[139]

Solar radiation reaches the upper atmosphere of the Earth at a rate of 1366 watts per square meter (W/m^2).[140] Solar energy generation technologies have been developed to make use of solar radiation by direct and indirect use of the sunlight for the production of heat and electricity.

Passive solar energy systems utilize a variety of techniques to capture and distribute light for both heating and indoor lighting including: capturing through materials that contain favorable thermal properties; architectural use of areas which circulate air; and positioning of facilities in a manner so as to increase absorbtion of sunlight.[141] An example of one passive system is the Trombe Wall, a heavy dark-colored wall that absorbs heat from the sun and warms an adjoining airspace, heat from the airspace then slowly and evenly flows into the interior of the home or building.[142] Trombe Walls have been integrated into the envelope of a recently completed Visitor Center at Zion National Park and a site entrance building at the National Renewable Energy Laboratory's National Wind Technology Center.[143]

Active solar technologies convert solar energy into heat that can be used immediately or stored for later use.[144] Direct solar power involves the transformation of light into usable energy through the use of photovoltaic cells in the production of electric-

136 *Id.* at 107 (citing San Luis Obispo Mothers for Peace v. Nuclear Regulatory Comm'n, 449 F.3d 1016 (9th Cir. 2006).

137 *Id.*

138 Gunther, *supra* note 111.

139 DOE SOLAR ENERGY UTILIZATION, *supra* note 12, at ix.

140 Solar Spectra: Standard Air Mass Zero, 2000 ASTM Standard Extraterrestrial Spectrum Reference E-490-00, http://rredc.nrel.gov/solar/spectra/am0/ASTM2000.html.

141 *See* PAUL TORCELLINI & SHANTI PLESS, TROMBE WALLS IN LOW –ENERGY BUILDINGS: PRACTICAL EXPERIENCES 1 (2004), http://www.nrel.gov/docs/fy04osti/36277.pdf.

142 *Id.*

143 *Id.*

144 Wikipedia.org, Active Solar, http://en.wikipedia.org/wiki/Active_solar (last visited Sep. 20, 2008).

ity. Indirect solar power addresses transformations of solar radiation that result in a form of energy that consumers can readily use.

Despite the fact that sunlight is the largest of all carbon-neutral sources of energy, at present, the use of solar power is relatively scarce when considering it is the most prevalent source of energy across the planet. The solar radiation that reaches the surface of the Earth is more than enough to provide for the planet's population, considering that it is "nearly 4 orders of magnitude greater world's [total primary energy supply] of nearly 13 [terawatts] in the year 2005."[145] Professor Smil also notes that solar power has the highest power density among renewable energies.[146]

Mirroring Smil's comments, Rebecca Smith, of the *Wall Street Journal*, writes that sunlight produces a miniscule amount of global power despite its obvious overabundance. "Solar power still accounts for less than 1% of the world's power generation, with 5,400 megawatts of capacity online, enough for the daytime needs of [only] 2 million to 3 million homes."[147]

But, this trend appears to be changing, and the DOE reports that the U.S.'s use of solar energy is rapidly growing. Industrial solar power is "a $7.5 billion industry growing at a rate of 35–40% per annum," and the DOE reports that solar-derived fuel from biomass actually "provides the primary energy source for over a billion people."[148]

The DOE stated,

> The huge gap between our present use of solar energy and its enormous undeveloped potential defines a grand challenge in energy research. Sunlight is a compelling solution to our need for clean, abundant sources of energy in the future. It is readily available, secure from geopolitical tension, and poses no threat to our environment through pollution or to our climate through greenhouse gases.[149]

Although the cost of harnessing solar energy has dropped significantly over the years, the process of using light from the sun to generate electricity by use of solar panels, has long been problematic for investors. According to Smith, "For decades, solar power has endured cycles of booms and busts as investors made big bets only to watch the technology fail to achieve its promise."[150]

The advantages of solar power are numerous: it is the most prevalent source of energy, it is readily accessible, and it is free. Furthermore, because most solar power is generated locally and used in the immediate vicinity of production, less electricity can escape through transmission (with standard electrical use, escape can be as high as 7.2 percent).[151]

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145 Smil, *supra* note 115, at 12.

146 *Id.* at 15.

147 Smith, *supra* note 9, at R1.

148 DOE Solar Energy Utilization, *supra* note 12, at ix.

149 *Id.*

150 Smith, *supra* note 9, at R1.

151 Transmission and Distribution Technologies, http://www.climatetechnology.gov/library/2003/tech-options/tech-options-1-3-2.pdf.

1. Difficulties with Solar Power

Unfortunately, some of the disadvantages of solar power come from the same source as the advantages. For example, power can be generated in massive doses during the day time; but at night, darkness means no power output. As Smith notes, "Solar power doesn't generate electricity at night, meaning backup energy sources are needed."[152]

Professor Smil explains that once installed, solar panels cannot easily be moved, and they are often difficult to combine with the present power grid.

> [D]irect solar conversions . . . share two key drawbacks with other renewables: loss of location flexibility of electricity generating plants and inherent stochasticity of energy flows. The second reality poses a particularly great challenge to any conversion system aiming at a steady, and highly reliable supply of energy required by modern industrial, commercial and residential infrastructures.[153]

Also, the efficiency of photovoltaic cells, though improving, has been a bit of a quandary when deciding whether to install solar cells. Smith comments, "One reason there's relatively little solar electricity is that traditional solar panels aren't very efficient at converting sunlight to electricity. So most solar electricity is made and consumed at a single site — and in many cases isn't even enough to meet the needs of a single house."[154]

2. Increasing Efficiency is Key to Solar Power

Increasing efficiencies is key to the success of solar power. Smil states, "direct solar radiation is the only renewable energy flux available with power densities of 10^2 W/m^2 (global mean of about 170 W/m^2) which means that increasing efficiencies of its conversion (above all better PV) could harness it with effective densities of several 10^1W/m^2 (the best all-day rates in 2005 were on the order of 30 W/m^2)."[155]

The efficiency argument is quickly becoming moot as new technologies increase productivity. A Greek-based firm called Lion Energy, S.A., has begun to solve the problems of inefficient solar facilities, and it is presently able to supply solar energy for less than it costs to use fossil fuels. The firm boasts it can "build solar power plants that produce electricity at a cost below the cost resulting from existing fossil fuel plants due to the high efficiency - solar to electric energy 65%."[156] Also, Lion Energy says it has solved the problem of solar power output being reduced during dark or cloudy days. "Due to the proprietary energy storage technology, the solar plants can deliver continuous output even during long periods of cloudy days."[157] Lion Energy says its plants are able to produce over 10 MW with low operating cost.[158]

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152 Smith, *supra* note 9, at R1.
153 Smil, *supra* note 115, at 12.
154 Smith, *supra* note 9, at R1.
155 Smil, *supra* note 115, at 12.
156 Lion Energy, Solar Thermal Power Plants, www.lionhellas.com/power2.htm (last visited Sep. 20, 2008).
157 *Id.*
158 *Id.*

As technology finds it way into the production of solar cells, new fields appear. A firm co-founded by Nobel Laureate Alan Heeger[159] has created ultra thin solenoids that are then imprinted onto sheets of plastic, a far cry from the previous photovoltaic cells that were up to 8 inches thick and weighed several pounds. Heeger's company, Konarka, "develops light-activated Power Plastic that is flexible, lightweight, lower in cost and much more versatile in application than traditional silicon-based solar cells."[160] Konarka's product, known as Power Plastic, is seen as revolutionary and was recently identified as one of 13 industry-led solar technology projects to which the DOE awarded funding.[161] The project will allow it to "receive up to $168 million in funding, subject to appropriation from Congress."[162]

Solar power will continue to grow with investor interest and federal initiatives, but also private entities are playing a role in its development. An organization known as The World Solar Challenge (WSC) has long played a role in implementing technology in the world of solar power.[163] Anyone who has seen one of the oddly shaped cars covered in solar cells zipping along a stretch of the Mohave Desert is familiar with their work. WSC motivates research and development into harnessing solar energy for future transport needs for many years and promotes the vital search for sustainable transport alternatives for future generations.[164]

F. Waves

Using oceanic tidal flows and the undulation of water to generate electricity, a concept known as "wave technology," is fast becoming a viable source of energy production. The use of this technology is still in its infancy but offers enormous promise. According to a CNN.com article investigating the economics behind wave technology, "researchers at Oregon State University say that only 0.2 percent of the ocean's untapped wave energy could power the entire world. This figure may seem incredible, but water is a very dense medium, about 1,000 times thicker than air, and capable of transmitting immense energy when in motion."[165] Sean O'Neill, president of a trade association called the Ocean Renewable Energy Coalition cites the total wave energy potential off the coast of the United States as being 252 million megawatt hours per year.[166]

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159 Konarka, Leadership Team, http://www.konarka.com/index.php/site/Company_leadership-team (last visited Sep. 20, 2008).

160 Konarka, Power Plastic, http://www.konarka.com/index.php/site/Company_aboutus (last visited Sep. 20, 2008) [hereinafter Konarka Power Plastic].

161 Konarka, Press Releases, U.S. Department of Energy Awards Konarka Solar America Initiative Funding, http://www.konarka.com/news_and_events/press_releases/2007/3_march/0308_sai.php [hereinafter Konarka, Solar America Initiative].

162 *Id.*

163 World Solar Challenge, http://www.wsc.org.au (last visited Sep. 20, 2008).

164 *Id.*

165 Dan Drollette, *Energy from the Motion of the Ocean*, CNNMoney.com, Dec. 15, 2006, http://money.cnn.com/2006/12/14/magazines/fsb/nextlittlething_wave_power.fsb/index.htm?postversion=2006121510.

166 Jason Margolis, *Wave Farm Shows Energy Potential*, BBC News, Mar. 2, 2007, http://news.bbc.co.uk/2/hi/technology/6410839.stm.

Doug Dixon, Program Technical Lead at the Electric Power Research Institute, stated, "global and domestic climate change and carbon management initiatives will lead to more electricity production to reduce overall demand on fossil fuels. These initiatives will also require that electricity be produced in manners that further minimize the impact of carbon usage."[167] He says wave-technology hydropower "offers expanding opportunities to increase generation based on renewable, domestic, carbon-free technologies."[168]

According to the U.S. Department of Interior's (DOI) Renewable Energy and Alternative Use Program, harnessing energy from waves is a feasible alternative source of energy. The DOI's 2006 Technology White Paper states, "Ocean waves represent a form of renewable energy created by wind currents passing over open water. Capturing the energy of ocean waves in offshore locations has been demonstrated as technically feasible."[169] It continues, "Compared with other forms of offshore renewable energy . . . wave energy is continuous but highly variable, although wave levels at a given location can be confidently predicted several days in advance."[170]

1. PRIVATE VENTURES

A company called MotorWave is in the process of installing and testing a system in Italy that uses oceanic wave motion to generate electricity. [171] Its land-based apparatus uses the natural up-and-down motion of waves, which creates energy. This wave-motion turn devices called "floaters." The movement of the floaters is transformed into a linear rotation, like the turn of an engine's pistons, which turns energy into hydro-electricity.[172]

MotorWave is not alone in this venture. A New Jersey-based engineering firm has been working in the field for nearly a decade. Ocean Power Technologies (OPT) develops commercial systems that generate electricity by harnessing the renewable energy of ocean waves.[173] The energy in ocean waves is predictable, and electricity from wave energy can be produced on a consistent basis at numerous sites located near major population centers worldwide.[174] Wave energy is an emerging segment of the renewable energy market.

The OPT system works in a similar fashion to the MotorWave system, only it is not land-based. "The rising and falling of the waves off shore causes the buoy," which looks like a typical navigation marker, to move freely up and down like a piston, "[t]he

167 ELECTRIC POWER RESEARCH INST., 58 HYDROPOWER ENVIRONMENTAL ISSUES 1 (2007), http://mydocs.epri.com/docs/Portfolio/PDF/2007_P058.pdf.

168 *Id.*

169 U.S. DEP'T OF THE INTERIOR, MINERALS MANAGEMENT SERVICE, TECHNOLOGY WHITE PAPER ON WAVE ENERGY POTENTIAL ON THE U.S. OUTER CONTINENTAL SHELF 2 (2006), http://ocsenergy.anl.gov/documents/docs/OCS_EIS_WhitePaper_Wave.pdf.

170 *Id.*

171 *See* MotorWave, Wind vs. Wave, http://www.motorwavegroup.com/new/index1.html (last visited Sep. 20, 2008).

172 *Id.*

173 Ocean Power Technologies, Making Waves in Power, http://www.oceanpowertechnologies.com (last visited Sep. 20, 2008).

174 *Id.*

resultant mechanical stroking is converted via a sophisticated power take-off to drive an electrical generator."[175]

When the U.S. Navy looked into the application of OPT's buoy system, it sought to address environmental concerns as well as concerns about interference with ocean mammals, tidal flows, and maritime traffic. According to CNN, the Navy's assessment "found that the problems environmentalists had feared — marine mammals getting entangled in the mooring line, or electrical faults disrupting sea life — did not occur."[176] Furthermore, the study found, "If anything, the undersea cables and anchors provided a place for coral to grow and attracted fish, much like an artificial reef. Similarly, there were no effects upon currents or wave patterns, no electromagnetic disturbances, no heat generation, and no undersea noise to disturb sea creatures."[177]

OPT is currently engaged in a massive-scale effort off the coast of Oregon that will be their largest effort to date. The buoys used in the Reedsport, Oregon project will be 30 feet wide, weigh 50 tons, and will be capable of generating 150 kilowatts each.

The project, if successful, will generate additional programs.

> By the year 2010 [OPT's founder and president, George Taylor] plans to have a 100-ton, 37-foot-wide buoy that could generate 500 kilowatts, a size that he calls the 'magic number,' because that's the point at which substantial economies of scale kick in. An array of 40 buoys that size, linked together, could generate electricity at prices significantly less than that of a typical coal-burning power station, and far less than the price at plants that burn more expensive fuels such as natural gas.[178]

Similar programs are being created in Europe. According to the BBC, "Europe is far out in front when it comes to embracing wave energy," likely due to the E.U.'s proposed commitment to generate 20 percent of Europe's energy from renewable sources by 2020.[179] In March of 2007, the Scottish engineering firm of Ocean Power Delivery (OPD) began work on a wave-generated power facility in Portugal, similar to a facility they built in Scotland.[180]

According to OPD's chief engineer, Max Carcas, the economic efficienct wave technology will take time to reach acceptability. "[W]ave energy holds a lot of promise considering it is still in its infancy. There's never been a new energy technology that's been economic out of the box. What gives us tremendous hope with this technology is that our opening costs are substantially below where wind power started 20, 25 years ago."[181] Carcas noted that wind power costs have dropped 80 percent since its incep-

175 *Id.*
176 Drollette, *supra* note 165.
177 *Id.*
178 *Id.*
179 Margolis, *supra* note 166.
180 *Id.*
181 *Id.*

tion.[182] "So, we think we've got a very compelling case for policymakers to put in place the right market enablement mechanisms."[183]

G. WIND

According the *Wall Street Journal*, "Wind power stands out as one of the splashiest success stories in renewable energy. Over the past 10 years, as wind farms sprouted around the world, the cost of generating electricity from wind has fallen dramatically."[184]

The North Carolina Wind Energy Center at Appalachian State University, stated, "Wind energy is a source of renewable power which comes from air current flowing across the earth's surface. Wind turbines harvest this kinetic energy and convert it into usable power which can provide electricity for home, farm, school or business applications on small (residential) — or large (utility) — scales."[185]

Economically, wind-generated power costs have plummeted in recent decades, as new technology begins to improve materials, allowing increased productivity that offsets costs and maintenance. International Energy Agency statistics show that "[i]n 1980, wind-power electricity cost 80 cents per kilowatt hour; by 1991 it cost 10 cents."[186] Presently, thanks in part to governmental subsidies, the costs associated with wind-generated power have crept closer towards the cost of coal-generated power, "having dropped as low as 3 cents to 4 cents per kilowatt hour . . . . In fact, costs are approaching the point where wind power may be able to prosper without subsidies — currently 1.9 cents a kilowatt hour in the U.S. — particularly if natural-gas prices stay high."[187]

The drop in costs and the rise in productivity and economic output have allowed investors and industry to see wind power as a viable alternative to coal, natural gas, and oil. Costs have decreased largely due to better equipment and enhanced technology in transferring power generated to consumers. "The materials used in wind turbines have improved, and the turbines are now much larger and more efficient: 125 meters in rotor diameter, compared with 10 meters in the 1970s. The cost of financing wind farms also has dropped as financial markets become more comfortable with the risks involved."[188]

According to the American Wind Energy Association, the Global Wind Energy Council (GWEC) reported wind industry delivered 32 percent of the annual global market growth in energy sources.[189] In its report, which came out the same day as the

182 *Id.*
183 *Id.*
184 Smith, *supra* note 9, at R1.
185 N.C. Wind Energy, Wind Power, http://www.wind.appstate.edu/windpower/windpower.php [hereinafter N.C. Wind Energy] (last visited Sep. 20, 2008).
186 Smith, *supra* note 9, at R1.
187 *Id.*
188 *Id.*
189 GLOBAL WIND ENERGY COUNCIL, PRESS RELEASE, GLOBAL WIND ENERGY MARKETS CONTINUE TO BOOM – 2006 ANOTHER RECORD YEAR 1 (2007), http://www.awea.org/newsroom/pdf/070202__GWEC_Global_Market_Annual_Statistics.pdf [hereinafter GWEC PRESS RELEASE].

IPCC report on climate change, the Association commented, "The booming wind energy markets around the world exceeded expectations in 2006, with the sector experiencing yet another record year."[190]

1. Big Business that Continues to Grow

The GWEC report stated the market for wind-generated energy continued to multiply by 32 percent annually as "wind farm" production in over 70 nations expanded, increasing the output ability by 15,132 megawatts.[191] According to its report, "This development shows that the global wind energy industry is responding fast to the challenge of manufacturing at the required level, and manages to deliver sustained growth."[192] Additionally, it stated, "In terms of economic value, the wind energy sector has now become firmly installed as one of the important players in the energy markets, with the total value of new generating equipment installed in 2006 reaching . . . $23 billion."[193]

Globally, the U.S. falls behind European wind energy production capabilities of 48,545 MW with 11,603 MW, but the U.S. is the global leader when it comes to installing new facilities.[194] According to Arthouros Zervos, Chairman of GWEC, "the U.S. continued to lead with 2,454 MW, followed by Germany. The tremendous growth in 2006 shows that decision makers are starting to take seriously the benefits that wind energy development can bring."[195]

According to Randy Swisher of the American Wind Energy Association, "Strong growth figures in the U.S. prove that wind is now a mainstream option for new power generation . . . . Wind's exponential growth reflects the nation's increasing demand for clean, safe and domestic energy, and continues to attract both private and public sources of capital."[196] Swisher stated, "New generating capacity worth $4 billion was installed in 2006, billing wind as one of the largest sources of new power generation in the country – second only to natural gas – for the second year in a row."[197]

According to the North Carolina Wind Energy Center, "Wind energy is one of the fastest growing sources of electricity and one of the fastest growing markets in the world today. These growth trends can be linked to the multi-dimensional benefits associated with wind energy."[198]

Although wind energy appears to be growing at a break-neck speed, its benefits are not only economic. Wind allows for a cleaner source of energy and alleviates political concerns about safety measures. Zervos of the GWEC says, "As security of energy supply and climate change are ranging high on the political agendas of the world's governments, wind energy has already become a mainstream energy source in many countries

190 *Id.*
191 *Id.*
192 *Id.*
193 *Id.*
194 *Id.*
195 *Id.*
196 *Id.*
197 *Id.*
198 N.C. Wind Energy, *supra* note 185.

around the world. Wind energy is clean and fuel-free, which makes it the most attractive solution to the world's energy challenges."[199]

In the U.S., states and investors are beginning to see that wind energy is big business. In February, 2007, the government of Texas announced its plan to join with several private organizations to invest over $10 billion in new wind energy facilities.[200]

The Governor of Texas, when unveiling the new program, commented, "The wind energy initiative will diversify the state's energy production, clean up the air and help Texas surpass its renewable energy goals."[201] He stated, "For every 1,000 megawatts generated by new wind sources, Texas will reduce carbon dioxide emissions by 6 million tons over the next 20 years. . . . The investment also will provide a boost to the economy. . . . This is a monumental investment that will make our air cleaner and our people healthier."[202]

IV. INCREASED UTILITY, INDUSTRY, AND INVESTOR INTEREST IN RENEWABLES

Despite the fact that fossil fuels "currently provide more than 85% of all the energy consumed in the United States, nearly two-thirds of our electricity, and virtually all of our transportation fuels,"[203] in recent months, many leading industries, utilities, and investors are seeing the great promise that alternative and renewable sources of energy present to citizens and share-holders alike. Biofuels, wind, wave technology, and solar power have experienced exponential growth as companies across the globe see a move from carbon-emitting sources might be beneficial both environmentally, and to their bottom-lines. This portion of the article will highlight a few of the investment booms in the area and discuss a portion of the new investors who are focusing on renewable energy.

According to Clean Edge, a clean technology market tracker,

> At long last, the tipping point is nigh: For the first time in modern history, clean-energy technologies are becoming cost-competitive with their 'dirtier' counterparts. While oil and natural gas prices remain stubbornly high and frustratingly volatile across the globe, and as nuclear and coal-based energy remain dogged by environmental and safety concerns, clean-energy prices continue their near-relentless downward march.[204]

199 GWEC PRESS RELEASE, *supra* note 189, at 2.

200 *Texas, Private Partners to Invest $10B in Wind Energy*, AUSTIN BUS. J., Oct. 3, 2007, http://www.bizjournals.com/austin/stories/2006/10/02/daily9.html?f=et51&hbx=e_du [hereinafter Texas Private Partners].

201 *Id.*

202 *Id.*

203 U.S. Dep't of Energy, Fossil Fuels, http://www.energy.gov/energysources/fossilfuels.htm.

204 CLEAN EDGE, CLEAN ENERGY TRENDS 2006 1 (2006), http://www.cleanedge.com/reports/pdf/trends2006.pdf [hereinafter Clean Edge].

A. History: The Rise and Fall of Previous Investment Cycles

Throughout history, interest and investment in renewables has mirrored costs of fossil-fuels. When prices rise, alternative energy comes back into vogue. When prices taper off, interest in alternative energy sources falls off. IEA statistics show that government alternative energy R&D budgets increased dramatically in the 1970s due to high oil prices. But accordingly, the IEA found that "by 1987, however, they had declined to about two-thirds of their peak level and thereafter stagnated until 2003. The share of renewable energy technologies in total energy RD&D spending remained relatively stable, averaging 7.6% for the whole period."[205] Similarly, the 1970s saw great enthusiasm for 'synfuels,' or synthetic substitutes for oil and natural gas; however, the enthusiasm and the funding dried up in the '80s, once gas prices plunged back to earth from their oil-crisis high."[206]

B. Record Investments and Record Incentives

The field of renewable and alternative energy has seen impressive recent investment. According to Ren21, the Renewable Energy Policy Network, investment in the field of renewable energy sources has hit an all-time high. According to its 2006 Renewables Global Status Report, "Record investment in new renewable energy capacity occurred in 2005—$38 billion, up from $30 billion in 2004."[207]

Clean Edge states, "The growth of clean-energy markets reflects its growing acceptance. Global wind and solar markets reached $11.8 billion and $11.2 billion in 2005 — up 47% and 55%, respectively, from a year earlier. The market for biofuels hit $15.7 billion globally in 2005, up more than 15% from the previous year."[208]

Ren21 notes, "Biomass power production saw 50–100 percent increases in annual production in several countries in 2004. High growth rates also occurred in biodiesel (85 percent increase in annual production) and grid-connected solar PV (55 percent increase in existing capacity). . . . And construction began in the United States and Spain on the world's first utility-scale solar thermal power plants in 20 years."[209]

C. Tech Barons Unite, and Bring Money to the Equation

As reported in a January 28, 2006 article in the *New York Times*, President Bush's decision to set broad goals for adopting alternative energy has created enormous investment opportunities. Silicon Valley's technology investors hope to fill in the details of his proposal. Venture capitalists that back global companies like Google, have begun to move towards using their own ingenuity and capital, rather than waiting on the U.S. government to lead the charge. Now, according to the *Times*, "they are heading to

205 Renewable Energy Addresses Energy Security, Energy World, Feb. 21, 2006, http://renewablenergyworld.com/rea/news/story?id=43836 (last visited Sep. 20, 2008).

206 Douthat, *supra* note 70, at 125.

207 Renewable Global Status Report, *supra* note 83, at 2.

208 Clean Edge, *supra* note 204, at 1.

209 Renewable Global Status Report, *supra* note 83, at 2.

Washington on a crusade to influence energy policy because they have a big stake in the outcome."[210]

The investors in recent years have poured billions of dollars into alternative energy start-ups in areas like solar and wind power or the production of fuel for cars from feedstock and crop waste. Many of these projects, investors say, could stall without subsidies or government mandates for greater energy efficiency.

According to Mark Baldassare, research director for the Public Policy Institute of California, "'It's very different from the business world, where you come in with a good idea and leave with a deal.'"[211] The question, he said, is whether venture capitalists "'have the patience to be part of the political process.'"[212] Venture capitalists "could become a powerful part of the realignment of energy politics. They are lending a new voice to the debate, one that politicians are likely to listen to given the investors' reputation as smart backers of next-generation companies."[213] A sizable amount of the political influence in this area comes from the ability to work with powerful political lobbyists. For example, "Lobbyists for oil and gas companies spent $59 million in 2005, compared with the $2 million spent by venture capitalists."[214]

D. Divergent Interest Groups Combine to Push for Wider Ethanol Use

Big money can create strange bedfellows. An interesting mix of environmentalists, farmers, hunters, and business associations have banded together to promote the expanded use of ethanol and are lobbying for federal incentives to achieve their goals. Pressure from organizations such as these has been successful in the past.

In 2005, farm groups, hunters, environmentalists, and some businesses pushed successfully for a directive in the 2005 Energy Policy Act to use ethanol-blended fuels. Called 25x'25 Renewable Energy Alliance, the group represents 400 members with apparently divergent interests.[215] For example, the American Farm Bureau Federation, General Motors Corporation, and the National Wildlife Federation are members working towards promoting ethanol.[216]

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210 Matt Richtel, *Tech Barons Take on New Project: Energy Policy*, N.Y. TIMES ONLINE, Jan. 29, 2007, http://www.nytimes.com/2007/01/29/technology/29venture.html?ex=1327726800en=0701926c36f5c245ei=5088partner=rssnytemc=rss.

211 *Id.*

212 *Id.*

213 *Id.*

214 *Id.*

215 John J. Fialka, *Coalition Pushes Wider Ethanol Use*, WALL ST. J., Feb. 28, 2007, at A6 http://www.25x25.org/index.php?option=com_content&task=view&id=12&Itemid=41 [hereinafter Fialka Ethanol Use]. The group's website explains the meaning behind their strange name, "25x'25 is a rallying cry for renewable energy and a goal for America – to get 25 percent of our energy from renewable resources like wind, solar, and biofuels by the year 2025."

216 *Id.*

Ethanol, long touted as the future of renewable energy, has caused a considerable amount of debate between industry analysts, farmers, politicians, and social scientists. Although this material will be covered more in Section VI., needless to say, its impact is already forcing investors to take another look at corn as a viable fuel alternative. The international market for biofuels is up more than 15 percent from 2004.[217] According to the American Coalition for Ethanol, ethanol's production drives economic development. In 2006, the U.S. ethanol industry provided nearly 6 billion gallons of clean burning, renewable fuel to the country's supply of energy.[218]

E. Sunlight: The Free Energy

According to Clean Edge, "It could be said that 2005 was the Year of the Sun. On both the private and public markets, solar outshined other energy technologies."[219] They say photovoltaics "put more than $150 million into U.S.-based companies such as Advent Solar, Energy Innovations, Heliovolt, Miasole, Nanosolar, and PowerLight in 2005 – double the investments in 2004."[220] The following year only saw a continued growth in the solar energy as Konarka Technologies, Inc., introduced the aforementioned "Power Plastic" in 2006 to much acclaim and an expected $168 million in DOE funding.[221]

F. Farm-Fresh Cow Power: Biomass

The energy technology design firm TerraPass is actively engaged in work in the field of biomass. Energy from biomass is produced by capturing methane and burning it from sources like cow manure. The advantages of biomass methane over fossil fuels, include that it is renewable. Furthermore, the process prevents methane from entering the atmosphere and "methane is 21 times as damaging as carbon dioxide when it comes to global warming."[222]

The TerraPass project, though still in the R&D phase, can keep barns warm and generate electricity. "In addition, a portion of the biogas powers a 5 KW fuel cell that is being used by the University of Minnesota to conduct research into fuel cell technology."[223]

G. Wind Profits Continue to Blow Away Investors

According to Ren21, "Wind power registered the second highest added capacity . . . with existing capacity growing 24 percent to reach 59 gigawatts (GW)."[224] According to Ren21 projections, "Wind power is expected to grow globally from $11.8 billion in 2005 to $48.5 billion in 2015."[225]

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217 Clean Edge, *supra* note 204, at 1.

218 Fred E. Foldvary, *The Corn is as High as the Subsidy's Aye*, Freeliberal.com, Dec. 19, 2006, http://www.freeliberal.com/archives/002493.html.

219 Clean Edge, *supra* note 204, at 4.

220 *Id.*.

221 Konarka, Solar America Initiative, *supra* note 161.

222 Farm Energy Projects, *supra* note 35.

223 *Id.*

224 Renewable Global Status Report, *supra* note 83, at 2.

225 Clean Edge, *supra* note 204, at 3.

As mentioned, the Texas wind initiative seeks to add more than $10 billion in new wind energy infrastructure. According to the *San Antonio Business Journal*, "Under the partnership, private companies will make the capital investments in wind energy generation and the Public Utility Commission will direct the construction of additional transmission lines to deliver the power."[226] In a press release, Texas Governor Rick Perry stated, "With this $10 billion announcement, the economic ripple will be more like a tidal wave as these companies pour millions of dollars into wages and salaries for Texas workers."[227]

H. Biofuel Production Gaining

As previously discussed, biofuels have seen an enormous increase in investment dollars recently. According to a September 2006 article in the *New York Times*, "About 76 commercial biodiesel plants are in production today, up from 22 in 2004. The average business operates one plant that yields 30 million gallons a year of fuel and costs up to $20 million to build. Some companies are planning refineries capable of brewing up to 100 million gallons a year."[228] According to Clean Edge, "biofuels (global manufacturing and wholesale pricing of ethanol and biodiesel) will grow from $15.7 billion in 2005 to $52.5 billion by 2015."[229]

I. Resistance Across the Board

Despite the international call for carbon reduction, the immense reports that climactic change is directly related to fossil fuels, and the record exponential growth of alternative sources of fuel, companies and industries that are entrenched in the old paradigm of exclusively using of fossil fuels to provide for energy needs have put up staunch resistance. It might be wise to question this resistance, , remembering the famous quote from Lord Kelvin: "There is nothing new to be discovered in physics now." A few years after Kelvin's comment, Einstein published his paper on relativity, and subsequently blew apart the previous notion that nothing new could be added to the discussion.

1. Resistance from the Coal Industry

According to a January 26, 2007 article in the *Wall Street Journal*, "Raising the federal mandate for using renewable and alternative energy sources may mean bigger government incentives for efforts to turn coal into diesel-engine fuel."[230] President Bush's recent initiative towards alternative energy would force industry to move away imported oil. This move "has ignited a battle between coal interests and environmentalists - and underscored tension between the goals of increasing U.S. energy security

226 Texas Private Partners, *supra* note 200.

227 *Id.*

228 Susan Moran, *Biofuels Come of Age as the Demand Rises*, N.Y. TIMES ONLINE, Sept. 12, 2006, http://www.nytimes.com/2006/09/12/business/smallbusiness/12bio.html?ex=1315713600&en=0f141e75db5758b0&ei=5088&partner=rssnyt&emc=rss.

229 Clean Edge, *supra* note 204, at 3.

230 John J. Fialka, *Energy Mandates Fuel a Rift: Bush's Proposal Pits Coal Interests Against Environmentalists*, WALL ST. J., Jan. 26, 2007, at A4 [hereinafter Fialka, Energy Mandates Fuel Rift].

and curbing global warming."[231] The article states that "[g]reater use of liquid fuels made from coal, the nation's most plentiful energy source, would reduce reliance on imported oil."[232]

2. Resistance from U.S. automakers

Resistance has also come from U.S. automobile manufacturers who are concerned that they will be forced to adopt mandatory governmental alternative energy measures, rather than letting consumers drive the effort. General Motors Corporation's Chief Executive Rick Wagoner recently stated the government should use tax credits or fuel subsidies to promote new technology, rather than forcing auto makers to adopt mandates.[233] Wagner stated, "'We run the risk of reverting back to our traditional energy policy. . . . That is, relying on the lowest-cost energy available on world markets,' including imported oil, 'without providing adequate support for developing alternative sources.'"[234]

Wagoner noted that automakers should lead the way, "but government and other industries such as oil, electric utilities, battery companies and research laboratories also must play a role. . . . Marketplace reality [is] going to require the government to step in and promote U.S. energy security and diversity 'regardless of what happens to the price of oil in the short term.'"[235]

25x'25 Renewable Energy Alliance calls on the Secretary of Energy to establish a "pay or play" obligation for auto manufacturers to modify half of the vehicles they make to use a blend called E-85 by 2012, or be subject to a fine of $1,000 per vehicle.[236] Auto manufacturers in the United States have agreed to strive for a 2012 target of 50 percent for "flex-fuel" vehicles (those that can run on blended gasoline), but petroleum companies have resisted attempts to force them to install more E-85 pumps.[237] According to Al Mannato, fuels expert at the lobbying group American Petroleum Industry, "We think that the marketplace should determine how much ethanol is used and where it's used."[238]

3. Resistance from the Petroleum Industry

Not surprisingly, international petroleum companies are interested in keeping their market free from competitors. Their present "choke-hold" on fossil fuels has led to record profits for these companies, with Exxon Mobil making history by reporting

231 *Id.*
232 *Id.*
233 Chief of General Motors Calls on Washington to Support the Diversification of U.S. Energy Supply, Int'l Herald Trib., Jan. 17, 2007, http://www.iht.com/articles/2007/01/17/business/gm.php.
234 *Id.*
235 *Id.*
236 Fialka Ethanol Use, *supra* note 215, at A6.
237 *Id.*
238 *Id.*

a quarterly profit of $10.25 billion, "the highest quarterly and annual profits ever for a U.S. company."[239] Exxon also broke annual profit records by reporting earnings of $40.61 billion last year, "or nearly $1,300 per second in 2007;" exceeding its previous record of $39.5 billion in 2006.[240]

John Schoen, Senior Producer at MSNBC, stated, "Since January of 2002, the price of crude has tripled, leaving oil producers awash in profits. During that period, the top 10 major public oil companies have sold some $1.5 trillion worth of crude, pocketing profits of more than $125 billion."[241]

The massive increase in oil revenues has flooded fuel companies with billions. According to Oppenheimer & Co. oil analyst Fadel Gheit, "This is the mother of all booms. . . . They have so much profit, it's almost an embarrassment of riches. They don't know what to do with it."[242]

4. Resistance from U.S. Investors

Ocean Power Technologies (OPT), the previously mentioned wave-generated electricity innovators, said investors put up similar resistance when it initially started looking for funding. Therefore, it was forced to look outside the U.S. for financing. According to CNNMoney.com, "[b]ecause there was so little enthusiasm for alternative-energy investments in the U.S., even as recently as a few years ago, [OPT's Director] had to take the company public on the London Stock Exchange."[243] Thanks to interest overseas, OPT's 2003 IPO raised $40 million, "at a time when interest in the U.S. was almost nil."[244] The article noted, "Britain is far ahead of other countries when it comes to funding and research in wave power, thanks to more than a decade of generous government subsidies, capital grants, and a long, wave-tossed coastline."[245]

5. Resistance from Petroleum-Producing Nations: OPEC says, "Deal With It"

Alternative energy production does not have to signal the death of the oil industry. As technology demands for alternatives increase, the shift from fossil fuels towards sustainable energy methods can be seamless. Resistance, however, comes from entrenched nations whose oil reserves are worth billions of dollars. These foreign-based states have powerful political connections, and they fear their tenuous grasp on the market-share for oil-based energy will slip if renewables encroach into their territory.

A majority of the energy producers are located in the Middle East, and the Organization of the Petroleum Exporting Countries (OPEC) nations are, understandably, concerned about expanding their revenue. OPEC forced oil prices to reach new record

239 David Ellis, *Exxon Shatters Profit Records*, CNNMoney.com, Feb. 1, 2008, http://money.cnn.com/2008/02/01/news/companies/exxon_earnings/index.htm?cnn=yes.

240 *Id.*

241 John W. Schoen, *Oil Industry Awash in Record Levels of Cash*, MSNBC, July 21, 2005, http://www.msnbc.msn.com/id/8646744.

242 John W. Schoen, *Oil Industry Awash in Record Levels of Cash*, MSNBC, July 21, 2005, http://www.msnbc.msn.com/id/8646744.

243 Drollette, *supra* note 165.

244 *Id.*

245 *Id.*

levels.[246] Because of the lack of stability in the region and because reserves are scarce in other parts of the planet, the U.S. hangs on the whims of OPEC pricing.

Interestingly, in a recent article in the *Middle East Economic Survey*, two authors stated the world would be better off if it recognized the iron-clad grip OPEC has on oil production. They seem to suggest the global community should learn to address this reality, rather than fight it. They suggest that "politicians, environmentalists, and the public in oil-consuming countries [should] not ignore the valid interests of the oil-exporters on whom they depend."[247] Furthermore, "They should not ignore the fact that the market has chosen a fuel — oil — that differs from some governments' current fuel preferences."[248] Apparently, these authors believe that non-oil rich nations should simply realize that OPEC has them over a barrel, only this time, it is an oil barrel.

V. The Role of Government Policies

This portion of this article will discuss the role of government in the economic development framework with alternative and renewable energy sources, specifically covering recent legislation enactments and discussing the interplay with the future of alternatives. Additionally, it will discuss the concept that even without governmental intervention, alternatives are likely to continue expanding through efforts in the private sector.

President Bush, in his 2006 State of the Union address, startled many when he commented, "Keeping America competitive requires affordable energy. And here we have a serious problem: America is addicted to oil."[249] He then stated, "The best way to break this addiction is through technology. Since 2001, we have spent nearly $10 billion to develop cleaner, cheaper, and more reliable alternative energy sources – and we are on the threshold of incredible advances."[250]

This comment was an impressive one, coming from a man who made a large share of his sizable wealth during his time in the oil industry. Clean Edge comments, "Even America's Oilman, George W. Bush, seems to be warming to clean energy. [His 2006 State of the Union comment is] not an inconsequential statement for a Texan whose vice president once dismissed energy conservation as merely a 'personal virtue.'"[251]

Mirroring Bush's call, Michigan Rep. John Dingell, the chairman of the House Energy and Commerce Committee, a man who once considered global warming to be merely a "theory," has had a change of heart, commenting, "The science on this question . . . has been settled."[252] According to the *Wall Street Journal*, Dingell recently

246 Mohammed Barkindo, *Energy Security: A Global Perspective*, Speech at London Oil Club, July 27, 2006, http://www.opec.org/opecna/speeches/2006/londonoilclub.htm.

247 Gavin Longmuir & AF Alhajji, *Reducing Oil Dependence Without Triggering A Global Crisis*, Middle East Econ. Surv., Feb. 26, 2007, at 11, http://www.mees.com/postedarticles/oped/v50n09-5OD01.htm.

248 *Id.*

249 State of the Union Address, *supra* note 7.

250 *Id.*

251 Clean Edge, *supra* note 204, at 1.

252 Greg Hitt, *Changed Climate on Warming: Rep. Dingell, a Recent Convert, Begins Emissions-Bill Hearings*, Wall St. J., Mar. 20, 2007, at A6.

invited former Vice President Al Gore to Washington as part of hearings on the issue of global warming.[253]

President Bush's declaration, and his subsequent proposal to break the U.S. of its "addiction" was extremely unusual, given that in his previous State of the Union addresses, he made mention of "oil" nine times. Previously, Bush never once used the terms "alternative fuel" or "climate change."[254]

In his State of the Union speech, Bush also introduced "the Advanced Energy Initiative — a 22-percent increase in clean-energy research — at the Department of Energy, to push for breakthroughs in two vital areas."[255] Bush commented, "To change how we power our homes and offices, we will invest more in zero-emission coal-fired plants, revolutionary solar and wind technologies, and clean, safe nuclear energy."[256]

After his speech, Bush presented, through an executive order, an energy plan seeking to target America's oil addiction. His new energy scheme called for a reduction in gasoline expenditure by 20 percent over the subsequent 10 years.[257] This reduction was to be accomplished through an increase in alternative fuels and by improving fuel-economy standards for U.S. vehicles.[258] Bush's CAFE Plan would propose a 4 percent increase annually to corporate average fuel economy (CAFE) standards for cars beginning in model year 2010 and for trucks in 2012.[259] The present standard aims for the use of almost 8 billion gallons of alternative fuels by 2012.[260] The new target would be 35 billion gallons of renewable and alternative fuels by 2017.[261]

Bush stated, "Breakthroughs on this and other new technologies will help us reach another great goal: to replace more than 75 percent of our oil imports from the Middle East by 2025."[262] He further commented, "By applying the talent and technology of America, this country can dramatically improve our environment, move beyond a petroleum-based economy, and make our dependence on Middle Eastern oil a thing of the past."[263]

It was not the first time President Bush has sought to change the way Americans address energy concerns. President Bush signed the Energy Policy Act of 2005 .[264] The Act authorized loan guarantees for "innovative technologies" that avoid greenhouse gases as well as "clean" coal and renewable sources of energy.[265] It also increased the

253 *Id.*
254 Words that Were Used, *supra* note 68.
255 State of the Union Address, *supra* note 7.
256 *Id.*
257 Office of the President, Twenty in Ten: Strengthening America's Energy Security, http://www.whitehouse.gov/stateoftheunion/2007/initiatives/energy.html.
258 *Id.*
259 *Id.*
260 *Id.*
261 *Id.*
262 State of the Union Address, *supra* note 7.
263 *Id.*
264 *Id.*
265 *Id.*

amount of biofuel to be mixed in domestic gas production, tripling the 7.5 billion gallon requirement.[266]

A. Criticism for Bush's Clean Energy Research Plan: Problems with Ethanol

Immediately after Bush's announcement came a wave of criticism. *New York Times* Op-Ed columnist Paul Krugman complained that the "only real substance on [energy policy in President Bush's State of Union address] was [his] call for huge increase in supply of 'alternative fuels.'"[267] Krugman said the problem is that using ethanol to replace gasoline is a "bad idea."[268] He notes ethanol in the U.S. comes from corn, but corn is such a poor source of ethanol that converting the entire U.S. corn crop into ethanol would replace only 12 percent of gasoline consumption.[269] Krugman says the obvious alternative — one Bush does not stress — is conservation.[270]

Jerry Taylor, a Cato Institute Senior Fellow opined that, "[a]ccording to the President, ethanol is the magical elixir that will solve virtually every economic, environmental and foreign policy problem on the horizon."[271] Taylor cautioned, "In reality, ethanol is enormously expensive and wasteful. If all the corn produced in America last year were dedicated to ethanol production (and only 14.3 percent of it was so dedicated), U.S. gasoline consumption would drop by only 12 percent."[272] Furthermore, Taylor noted, "For corn ethanol to completely displace gasoline consumption in this country, we would need to appropriate all cropland in the United States, turn it completely over to corn-ethanol production, and then find 20 percent more land on top of that for cultivation."[273] Finally, Taylor said the use of subsidies is erroneous, "[i]f ethanol has commercial merit, it will not need government subsidies. If it doesn't, no amount of subsidies will help."[274]

According to Shawn Langlois, of the Dow Jones-affiliated Market Watch, "The [CAFE] proposal . . . is either going too far or not nearly far enough, depending on whom you ask."[275] Langlois explains, "The CAFE standard for passenger cars is 27.5 mpg, where it has sat since 1990. For light trucks, a recent rule will push it to 24 mpg from 22.2 mpg within four years."[276] He states, "The U.S. Energy Department estimated the most recent increase to cost about $275 per light truck. Light trucks that exceed 8,500 pounds, like the Hummer and other big pickups and SUVs, have long

266 *Id.*
267 Paul Krugman, Op-Ed, *The Sum of All Ears*, N.Y. Times, Jan. 29, 2007, at A 19.
268 *Id.*
269 *Id.*
270 *Id.*
271 Cato Inst., State of the Union: Iraq, Jan. 24, 2007, http://www.cato.org/view_ddispatch.php?viewdate=20070124.
272 *Id.*
273 *Id.*
274 *Id.*
275 Shawn Langlois, *Carmakers Gird for New Fuel Economy Standards*, MarketWatch.com, Jan. 24, 2007, http://www.marketwatch.com/news/story/domestics-feel-heat-bush-unveils/story.aspx?guid=%7B9186F5DC-6FAD-45CF-B0FB-4DBAD0277E3A%7D.
276 *Id.*

been exempt from CAFE standards; but that will change in 2011."[277] Deutsche Bank analyst Rod Lache says, "Such regulatory changes could prove costly for automakers, particularly the Big Three, with each 5% increase in fuel economy standards costing between $200 and $400 per vehicle."[278]

B. Private-sector Advances without Government

One of the most vocal criticisms of clean-energy technology is that it usually requires massive government subsidies to begin operation. Ralph Nader cautions that in subsidizing industries in which pollution is a concern, a scenario is often created in which a "subsidy to local government turned into a subsidy to factories that increased [the] pollution — and at the taxpayers' expense."[279] This tragic result has been seen in the waste water industry in which, "[h]undreds of millions of dollars in . . . subsidies flow from Washington to local government for [waste water programs]" but the funding is often used to subsidize local factories that increase waste water pollution.[280]

Fortunately, some industry analysts have predicted that alternative energy markets will flourish, absent federal intervention. According to Clean Edge research,

> [B]iofuels will grow from $15.7 billion in 2005 to $52.5 billion by 2015. Wind power will expand from $11.8 billion in 2005 to $48.5 billion in 2015. Solar photovoltaics will grow from an $11.2 billion industry in 2005 to $51.1 billion by 2015. And the fuel cell and distributed hydrogen market will grow from $1.2 billion last year to $15.1 billion by 2015. In total, we project these four clean-energy technologies, which equaled $40 billion in 2005, to grow fourfold to $167 billion within the coming decade.[281]

VI. The "Fuel v. Food" Debate

As previously mentioned, the debate is enormous surrounding the future of ethanol and biofuels, mostly commonly stated as "food versus fuel." If corn is the main ingredient used in the production of ethanol, the price of corn will rise to accommodate production needs, a fact that has already begun to show its face in the market place as corn chips, corn tortillas, corn syrup, corn starch and all corn-based food products have experienced an increase in price. The "food versus fuel" debate asks whether the nation is prepared to handle the affects that expanded use of ethanol fuel will have on their grocery bill. This portion of this article will discuss the issue and provide alternatives to focusing solely on corn production in the future of ethanol. Ethanol from corn is one of the few field tested materials used in ethanol production. The fact that production-outputs of ethanol have improved so dramatically may, paradoxically, force the decline of corn as an alternative energy. As corn prices go up, the economics cause ripples in the cost of food.

277 *Id.*
278 *Id.*
279 *Id.*
280 DAVID ZWICK, WATER WASTELAND: THE REPORT ON WATER POLLUTION xiii (2005).
281 Clean Edge, *supra* note 204, at 1.

Some have surmised that it is simply impossible for the U.S. to produce enough domestic corn to supplant the use of fossil-fuels. According to the Organization for Economic Cooperation and Development (OECD), the United States simply does not have enough land to produce the corn necessary to meet ethanol production needs.[282] The OECD states that the U.S. would need 1.2 Gha (global hectares; a measurement of biological productivity capabilities of land).[283] This amount is more than 6 times the farmable land in the United States.[284]

The OECD comments, "Even large efficiency in . . . car performance will not make up for inherently low power densities of cropping."[285] If future U.S. transportation efficiencies were "3 times more efficient [than it was in 2000, it] would still claim some 75% of the country's farmland if it were to run solely on ethanol produced at rates prevailing in 2005."[286]

Even if the U.S. could overcome the aforementioned hurdle—which would seem to be impossible—ethanol has an enormous additional hurdle it must face if it is to become an economically viable alternative; namely, whether it can be proven that corn for ethanol will not disrupt the economic stability of the farming and food sectors of the United States.

As of 2006, according to the *New York Times*, the bulk of venture dollars spent on alternative fuels have gone towards ethanol development. "More than a third of the 2006 investments went to technologies related to ethanol . . . [President] Bush has high hopes for ethanol and other alternative fuels, calling for them to take the place of 35 billion gallons of gasoline by 2017."[287]

In his statement to the Senate, Keith Collins of the U.S. Department of Agriculture, points out that the costs for producing ethanol from corn have increased significantly. "U.S. Department of Agriculture surveys indicate that between 1998 and 2002 the average cost of producing ethanol remained at about 95 cents per gallon. Since 2002, the cost of producing ethanol has increased to the range of $1.45 per gallon, due the increased cost of energy and corn."[288]

However, Collins stated, "Each $1 increase in the per bushel price of corn adds about 36 cents per gallon to the production cost of ethanol, assuming no change in the price of co-products and 24 cents per gallon assuming the prices of co-products increase proportionally with the price of corn."[289] As more resources are directed at corn-produced ethanol, costs associated with corn have risen.

A. "Ethanol Push Could Deliver Rising Costs for Pizza Guys"

Soaring U.S. demand for ethanol has sent corn prices to their highest level in a decade. According to Scott Patterson of the *Wall Street Journal*, Chuck E. Cheese's

282 Smil, *supra* note 115, at 10.
283 *Id.* at 11.
284 *Id.*
285 *Id.*
286 *Id.*
287 Richtel, *supra* note 210.
288 Testimony of Keith Collins, *supra* note 23, at 3.
289 *Id.*

(traded on the New York Stock Exchange as CEC) restaurants were expected to post fourth quarter earnings of 33 cents. "But Chuck E. Cheese's might not be serving up much comfort for investors. CEC and other pizza makers could become victims of Washington's push to use corn-based ethanol as a substitute fuel."[290] Patterson notes, "The cost of every ingredient in a pepperoni pizza could rise because of the ethanol shift. Wheat prices are expected to rise as farmers dedicate more acreage to corn. Cattle and hogs feed on corn. And high-fructose corn syrup is a common ingredient in tomato sauce."[291] According to Patterson, "A pound of cheddar cheese traded on the Chicago Mercantile Exchange is up more than 20% from a year ago."[292]

According to a February, 2007 article, the increase in U.S. corn prices is having a global impact. "Experts are talking about a permanent change in food economics."[293] In Iowa, "farmers say they are already giving up rotating corn and soya crops to focus on corn alone, which is now highly lucrative as a material for biofuel production."[294] The article's author states, "Mexicans are already feeling the impact. Tens of thousands took to the streets in January when the price of tortillas tripled to 15 pesos ($1.36) a kilogramme (2.2 pounds). . . . Since half of Mexico lives on $5 a day or less, that's no small jump."[295]

According to Lester R. Brown of the Earth Policy Institute, global price increases will have profound impacts on world food consumption. Brown states,

> This unprecedented diversion of the world's leading grain crop to the production of fuel will affect food prices everywhere. As the world corn price rises, so too do those of wheat and rice, both because of consumer substitution among grains and because the crops compete for land. Both corn and wheat futures were already trading at 10-year highs in late 2006
> [. . .]
> With corn supplies tightening fast, rising prices will affect not only products made directly from corn, such as breakfast cereals, but also those produced using corn, including milk, eggs, cheese, butter, poultry, pork, beef, yogurt, and ice cream. The risk is that soaring food prices could generate a consumer backlash against the fuel ethanol industry.[296]

B. Is Coal a Better Alternative than Ethanol?

The *Wall Street Journal* added a comment to the mix from an interesting source: coal companies. Coal companies are saying that the imbalance in corn prices makes

290 Scott Patterson, *Ethanol Push Could Deliver Rising Costs for Pizza Guys*, WALL ST. J., Mar. 6, 2007, at C1.

291 *Id.*

292 *Id.*

293 Ruth Gidley, *Food or Fuel?*, Reuters AlertNet, Feb. 23, 2007, http://www.alertnet.org/thefacts/reliefresources/117224445861.htm.

294 *Id.*

295 *Id.*

296 Lester R. Brown, *Distillery Demand for Grain to Fuel Cars Vastly Understated: World May Be Facing Highest Grain Prices in History*, Earth Policy Institute, Jan. 4, 2007, http://www.earth-policy.org/Updates/2007/Update63.htm.

coal a better alternative. According to reporter John J. Fialka, "Coal companies say that problems for makers of ethanol-based fuels render coal-based fuels more competitive. They see an annual production ceiling on corn-based ethanol of about 15 billion gallons annually; above that point, food experts say, demand for corn will raise food and meat prices to unacceptable levels."[297]

C. Ethanol Doesn't Have to Come From Corn

It seems odd to delve into "alternatives" of alternative energy, but that debate is attracting attention as corn prices continue to set records. The fact is, options other than corn are available in the production of ethanol, but none of them are receiving much attention these days. Switchgrass is a viable substitute, as is sugar cane. According to Ross Douthat of *The Atlantic*, "Cellulosic ethanol could be made from agricultural waste, so that we need not rob our food supply for our energy supply. Better still, it could be derived from non-food producing plants grown on land otherwise unsuitable for cultivation."[298] Douthat comments that science is key, "[c]ellulosic ethanol wouldn't provide a complete solution to our energy problem, but even many skeptics acknowledge its promise, and the Department of Energy is excited enough to have made the pursuit of cellulosic ethanol a key component of its plan to replace a third of annual U.S. oil consumption with biofuels by 2030."[299]

VII. Consumer Choices and the Carbon Footprint

When one thinks of choices and alternative energy, the quote from Plato, "Necessity, who is the mother of invention," comes to mind. Sustainability choices in consumer decision-making can indeed change markets and perhaps alter the path industries take when making choices. At present, radical developments are occurring in the market that allow consumers to lower their "carbon footprint." A few ingenious companies are even giving consumers the option of going "off the grid" and generating energy on their own.

Columnist Jess Worth, in *UTNE Reader*, commented, "Irish rocker Bono recently pontificated: 'Shopping is politics. You vote every time you spend money.'"[300] But Worth notes that the concept of 'ethical consumerism' is "something of an oxymoron. The dictionary definition of 'consume' is 'to destroy by or like fire or disease: to cause to vanish.' A consumer is 'a person who squanders, destroys, or uses up.'"[301] And consumerism is indeed destroying the planet. Worth concludes, "Ethical consumerism offers attractively simple answers when these do not exist. Buying a different brand of detergent is easy. Effecting social change is hard."[302]

Be that as it may, consumers are "talking" with their pocket-books, and industries are listening. A Hong Kong-based health club has recently installed technology that

297 Fialka, Energy Mandates Fuel Rift, *supra* note 230, at A4.

298 Douthat, *supra* note 70, at 122.

299 *Id.*

300 Jess Worth, *Buy Now, Pay Later*, New Internationalists, Nov. 2006, http://www.newint.org/features/2006/11/01/keynote/.

301 *Id.*

302 *Id.*

harnesses the energy its members generate while exercising and can generate electricity sufficient to operate televisions, light bulbs, or "several hundred video iPods."[303]

Created by the previously-mentioned firm known as Motorwave, the technology has been installed into gyms such as California Fitness whose owner, 24 Hour Fitness Worldwide, paid about $15,000 for the cost of materials that can generate up to 300 watts of electricity.[304] According to the *Wall Street Journal*, "The company's U.S. parent is watching the Hong Kong experiment closely and says it would consider a global roll-out if the Hong Kong project is successful. The company has three million members and close to 400 gyms in the U.S."[305]

According to Lucien Gambarota, the CEO of Motorwave Co. Ltd.,

> The problem to date with renewable energy has been that it has been too expensive for the average citizen to apply to their daily lives. With our unique gym equipment technology, we are able to harness the energy that people use in their daily workouts, and turn that into a useable source of electricity.[306]

Gambarota continued, "The beauty of this is that it is also an enormous educational tool, as it raises the awareness to individuals that they too, can make a difference, even on a small scale. This will help spur further innovations."[307]

Gambarota wrote that "Motorwave's patented technology (producing electricity, desalinized water, and hydrogen) and Motorwind micro-wind turbines are also good examples of renewable energy technologies that are being made available for a broader base of individuals."[308] He added, "This technology is extremely cost effective, and can therefore be used on individual homes, rural village communities, and coastal cities which might not have previously been able to afford other types of renewable energy options."[309]

Consumers are being offered a host of items that convert the energy from their own body movements into electricity. London-based design firm, Facility: Innovate, develops mechanisms that convert mechanical movement from footsteps and vibrations into electricity that can be used to "power a streetlamp from your footsteps, illuminate a railway tunnel from the vibration within the structure, charge your iPod whilst walking to the photocopier [and] illuminate the timetable in Victoria Station via the rush-hour commute."[310]

Lightning Packs, a company created by University of Pennsylvania biology professor Larry Rome, generate electricity from the natural movement of a backpack during walking. "At Lightning Packs, our goal is to develop innovative backpacks that recover

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303 Jane Spencer, *While You're at It, Why Not Generate a Little Electricity*, WALL ST. J., Mar. 1, 2007, A1.

304 *Id.*

305 *Id.*

306 Email from Lucien Gambarota, inventor of the Motorwave, to Brett Buchheit (Mar. 1, 2007, 16:13 CST) (on file with author).

307 *Id.*

308 *Id.*

309 *Id.*

310 The Facility, http://www.the-facility.co.uk/energy_harvesting.php (last visited Sep. 20, 2008).

electricity from normal walking and that provide wearers with ergonomic benefits such as reduced joint stress."[311] As the wearer walks, the backpack moves with him. The pack's "load is suspended from the frame by vertically-oriented springs, which allow up and down movement of the load with respect to the backpack frame, whereas normal backpack loads are rigidly attached to the frame with no movement."[312] Rome has used a generator on the pack to store electricity that could be used to run small electrical applications like laptops, cell phones, and MP3 players.[313]

A Flagstaff-based company called Southwest Windpower will soon introduce a home-wind turbine. The company, according to CNNMoney.com, has $10 million in annual revenues and is the "world leader (with a 35% share) in so-called small wind, a category distinct from the huge turbines deployed on wind farms. Southwest's turbines provide power to boats and to houses off the electrical grid, even to base camps on Mount Everest."[314] The home-wind turbines are 45 feet high, compared to 100 feet for a conventional turbine.[315] They will retail for about $6,000 and could save households about $500 a year, paying for themselves in 12 years.[316] In some communities, owners can receive a tax credit.

The Dutch environmental group, Enviu, has even created a "sustainable nightclub" in Rotterdam. They offer the chance to produce and consume in a responsible manner.[317] The aptly-named Sustainable Dance Club offers "[a]n attractive way of clubbing, combined with a low impact on the environment."[318] According to the website, "you can generate energy while dancing and flush the toilet with rainwater. The color of the walls changes as a reaction to heat without any energy use and you can drink a biological beer at the water basin on the 'relax roof.'"[319]

Although these products and services entail a small portion of what it would take for a "consumer" to become a "producer," they show that technology and consumer-interest presently exist, thus increasing their impact on the economy. Markets are currently reflecting that consumers not only want to decrease their impacts on the environment, but they are also willing to pay to do so. According to the *Wall Street Journal*, "[n]ot everyone may be willing to overhaul their lives to accommodate the environment, but more people are opting for the rising number of options offered by companies to neutralize their 'carbon footprints,' meaning the amount of energy they consume."[320]

311 Lightning Packs, http://www.lightningpacks.com/index.html (last visited Sep. 20, 2008).

312 *Id.*

313 *Id.*

314 Justin Martin, *Your Own Windmill: Innovative New Turbines Bring Wind Power to the Home Market*, CNNMoney.com, Jan. 24, 2007, http://money.cnn.com/magazines/fsb/fsb_archive/2006/04/01/8373099/index.htm?postversion=2006050116.

315 *Id.*

316 *Id.*

317 The Critical Mass, Rotterdam Introduces the First 'Sustainable Dance Club,' http://www.enviu.org/cm/cm_index_site.html.

318 *Id.*

319 *Id.*

320 Lauren Tara LaCapra, *Take my Emissions, Please*, WALL ST. J., Mar. 1, 2007, D1.

Programs that seek to reduce an individual's 'carbon footprint,' usually require consumers to pay an additional amount for products, ranging from organic health-food company ClifBar's "Start Global Cooling" badges offered at music events, to AT&T's offer to donate funds toward conservation operations. The concept of carbon-offset programs allows participants to do everything from providing solar energy to low-income families in the Chicago area (through Carbonfund.org) to converting animal waste methane into renewable energy (with DrivingGreen.com). One can even promote energy-efficient lighting in Jamaica.

Similarly, a company called TerraPass asks, "Ever wished you could do something about global warming?"[321] The company sympathizes with consumer reluctance, saying, "It might seem there's nothing you can do about global warming. The problem is just too big. Of course, we all contribute to global warming. We all have a 'carbon footprint,' the total carbon dioxide emissions we create when we drive or fly or use electricity."[322] TerraPass offers consumers a way to eliminate their carbon footprint. They state, "When you buy a TerraPass, your money funds clean energy and efficiency projects such as wind farms. These projects result in verified reductions in greenhouse gas emissions."[323] These reductions counterbalance your own emissions.

Finally, some people are turning to what are known as "sustainable communities." A firm called Gas Technology Incorporated (GTI) invites people to "[i]magine living in a clean, vibrant city where open green spaces, shopping, entertainment and employment are all accessible without driving your own vehicle; and where most buildings produce more energy than they consume. Imagine this city to be your own, in the not-too-distant future."[324] GTI "introduces a vision for sustainable urban design as well as a plan and tools for how to get there." The firm shows how "efficient land use planning, integrated energy and environmental management systems, and advanced transportation and building technologies can make this vision a reality."[325]

According to the BBC, a geothermally-sustainable community in the United Kingdom is already up and running. A housing association in Cornwall has become the first in the England "to install alternative geothermal heating for its tenants. The system uses natural heat found just below the surface of the earth."[326]

In a recent summit titled *Energy and Climate Change, Natural Resources, and Sustainable Communities*, the U.S.-based Global Energy Center for Community Sustainability (GEC), in partnership with The Johnson Foundation, furthered the discussion of these communities.[327] Recent GEC projects include a collaboration with the State of

321 TerraPass, About TerraPass, Oct. 14, 2006, http://www.terrapass.com/about/index.html.

322 *Id.*

323 *Id.*

324 Gas Tech. Inc., Energizing Sustainable Cities, http://www.gastechnology.org/webroot/app/xn/xd.aspx?it=enweb&xd=1researchcap%5C1_7energyconsulting%5Cenergizingcitiesdvd.xml (last visited Sep. 20, 2008).

325 *Id.*

326 Alternative Energy for Village, BBC News, July 30, 2004, http://news.bbc.co.uk/2/hi/uk_news/england/cornwall/3937771.stm.

327 National Leadership Summits for a Sustainable America, June 5-7, 2006, http://summits.ncat.org/index.php.

California, the DOE, and the above-mentioned GTI. GEC creates model processes and designs for energy-efficient community developments. Its projects focus on promoting energy-smart land use, green building designs, urban heat island mitigation, and reduction of greenhouse gas emissions, and strive to integrate renewable energy, energy efficiency, distributed generation and other advanced energy technologies in different building types and in municipal operations.[328]

A. Covering the Dome

With all this available technology, can we imagine such a thing as an "eco-friendly" sports stadium? Picture the New Orleans Super Dome with solar panels spanning the entire 10-acre surface of the dome and providing all the electricity needs of the stadium. Such a notion is entirely within the technological capabilities of modern industry and in fact, it's already been done on a similar athletic facility. Sweden's Ullevi Stadium according to architectural design firm Swedish Gällivare Photovoltaic AB, will be able to produce up to 70,000 kWh of electricity from the tiles on its roof.[329]

According to Cathy Carrigan, Marketing Coordinator for New Jersey-based Energy Photovoltaics (EPV), covering the Superdome, while architecturally a difficult process, is entirely possible. "If you were able to place a majority of the cells in a southerly-facing direction to access the sun's light at its most conducive angle, it's highly likely a substantial portion of the Dome's energy needs could be generated with our products."[330] Mrs. Carrigan stated EPV's crystalline silicone products are capable of generating between 40 and 45 watts per panel. She estimated it would take approximately 50,000 panels to cover the Dome's 9.7 acre roof.[331] Not only would this process lower carbon-emission, it would also reduce the Dome's power bills. EPV notes their "manufacturing process is among the lowest cost commercially demonstrated processes, resulting in low cost modules and low cost electricity."[332]

A similar system was actually completed in the U.S. over a decade ago. Dr. Ajeet Rohatgi, Professor at Georgia Tech was instrumental in the design and installation of "the world's largest grid-connected, roof-top PV system on the Georgia Tech Aquatic Center," which supplemented power for that facility during the 1996 Atlanta Olympics.[333]

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328 *Id.*

329 SolarWorld Subsidiary to Equip European Championship Stadium With Solar Energy, Greenjobs.com, Sept. 5, 2006, http://www.greenjobs.com/Public/IndustryNews/inews01124.htm.

330 Telephone Interview with Cathy Carrigan, Marketing Coordinator at Energy Photovoltaics (Mar. 20, 2007).

331 *Id.*

332 Energy Photovoltaics Solar, Inc., The Wonders of EPV's Thin Film Photovoltaics, http://www.epv.net/static.asp?Page=4.

333 Ga. Inst. of Tech., Dr. Ajeet Rohatgi – Regent's Professor, http://www.ece.gatech.edu/research/UCEP/ucepdirector.htm.

VIII. A Future without Alternative Energy

The DOE paints a somber picture if consumers and governments do not adapt to alternative sources of energy. "World demand for energy is projected to more than double by 2050 and to more than triple by the end of the century. Incremental improvements in existing energy networks will not be adequate to supply this demand in a sustainable way. Finding sufficient supplies of clean energy for the future is one of society's most daunting challenges."[334]

According to DOE statistics on renewable energy usage from 1965 to 2005, the use of renewable energy sources has increased approximately 78 percent in that 40 year span.[335] The DOE cites renewable energy consumption as having increased from 1965's levels of 3.398 trillion BTUs to 2005's levels of 6.061 trillion.[336]

This increase of almost 80 percent over a 40 year period seems to be an immense one, until consideration is given to the notion that if you have a dollar, and someone gives you another dollar, you have twice as much money, but you still only have two dollars. The present DOE statistics show that should U.S. energy consumption has risen from 54.02 quadrillion BTUs in 1965 to 99.89 quadrillion BTUs in 2006.[337] A quadrillion is 10^{15} while a trillion is a mere 10^{12}. The difference between the two figures is a staggering 99,890,094,039,000,000 BTUs, and hardly represents *any* appreciable dent in U.S. energy production.

According to the DOE, "Current global energy consumption is 4.1×10^{20} J annually, which is equivalent to an instantaneous yearly-averaged consumption rate of13 trillion watts, or 13 terawatts (TW)."[338] The future consumption of energy, according to the DOE, will have to address a massive increase in population and growth. "Projected population and economic growth will more than double the global energy consumption rate by the mid-21st century and more than triple the rate by 2100, even with aggressive conservation efforts."[339]

The DOE states, "Alternative renewable fuels are at present far from competitive with fossil fuels in cost and production capacity. Without viable options for supplying double or triple today's energy use, the world's economic, technological, and political horizons will be severely limited."[340]

According to the International Energy Agency, "If governments stick with the policies in force as of mid-2004, the world's energy needs will be almost 60% higher in 2030 than they are now. Fossil fuels will continue to dominate the global energy mix,

334 DOE SOLAR ENERGY UTILIZATION, *supra* note 12, at ix.

335 *See* U.S. Dep't of Energy, Table 10.1, Renewable Energy Production and Consumption by Primary Energy Source, Selected Years 1949-2006, http://www.eia.doe.gov/emeu/aer/pdf/pages/sec10_3.pdf.

336 *Id.*

337 U.S. Dep't of Energy, Table 1.1 Energy Overview, 1949-2006, http://www.eia.doe.gov/emeu/aer/txt/ptb0101.html.

338 DOE SOLAR ENERGY UTILIZATION, *supra* note 12, at 3.

339 *Id.*

340 *Id.*

meeting most of the increase in overall energy use. The shares of nuclear power and renewable energy sources will remain limited."[341]

In a list of concerns brought forward by the IEA, the following statements were made: CO_2 emissions will have increased by 60 percent in 2030 over their present levels; world primary energy demand will expand by almost 60 percent between 2002 and 2030; future trends in oil prices will remain a major source of uncertainty; worldwide consumption of natural gas will almost double by 2030, and will overtake that of coal within the next decade.[342]

IX. Conclusion

The IPCC's report established a firm, incontrovertible connection between climate change and man. We are the reason for global warming. This historical report takes the debate out of the realm of theory and places the need for adopting alternative sources of non-fossil fuels directly in our hands. The concept of "maybe" is completely gone from the inquiry.

Discussion of alternatives energy sources, ground breaking developments by investors, and increasing U.S. Government involvement in renewable energy all point toward a future that might avoid the catastrophic results of which the IPCC warns.

And yet, with the writing on the proverbial wall, environmental issues too often take a back seat to the problems directly in front of our faces. As stated in a 2006 article in *The New Yorker*, "[A]ccording to a recent Pew Research Center Survey, Americans still rank global warming as a low policy priority — far behind Iraq, the economy, and health care – with less that half of respondents designating it a 'very important issue.'"[343] According to a March 2007 survey in the *Wall Street Journal*, Americans ranked "environment/global warming" behind the war in Iraq, health care, terrorism, job creation, and illegal immigration. Only 7 percent said global warming or environmental concerns were a "top priority."[344]

However, we still have hope. Humans have shown a remarkable ability to address impending problems. Boris Worm, professor at Dalhousie University in Nova Scotia, commented recently, "When humans get into trouble they are quick to change their ways. We still have rhinos and tigers and elephants because we saw a clear trend that was going down and we changed it."[345]

So how can we come together to solve this impending crisis? Addressing the issue of global environmental security, Professor Eric Dannenmaier of the Tulane University School of Law, offers a solution that is applicable to the present situation. "Ensure concrete progress by calling for the development of specific indicators to measure the

341 Int'l Energy Agency, World Energy Outlook 2004, Executive Summary 29 (2004), http://www.iea.org/textbase/npsum/WEO2004SUM.pdf.

342 *Id.* at 30–33.

343 John Cassidy, *High Costs*, The New Yorker, Nov. 13, 2006, at 35.

344 *Getting Warmer*, Graph, Wall St. J., Mar. 20, 2007, at A6.

345 Cornelia Dean, Study Sees 'Global Collapse' of Fish Species, N.Y. Times Online, Nov. 3, 2006, http://www.nytimes.com/2006/11/03/science/03fish.html?_r=1&adxnnl=1&oref=slogin&adxnnlx=1163006665-2xhM7MqpiP91YVJF2yJ7yQ.

nature and degree of environmental security challenges in the region and the ability of governance frameworks to respond to these challenges."[346]

Dannenmaier describes the paradoxical scenario of slow governmental action and the disaster on the horizon, commenting, "Despite the risk to resources, economies, and populations, the link between environmental policy and regional security is poorly understood and rarely viewed comprehensively. Ironically, if foreign troops or terrorists threatened the same consequences, the response would be more certain."[347]

According to Nobel Laureate Amartya Sen, the answer to global and local issues lies largely in public action. This action "includes not only what is done for the public by the state, but also what is done by the public for itself. It includes, for example, what people can do by demanding remedial action and through making governments accountable."[348]

Sen warns, however, that democracy alone is not enough. Entrusting the outcome of a crisis on the government, even a democratic one, will not solve the problem. "A democratic form of government is not in itself a guarantee," Sen commented, adding, "The political incentives to deal with these major failures would enormously increase if these issues were to be brought into political and journalistic focus, making greater use of the democratic framework."[349]

As retired politician Daniel Patrick Moynihan once commented, "Expect little of government, especially national government."[350] Such pessimism, according to Sen, is unnecessary. "Pessimism is not new . . . , and has had a major role over the centuries in dampening the hearts and in forestalling preventive public action."[351]

Perhaps the problem lies in our inability to see our moral connection both with the land and with each other. Without recognizing our modern-day impacts are having far-reaching results, and without understanding how those impacts tie us all together, we are unable to see that with each gallon of gas consumed and each headline story ignored, we are sliding further away from a solution and deeper towards the brink of collapse.

Aldous Huxley commented, "Good is that which makes for unity; Evil is that which makes for separateness."[352] Though one would hardly characterize our inaction and apathy as "evil," once the facts are presented and the outcome made clear, it is difficult to find another way to view the situation. By failing to address the global crisis,

346 Eric Dannenmaier, *Environmental Security and Governance in the Americas*, Canadian Foundation for Latin America Policy Paper (2001), at 2, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1078283. Prof. Danenmaier is currently an associate professor at the Indiana University School of Law.

347 *Id.* at 5–6.

348 Amartya Sen, *Public Action to Remedy Hunger*, Speech in London, Aug. 2, 1990, http://www.thp.org/reports/sen/sen890.htm.

349 *Id.*

350 DANIEL PATRICK MOYNIHAN, MILES TO GO: A PERSONAL HISTORY OF SOCIAL POLICY 229, (1996).

351 Sen, *supra* note 376.

352 ALDOUS HUXLEY, ENDS AND MEANS; AN INQUIRY INTO THE NATURE OF IDEALS AND INTO METHODS EMPLOYED FOR THEIR REALIZATION 351 (1937).

and by failing to unify, perhaps Huxley would state our actions are, for lack of a better word, evil.

According to Tom Sherry, professor of ecology and evolutionary biology at Tulane University,

> The ethical place to start is in the United States, the most consumption-crazy national of all. We alone can wean ourselves from a recklessly expanding, petroleum-based economy. Electric cars are a technology waiting for mass application, as are tougher fuel efficiency standards for automobiles and trucks, and more widespread public transportation. We already know how to make our homes and businesses energy efficient, but we need to make this mandatory for new construction. We have the means to upgrade energy efficiency of existing buildings. We already lag behind western Europe in using alternative energy sources such as wind, geothermal, passive and active solar power.[353]

Finally, and perhaps morbidly, the risks associated with inaction will eventually be solved, either by direct action, or simply, by inaction. As author Jared Diamond commented in *Collapse*, regardless whether a civilization acts or does not act, eventually time will be right all wrongs. One of two scenarios will unfold. Either the problems will be addressed in a proactive way and solutions will be implemented to stop the catastrophe; or the inhabitants of the area will address their woes through wars or such advanced environmental degradation the populous is forced to leave an area which can no longer sustain them. Given merely a second to ponder the alternatives, one cringes at the thought of the latter.

It has been said "Time heals all wounds." The planet has shown a remarkable ability to heal and cleanse itself, usually righting itself through environmental disasters such as flood, famine or drought. In *Where have all the Flowers, Fishes, Birds, Trees, Water, and Air Gone?*, Osborn Segerberg, asserts that absent action to prevent collapse, the situation will remedy itself with dire and fatal results. Segerberg quotes Thomas Malthus, 19th Century author on cultural evolution, who wrote, "The vices of mankind are active and able ministers of depopulation." Segerberg summarizes the situation with the appropriate comment, "If humanity falters, it may be overtaken by four phantom horsemen still riding at its heels."[354] Before their names were Pestilence, War, Famine, and Death. Their names now are Oil, Gas, Coal, and Consumption – "not the invisible White Plague of the 19th Century, but the conspicuous consumption of the 20th."

It seems the global community has been warned. Now its time to act

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353 Tom Sherry, *Seeing Past Distractions to Tame Global Change*, TIMES-PICAYUNE, Mar. 6, 2007, at 7.

354 OSBORN SEGERBERG, WHERE HAVE ALL THE FLOWERS, FISHES, BIRDS, TREES, WATER, AND AIR GONE? 268 (1971).

focused on water scarcity in the American Southwest, the international water crisis, and the Food v. Fuel debate. He received his JD from the Appalachian School of Law, where he served as Editor of the school's Natural Resources Law Journal. *He received his LLm in Energy and Environmental Law from Tulane University School of Law.*

Mr. Buchheit would be remiss if he failed to thank Professors Houck and Handl of Tulane University. It was only under their tutelage he was able to see the over-arching issues surrounding our world and the fact that there are solutions if we look for them.

Finally, he wishes to thank his wife Leslie who kept him fueled with coffee and never minded when he worked long into the night. Without her support, this article never would have come to fruition. Here's to Montana.

The Hard Road: NEPA Review of the Trans-Texas Corridor after SEP-15 and SAFETEA-LU § 6005

by Bina Reddy

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I. Introduction

The Trans-Texas Corridor (TTC) is heralded as the future of transportation in Texas. "We need a transportation system that meets the needs of tomorrow, not one that struggles to keep up with the needs of yesterday," announced Governor Perry when unveiling the TTC plan in 2002.[1] "The Trans Texas Corridor will map out a brighter future for Texas."[2]

With this ambition in mind, the TTC is truly Texas-sized and worthy of its designation as a "super" or "mega" highway.[3] With a 50-year plan and a projected cost rang-

1 Press Release, Office of the Governor Rick Perry, Governor Rick Perry Unveils 'Trans Texas Corridor' Plan (Jan. 28, 2002), http://www.governor.state.tx.us/divisions/press/pressreleases/PressRelease.2002-01-28.3252/view.

2 *Id.*

3 *Texas Begins a Huge Highway Project; Not All Are Happy*, N.Y. Times, January 1, 2005, at 14.

ing from $145.2 to $183.5 billion,[4] the TTC is the largest public works project ever that the State of Texas has undertaken.[5] TTC planners contend that a plan of this scale demands innovative paradigms in the finance, building, and maintenance of a major highway project.[6] Other states are closely watching to see how Texas will pursue these innovations and exactly what form this monolith will take.[7]

To accommodate the grand vision of the TTC and other federally funded transportation projects like it, the environmental review process under the National Environmental Policy Act (NEPA) has been reworked. Specifically, the federal government has increasingly sanctioned departures from time-honored NEPA procedures in the interest of attracting private investment to highway projects.[8] The environmental review process under NEPA traditionally involves state transportation agencies, the federal government, and private sector developers, each wearing a different "hat" in the process. State agencies prepare the environmental impact statement (EIS), the federal government oversees the EIS, and private developers construct the highways based on the EIS. To lure private sector investment to highway projects, recent statutory and regulatory changes have been made to allow, (1) private developers rather than state agencies to prepare the EIS, and (2) state agencies rather than the federal government to oversee the EIS.[9] These changes in procedure amount to the switching of NEPA "hats." The intention is to streamline NEPA and, in the process, change the current perception that NEPA procedures are too lengthy, costly, and risky for private investors to get involved.[10]

This note argues that these procedural changes will strip NEPA of its power by upsetting the delicate balance among state transportation agencies, the federal government, and developers. The Supreme Court has found NEPA's mandate to be "essentially procedural". [11] Accordingly, changes in NEPA procedure go directly to the core of the Act and are bound to impact its effectiveness in providing a meaningful form of environmental review. Although these new procedures claim full compliance with NEPA, the ability to comply with the spirit of the Act is highly specious. In the

4 TEX. DEP'T. OF TRANSP. (TxDOT), CROSSROADS OF THE AMERICAS: TRANS TEXAS CORRIDOR PLAN REPORT SUMMARY 7 (2002) http://www.keeptexasmoving.com/publications/files/ttc_report_summary.pdf [hereinafter TxDOT, CROSSROADS]; Elizabeth Austin Lunday, *Everything's Bigger in Texas*, PLANNING, May 2005, at 10 ("A total bill of up to $183 billion—nearly half the cost of the entire U.S. Interstate System in 2004 dollars.").

5 *See* TxDOT, CROSSROADS, *supra* note 4 at 5.

6 "The Trans Texas Corridor is a way of looking at transportation planning, design, construction, operation and finance in a different way than we have ever looked at these processes before." TX Transp. Comm'r Ric Williamson. Address to TX House Transp. Comm. (March 25, 2003), http://www.corridorwatch.org/ttc/cw-Williamson-HTC-032503.

7 *See* Antonio Palacios, *Trans-Texas Corridor*, PUBLIC ROADS, July/Aug. 2005, http://www.tfhrc.gov/pubrds/05jul/07.htm. ("We're getting requests for presentations on how we're developing this project from DOTs that might want to put some of these concepts into practice in their own States, [TxDOT spokesperson Gaby] Garcia says.")

8 *See infra* Part II.

9 *See infra* Parts III-IV.

10 *See infra* Part II.

11 *Vt. Yankee Nuclear Power Corp. v. Nat. Resources Def. Council*, 435 U.S. 519, 558 (1978).

big-money, high stakes arena of highway building, these alterations to NEPA's process could prove disastrous to the environment.

Using the TTC as a case study, this note focuses on two recent federal highway pilot projects: Special Experimental Project 15 (SEP-15)[12] and Section 6005 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU).[13] As pilot programs, SEP-15 and SAFETEA-LU § 6005 reveal the federal government's current transportation priorities and, if they prove successful, hint at what future highway legislation will look like. Part II of this note introduces the TTC and briefly describes how it fits in the national plan for highways. Part III describes the environmental hazards of highways, the role of NEPA, and the arguments for and against streamlining NEPA procedures. Part IV addresses the SEP-15 project and how it has shifted the responsibility of preparing the EIS from state agencies to private developers. Part V looks at how SAFETEA-LU § 6005 has taken the job of evaluating and approving the EIS from the federal government and given it to the states. Finally, Part VI offers suggestions on how Texas should strive to reverse the trend of weakening environmental protection by building safeguards into its plans for the TTC.

II. The Trans –Texas Corridor and Public-Private Partnerships

A. The Trans-Texas Corridor (TTC)

Texas foresees a transportation crisis on the horizon. According to the Texas Department of Transportation (TxDOT), by 2030, the population of Texas will grow by 12 million, road use will increase by 214 percent, and highway freight traffic will increase by 77 percent.[14] Currently, 45 percent of all Texans live within 50 miles of Interstate-35 (I-35),[15] and by 2030, a total of 15 million people will live within the I-35 corridor.[16] Compounding this situation are anticipated increases in road traffic, particularly semis and freight trucks, due to the North American Free Trade Agreement (NAFTA). Seventy-nine percent of U.S.-Mexico trade passes through Texas, and trade traffic is expected only to increase in the coming years as a result of NAFTA.[17]

The TTC is intended to be the magic bullet to Texas' transportation woes. It is planned to be large enough to absorb current congestion and forecasted growth. The TTC is also considered to have tremendous regional importance as the first leg of the proposed NAFTA-superhighway system.[18] A study of I-35 as a trade corridor states, "I-

12 New Special Experimental Project (SEP-15) To Explore Alternative and Innovative Approaches to the Overall Project Dev. Process; Info., 69 Fed. Reg. 59983, 59983 (Oct. 6, 2004).

13 Safe, Accountable, Flexible, Efficient Transp. Equity Act: A Legacy for Users (SAFETEA-LU), Pub. L. No. 109-59, § 6005, 119 Stat. 1868-72 (2005).

14 Tex. Dep't. of Transp. (TxDOT), TxDOT: Meeting the Challenge 3 (2006) ftp://ftp.dot.state.tx.us/pub/txdot-info/pio/annualsummary2006.pdf [hereinafter TxDOT, Challenge].

15 North America's Super Corridor Coalition (NASCO), Trans-Texas Corridor 35, http://www.nascocorridor.com/pages/projects/ttc-35.html (last visited December 20, 2007).

16 *See* TxDOT Challenge, *supra* note 14 at 3.

17 *See* Palacios, *supra* note 7.

18 *See* NASCO, *supra* note 15.

35 . . . carries a greater percentage of trade among the NAFTA partners than any other U.S. Interstate Highway. Its multi-modal transportation hubs—where air, rail, river and truck cargo converge—ideally position I-35 to be a major route for what's expected to be increasing levels of international trade activity."[19]

All told, the 50-year plan will create a multi-modal system of 4,000 miles of roads, rail, water lines, lift stations, broadband, oil and gas pipelines, and electric utilities.[20] TxDOT already has the basic features of the corridor outlined:

The Trans Texas Corridor is an all-Texas transportation network of corridors up to 1,200 feet wide. The corridor will include separate tollways for passenger vehicles and trucks, high-speed passenger rail, high-speed freight rail, commuter rail, and a dedicated utility zone. The concept includes separate lanes for passenger vehicles (three lanes in each direction) and trucks (two lanes in each direction). The corridor also would contain six rail lines (three in each direction): one for high-speed rail between cities, one for high-speed freight rail, and one for commuter and freight rail. The third component of the corridor would be a protected network of safe and reliable utility lines for water, petroleum, natural gas, electricity, and data.[21]

Unsurprisingly, all this is going to be extremely costly. Texas cannot afford the TTC bill using its current gasoline tax, and Governor Perry is adamantly against increasing the tax.[22] TxDOT estimates that it needs $86 billion more than currently available to meet "Texas' mobility challenge."[23] To pay for this enterprise, Texas is planning to make use of public-private partnerships (PPP). A PPP is a contractual agreement between a public agency and private sector entity that provides for more private sector participation in transportation projects.[24] TxDOT's website for the TTC states that the government "does not have all the answers to the transportation challenges facing Texas and needs the innovation of the private sector."[25] The hope is that the private sector will bring both innovation and a very large pocketbook to the TTC. In recognition of this need, a new chapter in the Texas Transportation Code was added in 2003 to authorize the use of PPPs.[26]

B. Public-Private Partnerships (PPP)

Typically, the use of PPPs involves charging citizens for public services (*i.e.,* toll lanes) in order for a private sector entity to realize a return on its investment. It is this

19 I-35 TRADE CORRIDOR STUDY, TxDOT, I-35 TRADE CORRIDOR STUDY BEGINS 1 (Winter 1998), ftp://ftp.dot.state.tx.us/pub/txdot-info/aus/mis/i35corr/i35tcstx.pdf.

20 *See* TxDOT, CROSSROADS, *supra* note 4 at 5.

21 *Id.* at 8.

22 Clay Robinson, *Federal transportation chief backs Perry's toll: A majority of lawmakers want a 2-year moratorium on similar projects,* HOUSTON CHRON., April 3, 2007, http://www.chron.com/disp/story.mpl/metropolitan/4686227.html.

23 TxDOT, CHALLENGE, *supra* note 14 at 3.

24 U.S. Dep't. of Transp., Fed. Highway Admin., PPPs Defined, http://www.fhwa.dot.gov/ppp/defined.htm#1 (last visited Dec. 31, 2007).

25 Trans-Texas Corridor Guiding Principles, http://ttc.keeptexasmoving.com/about/guiding_principles.aspx (last visited Dec. 20, 2007).

26 *See* TEX. TRANSP. CODE § 227 (Vernon 2006).

feature of the TTC that has received the most media attention.[27] Texas has traditionally paid for its roads through a gasoline tax, and many groups vehemently oppose converting to tolls on Texas roads, particularly if the profits are going to foreign companies.[28]

In 2006, TxDOT signed a deal to develop the first leg of the corridor, TTC-35, with Cintra-Zachry.[29] Cintra-Zachry is a joint venture between Madrid-based Cintra, and San Antonio-based Zachry.[30] The contract provides an investment of $6 billion for Cintra-Zachry to design, construct, and operate a toll road between Dallas and San Antonio as the first portion of TTC-35.[31] Cintra-Zachry will also pay $1.2 billion for operating the Dallas–San Antonio segment as a toll facility that Texas may use to fund other projects along the I-35 corridor.[32] Cintra-Zachry is also authorized to begin a master development and financial plan for a new system of roads, rail, and utilities at a cost of $3.5 billion.[33] Finally, the contract also includes options for Cintra-Zachry to fund a road connecting San Antonio to State Highway 130, a $1.5 billion project that is currently under way.[34]

While the involvement of the private sector and the attendant tolls may seem new and wrong to many Texans, the use of private developers for public infrastructure projects has been unequivocally encouraged by the federal government since the Clinton administration. President Clinton's 1994 Executive Order 12,893[35] established more cost-effective infrastructure investment as a priority for all federal agencies and encouraged private sector participation in infrastructure investment and management.[36] President Bush's 2002 Executive Order 13,274 reinforced this sentiment while bringing environmental review into the fold.[37] The TTC's desire to take advantage of PPPs is in step with national priorities with regard to infrastructure building.

The trick for Texas will be figuring out how to make highway projects as attractive as possible to the private sector while being a responsible steward of the environment. The historical landscape of highways and the environment is pockmarked, and the TTC is the latest battlefield.

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27 *See* N.Y. TIMES, *supra* note 3 at 14; Cathy Booth & Thomas Hutto, *The Next Wave in Superhighways, or A Big, Fat Texas Boondoggle?*, TIME (Nov. 29, 2004).

28 *See generally* CorridorWatch.org, http://www.corridorwatch.org/ttc/cw-tolls.htm (last visited Dec. 20, 2007).

29 Eileen Schwartz, *Plan Moves Forward with Consortium Selection*, TEXAS CONSTRUCTION (May 2005) http://texas.construction.com/features/archive/2005/0505_cover.asp.

30 Id.

31 *Id.*

32 *Id.*

33 *Id.*

34 *Id.*

35 Exec. Order No. 12,893, 59 Fed. Reg. 4233 (Jan. 31, 1994).

36 *See* SEP-15, *supra* note 12 at 59983.

37 Exec. Order No. 13,274, 69 Fed. Reg. 58,449 (Sept. 20, 2004).

III. HIGHWAY PROJECTS AND THE ENVIRONMENT, NEPA, AND ENVIRONMENTAL STREAMLINING

A. HIGHWAY PROJECTS AND THE ENVIRONMENT

A project of the scale of the TTC will naturally have a substantial environmental impact. Transportation projects, and highways in particular, bring about their own unique array of environmental hazards.

Many of the major environmental problems that the United States faces today, including air pollution, water pollution, excessive energy use, fragmented farmlands and habitat, wildlife and biodiversity losses, and community disruption, result, at least in part, from our massive highway systems. [38] Related concerns are about the ways that road building determines land use and encourages urban sprawl. Roads and parking consume urban space, homes and businesses move outward, more roads are built, and the process repeats itself slowly changing forests, ranches, farms, and recreational areas into development.[39] The actual processes involved in constructing a highway have tremendous environmental ramifications as well. [40] With such far reaching effects, it is not a surprise that over thirty federal environmental laws and regulations are triggered in the construction of a major federally funded highway project.[41]

B. THE NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

At least one commentator attributes the birth of the environmental movement in America to unchecked highway building.[42] NEPA was signed in the wake of a highly

38 SURFACE TRANSP. ENVTL. COOP. RES. PROGRAM ADVISORY BD.,TRANSP. RES. BD., SURFACE TRANSP. ENVTL. RES.: A LONG-TERM STRATEGY 2 (2002) http://onlinepubs.trb.org/onlinepubs/sr/sr268.pdf [hereinafter TRANSP. RES. BD.].

39 *Id.*

40 *See generally* U.S. ENVTL. PROTECTION AGENCY, INDICATORS OF THE ENVTL. IMPACTS OF TRANSP. 34-94 (October 1996) http://ntl.bts.gov/lib/6000/6300/6333/indicall.pdf (provides a very extensive study of environmental impacts associated with highway construction, maintenance, and use).

41 This includes: NEPA; FHWA Envtl. Regulations; CEQ Regulations; Endangered Species Act of 1973; Marine Mammal Protection Act; Anadromous Fish Conservation Act; Fish and Wildlife Coordination Act; Migratory Bird Treaty Act; Magnuson-Stevenson Fishery Conservation and Mgmt. Act of 1976; Nat'l Historic Preservation Act of 1966; Archeological Resources Protection Act of 1977; Native Am. Grave Protection and Repatriation Act; Farmland Protection Policy Act; Clean Water Act; Coastal Barrier Resources Act; Coastal Zone Mgmt. Act; Land and Water Conservation Fund ; Safe Drinking Water Act ; Rivers and Harbors Act of 1899; Wild and Scenic Rivers Act; Emergency Wetlands Resources Act; Flood Disaster Protection Act; Section 4(f) of the Dep't of Transp. Act of 1966; Comprehensive Env'l Response, Compensation, and Liability Act; Superfund Amendments and Reauthorization Act of 1986 (SARA); and Resource Conservation and Recovery Act.

42 Oliver A. Houck, *More Unfinished Stories: Lucas, Atlanta Coalition, and Palila/Sweet Home*, 75 U. COLO. L. REV. 331, 377 (Spring 2004).

visible public opposition to highways. Urban areas in particular mobilized against oncoming highways.

> In San Francisco, the elevated Embarcadero Freeway blocked city views of the historic Ferry Building; outraged citizens prevented further freeway construction. In New Orleans, a proposal to build an Interstate through Vieux Carre was rejected. In Memphis, plans to build an Interstate through Overton Park were halted through litigation. Los Angeles' proposals to build freeways through the low-income and minority neighborhoods of Watts, Compton, and Hacienda Park were tabled after massive protests. And Boston's plans for an Inner Belt and a Southwest Expressway were scrapped after a massive restudy. Concerns about the potential adverse social and environmental consequences of highways were increasingly voiced: impacts on community cohesion, historical and cultural resources, and the natural environment became a rallying point for opposition to urban Interstates.[43]

NEPA was signed in 1969 in response to a roused public and held the promise of an environmentally conscientious federal government. It declared a national policy to, "encourage productive and enjoyable harmony between man and his environment," and "promote efforts which will prevent or eliminate damage to the environment."[44]

However, along with such lofty ambitions came very little substantive law with which agencies had to comply. NEPA laid out fairly bare-boned "action-forcing" provisions for meeting its goals.[45] For major federal actions significantly affecting the environment, NEPA requires the preparation of an environmental impact statement (EIS). The EIS provides a description of the proposed project, the existing environment, and an analysis of the anticipated beneficial and adverse environmental effects of the proposed project and all reasonable alternatives. One of these alternatives is required to be a "no-build" alternative. Preparation of the EIS is usually done in two stages, resulting in a draft (DEIS) and final EIS (FEIS).[46]

The Federal Highway Administration (FHWA) and the Council on Environmental Quality (CEQ) have established through their regulations comprehensive procedures for highway compliance with NEPA.[47] Under these regulations, the traditional review process requires that before proceeding with final design, property acquisition, or construction, the FHWA must show compliance with all applicable state and federal environmental laws, including NEPA.[48] Three basic steps are involved: preparation of the EIS, evaluation and approval of the EIS, and construction.[49] In a typical scenario, a state DOT sponsors a highway project and prepares the DEIS.[50] A notice and com-

43 Transp. Res. Bd., *supra* note 38 at 18.
44 Nat'l Envtl. Pol'y Act, 42 U.S.C. § 4321 (2006).
45 40 C.F.R. §1500.1(a) (2006).
46 RL33057, Surface Transp. Reauthorization: Envtl. Issues and Legis. Provisions in SAFETEA-LU (H.R. 3), U.S. Cong. Res. Serv., 6 (Sept. 1, 2005).
47 U.S.C. § 109(h); 23 C.F.R. § 771; 40 C.F.R. §§ 1500–1508.
48 23 C.F.R. § 771.101 (2007).
49 23 C.F.R. § 771.109 (2007).
50 23 C.F.R. § 771.123 (2007).

ment period is held, comments are evaluated, and the FEIS is prepared.[51] The U.S. Secretary of Transportation then independently evaluates and approves the state-prepared FEIS.[52] Once the Transportation Secretary approves the FEIS, the state can go forward with awarding a contract, and a private developer can begin construction.[53]

These FHWA and CEQ procedures have evolved from the lessons of fifty years of highway building and are calibrated to balance the roles of the states, private entities, and the federal government. For example, in 1975, NEPA procedures were amended to allow state DOTs to create EISs instead of the federal government.[54] This amendment reflected an understanding that environmental review is most effectively carried out at the state level, both from efficiency and public interest standpoints.

C. Environmental Streamlining

Although CEQ and FHWA regulations are competent in implementing NEPA, they have, nonetheless, come under considerable fire recently. In particular, the transportation community has accused NEPA procedures of being overly cumbersome, resulting in a process that is too lengthy, costly, and risky.[55] The current emphasis on "environmental streamlining" buttresses that proposition.[56] Executive Order 13,274, which President Bush signed in September 2002, was issued to promote environmental stewardship in the nation's transportation system and to streamline the environmental review and development of transportation infrastructure projects.[57] According to the United States Department of Transportation (USDOT) the purpose of streamlining is, "[t]o coordinate Federal agency involvement in major highway projects under the [NEPA] process to address concerns relating to delays in implementing projects, unnecessary duplication of effort, and added costs often associated with the conventional process for reviewing and approving surface transportation projects."[58]

The decision to streamline arose from the popular conception that the environmental review process is the primary source of delay in highway projects, and consequently a deterrent to potential investors.[59] The American Association of State Highway and Transportation Officials (AASHTO) identified the traditional environmental review process as creating a procedural gridlock.[60] A report from the General Accounting Office (GAO) also found that transportation stakeholders believe that environ-

51 23 C.F.R. §§ 771.123-125 (2007).
52 *Id.*
53 23 C.F.R. § 771.113 (2007).
54 Nat'l Envtl. Pol'y Act, 42 U.S.C. § 4332 (1975).
55 *See generally* Jenna Musselman, Comment, *SAFETEA-LU's Environmental Streamlining: Missing Opportunities for Meaningful Reform*, 33 ECOLOGY L.Q. 825 (2006).
56 *Id.*
57 *See* Exec. Order 13,274, *supra* note 37 at 58449.
58 FHWA, TEA-21 – Transp. Equity Act for the 21st Century, http://www.fhwa.dot.gov/TEA21/factsheets/envstr.htm (last visited Dec. 20, 2007).
59 Expediting Project Delivery to Improve Transp. and the Env't Act: Hearing on H.R. 5455 Before the Subcomm. On Highways and Transit of the H. Comm. On Transp. and Infrastructure, 107th Cong. (2002) (statement of John C. Horsley, Exec. Dir., Am. Assn. of State Highway and Transp. Officials).
60 *Id.*

mental review is the cause of the greatest delay in projects.[61] These groups charge that the process involves far too many agencies, often resulting in duplicative work.[62] For each federal environmental law implicated in a transportation project, the corresponding agency with jurisdiction over the matter must be consulted to assess the issue and contribute their conclusions to the EIS.[63] In large highway projects, the EIS process is extremely complex, and duplicative work comes at the expense of considerable time and money.[64] Streamlining advocates also argue that the NEPA process includes an unnecessary degree of federal oversight of the EIS, which also contributes to delay.[65] Risk is also associated with the potential for EIS-related litigation.[66] Streamlining aims to eliminate some of this delay and risk, and in turn attract the private sector to highway projects.

However, the perception that NEPA is the primary culprit for delay is not a forgone conclusion. In a 2000 FHWA study, 61 percent of participants listed lack of funding, low priority, local controversy (unrelated to environmental issues), or complexity as the primary source of delay.[67] Moreover, judicial review of final agency action is very deferential. Therefore, the risk of a court issued injunction based on final DOT approval is unlikely.[68]

Although it is well accepted that transportation projects exact large environmental tolls, the United States does not have a national policy in place to quantify these costs. This fact makes it difficult to account accurately for the relative benefits and harms of environmental streamlining. Executive Order 13,274 has dual goals: to streamline projects and to promote environmental stewardship of the nation's transportation system.[69] The emphasis on streamlining may reflect an attitude that the environment is fundamentally derivative to transportation goals, or perhaps more accurately, thought of as something to be *overcome* to achieve transportation goals.

IV. Special Experimental Project 15 and Expanding the Role of the Private Sector

The FHWA's Special Experimental Project (SEP-15)[70] draws upon the cost-benefit ideals in Executive Order 12,893 and the environmental streamlining goals of Execu-

61 U.S. Gen. Accounting Office, GAO-03-534, Highway Infrastructure: Stakeholders' Views on Time to Conduct Envtl. Reviews of Highway Projects 1 (2003), http://www.gao.gov/new.items/d03534.pdf (last visited Jul. 31, 2008).

62 *Id.*

63 23 C.F.R. § 771.111 (2007).

64 U.S. Gen. Accounting Office, *supra* note 61 at19.

65 Musselman, *supra* note 55 at 830.

66 *Id.* at 834.

67 U.S. Dep't. of Transp., Fed. Highway Admin., Reasons for EIS Project Delays, http://www.environment.fhwa.dot.gov/strmlng/eisdelay.asp (last visited Dec. 20, 2007).

68 *See generally* Chevron U.S.A., Inc. v. Nat. Res. Def. Council, Inc., 467 U.S. 837, 844 (1984) ("We have long recognized that considerable weight should be accorded to an executive department's construction of a statutory scheme it is entrusted to administer . . .)

69 *See* Exec. Order 13,274, *supra* note 37 at 58449.

70 *See* SEP-15, *supra* note 12 at 59983.

tive Order 13,274.[71] With these ends in mind, SEP-15 aims to experiment with the highway building process in order to encourage more private sector involvement.[72] SEP-15 is significant in the way it impacts NEPA's requirement to prepare an EIS. The program takes the responsibility to prepare an EIS from the state DOT, and gives it to the private sector developer that will be constructing the highway. While this change in procedure may improve efficiency and encourage private investment, allowing a financially interested party to prepare environmental documents does not further the aims of NEPA.

The primary objectives of the SEP-15 program are:

1. To encourage tests and experimentation in the entire project development process leading to increased project management flexibility, more innovation, improved efficiency, timely project implementation and potentially new revenue streams;
2. To identify impediments to current laws, regulations, and practices to the greater use of public-private partnerships and private investment in transportation improvements;
3. To develop procedures and approaches addressing these impediments; and
4. To evaluate and propose administrative and statutory recommendations to remove these impediments.[73]

The "current laws, regulations, and practices" referred to are contained within Title 23 of the United States Code. SEP-15 provides a waiver of the requirements under Title 23 thereby allowing state DOTs to freely experiment in meeting the above objectives. As this experiment relates to environmental review, SEP-15 provides suggestions on how states may wish to experiment with Title 23 requirements. They include allowing state DOTs to enter into contracts with developers prior to completing the NEPA process, and allowing the selected developer to conduct environmental analysis and prepare NEPA documents[74] (with the Secretary of Transportation making the final review and evaluation of an EIS).[75] Underpinning these types of innovations is the belief that integrating developers into the planning and environmental review process will be beneficial to the private sector, the government, and the public. To participate, state DOTs must submit an application for a project that details how the project will

71 *See* Exec. Order No. 12,893, *supra* note 35, at 4233; Exec. Order No. 13,274, *supra* note 37 at 58449.

72 *See* SEP-15, *supra* note 12 at 59983 ("increased private sector participation in the project development, finance, design, construction, maintenance, and operations of highways and bridges").

73 U.S. Dep't. of Transp., Fed. Highway Admin., Special Experimental Project 15 Implementation Procedures, http://www.fhwa.dot.gov/ppp/sepprocedure.htm (last visited May 18, 2007).

74 State agencies have long been allowed to use developers in the preparation of the EIS, but not if they are already selected to build the highway. Usually, a state uses a competitive bidding process after NEPA is completed. Therefore, a developer with a guaranteed financial interest in the outcome of the project is not assisting with the NEPA process.

75 *See* SEP-15, *supra* note 12 at 59984-85 (The FHWA also suggests making use of a tiered environmental analysis and identifying innovative ways to include the public and other agencies in various phases of planning and project development.)

further the goals of SEP-15. Texas is leading the way with SEP-15, with TxDOT sponsoring four of the seven approved SEP-15 projects.[76]

TxDOT's TTC-35 application was the first that the FHWAapproved to participate in the SEP-15 program. An early development agreement (EDA) between TxDOT and the FHWA was entered into on July 11, 2005.[77] The EDA identifies the scope of the agreement and the provisions of TTC's participation in the SEP-15 program. The EDA specifies the experimental features of the TTC-35 and how TxDOT will to depart from Title 23 requirements.

In Section 4.1(A) of the EDA, the FHWA acknowledges and agrees to TxDOT's deviation from 23 C.F.R. § 636.109, by allowing for the execution of a comprehensive development agreement (CDA) before completion of NEPA requirements.[78] In the context of the TTC, this provision allowed TxDOT to sign an agreement with Cintra-Zachry to develop TTC-35 before the EIS was completed and before the federal government approved it. Further, Section 4.1(A) of the EDA allows the private developer to provide NEPA support services, including preliminary engineering, tests, studies, data, analyses, and reports.[79] The developer is also permitted to perform limited non-construction work under the comprehensive development agreement prior to the conclusion of the NEPA review process.[80] Taken together, these experimental features authorized a dramatically increased role for Cintra-Zachry in the environmental review of TTC-35, and effectively provided a back-door to avoiding some of NEPA's strongest environmental protections – environmental review by uninterested parties and completion of review prior to commencement of construction.

Section 4.1(C) of the TTC-35 EDA recognizes the need to ensure an unbiased NEPA decision-making process.[81] The Fifth Circuit addressed the source of this potential for bias in *Sierra Club v. Sigler*.[82] *Sigler* involved a FEIS that the Army Corps of Engineers approved to construct a port and crude oil distribution system in Galveston, Texas. Remarking on the FEIS, the court stated,

> This record leaves us with the distinct impression that most, if not all, of the preparation of the DEIS and FEIS was done by the private consulting firm hired by applicants. . . The role of the private firm in the preparation of the DEIS and FEIS is particularly troubling in this case because the consulting firm also has a stake in the project which it was evaluating.[83]

The court identifies a rather obvious conflict of interest in allowing those with a financial interest in a project to take on EIS preparation responsibilities. Sensibly,

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76 U.S. Dep't. of Transp., Fed. Highway Admin., SEP-15 Program, http://www.fhwa.dot.gov/ppp/sep15.h (last visited May 18, 2007).

77 U.S. Dep't. of Transp., Fed. Highway Admin., TTC 35 Early Development Agreement http://www.fhwa.dot.gov/ppp/ttceda.htm (last visited May 18, 2007) [hereinafter EDA].

78 *Id.*

79 *Id.*

80 *Id.* at § 4.1(A).

81 *See* EDA, *supra* note 77 at § 4.1(B).

82 695 F.2d 957, 962 (1983).

83 *Id.*

this practice is forbidden out of fear that if a developer and its money are on the line, the NEPA process will suffer. In fact, under 23 C.F.R. § 636.109, the environmental commitments in the FEIS must be contained in the state DOTs requests for proposals from potential investors. This format allows for an objective environmental review to take place and imposes on the developers the obligation to meet the FEIS requirements. The CEQ also regulates contractor-prepared statements when a conflict of interest may arise.[84] Contractors are required to prepare a "disclosure statement" affirming that they do not have any financial interest in the outcome of the project.[85] This regulation is designed to, "minimize the conflict of interest inherent in the situation of those outside the government coming to the government for money, leases or permits while attempting impartially to analyze the environmental consequences of their getting it."[86] CEQ further clarified its intent in a 1983 NEPA guidance memo stating,

> Section 1506.5(c) prohibits a person or entity entering into a contract with a federal agency to prepare an EIS when that party has at that time and during the life of the contract pecuniary or other interests in the outcomes of the proposal. Thus, a firm which has an agreement to prepare an EIS for a construction project cannot, at the same time, have an agreement to perform the construction, nor could it be the owner of the construction site.[87]

More recently, in *Utahns for Better Transportation v. USDOT*, the Tenth Circuit relied on these CEQ regulations in determining that hired contractors had improperly been responsible for preparing a FEIS without such a disclosure statement.[88]

Accordingly, § 4.1(c) of the TTC-35 EDA contains steps that TxDOT has taken in an attempt to ensure that the NEPA decision making process is unbiased and that public officials and citizens have the necessary environmental impact information before full construction is underway.[89] These include ensuring that FHWA and TxDOT will direct and control the NEPA process at all times, that the FHWA is solely responsible for the project approval process under NEPA, and that no decisions regarding preferred alternative routes will be made prior to NEPA completion.[90]

But, while these steps are useful, they do not go far in terms of ensuring against the concerns of the CEQ and Fifth Circuit in *Sigler.* It is important to keep in mind that NEPA's force is only procedural, and judicial review of a final agency action is extremely deferential.[91] Therefore, FHWA final approval of a financially-interested, developer-prepared, FEIS is a meager concession towards environmental protection.

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84 *See* 40 C.F.R. 1506.5(c) (This regulation applies only to agencies without statewide jurisdiction. Therefore, it does not apply to state DOTs. However, the requirement that developers be selected after FEIS approval eliminated the possibility of those contracted to assist with the EIS having a direct financial interest in the project. *See infra* note 88.)

85 *Id.*

86 43 Fed. Reg. 55,987 (1978).

87 48 Fed. Reg. 34,263 (1983) http://www.nepa.gov/nepa/regs/1983/1983guid.htm.

88 305 F.3d 1152, 1185 (2002).

89 *See* EDA, *supra* note 77.

90 *Id.*

91 *See Chevron, supra* note 68 at 844.

Approval of conclusions based on suspect data is not an adequate safeguard. Further, TxDOT's direction of the NEPA process is not particularly confidence-inspiring when considering the billions in financial gain Texas stands to reap from its CDA with Cintra-Zachry.[92] Because the content of a FEIS is not easily contestable, the publice must have the utmost faith in the objectivity of its preparer's conclusions. In theory, objectivity is possible under the TTC-35 EDA. However, with Cintra-Zachry already in for at least $6 billion, imagining the choice of a no-build alternative at this point seems almost laughable.[93]

In allowing for financially interested parties to help prepare an EIS, SEP-15 chips away at NEPA's potential for meaningful environmental review in the name of making the process more amenable to private investors. Under NEPA, environmental stewardship should be pursued by all involved, at all stages. But after SEP-15, the responsibility of environmental stewardship shifts disproportionately towards the federal government at the approval stage.

Section 1 of the TTC-35 EDA preserves this federal stewardship role, stating, "Nothing in this EDA shall be construed as a relinquishment of any Federal oversight or stewardship responsibility."[94] Unfortunately, this procedural safeguard also disappears with SAFETEA-LU § 6005.

V. SAFETEA-LU § 6005 and the Elimination of Federal Oversight

The most recent surface transportation authorization from Congress, SAFETEA–LU, makes many of the provisions formerly available only to state DOTs participating in SEP-15 available to all.[95] SAFETEA-LU authorizes $286.5 billion in funding for surface transportation projects through 2009,[96] and gives PPPs bold tools to move forward with innovative financing for highways. The boldest of these tools is § 6005, which allows for participating states to assume all of the responsibilities of the Secretary of Transportation for environmental review under federal law.[97] This program shifts the responsibility of EIS oversight from the federal government to the state DOTs. In so doing, § 6005 removes NEPA's last procedural safeguard, thereby threatening the legitimacy of an EIS and the overall integrity of the NEPA process.

Many of the provisions of SAFETEA-LU echo the experiments undertaken in SEP-15. Familiar from SEP-15 is SAFETEA-LU § 1503. Section 1503 directs the Secretary of Transportation to revise the applicable regulations to permit state transportation agencies to proceed with certain actions relating to design-build contracts, prior to receipt of final NEPA approval. SAFETEA-LU also clarifies for the courts the issue

92 *See* Booth, *supra* note 27 ("[T]he TTC could generate $ 135 billion in annual personal income for Texans and nearly 2.2 million jobs.").

93 *See* 40 C.F.R. 1502.14 (A "no-build" alternative is required by law in an EIS).

94 *See* EDA, *supra* note 77, at § 1.

95 *See* SEP-15, *supra* note 12, at 59984 ("Our goal is to establish comprehensive policies and to seek future legislation to authorize those public-private innovations that have proved most useful under SEP-15.").

96 *See* SAFETEA-LU, *supra* note 13, at 1153-56.

97 *Id.* at 1869.

raised in *Utahns*,[98] underscoring Congress' intent to allow state DOTs to prepare EISs with the assistance of private parties as long as federal oversight is provided.[99]

However, for a select group of states the federal oversight requirement is also being lifted by § 6005. Section 6005, like SEP-15 before it, pushes the established boundaries of the NEPA process. Section 6005 establishes a project delivery pilot program for five states, allowing them to apply to USDOT to *assume all USDOT environmental responsibilities under NEPA and other environmental laws* (excluding Clean Air Act conformity determinations and transportation planning requirements).[100] This delegation of authority is limited to highway projects, and it can be for specific projects or a state transportation program, [101] but put simply, § 6005 allows a participating state DOT to approve its own EIS.

Section 6005 represents a critical change in NEPA procedures for highways. Unlike the innovations of SEP-15, which were responses to concerns expressed by the transportation community, no notable discussion of handing oversight responsibilities to the States occurred prior to this legislation. It is unprecedented, and even exceeds the Bush Administration's stance on the matter. SAFETEA, the Administration's original proposal for the later enacted SAFETEA-LU, did have an opportunity to contemplate this issue but chose to retain the oversight role of the federal government.[102] SAFETEA specifically addressed the Second Circuit's decision in *Sierra Club v. U.S. Army Corps of Engineers*.[103] *Sierra Club* recognized that NEPA §102(D) allows for federal reliance on state agencies for preparation of a FEIS, but interpreted § 102(D) to apply only when the federal agency approved funding, not when it approved permits.[104] The SAFETEA legislation proposed to affirm the practice of allowing states to prepare an EIS in both funding and permitting contexts, "so long as the U.S. Department of Transportation furnishes guidance and participates in such preparation, and *independently evaluates* the document."[105] This condition seems to imply that the very legitimacy of state-prepared EISs depend on federal oversight, a fact that was somehow ignored in the subsequent adoption of SAFETEA-LU.

Usual procedures dictate mandatory federal oversight of a state-prepared EIS and specifically call for an independent evaluation of the EIS.[106] NEPA § 102(2)(D)(iii) states that an EIS shall not be deemed to be legally insufficient solely by reason of having been prepared by a State agency if "the responsible Federal official indepen-

98 *See Utahns*, *supra* note 88, at 1185.

99 Karen Hedlund & Nancy Smith, SAFETEA-LU Promotes Private Investment in Transp., http://transportation1.org/aashtonew/docs/pabs.doc (last visited May 18, 2007).

100 *See* SAFETEA-LU, *supra* note 13, at 1869.

101 U.S. Dep't. of Transp., Fed. Highway Admin., Fact Sheets on Highway Provisions, http://www.fhwa.dot.gov/safetealu/factsheets/enviroreview.htm (last visited May 18, 2007).

102 U.S. DEP'T. OF TRANSP., FED. HIGHWAY ADMIN., THE SAFE ACCOUNTABLE, FLEXIBLE, AND EFFICIENT TRANSPORTATION EQUITY ACT OF 2003: SECTION-BY-SECTION ANALYSIS 23 (2003), http://www.fhwa.dot.gov/reauthorization/safetea_analysis.pdf.

103 701 F.2d 1011 (1983).

104 *Id.* at 1038.

105 *See* U.S. Dep't. of Transp., *supra* note 103 at 23 (emphasis added).

106 *See infra* notes 109-113.

dently evaluates such statement prior to its approval and adoption . . ."[107] This requirement features prominently in all EIS-relevant statutes and regulations.[108] 23 C.F.R. § 771.109(c)(1), for example, states,

> [i]f the applicant is a public agency that has statewide jurisdiction . . . and meets the requirements of section 102(2)(D) of NEPA, the applicant may prepare the environmental impact statement (EIS) and other environmental documents with the [FHWA] furnishing guidance, participating in the preparation, and independently evaluating the document.[109]

23 C.F.R. § 771.125 also demands that a FEIS is reviewed by a federal agency for legal sufficiency under NEPA §102(2)(D)(iii).[110] Finally, the CEQ requires also requires federal oversight at 40 C.F.R. §1506.2.[111]

Although this responsibility of the federal government appears to be largely symbolic, it functions as an important safeguard in the NEPA process. Under NEPA, federal agencies are charged with the difficult task of balancing both the interests of the environment and the interests of the proposed project.[112] The ability to balance these obviously conflicting interests is possible only because the process is tethered to the requirement of an independent evaluation. Thus, the delegation of this responsibility is counterproductive because a state DOT cannot independently evaluate an EIS it prepared itself.

Fortunately, courts have recognized that the § 102(2)(D) independent federal evaluation requirement a non-trivial step in the NEPA process. The Fifth Circuit opinion in *Sigler* addressed this matter despite its not being in issue in the case. In *Sigler* the court seriously questioned whether the FEIS prepared objectively represented the independent judgment of the Army Corps of Engineers as the responsible lead federal agency.[113] The court in *Sigler* identified their concern over the integrity of the NEPA process, and looked askance at the lack of federal oversight.[114]

Conservation Society v. Secretary of Transportation is another case that is tremendously useful in illuminating the importance of federal oversight in the EIS process. The Second Circuit decision in *Conservation Society I* was the impetus for Congress' enacting Public Law No. 94-83, which added §102(2)(D) to NEPA in 1975.[115] The court had held that a state agency could not prepare an EIS under NEPA, and Congress responded by adding §102(2)(D), which allowed for state-prepared EISs with the fed-

107 *See* Nat'l Envtl. Pol'y Act , *supra* note 44 at § 102(2)(D)(iii).
108 *See infra* notes 111-113.
109 23 C.F.R. § 771.109(c)(1) (2005).
110 23 C.F.R. § 771.125 (2005).
111 40 C.F.R. §1506.2 (1978).
112 *See* Nat'l Envtl. Pol'y Act , *supra* note 44 at § 101(b).
113 *Sigler*, *supra* note 82 at 962.
114 "In applying these criteria, we are not to concern ourselves with the merits of the agency's decision; our concern instead is with the integrity of NEPA-EIS process used to make that decision." *Id.* at 965.
115 508 F.2d 927 (2d Cir. 1974).

eral government furnishing guidance and participation, and independently evaluating the EIS.[116] Following this legislation, the court in *Conservation II* looked directly for evidence of federal oversight in holding the EIS legally sufficient.[117] Therefore, it appears the sufficiency of a state-prepared EIS under NEPA is conditioned upon proper federal oversight. Judge Adams, dissenting in *Conservation II*, looked to the legislative history of § 102(2)(D) and found Congress' intent to require federal agency oversight unambiguous. Quoting H.R. Rep. No. 144, Judge Adams wrote, "[t]he phrase "independently evaluates" is "intended to assure that the Federal agency consider, critically review and, when appropriate, change and supplement" the work done by the state agency."[118] Judge Adams also noted that an earlier version of the bill that would become § 102(2)(D) was rejected in Committee because, "one reading of [the proposed bill] is that it permits virtual total delegation of EIS requirements to the states . . . This degree of delegation is contrary to NEPA's most basic purpose of providing Federal accountability for the environment . . ."[119] It is quite clear that in § 102(2)(D), Congress did not wish to delegate federal oversight responsibilities under NEPA to the states. Such a result would undermine the very purpose of NEPA.

Finally, it may be instructive to briefly inquire why § 6005 has excluded conformity determinations under the Clean Air Act (CAA) from the responsibilities delegated to the states.[120] Under the CAA, federal highway money is conditioned upon attainment of federally mandated air quality levels. The history of state and city transportation agencies' compliance with CAA regulations is generally disappointing, and unfortunately contains consistent patterns of "cooked books" and other disreputable behavior designed to evade CAA requirements and gain access to federal highway funds.[121] It is conceivable that conformity determination were excluded from § 6005 because Congress did not think the states could be trusted with this responsibility.

This same argument can apply with similar force when delegating other environmental determinations to the states. This position is not to imply that state DOTs will be dishonest in approving an EIS, because state interests are strong in using a process that engenders public confidence and in building highways that enjoy support. However, it is still important to carefully consider the dangers that lurk in changing this well-established procedure.

Section 6005 permits a seemingly innocuous change in NEPA procedure by authorizing five states to assume the responsibilities of the federal government under NEPA and other federal environmental laws. However, a brief look at the relevant statutes and regulations, caselaw, and legislative history indicate that these responsibilities are more than mere formalities. Federal oversight of EISs protect the legitimacy of a state-prepared EIS and the overall integrity of NEPA. The effect that procedural changes

116 *See* Nat'l Envtl. Pol'y Act , *supra* note 44 at § 102(D)(2)(ii-iii).

117 *Conservation Soc'y of S. Vt., Inc. v. Sec'y of Transp.,* 531 F.2d 637, 639 (2d Cir. 1976).

118 *Id.* at 642.

119 *Id.* at 643.

120 Surface Transp. Project Delivery Pilot Program, 72 Fed. Reg. 6464, 6465 (Feb. 12, 2007) (Comment received from the Am. Road and Transp. Builders Assoc. requesting delegating conformity determinations to state DOTs in the § 6005 program. FHWA declined this suggestion in formulating the final rule.)

121 *See* Houck, *supra* note 42, 385-97.

which remove this oversight will have on the environment will not be known for many years. Therefore, a project the size of the TTC demands particular vigilance when considering the prudence of adopting § 6005.

VI. Recommendations and Conclusion

A. Recommendations

TxDOT is currently awaiting the necessary statutory authority from the Texas Legislature before it can participate in the § 6005 pilot program.[122] That said, TxDOT is interested in participating and may have an opportunity to do so after the 2009 Texas legislative session, pending the reauthorization of SAFETEA-LU.[123] To ensure that the TTC's environmental review process meets the public's standards and expectations, Texans must be very proactive should TxDOT decide to participate in the § 6005 program. The FHWA issued the final rule for § 6005 in the *Federal Register* on February 12, 2007.[124] To participate, Texas is required to submit a statement of interest, an application, and enter into a Memorandum of Understanding (MOU) with the FHWA.[125] The MOU details how Texas will carry out its newly delegated responsibilities under § 6005. The § 6005 application is required to be published to provide notice and solicit public comments. Texas should take advantage of this opportunity to strengthen NEPA procedures for the TTC. The contours of § 6005 were determined largely by state DOTs and the transportation sector. Of ten comments received, only one came from a public interest group.[126] The opportunity provided by the § 6005 MOU notice and comment period should not be similarly overlooked.

With regard to the TTC, greater objectivity can be achieved by crafting the EIS approval process to have less discretion and more built-in requirements. For example, a checklist can be required as a step in the approval process that ensures that the responsible state official balances all the relevant environmental issues. The more detailed the checklist, the greater the protection. This detail would provide a degree of transparency and force the responsible state official to carry out the Secretary's responsibilities under NEPA in a manner that is faithful to the Act's objectives. Objectivity can also be reinforced by requiring cooperating federal and state agencies to sign off on an FEIS approval to ensure that their conclusions have been accurately evaluated in the final document.

The California Department of Transportation (Caltrans) has already entered into a MOU with the FHWA for § 6005 of SAFETEA-LU.[127] The Caltrans MOU includes

122 Telephone Interview with Jimmy Tyree, Deputy Director, Environmental Affairs, TxDOT, in Austin, Tex. (Nov. 17, 2007).

123 *Id.*

124 *See* 72 Fed. Reg. 6464, *supra* note 121, at 6464-72.

125 *Id.*

126 *Id.* at 6465.

127 Cal. Dep't of Transp., Memorandum of Understanding Between the Fed. Highway Admin. and the Cal. Dep't of Transp. Concerning the State of California's Participation in the Sur-

a provision that allows the FHWA to step in and take to action, including termination, should the agency determine Caltrans is failing to meet its responsibilities under the program.[128] This provision maintains a stewardship role for the federal government should any doubt arise about the state's performance. The MOU also contains a provision that involves the FHWA in performance monitoring and quality assurance controls.[129] This monitoring also functions as a federal oversight safeguard of state performance. Similar provisions can be incorporated into the TxDOT §6005 MOU to achieve greater environmental protection.

B. Conclusion

It looks as though PPPs are here to stay. We do not know what advantages they may bring, and therefore, should be open to innovations as our transportation needs grow and become more complex. The relationship between highways and the environment has been undeniably contentious, but that history does not warrant clinging to the status quo and fighting against potentially positive developments.

We should also not be too quick to dismiss the lessons of fifty years of highway building, the goals of NEPA, and basic common sense. SEP-15 and SAFETEA-LU § 6005 have pursued the favor of the private sector by taking unprecedented liberties with the environmental review process under NEPA, and the combined environmental effects of these decisions will not be known for many years. The TTC is the largest public works project ever undertaken by the State of Texas, and the financial stakes are extremely high. As transportation projects grow and the money involved gets larger, we must correspondingly increase our environmental protections, not decrease them. We should be cautious not to act heedlessly and sacrifice the procedural core of NEPA environmental review for an "easier" process. Once the damage is done, it will not be easy to fix.

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face Transp. Project Delivery Pilot Program, http://www.dot.ca.gov/ser/downloads/MOUs/nepa_delegation/sec6005mou.pdf (last visited January 8, 2009).

128 *Id.* at 16.

129 *Id.* at 13.

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AIR QUALITY

EPA'S PROPOSED REFINERY HAZARDOUS AIR POLLUTANTS RULE AMENDMENTS

On Tuesday, November 27, 2007, the United States Environmental Protection Agency (EPA) held a public hearing to take comments on proposed amendments to the EPA's 1995 air toxics standards for petroleum refineries. *EPA to Hold Hearing on Amendments to Petroleum Refinery Rule, Give Public Additional Time to Comment, Press Release*, (November 5, 2007), *available at* aahttp://yosemite.epa.gov/opa/admpress.nsf/eebfaebc1afd883d85257355005afd19/9db7fee0e7a193988525738a005c9a08!OpenDocument. Potential amendments to the air toxics standards are of particular interest to Texas, as the rule affects all of Texas' crude oil refineries. *Final Air Toxics Rule for the Petroleum Refining Industry, Fact Sheet*, (July 28, 1995), *available at* http://www.epa.gov/ttn/atw/petrefine/fsrefine.pdf (last visited on February 1, 2008). This column will provide some background on the original 1995 rule and summarize the effect of the proposed amendments on Texas petroleum refineries.

1995 Air Toxics Rule for the Petroleum Refining Industry

Originally proposed in July 1992, the EPA promulgated the National Emissions Standards for Hazardous Air Pollutants (NESHAP) air toxics rule for the petroleum refining industry in August 1995. *Petroleum Refinery MACT Standard Guidance* 1-1 (September 1997), *available at* http://www.epa.gov/Compliance/resources/publications/assistance/sectors/mactdoc.pdf (last visited on February 9, 2008). NESHAP standards require petroleum refineries that are major sources of Hazardous Air Pollutants (HAPs) "to meet emission standards reflecting the application of the maximum achievable control technology (MACT)." *Id.* The 1995 rule is quite expansive, covering multiple sources at petroleum refineries, including all process vents, storage vessels, marine tank vessel loading operations, gasoline rack operations, equipment leaks, and on site wastewater treatment systems. *See id.* The MACT standard for petroleum refiners "stems from the Clean Air Act Amendments of 1990," which defined "major"

HAP emitters as those emitting ten tons annually or more of any single listed pollutant or twenty-five tons of a combination of pollutants. Id. at 2-1. Petroleum refineries exceed these thresholds and are a major source of HAP emissions, hence the EPA has categorically included petroleum refineries as an industry group regulated under the Act. *Id.*

NESHAP contains a "market-based provision" called "emissions averaging" that allows petroleum facilities to "choose certain emissions points to control in order to achieve the acquired emissions reductions in the most cost-effective manner . . . ." *Final Air Toxics Rule for Petroleum Refining Industry, Environmental Protection Agency Public Release*, (July 28, 1995), *available at* http://www.epa.gov/ttn/atw/petrefine/fsrefine.pdf (last visited on March 26, 2008). The rule also contains extensive requirements for emission sources. *Id.* For example, petroleum liquids above certain vapour pressures may be held in existing storage tanks only if they are equipped with double seals to "prevent evaporation between the roofs and the tank walls." *Id.* The rule is even more stringent on new tanks, requiring that they be fitted with controls for all access hatches and openings for guide poles, and with a variety of other gaskets and seals to reduce evaporation. *Id.* Refineries are also required to implement programs to detect and repair leaks from "pumps, valves, and other refinery equipment when the HAP content of products from the process units is equal to or greater than 5 percent by weight." *Id.* The rule further requires that process vents must be controlled if Volatile Organic Compound (VOC) content equals or exceeds 33 kg/day (6.8 kg/day for new sources) and the HAP concentration equals or exceeds 20 ppmv." *Id.* Regarding wastewater collection and treatment systems, the 1995 rule deferred to the EPA's benzene waste NESHAP rule codified in 40 C.F.R. 61 subpart FF. *Id.* "Refineries that are in compliance with the Benzene Waste NESHAP rule are in compliance with the refinery NESHAP rule." *Id.*

Proposed Changes

On September 4, 2007, the EPA released its proposed amendments to the 1995 NESHAP rule "to address the risk remaining after applications of the 1995 standards." NESHAP, 72 Fed. Reg. 50,716 (Sept. 4, 2007) (to be codified at 40 C.F.R. pt. 63), *available at* http://www.epa.gov/ttn/atw/petrefine/fr04se07.pdf (last visited April 2, 2008). Specifically the proposed amendments to these EPA regulatuiubs offer options for addressing wastewater treatment systems, storage vessels, and cooling towers. *Id.* All of the proposals were based on the results of residual risk and technology review. *Id.*

Proposed Wastewater Treatment System Amendments

The EPA has proposed two options regarding wastewater treatment systems. "The first option would not require any additional controls as necessary to address residual risk or under the technology review." *Id.* The second would require refineries to apply new or additional requirements for their wastewater treatments systems. *Id.* Specifically, the proposed amended regulations would revise the wastewater provisions in the Refinery MACT I to add specific performance standards and a monitoring requirement. *Id.* The new regulations would require refineries to conduct an initial performance demonstration and, based on the results, establish operating limits for the mixed liquid volatile suspended solids concentration and the food-to-microoganism ratio. *Id.*

PROPOSED STORAGE VESSEL AMENDMENTS

Like the proposed wastewater amendments, the first option proposed for amending the regulation of storage vessels would be not to require any additional commitments from refineries. *Id.* The second option "would remove the current exemption for the requirements in 40 CFR 63.119(c)(2)(ix) and (x) for slotted guide poles," requiring refinery operators to equip each slotted guide pole "with a gasketed sliding cover or flexible fabric sleeve seal and a gasketed cover or other device which closes off the liquid surface from the atmosphere." *Id.* at 50,721. The amendments would also increase inspection and reporting requirements. *Id.*

PROPOSED COOLING TOWER AMENDMENTS

Currently, the Refinery MACT 1 rule does not address cooling towers. *Id.* at 50,719. The EPA is proposing to regulate cooling towers under the Clean Air Act, Section 112(d) (2) and (f) (2). *Id.* at 50,721. The EPA also proposes a "work practice standard for cooling towers which would require the owner or operation of a new or exiting source to monitor for leaks . . . ." *Id.*

COMPLIANCE TIMING

The proposed amendments to the Refinery MACT 1 rule would become effective immediately upon publication in the *Federal Register,* while the Clean Air Act amendments would require compliance no later than three years after the effective date of the standard for existing plants. *Id.* at 50,722. New sources would need to meet the standards on startup. *Id.*

CONCLUSION

The proposed amendments to the National Emissions Standards for Hazardous Air Pollutants, though not expansive, could potentially put significant new obligations on Texas petroleum refineries, particularly in the maintenance of wastewater treatment facilities, storage vessels, and cooling towers. The EPA took oral comments on the proposed amendments on November 27, 2007 in Houston and took written comments until December 28, 2007. *Press Release, United States Environmental Protection Agency, EPA to Hold Hearing on Amendments to Petroleum Refinery Rule, Give Public Additional Time to Comment* (November 5, 2007), *available at* http://yosemite.epa.gov/opa/admpress.nsf/eebfaebc1afd883d85257355005afd19/9db7fee0e7a193988525738a005c9a08!OpenDocument (last visited on March 26, 2008). The EPA has not yet issued a final rule, but the EPA is under court order to sign the new regulations for publication in the *Federal Register* by August 22, 2008. Our Children's Earth Foundation and the Sierra Club and Defendants United States Environmental Protection Agency and Stephen L. Johnson, Consent Decree, No. C 05-5184 WHA at 3 (N.D. CA August 22, 2006).

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Natural Resources

The Renewable Fuels Standard (RFS) Program

Rising gas prices and concerns about the impact of carbon dioxide emissions on the environment have increased the focus on renewable fuels. The federal government has adopted a program intended to mandate increased use of renewable fuels. September 1, 2007 marked the start of the nation's Renewable Fuels Standard (RFS) program. 40 C.F.R. §80.1106 (2007). The program is the result of talks between the Environmental Protection Agency (EPA), Department of Energy, Department of Agriculture, and stakeholders. Environmental Protection Agency, *EPA Finalizes Regulations for a Renewable Fuel Standard (RFS) Program for 2007 and Beyond*, 1 April 2007, *available at* http://www.epa.gov/otaq/renewablefuels/420f07019.pdf ("*EPA Finalizes Regulations*").

The history leading up to the RFS program demonstrates the rising environmental and energy concerns underlying the decision to increase use of renewable fuels. Following the Clean Air Act Amendments of 1990, the use of renewable fuels, including ethanol, increased dramatically and new markets were established for ethanol. Regulation of Fuels and Fuel Additives: Renewable Fuel Standard Program 72 Fed. Reg. 23900 (2007). In 1995, the Reformulated Gasoline (RFG) program set new stringent controls on the emissions performance of gasoline and required that reformulated gasoline meet an oxygen content standard. *Id.* In December 2005, the EPA set a statutory default standard that required that 2.78 percent of gasoline sold or dispensed in 2006 be renewable fuel. 40 C.F.R. § 80.1100. Most recently, in 2007, the current increase in crude oil prices coupled with a concern about U.S. dependence on foreign sources of crude oil fueled the RFS program. 72 Fed. Reg. 23,900 (2007).

The RFS program requires that 7.5 billion gallons of renewable fuel be blended into motor vehicle fuel by 2012 and sets a minimum volume of renewable fuel that must be used each year between 2007 and 2012. Environmental Protection Agency, *EPA Program on Track; Begins Sept. 1*, Aug. 30, 2007, *available at* http://yosemite.epa.gov/opa/admpress.nsf/names/hq_2007-8-30_RFS ("*Program on Track*"). "Renewable fuel" is broadly defined for the purposes of the RFS program as motor vehicle fuel that is produced from grain, starch, oil seeds, vegetable, animal, or fish materials, sugar components, potatoes, natural gas produced from a biogas source, waste derived ethanol, and various other plant or animal products or wastes. 40 C.F.R. § 80.1101. The minimum volume of renewable fuel required to be used each year will be determined by the percentage of total fuel a company produces or imports, and this minimum amount will increase each year through 2012. *Program on Track, supra*. In 2007, 4.02 percent of fuel sold or dispensed to consumers must come from renewable sources, the equivalent of 4.7 billion gallons of renewable fuel. 40 C.F.R. § 80.1105. Potential renewable sources include but are not limited to ethanol, biodiesel, and renewable crude fuels (vegetable oils and animal fats). 40 C.F.R § 80.1101 (2007).

The parties regulated under the RFS program include major refiners, blenders, and petroleum importers. However, petroleum exporters are specifically exempted. 40 C.F.R § 80.1106 (2007). Also, several entities are *temporarily* exempted from participating, including small refiners and refineries that produce less than 750,000 barrels per

day (bpd) of crude oil or have less than 1,500 employees and a capacity of less than 155,000 bpd of crude oil. 40 C.F.R § 80.1141 (2007). These temporary exemptions will expire on December 31, 2010, but may be extended if necessary. *Id.* Gasoline producers in Hawaii, Alaska, and other U.S. territories are exempt from the program indefinitely. 40 C.F.R § 80.1106 (2007).

The EPA will measure compliance with the RFS program through the use of Renewable Identification Numbers (RIN) that will be assigned to every batch of renewable fuel made in the U.S. or imported. 40 C.F.R § 80.1126 (2007), 40 C.F.R § 80.1127 (2007). Each year parties to the program must acquire a sufficient number of RIN's to show that they have complied with the renewable fuel volume requirement. *Id.* The RIN's can be traded and function as credits. *Id.*

The potential impacts resulting from the RFS program are wide-ranging. By 2012, nationwide volumes of renewable fuel are expected to reach 11 billion gallons (although only 7.5 billion gallons are required) because of the construction of new and expanded facilities. *EPA Finalizes Regulations*, supra. Petroleum consumption is expected to be reduced by 0.8 to 1.6 percent. *Id.* Domestic sources of energy are projected to increase along with a decreased dependence on foreign sources of petroleum. 72 Fed. Reg. 23,900 (2007). The increased use of renewable fuels will result in a more diversified energy portfolio. *Id.* The environmental impacts include reductions in carbon dioxide emissions that could affect climate change. *Id.* Carbon monoxide and benzene emissions are expected to decline by 0.9 to 2.5 percent and 1.8 to 4 percent, respectively. *EPA Finalizes Regulations*, supra. The RFS program will also help inform greenhouse gas regulation that the EPA and other federal partners are expected to develop. *Program on Track, supra.* It is anticipated that the increased use of ethanol and biodiesel will have the additional effect of providing a greater market for agricultural products such as corn and soybeans and a wider array of feedstocks. 72 Fed. Reg. 23,900 (2007). As a result, the net U.S. farm income is projected to increase by between 2.6 and 5.4 billion dollars. *EPA Finalizes Regulations*, supra. While the RFS program did repeal the oxygen content mandate in the RFG program of 1995, the required volume of renewable fuel will offset any loss in demand for renewable fuels. 72 Fed. Reg. 23,900 (2007).

Now for the big question: how will this affect the price of gasoline at the pump? While the cost of producing a gallon of gasoline will rise between 0.5 and 1.1 cents, the excise tax credit for ethanol is projected by EPA to produce a net savings at the pump of between 0.4 and 0.7 cents per gallon. *EPA Finalizes Regulations*, supra.

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Solid Waste

Dormant Commerce Clause and Solid Waste Flow Control after *United Haulers Ass'n, Inc. v. Oneida-Herkimer Solid Waste Mgmt. Auth.*, 127 S. Ct. 1786 (2007).

In 1994, the U.S. Supreme Court struck down under the Commerce Clause a flow control ordinance that forced solid waste haulers to deliver waste to a particular *private* processing facility. *C & A Carbone, Inc. v. Clarkstown*, 114 S. Ct. 1677 (1994). In *United Haulers Ass'n, Inc. v. Oneida-Herkimer Solid Waste Mgmt. Auth.* the Court faced a similar ordinance and was able to clarify its flow control jurisprudence, this time upholding the ordinance. 127 S. Ct. 1786, 1790 (2007). "The flow control ordinances in this case benefit a clearly public facility, while treating all private companies exactly the same . . . we decide that such flow control ordinances do not discriminate against interstate commerce for purposes of the dormant Commerce Clause." *Id.* at 1795. "The only salient difference [between the flow control ordinances in this case and the ordinance in the *Clarkstown* case] is that laws at issue here require haulers to bring waste to facilities owned and operated by a state-created public benefit corporation. We find this difference constitutionally significant. Disposing of trash has been a traditional government activity for years, and laws that favor the government in such areas – but treat every private business, whether in-state or out-of-state, exactly the same – do not discriminate against interstate commerce for purposes of the Commerce Clause." *Id.* at 1790.

Summary of Facts

Oneida and Herkimer Counties ("Counties") span over 2,600 square miles of central New York. In these counties, each city, town, or village has traditionally been responsible for disposing of its own waste. 127 S. Ct. at 1790. Facing permit-less landfills, millions of dollars in remediation, price fixing, and the influence of organized crime, the Counties requested, and New York's Legislature and Governor created, the Oneida-Herkimer Solid Waste Management Authority ("Authority") – a public benefit corporation empowered to collect, process, and dispose of solid waste generated in the Counties. *Id.* at 1790-91.

Private haulers remained free to pick up citizen's trash from the curb, but the Authority would take over the job of processing the trash, sorting it, and sending it off for disposal. *Id.* at 1791. To this end, the Authority agreed to purchase and develop facilities for the processing and disposal of solid wastes generated in the Counties. *Id.* To cover the operating and maintenance costs of these facilities, the Authority collected "tipping fees". *Id.* While the fees significantly exceeded those charged for waste removal on the open market, the premium allowed the Authority to provide more services than the average private waste disposer had provided. *Id.*

The agreement provided that any of the Authority's costs not recouped through these fees and other charges would be covered by the Counties. *Id.* But, to avoid being stuck footing the bill when citizens opt to have their waste hauled to facilities with lower tipping fees, the Counties enacted flow control ordinances requiring all solid waste generated within the Counties be delivered to the Authority's processing sites. *Id.*

Petitioners are a trade association made up of solid waste management companies, and six haulers that operate in Oneida and Herkimer Counties. *Id.* at 1792. Petitioners sued the Counties and the Authority alleging the flow control laws violate the Commerce Clause by discriminating against interstate commerce. *Id.*

Citing conflicting decisions in the 2nd and 6th circuit, the Court granted certiorari. *Id.* (citing *United Haulers Ass'n v. Oneida-Herkimer Solid Waste Mgmt. Auth., 438 F.3d 150, 160 (2006); Nat'l Solid Wastes Mgmt. Ass'n. v. Daviess County,* 434 F.3d 898 (2006)).

ANALYSIS

After a brief reaffirmation of the Court's dormant Commerce Clause jurisprudence, the Court held that flow control ordinances that benefit a clearly public facility, while treating all private companies the same, do not discriminate against interstate commerce for purposes of the dormant Commerce Clause. 127 S. Ct. at 1792-93, 95.

The Court first focused on the "compelling" reasons for treating laws favoring a public facility different from those laws favoring a private facility. "Unlike private enterprise, government is vested with the responsibility of protecting the health, safety, and welfare of its citizens." *Id.* at 1795. These responsibilities, the Court said, "set state and local government apart from a typical private business." *Id.* The court reasoned that these responsibilities justify a different level of scrutiny from the rigorous scrutiny required when a law favors in-state business over out-of-state competition. *Id.* at 1795-96. When a law favors in-state private businesses over out-of-state competition, the law is often a product of "simple economic protectionism." *Id.* at 1796. "Laws favoring local government, by contrast, may be directed toward any number of legitimate goals unrelated to protectionism. Here the flow control ordinances enable the Counties to pursue particular policies with respect to the handling and treatment of waste generated in the Counties, while allocating the costs of those policies on the citizens and businesses according to the volume of waste they generate." *Id.*

The Court noted that treating public and private entities the same under the dormant Commerce Clause would lead to "unprecedented and unbounded interference by the courts with state and local government." *Id.* The Court explained that the dormant Commerce Clause does not give the federal courts license to determine which undertakings are or are not appropriate for state or local governments and which are are better left to private market competition. *Id.* "It is not the office of the Commerce Clause to control the decision of the voters on whether government or the private sector should provide waste management services." *Id.*

The Court acknowledged its hesitancy to interfere with the Counties' efforts because waste disposal is both typically and traditionally a local government function. *Id.* "Congress itself has recognized local government's vital role in waste management, making clear that 'collection and disposal of solid wastes should continue to be primarily the function of State, regional, and local agencies.'" 127 S. Ct. at 1796 (citing Resource Conservation and Recovery Act of 1976, 42 U.S.C. § 6901(a)(4)). It is also the policy of the State of New York to favor "displac[ing] competition with regulation or monopoly control" in this area. 127 S. Ct. at 1796 (citing N.Y. Pub. Auth. Law Ann. § 2049-tt(3)). The Court concluded, "We may or may not agree with that approach, but nothing in the Commerce Clause vests the responsibility for that policy judgment with the Federal Judiciary." 127 S. Ct. at 1796.

The Court noted finally, "the most palpable harm imposed by the ordinances-more expensive trash removal- is likely to fall upon the very people who voted for the laws." *Id.* at 1797. Here, the citizens and businesses of the Counties bear the costs of the ordinances. *Id.* Local businesses could obtain relief without the Court's interference through a victory of their own via the political process. *Id.*

A plurality of the Court applied the *Pike* balance test, in which a nondiscriminatory statute is upheld unless it imposes a burden on interstate commerce which is excessive in relation to its putative benefits. 127 S. Ct. 1797 (citing *Pike v. Bruce Church, Inc.*, 397 U.S. 137, 142 (1970)). Finding that the local benefits, convenient financing of waste-disposal services, and increase in recycling outweighed the burden on interstate commerce, the Court upheld the ordinances. 127 S. Ct. 1797-98.

Subsequent Treatment

The Commerce Clause discussion in *United Haulers* has been cited in a variety cases going beyond the solid waste flow control context.

In *City of Los Angeles v. County of Kern*, a county ordinance banning land application of biosolids in the unincorporated areas of the county was found to violate the Commerce Clause. *City of Los Angeles v. County of Kern*, 509 F. Supp.2d 865, 888 (C.D. Cal. 2007). The ordinance was found to shift "costs resulting from its regulation almost entirely to out-of-county interests through an initiative process that was unchecked by the operation of the normal political restraints." *Id.* at 886-87.

In *Illinois Restaurant Ass'n v. City of Chicago*, a city ordinance banning the sale of foie gras was upheld against a Commerce Clause challenge. *Ill. Rest Ass'n. v. City of Chicago*, 492 F.Supp.2d 891, 905 (2007). The discussion reconciled Seventh Circuit jurisprudence and the *Pike* balancing test applied by the plurality in *United Haulers*. *Id.* at 904.

In *SPGGC, LLC v. Blumenthal*, in which an injunction was sought to prevent enforcement of the Connecticut Gift Card Law as violating the Commerce Clause, the law was held not to violate the Commerce Clause. *SPGGC, LLC v. Blumenthal*, 505 F.3d 183, 196 (2nd Cir.(Conn.) 2007). The court noted its hesitance to interfere with the State's efforts "because consumer protection is a field traditionally subject to state regulation. *Id.* at 194.

However, in *State of Alabama Dept. of Revenue v. Hoover, Inc.*, complaining the State Department of Revenue's final assessment of additional sales tax on sales made to out-of-state governmental entities unconstitutionally discriminated against interstate commerce, the court distinguished *United Haulers*. *See State of Alabama Dept. of Revenue v. Hoover, Inc.*, 2007 WL 2460086, *4 (Ala. Civ. App. Aug. 31, 2007). "*United Haulers* dealt with a flow-control ordinance as opposed to a tax exemption. Furthermore, *United Haulers* did not specifically hold that all regulations treating in-state and out-of-state private entities, *and out-of-state public entities*, the same do not facially discriminate against interstate commerce." *Id.* at *5 (emphasis in original).

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WATER QUALITY AND UTILITIES

RECENT TCEQ DECISIONS ON EXPEDITED RELEASE FROM CERTIFICATE OF CONVENIENCE AND NECESSITY PETITIONS

In the 2005 legislative session, the Texas Legislature enacted House Bill 2876 ("HB 2876"). HB 2876 provides landowners with a mechanism by which they can obtain from the Commission on Environmental Quality (TCEQ) an expedited release from a certificate of convenience and necessity (CCN) enabling the landowner to receive water or sewer service from another service provider. Tex. H.B. 2876, 79th Leg., R.S. (2005). The statutory provision is found in Section 13.254(a-1) of the Texas Water Code. The TCEQ recently considered two petitions for expedited releases under this provision. The outcomes differed due to the petitioners' ability to demonstrate that the utility holding the CCN lacked capacity to meet their water service needs.

A CCN is an encumbrance on the land. A utility must obtain a CCN from the TCEQ to provide water and sewer service to an area. It effectively grants a monopoly to the utility to provide water and sewer services to that area. In the past, landowners did not receive sufficient notice about the issuance of CCNs that included their land. This lack of notice has caused some problems in the past. Some landowners had land within a CCN, but still did not receive adequate water or sewer service and were unable to look elsewhere for service without going through a time-consuming and costly administrative process at TCEQ.

House Bill 2876 amended the Texas Water Code in regards to CCNs. The amendments gave the TCEQ more discretion when granting CCN certificates. The amendments also gave qualifying landowners more voice in having their land included within a CCN and to have their land decertified if already within a CCN. One important change was to add Section13.254(a-1) to the Texas Water Code. This provision adds an alternative decertification process. An owner of a tract of land that is at least fifty acres and is not in platted subdivision can petition the TCEQ under this subsection for an expedited release of their land from a CCN, so that their land can receive utility service from another retail public utility.

DOUBLE DIAMOND

On July 23, 2007, the Executive Director of the TCEQ denied the petition of Double Diamond, Inc. ("Double Diamond" or "Petitioner") for an expedited release. Tex. Comm'n on Evntl. Quality, *Double Diamond, Inc.'s Petition for the Expedited Release from the Retail Water CCN No. 12362*, Order, 1 [hereinafter *Diamond Order*]. The Executive Director denied Double Diamond's Motion to Overturn the Executive Director's Decision petition filed on September 18, 2007. Tex. Comm'n on Evntl. Quality, *Double Diamond, Inc.'s Petition for the Expedited Release from the Retail Water CCN No. 12362*, The Executive Director's Response to Double Diamond, Inc.'s Motion to Overturn, 1 [hereinafter *Response to Diamond's Motion to Overturn*]. Petitioner owns 1,250 acres in Grayson County that is not located in a platted subdivision. *Diamond Order* at 1. The land is located in CCN No. 12362 of the Northwest Grayson County Water Control and Improvement District ("District" or "Respondent"). *Id.* Double Diamond requested an expedited release from this CCN. *Id.* Petitioner planned to develop the land

by creating a master planned community. *Id.* Petitioner asserted that the District was not capable of providing adequate service to Double Diamond and that the District did not have the capacity to provide them with service. *Id.* at 2-4. Double Diamond was also concerned with the cost estimates for service. *Id.* at 3. Petitioner alleged that it could provide cheaper, better quality water service through Double Diamond Utility. *Id.* at 2. The District stated that it had the capacity to provide adequate service for Double Diamond, but conditioned its service on the payment of certain costs by Double Diamond. *Id.* at 3.

After both sides provided the Executive Director with more information at his request, the Executive Director ruled that Double Diamond had failed to meet the elements required for an expedited release from a CCN as set forth in Section 13.254(a-1) of the Texas Water Code and Section 291.113(b)(3) of Title 30 of the Texas Administrative Code. *Diamond Order* at 4. The statute "requires a petitioner for an expedited release to show the Certificate Holder: (A) has refused to provide service; (B) is not capable of providing the service on a continuous and adequate basis within the time frame, at the level, or in the manner reasonably needed or requested by current and projected service needs in the area; or (C) conditions the provision of service on the payment of costs not properly allocable directly to the petitioner's service request, as determined by the Commission." *Id.* at 4-5.

The Executive Director found that Double Diamond had failed to show that the District had refused to provide service; instead the District had enthusiastically offered to provide it. *Id.* at 5. The Executive Director also found that Double Diamond failed to prove that the District could not provide adequate service. *Id.* at 5-6. An engineer for the District submitted information that the District could provide service. *Id.* at 6. The Executive Director also found that Double Diamond failed to show the District conditioned service on unfair costs. *Id.* at 7. Finally the Executive Director found that Double Diamond failed to show that Double Diamond Utilities Company would have been capable of providing the service required. *Id.* at 7-8.

While denying the Petition to Overturn the Executive Director's original decision, the Executive Director noted that Double Diamond overstated their level of need and their timeline which created difficulty in evaluating their ability to meet the burden of proof required to meet the statutory requirements for a release. *Response to Diamond's Motion to Overturn* at 5.

Kerala Christian Adult Homes

In the second case, the Executive Director of the TCEQ granted the petition for an expedited release from a CCN. Tex. Comm'n on Evntl. Quality, *Petition from Kerala Christian Adult Homes 1, L.P. for an Expedited Release from Water Certificate of Convenience and Necessity No. 10064, Executive Director's Response to BHP WSC's Motion to Overturn*, 1 [hereinafter *Response to Kerala's Motion to Overturn*]. In this case, the Respondent, BHP WSC (BHP), timely filed a Motion to Overturn the Order of the Executive Director that granted Kerala Christian Adult Homes' (Kerala), petition for expedited release. *Id.* The Executive Director recommended that BHP's Motion to Overturn be denied. *Id.* at 10.

Kerala owned over 432 acres in Collin County that were not in a platted subdivision actually receiving water service. *Id.* at 1. The land, however, was in BHP's water CCN, CCN No. 10064. *Id.* Kerala requested service from BHP for its planned subdi-

vision. *Id.* Through correspondence with the engineer for BHP, Kerala decided that BHP could not provide adequate service and petitioned the TCEQ for an expedited release. *Id.* at 2. Kerala also requested service from the City of Royse City. *Id.*

BHP's main complaint was that the Executive Director did not fairly review the case and that improper ex parte communications took place. The Executive Director concluded that BHP was not denied participation in the decision making process and that improper ex parte communications had taken place. *Id.* at 4-5. The Executive Director requested information from BHP and kept up communications with it throughout the process. *Id.* at 4. The Executive Director found that his staff communicated with Kerala at times without BHP present, but that these communications were not improper ex parte communications. *Id.* at 6-7. The Executive Director, the actual decision maker did not have any private correspondence with Kerala whatsoever. *Id.* at 7.

The Executive Director decided that Kerala successfully met the requirements of Section 13.254(a-1) of the Texas Water Code and Section 291.113(b)(3)(B) of the TCEQ's rules by showing that BHP was not capable of providing adequate water service to Kerala. *Id.* at 8. With information from Kerala and its own investigation, the Executive Director concluded that BHP was not in compliance with the minimum drinking water standards and exceeding its production capacity. *Id.* If BHP took Kerala's demand for supply the situation would be exacerbated. *Id.* at 9. Based on this information, the Executive Director determined that an expedited release was warranted. *Id.*

The outcome of these petitions turned on the new amendments to the Texas Water Code brought about by House Bill 2876. Double Diamond could not provide adequate information to meet any of the requirements in Section 291.113(b)(3) of the Title 30 of the Texas Administrative Code. *Diamond Order* at 7-8. Kerala, however, provided detailed enough information to be released from the subject CCN under Section 291.110(b)(3). *Response to Kerala's Motion to Overturn*, at 9.

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WATER RIGHTS

WATER RESOURCES DEVELOPMENT ACT OF 2007 ENACTED OVER PRESIDENTIAL VETO

The Water Resources Development Act of 2007 ("WRDA") became law on November 8, 2007, after the U.S. Senate voted to override President Bush's veto of the bill. GovTrack.us., H.R. 1495~110th Congress (2007): Water Resources Development Act of 2007, http://www.govtrack.us/congress/bill.xpd?bill=h110-1495 (last visited April 3, 2008). The WRDA authorizes funding for water resources infrastructure as well as for a number of water-related environmental projects nationwide. James Mar-

ren, *In the News 2007-2008: Congress Passes the Water Resources Development Act of 2007*, VT. ENVTL. L. J. (Nov. 2007), *available at* http://www.vjel.org/news/NEWS100111.html. While opponents of the bill believe that the bill diverts taxpayer dollars from more pressing needs, supporters insist that the bill addresses long neglected projects. *See id.* The bill authorizes several projects that will be carried out in Texas. Suzanne Gamboa, *Water Bill Authorizes Texas Projects*, Star-Telegram (Nov. 8, 2007), *available at http://www.mysanantonio.com/sharedcontent/APStories/stories/D8SPODKG0.html* (last accessed April 3, 2008).

The first bill to authorize flood control projects since 2000, the WRDA approves flood protection projects along the Gulf Coast, including a 100-year levee protection in New Orleans. NPR.org, *Senate Overrides Bush Veto on Water Bill*, http://www.npr.org/templates/story/story.php?storyId=16114910 (last visited April 3, 2008). Additionally, the bill authorizes the construction of navigation improvements for the Upper Mississippi, funds an ecosystem restoration project for the Upper Mississippi, and approves funding for the Indian River Lagoon project in the Florida Everglades. *Id.* The bill also makes a bid to cut down on wasteful spending by calling for an independent peer review process of all Army Corps projects costing $45 million or more. *Id.* According to the Congressional Budget Office, the WRDA will cost $11.2 billion over the next four years and $12 billion in the ten years after that time period. *Id.*

Opponents of the bill insist that the bill diverts "taxpayer dollars from core responsibilities to water-sports and other low-priority schemes." Ronald D. Utt, *The Water Resources Development Act of 2007: A Pork Fest for Wealthy Beach-Front Property Owners* (May 15, 2007), http://www.heritage.org/Research/Budget/wm1458.cfm (last visited April 3, 2008). In his veto of the bill, President Bush stated that taxpayers should not have to support a "pork-barrel system of Federal authorization," and that the bill's inclusion of "hundreds of earmarks" hampers the Corps' ability to fulfill the country's water resources needs. George W. Bush, *President Bush Vetoes Water Resources Development Act of 2007* (Nov. 2, 2007), http://www.whitehouse.gov/news/releases/2007/11/20071102-3.html (last visited April 3, 2008). President Bush suggested that he would not support funding for water resource projects unless the projects would lead to high economic and environmental returns for the country. *Id.*

WRDA proponents call the bill "constructive," and insist that what opponents see as "pork-barrel items" are actually "good, deserved, justified projects." NPR.org, *Senate Overrides Bush Veto on Water Bill*, *supra*. Republican Senator Kay Bailey Hutchison, who voted to override Bush's veto, said that the projects included in the bill would "ensure that our waterways remain viable for commerce, our communities are protected from floods, and our precious ecosystems are restored." Suzanne Gamboa, *supra*.

The legislation authorizes various projects around Texas. *Id.* For example, the bill authorizes funding to enhance navigation routes and ecosystem protection along the Corpus Christi Ship Channel. Ruben Bonilla, *Channel Projects Important to Community*, (November 10, 2007), *available at* http://www.caller.com/news/2007/nov/10/channel-projects-important-to-community/ (last visited April 3, 2008). These financial resources will help dredge part of the Ship Channel, a critical element in the proposed La Quinta Container Terminal project. *Id.* The completion of this project has the potential to stimulate significant economic growth in the Corpus Christi region. *Id.* Another Texas project that will benefit from the WRDA's passage is the

Johnson Creek Conservation Plan in Arlington, Texas. *Cowboys Stadium Scoreboard*, City of Arlington, Nov. 2006, at 3, *available at* http://www.arlingtontx.gov/cowboys/pdf/scoreboard/cowboysscoreboardreport_1106.pdf (last visited April 3, 2008). The WRDA authorizes financial support that will help improve storm water and recreational facilities at three Arlington parks. *Id.* In addition to projects in Corpus Christi and Arlington, the WRDA calls for the Army Corps of Engineers to sell 900 acres around Lake Texoma, allowing development plans to move forward in the Denison area. KJRH.com, *Oklahoma Projects from Water Resource Development Act*, http://www.kjrh.com/content/news/2viewgc/story.aspx?content_id=73ae448b-7410-4091-a4f7-09c30d68b8f3 (last visited April 3, 2008). Other projects Texas projects authorized include the following:

(1) The Dallas Floodway. If this project is deemed feasible and environmentally sound, it is authorized to receive $298 million federal money and $161 million non-federal money. Suzanne Gamboa, *supra*.

(2) Gulf Intracoastal Waterway dredging. This project would receive $17.3 million federal funds for dredging in the Intercoastal Waterway between the Brazos River and Port O'Connor, and another $14.5 million for dredging in the area from the Sabine River to Corpus Christi. *Id.*

(3) Study of Onion Creek. This project is a flood control project in Austin. *Id.*

(4) A University of Dallas research project. This $5 million research project would address transboundary water resource management in the southwestern U.S.

It is important to note, that the WRDA does not provide money for the projects, it authorizes Congressional spending for these purposes, but "funding for the projects would not be seen until 2009 if included in spending bills that year." Suzanne Gamboa, *supra*.

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FEDERAL CASENOTES

SAVE OUR SPRINGS ALLIANCE V. NORTON, NO. A-05-CA-683-SS, SLIP OP., 2007 WL 958173 AT *1 (W.D. TEX. FEB. 20, 2007)

In *Save Our Springs Alliance v. Norton*, decided in February 2007, the federal court for the Western District of Texas denied the plaintiff's claims that the U.S. Fish and Wildlife Service (FWS) had violated the Administrative Procedure Act (APA), the Endangered Species Act (ESA), and the National Environmental Policy Act (NEPA) in the course of issuing an advisory letter to the Texas Commission on Environmental Quality (TCEQ) that affected endangered species. No. A-05-CA-683-SS, slip op., 2007 WL 958173 at *1 (W.D. Tex. Feb. 20, 2007).

The letter in question expressed the FWS' general approval of the TCEQ's "Optional Enhanced Measures for the Protection of Water Quality in the Edwards Aqui-

fer" ("Optional Measures"), which outlines what the TCEQ considers "best management practices" for developers attempting to comply with Edwards Aquifer Rules. *Id.* The Regional Director of the FWS agreed with the TCEQ that, if followed, the Optional Measures would likely be sufficient to prevent the taking of local endangered species, and specifically the Barton Springs Salamander, by avoiding the degradation of the quantity and quality of water in the Edwards Aquifer watershed. *Id.*

The plaintiff, Save Our Springs Alliance ("SOS"), sought injunctive and declaratory relief on several claims: (1) the FWS letter was a final agency action reviewable under the APA; (2) the issuance of the letter was subject to the notice and comment procedures outlined in the ESA and the APA; (3) the issuance of the letter constituted arbitrary and capricious decision-making; and (4) the FWS issued the letter without conducting the required NEPA analysis. *Id.* In response, the FWS moved for summary judgment and denied each of SOS' claims. *Id.* at *1-2.

The threshold issue in the dispute was whether the letter was a final agency action, in which case it would be subject to judicial review under the APA. *Id.* at *2. First, the court laid out the standard for what constitutes a final agency action: "the action must mark the consummation of the agency's decision-making process" and "must be one by which rights or obligations have been determined, or from which legal consequences will flow." *Id.* (quoting *Bennett v. Spear*, 520 U.S. 156, 177-178 (1997) (internal quotations and citations omitted)). The court relied on a Ninth Circuit case cited by the defendants, which held that letters from the FWS to timber companies giving advice on how to avoid taking endangered species were not final agency actions under the ESA, nor were they major federal actions subject to NEPA's requirements. *Save Our Springs Alliance,* 2007 WL 958173 at *2. The court quoted at length from the FWS' letter to the TCEQ, which stated FWS' approval of the Optional Measures but was careful to reserve its authority to become involved should measures prove insufficient to protect endangered species. *Id.* at *3.

Ultimately, the court determined that the letter did not rise to the level of a final agency action. *Id.* In reaching this conclusion, the court found that the letter did not alter any legal rights or obligations, nor did it create a situation from which legal consequences flowed. *Id.* Instead, the court observed that "the TCEQ, landowners, and Plaintiff are in no different position legally after the issuance of the February 2005 letter than before its issuance." *Id.* In addition, the court noted that the letter in no way lessened the landowners' obligation to avoid unlawfully taking Barton Springs salamanders under the ESA. *Id.* If development on a landowner's property would result in the taking of endangered species, then the landowner would still have to apply to the FWS for an incidental take permit. *Id.* The court emphasized that whether the landowner had complied with the TCEQ's Optional Measures might be relevant, but not dispositive, to the issuance of the permit. *Id.* Thus, even compliance with the Optional Measures approved of in the FWS letter would not alone relieve the landowners of their legal obligations under the ESA, nor would it prevent the FWS from prosecuting them for the unlawful taking of endangered species. *Id.* at *3-4.

Because it held that the FWS letter did not constitute a final agency action, the court determined that the letter was not subject to judicial review under the APA,

ESA, or NEPA. *Id.* at *4. Therefore, the court denied the plaintiff's remaining claims and granted summary judgment for the defendants. *Id.*

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STATE CASENOTES

BEXAR METROPOLITAN WATER DIST. V. EVANS, NO. 04-07-00133-CV, 2007 WL 2481023 (TEX. APP.—SAN ANTONIO SEPT. 5, 2007, NO PET.) (MEM. OP.)

SUMMARY OF FACTS

Alfred Evans and seven joint plaintiffs ("Evans") brought a negligence suit against Bexar Metropolitan Water District ("the Water District") in the wake of a May and June 2006 outbreak of Legionnaire's Disease at a hospital in San Antonio. *Bexar Metro. Water Dist. v. Evans*, No. 04-07-00133-CV, 2007 WL 2481023, at *1 (Tex. App.—San Antonio Sept. 5, 2007, no pet.) (mem. op.) (hereinafter "*BexarMet*"). In the trial court, Evans alleged the disease outbreak resulted in part from the Water District's negligent delivery of inadequately chlorinated water. *Id.* Evans further alleged that the Texas Tort Claims Act waived the Water District's governmental immunity, affording the trial court jurisdiction over the claim. *Id.*

The Water District filed a plea to the jurisdiction asserting Evans had not established the requisite jurisdictional facts alleging negligence that would give way to a waiver of governmental immunity under the Tort Claims Act. *Id.* The Water District argued "the residual concentration level of chlorine ... met the requirements set by the [TCEQ]." *Id.* The Water District supplemented its plea with substantiating evidence and argued that no issue of fact existed regarding whether or not it breached its duty. *Id.* Evans responded that the petition "alleged facts sufficient to bring the cause of action" under the immunity waiver in the Texas Tort Claims Act." *Id.* The case reached the court of appeals after the trial court denied the Water District's plea to the jurisdiction. *Id.*

APPLICABLE LAW

The court of appeals relied heavily on the Texas Supreme Court's 2003 *Miranda* decision, and found that, "when a plea to the jurisdiction challenges the existence of jurisdictional facts and implicates the merits of the plaintiff's cause of action, the parties may submit evidence if necessary to resolve the jurisdictional issues." *BexarMet*, 2007 WL 2481023, at *2 (citing *Miranda v. Dep't of Parks & Wildlife*, 133 S.W.3d 217, 227 (Tex. 2004)). Thus, the appellate court found that the trial court should have applied a standard akin to that of summary judgment to determine if

a fact issue was present. *BexarMet*, 2007 WL 2481023, at *2 (citing *Miranda*, 133 S.W.3d at 228). "[I]f the relevant evidence is undisputed or fails to raise a fact question on the jurisdictional issue, the trial court rules on the plea to the jurisdiction as a matter of law." *BexarMet*, 2007 WL 2481023, at *2 (citing *Miranda*, 133 S.W.3d at 227-28). Because the Water District introduced evidence on the jurisdictional issue implicating the merits of the case, the trial court was charged to "take as true all evidence favorable to [Evans] and indulge every reasonable inference and resolve any doubts in [Evans'] favor." *BexarMet*, 2007 WL 2481023, at *2 (citing *Miranda*, 133 S.W.3d at 288).

Breach of Duty

The Water District conceded that a waiver of immunity would apply by reason of personal injury or death if it was negligent in chlorinating the water. *BexarMet*, 2007 WL 2481023, at *2. However, the Water District maintained that the trial court erred by denying its plea to the jurisdiction because the Water District had conclusively established that it met its duty to chlorinate the water. *Id.*

The Water District submitted affidavits and data sheets supporting its position that it was not negligent in fulfilling the duties required by TCEQ to chlorinate the water at or above the level of 0.2mg/L of free chlorine, monitoring the chlorine level daily, and monitoring the chlorine level each time a bacteriological sample was taken. *BexarMet*, 2007 WL 2481023, at *3 (citing 30 Tex. Admin. Code § 290.110 (2007) (Tex. Comm'n on Envtl. Quality, Public Drinking Water)). The Production Manager's affidavit included testimony that the chlorine levels were checked daily and recorded on Daily Operator Sheets. These sheets, attached to the affidavit, "reflect[ed] residual levels of greater than 0.2mg/L free chlorine each day." *BexarMet*, 2007 WL 2481023, at *3. Evans failed to "attach or cite to any evidence on this issue in his response" to the Water District's plea. *Id.* at *4. The court held that the Water District's evidence demonstrated that the chlorine level in the water distribution system "as a whole" never dropped below 0.2mg/L, and that "because the distribution system includes the point where the Water District's service lines meet the hospital's service lines, it was incumbent on Evans to bring forward some evidence raising a fact question on this issue." *Id. at* *4.

Evans argued that the petition established an issue of fact since it alleged that water analysis following the identification of the outbreak indicated a chlorine level "far below those levels required to control bacterial growth and proliferation." *Id.* In *Miranda*, the Supreme Court held that "if the plaintiffs' factual allegations are challenged with supporting evidence necessary to consideration of the plea to the jurisdiction, to avoid dismissal plaintiffs must raise at least a genuine issue of material fact to overcome the challenge to the trial court's subject matter jurisdiction". *BexarMet*, 2007 WL 2481023, at *4 (citing *Miranda*, 133 S.W.3d at 221). In light of *Miranda*, the court held that Evans' allegation was not supported with sufficient evidence to raise a question of fact on the issue. *Id.*

Moreover, the court concluded the Water District did not breach its duty to chlorinate the water and that Evans failed to adequately raise a question of fact in regards to the Water District's alleged negligence. *Id. at* *5. Accordingly, the court

of appeals reversed the trial court's order and dismissed the claims against the Water District for lack of jurisdiction. *Id.*

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Howard Slobodin received his B.A. from the University of Oregon in 1998 (cum laude) and his J.D. from the University of Texas School of Law in 2001 (with honors). A native of Portland, Oregon, a former Honors Assistant Attorney General with the Natural Resources Division of the Office of the Attorney General, and a former associate with Hazen & Terrill, P.C. in Austin, Mr. Slobodin is a Staff Attorney with the Trinity River Authority in Arlington, Texas.

PUBLICATIONS

JONATHAN S. MARTEL, *CLIMATE CHANGE LAW AND LITIGATION IN THE AFTERMATH OF MASSACHUSETTS V. EPA*, DAILY ENVIRONMENT REPORT, NOV. 6, 2007, AT B-1.

Jonathan Martel argues in his article that the Supreme Court decision in *Massachusetts v. EPA*, 127 S.Ct. 1438 (2007), may be the most important judicial decision in the history of environmental law because of its potentially enormous impact on federal regulation. Jonathan S. Martel, *Climate Change Law and Litigation in the Aftermath of Massachusetts v. EPA*, DAILY ENVIRONMENT REPORT, Nov. 6, 2007, at B-1, available at http://www.arnoldporter.com/resources/documents/BNA-Artice_Martel_1107.pdf. Specifically, *Massachusetts* "set off a . . . paradigm for climate change in which the specific goals of regulation presently are ill-defined and aspirational with 'success' very far into the future." *Id* at 2.

In attempting to frame these issues in an initial regulatory response, Martel identifies four major parts of the Clean Air Act (CAA) that are the current "chief battlegrounds" on how to regulate greenhouse gases. *Id.* These four parts are:

1. "the regulation of motor vehicles under Title II of the act, which was subject of the *Massachusetts* case and thus remanded;"
2. "potentially broader utilization of the National Ambient Air Quality Standards (NAAQS) program [. . .] to adopt a more comprehensive regulatory reform;"
3. "EPA adoption of [greenhouse gas] New Source Performance Standards (NSPS) for new, modified and also existing stationary sources across a broad range of listed source categories;"
4. "application of the Prevention of Significant Deterioration (PSD) permit program to require Best Available Control Technology (BACT) for new construction or modification of what might appear to be virtually any modest size emitter of carbon dioxide."

Id.

Case Overview

Massachusetts arose out of state and environmental groups' challenge to the EPA's 1999 denial of a petition to regulate greenhouse gases from motor vehicles under Section 202(a)(1) of the Clean Air Act." *Id.* The CAA requires the EPA administrator to set motor vehicle emissions standards "of any air pollutant [. . .] which in his judgment cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare." *Id.* (citing 42 U.S.C. § 7521(a)(1)). Martel argues that since this language of "endanger to public health or welfare" appears ubiquitously throughout the CAA, the Supreme Court's decisions about of this language in this respect, could have "broad repercussion for greenhouse gas regulation" throughout the many programs of the Clean Air Act. *Martel*, supra, at 3.

The Court in *Massachusetts* made three important holdings: the petitioners had standing to bring the case, carbon dioxide qualified as a Section 302(g) pollutant, and the use of policy indicators in an endangerment finding for greenhouse gases (GHGs) was improper. *Id* at 3. With regard to standing, the Court emphasized procedural interest and the "special solicitude" given to states as petitioners. *Id.* The states made a showing of concrete injury through the risk of higher sea levels that would be traceable to the EPA's denial of the petition, and the Court concluded that this injury would likely be reduced with a favorable decision. *Id.* The importance of the Court's finding of standing is that it has arguably opened the door for environmental advocates to bring greenhouse gas claims under other various CAA programs. *Id.* Martel tempers this statement, noting that standing survived on the thin margin of 5-4. *Id.*

Second, the Court's determination that carbon dioxide qualified as a Section 302(g) pollutant was crucial because it can apply to sections well beyond Section 202(a)(1). *Id.* If carbon dioxide had not been found to be a "pollutant," Martel emphasizes that the "potential for Clean Air Act regulation of greenhouse gases under current law would have been stopped dead in its tracks." *Id*

Finally, the Court held that the EPA must make a determination as to whether greenhouse gases "present an endangerment" under Section 202(a)(1) based "alone on the existence of an endangerment to health and welfare presented by the air pollutant." *Id.* The Court found that the EPA's use of "policy factors such as foreign relations" in declining to perform an endangerment analysis was improper. *Id.* Although "the [C]ourt did not order EPA to regulate greenhouse gases from motor vehicles," as a practical matter it may now be difficult for the EPA to decline to develop greenhouse gas restrictions. *Id.*

Four "Battlegrounds" for Regulation

Regulation of Motor Vehicles/Mobile Sources

The remand from *Massachusetts v. EPA* obligated the EPA to "revisit its position under Section 202(a)(1) as to whether to regulate greenhouse gases from motor vehicles." *Id.* The EPA indicated that it does intend to regulate these gasses. *Id.* The EPA also stated that it plans "to adopt limits on greenhouse gases for motor vehicles, and [...] promulgate rules to limit carbon emission from fuels." *Id.* The fuel additive language contains the same "endanger the public health or welfare" language found in Section 202(a)(1). *Id.* (citing 42 U.S.C. § 7545(c)(1). The EPA indicated that it will

propose these vehicle and fuel rules by the end of 2007and will take final action by the end of 2008. *Martel*, supra, at 4. Plans for implementing any new programs are vague. However, the EPA indicated that it is planning to make an endangerment finding. The extent to which EPA will rely on "public health" or "welfare" justifications for this finding is still unknown. *Id.*

The EPA also intends to coordinate with the National Highway Transportation & Safety Administration. *Id.* Besides promoting cooperation between departments at the federal government, the EPA is considering establishing an allowance trading program to encourage emissions trading "between fuel and vehicle manufacturers." *Id.* Reports also indicate that the EPA is seeking to develop a structure that would allow "refiners to meet low-carbon targets on an averaged basis or through credit purchases, with the aim of preserving the potential for 'coal-to-liquids' [. . .] to participate in the market." *Id.*

Arising out of these federal programs is the potential preemption of state regulation of these sources. California's current waiver from federal guidelines to enforce their own auto emission standards conflicts with proposed standards for greenhouse gases. Besides meeting federal standards, California also had to show "compelling and extraordinary conditions" for its current waiver regarding auto emission standards. *Id* at 4. (citing 42 U.S.C. § 7543(b)). California has also applied for a waiver for its greenhouse gas emissions standards for motor vehicles, but the EPA has yet to make a decision on this waiver request. *Martel*, supra, at 4. It is unclear if the courts will find a "compelling and extraordinary position" warranting the waiver, since many states that lie in coastal areas suffer the same perceived threat of rising ocean levels and other states could possible claim they will suffer from droughts and other maladies. *Id.*

Contributing to this preemption issue are Corporate Average Fuel Economy (CAFE) standards under the Energy Policy and Conservation Act (EPCA). Automakers have argued that since fuel economy is closely correlated with greenhouse gas emissions from vehicles, the language of the EPCA stating that "no state shall have authority to adopt or enforce law or regulation related to fuel economy standards" preempts states from promulgating their own standards. *Id.* at 5 (citing 49 U.S.C. §32919(a)). The EPCA does not provide any exception for the California standards. *Martel*, supra, at 5.

It is under these conflicting preemption doctrines that California is trying to navigate arising conflicts and litigation. In the case *Central Valley Chrysler-Jeep v. Witherspoon*, a California federal district court has stated that the automaker's preemption arguments were sufficient to move the case forward, rejecting California's motion for judgment on the pleadings. *Id.* (citing 456 F. Supp. 2d 1160, 1167-83 (E.D. Cal. 2006)). Parallel legislation is at issue in Vermont in the *Green Mountain Chrysler v. Crombie* case in the U.S. District Court for the District of Vermont. *Martel*, supra, at 6 (citing 508 F.Supp.2d 295 (D. Vt. 2007)). Vermont has adopted California greenhouse gas standards. *Martel*, supra, at 6. The district court found that if California fails to receive a waiver for its greenhouse standards, then Vermont's gas standards are invalidated, but if not, then they are valid. Regarding conflict with EPCA, the court stated that the EPCA does not conflict, because once the EPA grants the waiver, those state standards are "considered federal standards within the meaning of EPCA," and therefore, preemption no longer applies. *Id.*

Ultimately the conflict over preemption leads to the question of whether the EPA can establish by preemption a "sole national program to govern greenhouse gas emission from automobiles or whether California might play its historical role of forging its own rules independently from the federal government." *Id.* at 7. If the EPA does conclude that "California faces 'compelling and extraordinary' conditions with respect to climate change," it would place "costs and the balance and structure of how to structure control over the automotive piece of the climate change puzzle beyond federal control." *Id.* Finally, Congress still retains the power to step in with its own approach or a clarification on the role of California, but has yet to do so.

National Ambient Air Quality Standards

The broadest, but perhaps most far-fetched, approach the EPA could take to address greenhouse gases would be the adoption of National Ambient Air Quality Standards for carbon dioxide or other GHGs. *Id.* Martel illustrates that Section 108 of the CAA contains language similar to the provisions at issue in *Massachusetts*. *Id.* This language states that the EPA is required to establish criteria for "NAAQS for those air pollutants which, in EPA's judgment, reasonably pose an endangerment to health or welfare." *Id.* (citing 42 U.S.C. § 7408(a)(1)(a)).

NAAQS are implemented through State Implementation Plans (SIPs), but it is in this state/federal arrangement that issues arise. If the EPA was to set ambient concentration of GHGs to protect human health and welfare, and then require states to adopt these programs for air within their borders, this decision would be "obviously . . . dissonant" because carbon dioxide is a pollutant that travels globally and is not confined to particular states or regions, and does not have local polluting effects. *Martel*, supra, at 7. However, Martel argues that because the Court in *Massachusetts* found greenhouse gases to be "air pollutants" and because the EPA must decide on the basis of "endangerment" whether to regulate it, "it is no longer so far-fetched at least to envision" a NAAQS program. *Id.*

Realizing that a strong classification of greenhouse gases as a public health and welfare endangerment could have implications for other programs, "the EPA has engaged in interagency discussion on whether to limit the scope of the "endangerment finding" under Section 202(a) from motor vehicles to just "welfare" instead of also "public health." *Id.* Under the NAAQS system, standards for health risks can be more stringent than standards for welfare risks, under the two tier "primary" and "secondary" classifications. *Id.* at 8. By doing taking this approach, Martel emphasizes that the EPA might well be "foreshadow[ing] its views regarding the potential for a NAAQS for greenhouse gases." *Id.*

New Source Performance Standards

Rulemaking proceedings and litigation are currently underway regarding the "EPA's obligation to set Best Demonstrated Technology (or best achievable) standards for carbon dioxide as part of its New Source Performance Standards (NSPS) under Section 111 of the Clean Air Act." *Id.* NSPSs apply to new or modified stationary sources and are guided by the EPA's list of source categories. *Id.* Sources make it on the list if, in language mirroring that of *Massachusetts v. EPA*, within the "administrator's judgment, the category of sources 'causes, or contributes significantly to air pol-

lution which may reasonably be anticipated to endanger public health or welfare.'" *Id.* (citing 42 U.S.C. § 7411(b)(1)(a)).

Once a pollutant makes the source categories list, the agency is required "to set standards of performance for each source category on the list that would apply to new and modified sources." *Id.* Standard of performance is a "'standard for emissions of *air pollutants*' which reflects the degree of emission limitation achievable through the application of the best system of emission reduction that EPA determines has been demonstrated adequately, taking into account cost, any non-air quality health and environmental impacts and energy requirements." *Id.* (emphasis in original)(citing 42 U.S.C. § 7411(a)(1)).

To date, states and environmental groups have made two challenges to NSPS standards on the claim that the "EPA failed to set standards for greenhouse gases." *Martel*, supra, at 8. These challenges concern new NSPS standards for power plants and industrial boilers. *Id.* These cases were stayed pending the outcome of *Massachusetts v. EPA*, and because the outcome of that case, they are being voluntarily remanded back to the EPA. *Id.* This issue is continuing as indicated by the EPA's April 2007 proposed NSPS for refineries that did not include "standards for carbon dioxide and methane as greenhouse gases." *Id.* Martel predicts, that as the "EPA continues to promulgate NSPS for various source categories," repeated comments and litigation from both sides will continue regarding EPA's decisions. *Id.*

PREVENTION OF SIGNIFICANT DETERIORATION PERMIT PROGRAM

Prevent of Significant Deterioration (PSD) permits are issued by states in accordance with their own EPA-approved rules or, in the absence of such rules, in accordance with EPA rules, , or by the EPA itself. *Id.* at 9. Parties are required to obtain PSD permits to construct a new major source or modify an existing source that would result in a significant increase in emissions. *Id.* (citing 42 U.S.C. § 7475(A)(4). A new "major" stationary source is defined as either: (a) one of a handful of industrial sources that emit "100 tons per year or more of any air pollutant," or (b) any source not within those listed categories that emits 250 tons per year or more of "any air pollutant." *Martel*, supra, at 9 (citing 42 U.S.C. § 7479(1)). If a source is a new major source and, thus, must obtain a PSD permit, then the source must install "Best Available Control Technology" for that pollutant. *Martel*, supra, at 9.

Post-*Massachusetts,* the issue arises that if "greenhouse gases, and particularly carbon dioxide, is or will be considered subject to regulation, then will the PSD limits for new or modified stationary sources could force the installation of BACT to prevent greenhouse gas emissions. *Id.* This approach could affect a huge swath of industry and even comparatively small facilities and businesses. For instance, even a commercial building furnace or boiler releases approximately 250 tons of carbon dioxide in a year. *Id.* Subjecting these facilities to permitting and controls could result in incredibly high costs, because the BACT process entails a lengthy permitting process and carbon dioxide emissions arguably would have to be set on a "case-by-case basis by the state or EPA permitting authority." *Id.*

On September 19, 2007, an official with the Office of Air and Radiation in the EPA "reportedly advised members of EPA's Clean Air Act Advisory Committee [. . .] that the agency likely will begin work on a PSD rule governing carbon dioxide once the EPA completes its proposed rule governing carbon dioxide from automobiles." *Id.*

It is still unclear "at what point BACT requirement for greenhouse gases would apply, and whether that must await EPA rulemaking." *Id.* However, the EPA and a Georgia Administrative Law Judge "recently have taken the position that carbon dioxide is not yet 'subject to regulation' under the Clean Air Act and will not be until there are actual greenhouse gas standards in place for some type of source under some provisions of the statute." *Id.* Furthermore, the EPA argued in recent cases that "PSD and BACT do not apply to greenhouse gases until there is actual GHG regulation" which leaves it further unclear as to "whether those requirements apply once EPA adopts greenhouse gases standards for automobiles as planned, or whether it must further await new rules to apply PSD to greenhouse gases as EPA has suggested it is now to considering." *Id.* at 10.

Conclusion

Martel's article illustrates many possible ways that the decision in *Massachusetts v. EPA* has and can affect the regulatory framework under the Clean Air Act. Few firm conclusions are reached in the article due to the flux in current and potential law regarding this subject, as well as the mass of regulations that are and can be affected. However, Martel concludes in his article, that a history of regulatory "inertia" has now changed. *Id.* Public concern about global warning is growing, and with the *Massachusetts* case, judicial precedent, even in the absence of legislative action, may "force EPA to pursue regulation" under the CAA or else "pursue a very substantial set of initiatives on its own." *Id.* Ultimately though, trying to implement greenhouse gas controls in the current statutory and regulatory framework of automobile emission control, NSPSs, NAAQS, and PSDs is "fraught with potential" problems for policy and for business, presents potential for a large strain on the EPA's resources, and could result in rampant litigation. *Id.* These problems, as Martel emphasizes, could "shift the equation in Congress" since legislative inaction serves as a backdrop for this "potentially sweeping regulatory activity." *Id.*

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CHANGES IN THE ENVIRONMENT

Chesley Blevins has joined the Austin office of Jackson Walker, L.L.P. as a Partner. Mr. Blevins' practice focuses on environmental, regulatory, compliance, and legislative issues for the surface and in-situ mining, energy, and residuals management industries. He practices before the Railroad Commission of Texas and Texas Commission on Environmental Quality, as well as other state and federal agencies, including the EPA, COE, MSHA, NRC, and DOE.

Joshua Katz has joined The Terrill Firm, P.C., Austin, Texas, as an associate practicing natural resources, water rights and water utilities litigation. He comes to the Terrill Firm from Clark, Thomas and Winters.

Mary Kelly has been promoted to Vice President, Rivers and Deltas at the Environmental Defense Fund (EDF), managing EDF's national work to protect and restore aquatic ecosystems.

Ken Petersen became General Counsel to the Texas Water Development Board on May 19, 2008. Prior to joining the TWDB, he served as General Counsel to Texas Rural Water Association, and has enjoyed nearly 30 years of practice with state water agencies and in the private sector.

Lynn Sherman recently opened his own solo consulting and law practice in Austin, where he will continue to focus on the protection of water rights and other landowner property rights; condemnation issues; the development of water supplies, water projects and wastewater facilities; water transactions; and issues related to water and wastewater utilities. In previous capacities, he served as a member of Winstead Consulting Group, an executive of Sustainable Water Resources, President of WaterTexas, and Executive Manager of Governmental Affairs and Community Relations for the Lower Colorado River Authority. Prior to these capacities, Lynn was a Partner with the Austin law firm of Bickerstaff, Heath, Pollan, Kever & McDaniel, LLP.

Former Bickerstaff Heath partner **Bruce Wasinger** has joined the Guadalupe-Blanco River Authority as its new General Counsel.933 East Court Street, Seguin, Texas 78155, (830) 379-5822.

Lara Nehman Zent was named General Counsel to the Texas Rural Water Association in July 2008. She started at TRWA in 2004 as Director of Legal Services after several years at the TCEQ. Her responsibilities include representing and providing legal counsel to the Association and its membership, and lobbying at the state and federal levels. She also addresses legal issues affecting rural public water systems, including EPA and TCEQ regulations. Lara formerly served as the Legal Services Director

Annual Texas Environmental Superconference and Other Continuing Legal Education

The Environmental and Natural Resources Law Section holds its annual Texas Environmental Superconference on or about the first weekend in August of each year. In August of 2009, the Section will hold the twenty-first version of the educational, entertaining, and fun event. The conference has been at the Four Seasons Hotel in Austin, Texas and will be again next summer.

For details about this great event and other CLE opportunities in the environmental and natural resources area, please see the Section's website at www.texenrls.org.

Special Announcements

Please see the Section's website, www.texenrls.org, for additional and more current information.

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