

**WEAVING A TANGLED WEB:
THE INTERSECTION OF ENERGY POLICY AND
BROADER GOVERNMENTAL POLICIES**

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I. INTRODUCTION

Energy is a basic component of modern life. Our homes and workplaces are heated, cooled, and lighted by the use of energy. We drive thousands of miles per year in cars powered by fossil fuels. The consumer products we use are made possible because of manufacturing and distribution processes that consume energy. From the moment our alarm clocks go off in the morning until we turn out the lights to go to bed at night, we constantly use electricity to power today's essentials: televisions, radios, cell phones, MP3 players, and computers. In fact, it is because we have become so adept at energy production and consumption that a majority of our population no longer lives and works on farms. Yesterday's mules have been replaced by diesel-powered tractors, allowing one person to farm large tracts of land.

To see the pervasive impact energy consumption has on our lifestyles, consider the food that you ate last night. A farmer used diesel in his tractor to cultivate the soil, plant the seeds, apply fertilizer, and harvest the crop, and used diesel or electricity to irrigate the crop. The harvested crop was transported by diesel-burning truck to a processing plant that utilized electricity to process and package the food. The packaged food was then transported by truck to a distributor and later to a grocery store (both of which utilized at least electricity to power their operations). You drove to and from the grocery store in your gasoline-powered car, obeying all the electrically-powered traffic lights in the process. At home, you used electricity for lighting and gas or electricity for cooking. From the time the farmer first started his tractor until your dishes were cleared and cleaned, energy was used to promote efficiency or convenience. What if any of this energy had been suddenly unavailable? What impact would that have had on what—or whether—you ate?

Three things should be apparent from this list of energy expenditures. First, this was only a partial listing because, for example, there was no reference to the energy required to manufacture the tractors, trucks, or other equipment used. Second, energy consumption is a necessary predicate for the lifestyle we live. The ability to convert fossil fuels into gasoline, diesel, and electricity is what separates us from our ancestors who lived and worked on small farms.¹ Third, because energy touches almost every facet of our lives, anything that impacts our energy prices or supplies carries large consequences. Regrettably, as our energy

1. Until the late 1800s, fuel wood was the dominant source of energy in the U.S. Coal became the leading source of energy around 1885. It was replaced by petroleum and natural gas in 1947. ENERGY INFO. ADMIN., HISTORY OF ENERGY IN THE UNITED STATES: 1635-2000: INTRODUCTION, <http://www.eia.doe.gov/emeu/aer/eh/intro.html> [hereinafter INTRODUCTION].

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consumption increases (even despite conservation efforts), the potential consequence of a sudden unavailability of energy also increases.²

Americans devour energy prodigiously. In 2006 every day Americans consumed 20,687,000 barrels of oil and over 21.5 trillion cubic feet of natural gas, more than 3.8 trillion kWhs of electricity, and more than a billion short tons of coal.³ Interestingly, the largest single category of energy use is energy production. For 2007 just over 40% of the energy we consumed was used to generate electricity.⁴ Coal is currently the most critical source of electricity production. It accounts for 51% of the energy consumed to generate electricity, and 91% of the coal we consume is used to generate electricity.⁵ Because we consume so much energy, ensuring our access to it is a vital national concern.

Despite the critical importance of energy access, there is no official U.S. Energy Policy, but it would be a mistake to suggest that we do not have one, in the same sense that to decide not to decide is to decide. Because energy is a basic component of life, anything that impacts the price we pay for energy, anything that alters the way that energy is manufactured, or anything that influences our patterns or methods of energy consumption, is a part of our energy policy. Such impacts can be found in state and federal taxes, foreign policy, monetary policy, and environmental protection statutes and regulations. Because these policies shape our energy policy, it is appropriate to consider the relationship between energy policy and other broader governmental policies.

The intent of this article is not to suggest or endorse any particular energy policy but to inform decision-makers and the public debate by highlighting the interconnections between energy policy and other broader policies, and to show how changes in one policy can have unintended consequence in others. First, energy policy as part of foreign policy is considered. Often, U.S. need for foreign-produced energy drives or limits our interactions with other countries. Conversely, the desire to increase U.S. national security by lessening dependence on foreign-

2. In 1950 Americans consumed approximately 32 quadrillion British thermal units (“Btu”) of energy. That grew to 98 quadrillion Btu in 2000 even though energy efficiency improved 49% during this same time period. ENERGY INFO. ADMIN., HISTORY OF ENERGY IN THE UNITED STATES: 1635–2000: TOTAL ENERGY, <http://www.eia.doe.gov/emeu/aer/eh/total.html> [hereinafter TOTAL ENERGY]. Total consumption is expected to grow 29% to 127 quadrillion Btu by 2020. ENERGY INFO. ADMIN., HISTORY OF ENERGY IN THE UNITED STATES: 1635–2000: THE U.S. ENERGY OUTLOOK AS OF 2001, <http://www.eia.doe.gov/emeu/aer/eh/outlook.html>.

3. See ENERGY INFO. ADMIN., ENERGY BASICS 101 (2008), archived at <http://web.archive.org/web/20080728131053/http://www.eia.doe.gov/basics/energybasics101.html> [hereinafter ENERGY BASICS 101].

4. ENERGY INFO. ADMIN., ANNUAL ENERGY REVIEW: U.S. PRIMARY ENERGY CONSUMPTION BY SOURCE AND SECTOR, 2008, http://www.eia.doe.gov/emeu/aer/pecss_diagram.html. The remaining 60% was consumed for transportation (27.8%), industry (20.6%), and residential and commercial uses (10.8%). *Id.*

5. *Id.* Nine percent of coal was used in industrial applications, and less than 1% was used in residential and commercial settings.

produced oil can impact energy decisions by encouraging the development and use of alternative energy sources. Next, the article considers energy policy and environmental concerns and the perception that one cannot be promoted without cost to the other. Finally, the article addresses energy policy's potential impact upon the economy and taxes.

II. ENERGY POLICY AND FOREIGN POLICY

Secure access to stably priced energy sources is a fundamental requirement for a successful economy.⁶ Consequently, energy policy is a vital component in any country's foreign policy.⁷ Interruptions in supply, or unstable pricing, involve a nation's vital interests, and a country can be expected to take appropriate action to secure its access to the natural resources it needs. When a nation must import those resources, risk and vulnerability is created. The U.S. imports over 10 million barrels of oil a day and depends on its net petroleum imports to meet about 60% of its petroleum needs.⁸ Seventy percent of the oil the U.S. consumes is used by the transportation sector, and 96% of the energy it uses comes from oil.⁹ Americans are, therefore, dependent upon other countries.

What if, through election or force, the leadership of an oil-producing country changes and the new leadership decides to sell its oil to other countries? Or, because of this leadership change it no longer has the capacity to produce the oil necessary to satisfy current demand? What if supplies are disrupted because of a terrorist attack? The answers are as obvious as they are disquieting. Without a steady stream of foreign oil our transportation sector cannot operate at anywhere near current levels. The tap need not be completely closed for our economy to feel the impact. Even short-term disruptions—or the fear of disruptions—can impact the price we pay at the pump.

Rapid changes in the price of gasoline can have a tremendous impact on our lives and, potentially, our economy. During the summer of 2008, when gasoline was at or near \$4 a gallon, not only did it impact the cost to drive or fly, but also it increased the cost of everything that is transported and, as Americans quickly learned, almost everything that consumers purchase has a transportation component. Small, short-term spikes in the price of oil may be little more than an inconvenience for consumers; but because the U.S. imports such a large percentage of oil, and because oil

6. Leon Fuerth, *Energy, Homeland, and National Security*, in *ENERGY & SECURITY: TOWARD A NEW FOREIGN POLICY STRATEGY* 411 (Jan H. Kalicki & David L. Goldwyn eds., 2005).

7. Ben Lando, *Analysis: Energy Policy is Foreign Policy*, UNITED PRESS INT'L, Feb. 13, 2008, available at http://www.upi.com/Energy_Resources/2008/02/13/Analysis-Energy-policy-is-foreign-policy/UPI-54961202947629/.

8. ENERGY BASICS 101, *supra* note 3.

9. *Id.*

constitutes such a large percentage of the energy used by the transportation sector, anything that threatens the stability of the oil market threatens the U.S. economy and, therefore, implicates foreign policy.

A. Energy Policy in the Cold War

In the twentieth century, countries such as the U.S., the United Kingdom, France, Italy, Germany, and Japan all moved to secure their access to energy. Their bilateral and multilateral relationships, security alliances, and international institutions all served to promote the security of their energy supplies.¹⁰ During the Cold War, when the world's leading powers were divided between NATO and the Warsaw Pact, America's foreign policy required assuring that the economic and energy lifelines of the U.S. and the West would prevail.¹¹ The U.S. did this, in part, by trying to align the interests of oil-producing nations with its own. The centerpiece of the country's energy policy/foreign policy is, and has been, the U.S.'s relationship with Saudi Arabia.¹² Historically, the U.S. guaranteed Saudi Arabia's security in exchange for its cooperation in keeping a reliable flow of moderately priced oil to international petroleum markets.¹³ But many other Persian Gulf states also aligned themselves with the U.S. in return for Western defense and protection.¹⁴

During the Cold War the ultimate—if not only—question in America was: Are you with us or against us? If a producing country was willing to align itself with Western nations, other issues, such as democracy and human rights, were ignored or were given limited consideration.¹⁵ In fairness, the Soviet threat not only made the U.S. less discriminatory when dealing with producing countries, it also simplified the Gulf states' foreign policy analyses. A Gulf state could look to the Soviet Union's actions in Eastern Europe and conclude that the U.S.'s guarantee of protection against that threat outweighed any concern over differences with American culture or politics.

10. Jan H. Kalicki & David L. Goldwyn, *Conclusion: Energy, Security, and Foreign Policy*, in *ENERGY & SECURITY: TOWARD A NEW FOREIGN POLICY STRATEGY* 561 (Jan H. Kalicki & David L. Goldwyn eds., 2005).

11. *Id.*

12. Edward L. Morse & Amy Myers Jaffe, *OPEC in Confrontation with Globalization*, in *ENERGY & SECURITY: TOWARD A NEW FOREIGN POLICY STRATEGY* 65 (Jan H. Kalicki & David L. Goldwyn eds., 2005).

13. *Id.*

14. *Id.*

15. *Id.*

B. Energy Policy in the 21st Century

The dichotomy of East versus West, Us versus Them is gone. The Soviet Union's demise has eliminated many of the worst fears of the Cold War—such as a World War III fought with Intercontinental Ballistic Missiles carrying thermonuclear warheads. But the absence of a Soviet threat has, unfortunately, made today's foreign policy more complicated and dynamic. These complications are present in U.S. energy policy as well. During the Cold War the U.S. could align its interests with those of many oil-producing nations by highlighting a shared Soviet threat. Today, a producer's most pressing national security threat may be internal strife. Many Arab countries are seeing increases in Islamic fundamentalism and anti-Western sentiment amongst their general population. The U.S. State Department currently has travel warnings in effect for countries such as Saudi Arabia, Pakistan, and Yemen because of fears of attack by fundamentalists.¹⁶ If internal strife is present, any visible U.S. presence may do more harm than good. Growing economies in countries such as China and India constitute new competition for scarce oil supplies. Because neither nation has a Christian tradition nor played a significant role in either of the Gulf Wars, they have advantages over many other importing nations when seeking relationships with producers.

There are still some remnants of U.S. Cold War foreign policy/energy policy. Saudi Arabia is still an important partner. Not only is it the world's largest exporter of oil, but also it possesses a quarter of the global petroleum reserves and has the excess capacity to increase petroleum supplies in the event of an emergency.¹⁷ Even so, an American energy policy must have a much broader focus today. There is only one oil market. When the supply of, or the demand for, the oil available for sale in that market is impacted, the price that all importing countries must pay and the revenues that all exporting countries will receive is impacted.¹⁸ Thus, the events in any country that imports or exports a significant amount of oil can impact all others.

U.S. consumers have experienced several recent examples of this phenomenon. For example, Americans saw rapid gasoline price spikes caused by the Arab oil embargo in 1973, the Iranian revolution in 1978,

16. See U.S. Dep't of State, Travel Warning: Saudi Arabia (June 26, 2009), http://travel.state.gov/travel/cis_pa_tw/tw/tw_932.html; U.S. Dep't of State, Travel Warning: Pakistan (June 12, 2009), http://travel.state.gov/travel/cis_pa_tw/tw/tw_930.html; U.S. Dep't of State, Travel Warning: Yemen (June 26, 2009), http://travel.state.gov/travel/cis_pa_tw/tw/tw_936.html.

17. Morse & Jaffe, *supra* note 12. According to the State Department, Saudi Arabia's proven reserves are estimated at 263 billion barrels, about one-quarter of world oil reserves. U.S. Dep't of State, Background Note: Saudi Arabia (Jan. 2009), <http://www.state.gov/r/pa/ei/bgn/3584.htm>.

18. Lando, *supra* note 7.

the Iran/Iraq War in 1989, and the Persian Gulf conflict in 1990.¹⁹ When prices suddenly drop, a reciprocal impact falls upon the economies of exporting countries. Consequently, one could argue that a coordinated foreign policy/energy policy—regardless of whether a country is an oil importer or exporter—should promote energy price stability. While certainly true, foreign policy decisions in the twenty-first century unfortunately involve consideration of several other factors as well.

1. Using Energy Policy to Influence Other Countries

The Middle East has long been a repository for complex foreign policy issues. In the recent past the region has seen armed conflict between neighboring nations (e.g., Iran vs. Iraq, Iraq vs. Kuwait), between different religious sects (e.g., Sunni vs. Shia), and between different political groups (e.g., Hamas vs. Fatah). Because much of U.S. oil comes from and through the Middle East, U.S. foreign policy in this region is a critical component of energy policy. Oil-producing countries are more reliable sources of supplies when they are not involved in armed conflict with their neighbors, embroiled in civil war, or destabilized by internal political discord. The absence of armed conflict near major trade routes promotes stable supply. Thus, promoting stability in the region promotes the U.S.'s energy policy.

Assume that, in an effort to discourage Iran from developing nuclear weapons, the U.S. pursues a policy of discouraging investment in Iran by Western governments, businesses, and banks. If the effort is successful, Iran would produce and sell less oil and would, therefore, receive less oil-related revenue. That financial pressure could ultimately lead Tehran to abandon any nuclear weapons program. But, so long as the problem remains unresolved, a successful U.S. foreign policy would result in less oil being available on the world market and would mean higher oil prices for importing countries. In the case of Iran, that risk is considerable.

Iran controls 10% of the world's oil reserves and has the world's second-largest natural gas reserves.²⁰ The potential unintended consequence of exerting foreign economic pressure on it cannot be ignored. A disruption in Iran's ability to produce and sell oil and natural gas could, conceivably, have significant impact on world prices. Either because of this or in addition to, international cooperation by oil importing countries against oil exporters can be difficult to achieve

19. ENERGY INFO. ADMIN., ENERGY EXPLAINED: A PRIMER ON GASOLINE PRICES (2009), <http://www.eia.doe.gov/bookshelf/brochures/gasolinepricesprimer/> [hereinafter GASOLINE PRICES] (last visited Nov. 16, 2009).

20. *Rising Oil Prices, Declining National Security: Hearing Before the H. Comm. on Foreign Affairs*, 110th Cong. 2 (2008) (statement of Anne Korin, Co-Director, Institute for the Analysis of Global Security), available at http://www.iags.org/Korin_HFRC_052208.pdf.

because each importer has an incentive to forgo diplomatic cooperation if it can thereby secure a favorable purchase agreement with the recalcitrant producer.

This temptation is not simply an excuse for a rogue nation to justify its actions but a legitimate national security concern for any oil-importing country. For example, consider India. It is the sixth-largest, and one of the fastest growing, energy consumers in the world.²¹ India has limited petroleum reserves and must import 72% of its crude oil and petroleum products.²² As India's economy grows, that number is expected to increase.²³ India has attempted to meet its national security needs by developing "as many potential supply arrangements, with as many potential suppliers, as it . . . can and [by] neutraliz[ing] its potential competitors (principally China) with cooperation agreements."²⁴

If India did not feel directly threatened by Iranian nuclear warheads, it would have an incentive to secure its own energy needs by ignoring the international effort and dealing directly with the Iranians. Recognizing this, the international community would necessarily need to consider India's energy needs if it wishes to obtain and maintain India's cooperation. This could be accomplished by replacing any oil or gas India purchases from Iran, but unless this comes entirely from excess capacity—necessitating the cooperation of one or more producing nations as well—it means higher prices and potential shortages for others. At some point, higher prices will unravel a coalition of petroleum purchasers.

Alternatively, the U.S. could help ease India's dependence upon imported oil. India has large coal reserves.²⁵ The U.S. could, therefore, help India refit gas-burning electricity generators to become coal-burning plants. Greater coal use would, however, result in greater greenhouse gas emissions. India also has several nuclear power plants. Because it is outside the Nuclear Non-Proliferation Treaty²⁶ due to its weapons program, India has, until recently, been largely excluded from trade in nuclear plants or materials.²⁷ Consequently, India's nuclear reactors have

21. *India Is the Sixth Largest and One of the Fastest Growing Energy Consumers in the World*, BUSINESS WIRE, May 16, 2008, http://findarticles.com/p/articles/mi_m0EIN/is_2008_May_16/ai_n25430855/.

22. *Id.*

23. *Id.*

24. Vibhuti Hate, *India's Energy Dilemma*, SOUTH ASIA MONITOR (CENTER FOR STRATEGIC AND INT'L STUD.), Sept. 7, 2006, at 2, available at <http://www.csis.org/media/csis/pubs/sam98.pdf>.

25. *Id.*

26. Treaty on the Non-Proliferation of Nuclear Weapons, July 1, 1968, 21 U.S.T. 483, 729 U.N.T.S. 161.

27. *Nuclear Power in India*, WORLD NUCLEAR ASS'N, Oct. 19, 2009, <http://www.world-nuclear.org/info/inf53.html> (last visited Nov. 16, 2009).

had some of the lowest capacity of any plants in the world.²⁸ The U.S. or other Western nations could provide India with greater technical assistance with building new nuclear power plants or with improving the operations of existing plants; however, this would create the possibility of greater nuclear proliferation and higher tensions with Pakistan.

The complicated nature of energy policy/foreign policy can be seen in the Energy Information Administration's ("EIA") 2009 Annual Energy Outlook.²⁹ The EIA assumes oil will cost \$130 per barrel (real 2007 dollars) in 2030 but, recognizing the uncertainty inherent in such predictions, also prepared alternative analyses using \$50 and \$200 per barrel prices.³⁰ The EIA assumes OPEC's share of total world production is 40% in the reference case, 30% in the low price case, and 50% in the high price case.³¹ Thus, in any scenario, non-OPEC nations are expected to produce at least half of the world's liquid hydrocarbons.

OPEC production decisions will remain the most significant factor underlying oil prices.³² But the EIA gave considerable effect to the actions of non-OPEC countries. In the high price case, the EIA assumes that several non-OPEC countries with large resource holdings—such as Russia, Brazil, or Kazakhstan—restricted opportunities for investment in resource development, thus limiting their contributions to total liquids supply. The EIA notes that "[p]olitical, fiscal, and resource conditions in each of those countries are unique," but opines that each "will require domestic and foreign investment to develop new projects and maintain infrastructure," and cautions that each has "either resisted encouraging such investment or has indicated that they might enact restrictions on foreign investment."³³ In the low price case, several resource-rich nations, including Russia and Venezuela, encourage foreign investment in the development of their resources.

The EIA's assumptions imply that for the foreseeable future, a foreign policy that incorporates an energy policy promoting moderation and stability in the price of oil must account for the political, fiscal, and resource conditions in several exporting countries. Today, the largest part of the world's reserves are located in regions where democratic governments do not exist, exist in name only, or do not yet have reliable patterns of governance.³⁴ A foreign policy concerned only with protecting U.S. energy supplies would ignore considerations such as corruption or

28. *Id.*

29. ENERGY INFO. ADMIN, ANNUAL ENERGY OUTLOOK 2009, at 1 (2009), [http://www.eia.doe.gov/oiaf/aeo/pdf/0383\(2009\).pdf](http://www.eia.doe.gov/oiaf/aeo/pdf/0383(2009).pdf) [hereinafter ENERGY OUTLOOK].

30. *Id.* at 2.

31. *Id.* at 61.

32. *Id.*

33. *Id.* at 61.

34. Fuerth, *supra* note 6, at 413.

human rights abuses if the exporting nation's government was favorably predisposed to allowing outside investment in resource development and some measure of outside control of these developmental activities and it wanted to maximize oil-related revenues. In a world with 24-hour cable news coverage, such a policy would be difficult to maintain if an exporting nation's actions became part of the public conscience. One need only consider the public reaction to the Abu Ghraib pictures to realize the public pressure that could be brought to bear in response to news stories of abuse by a foreign government.

When considering the interplay between foreign policy and energy policy, the conduct of oil producing countries is frequently considered because it directly and visibly impacts the prices American consumers pay for gasoline. But, as shown with the hypothetical of economic sanctions against Iran, the conduct of oil importing countries is equally significant—not only because one purchaser can thwart the efforts of many to moderate behavior the larger world community perceives as threatening, but also because policies such as environmental protection necessarily require broad international cooperation.

The U.S. and China have both competing and complementary energy interests. Both have significant oil reserves and production, yet both are major oil importers.³⁵ Consequently, while both are, to some degree, in competition for the same resources, both benefit from properly functioning oil markets. They are the world's two largest electricity generators, and both depend heavily on coal to generate that power.³⁶ Thus, both have the same concern of weighing the environmental impact of coal use versus the cost and consequence of alternative forms of electricity production. To this end, the U.S. has engaged in regular dialogue with China concerning energy and environmental issues.³⁷

Most recently, the U.S. appointed Todd Stern as its Special Envoy on Climate Change to represent the U.S. on international environmental issues.³⁸ Last April, the U.S. hosted the Major Economies Forum on Energy and Climate.³⁹ One of the issues discussed was cooperative

35. Daniel S. Sullivan, Assistant Sec'y for Econ., Energy, and Bus. Affairs, *U.S.-China Energy Policy: Toward Closer International Partnerships*, US-CHINA TODAY, May 20, 2008, available at <http://china.usc.edu/ShowArticle.aspx?articleID=1147&AspxAutoDetectCokieSupport=1>.

36. *Id.*

37. *Id.* The two countries have held semi-annual Strategic Economic Dialogue meetings since 2006 and annual U.S.-China Energy Policy Dialogue meetings since 2004.

38. Hillary R. Clinton, Sec'y of State, Appointment of Special Envoy on Climate Change Todd Stern (Jan. 26, 2009), available at <http://www.state.gov/secretary/rm/2009a/01/115409.htm>.

39. Hillary R. Clinton, Sec'y of State, Remarks at the Major Economies Forum on Energy and Climate (Apr. 27, 2009), available at <http://www.state.gov/secretary/rm/2009a/04/122240.htm>. The forum was held to build political momentum among the 17 largest developing and developed economies to reach a positive outcome in the upcoming Copenhagen climate change negotiations and to build political support for the development of key transformation

solutions for greenhouse gas emissions. Secretary of State Clinton noted, “There is no sense in negotiating an agreement if it will have no practical impact in reducing emissions to safer levels.”⁴⁰ Thus, an energy policy devoted to reducing greenhouse gas emissions should incorporate achieving meaningful international consensus. It does the environment little good if the U.S. reduces its greenhouse gas emissions but other countries offset that with higher emissions. And as will be discussed below, environmental policies typically impose economic costs. When major energy consuming nations act cooperatively, no one is punished for taking environmentally-friendly actions. But if cooperation is limited, every country that decides not to pursue an environmentally-friendly policy will gain a competitive advantage. That situation is present in the U.S.–China talks. Special Envoy Stern recognized that much work remains before an agreement with China on greenhouse gas emissions can be reached.⁴¹

The U.S. is not alone when it comes to balancing foreign policy with energy policy. Since the mid-1980s, Saudi Arabia has pegged its currency to the U.S. dollar.⁴² In response to the current economic crises, the Federal Reserve Board lowered interest rates significantly. Saudi Arabia would undoubtedly prefer higher interest rates so that its investment

technologies to help address climate change issues. Todd Stern, Special Envoy for Climate Change, Special Briefing: Major Economies Forum on Energy and Climate (Apr. 28, 2009), available at <http://www.state.gov/oes/rls/remarks/2009/122344.htm>.

40. Clinton, *supra* note 39.

41. Stern, *supra* note 39. At a news conference following the Forum, Stern was asked:

I’m having difficulty understanding your optimism going ahead in terms of the largest emitters. And perhaps you can help to shed some light how you arrived there, particularly in light of the fact that the science that you’re talking about, what science is needed, if you take the U.S. target of, say, 20 percent, 40 percent by 2030, you’re talking about a reduction of about to about three, I think, billion tons a year annually. That would be one quarter of what China produces by 20, say, 12, 2015. So how do you perceive China meeting those goals with only energy efficiency targets and renewables, which doesn’t tackle the coal?

Id. His response was:

The question that was asked of me was whether I came out of the meeting somewhat more optimistic than I went in. And I believe what I said is I came out a bit more optimistic, because it was a discussion in which people were not—were neither refusing to, you know, engage past their kind of canned remarks; where the atmosphere, unlike some other past meetings run by other people, were not head-butting exercises; where people were engaged in trying to work through issues. I’m not—believe, me, I’m not trying to oversell. I described myself a bit more optimistic, because, and as Mike said, to a person, everybody—the Chinese, the Indians, the Brazilians, everybody—came out of that room feeling—I think, feeling more optimistic than they went into the room, frankly. So—but I also said, and you’ve just explained some reasons why, I would not downplay or underestimate the difficulty of getting an agreement in Copenhagen in the first instance, and the enormous difficulty of wrestling this problem to the ground, because it is. I mean, you just stated some reasons why it’s so hard, and I totally agree with that.

Id.

42. Lando, *supra* note 7.

revenue might help offset diminished oil revenue due to decreased demand.⁴³ However, if it pursues a different currency policy, that decision would carry large political dimensions and would send a loud political message.⁴⁴

In the past, the U.S. was an important partner for Saudi Arabia because of the national security guarantee it provided against a Soviet threat. Today, however, Saudi Arabia's leadership is more concerned with other threats. Osama bin Laden's rise to power was fueled by objections to the presence of American troops in Saudi Arabia.⁴⁵ Those troops have long since departed but the conflict between al-Qaeda and the U.S. remains. Consequently, Saudi Arabia, or any other country with a large Muslim population, may face internal objection on selling oil to Americans or working with American companies when developing their oil reserves. In that instance the U.S. can expect them to ask whether the benefits of a visible relationship with America or American companies is worth the domestic costs and, more importantly, the U.S. can expect them to act consistently with the answer.

The dollar's role in international oil transactions also frequently implicates foreign policy because increases or decreases in the dollar's value drives oil prices higher or lower. Oil traded in international markets is priced in dollars. The price of oil increases when the dollar's value declines and vice versa.⁴⁶ These swings literally have world-wide impact.

Russia relies heavily on oil exports to balance its budget and has pursued policies based upon devaluation of the ruble.⁴⁷ When the ruble rises in value against the dollar, the Russian economy suffers.⁴⁸ Iranian President Mahmoud Ahmadinejad has advocated replacing the dollar with other major hard currencies, complaining that oil-producing countries do not benefit from higher prices caused by the dollar's devaluation.⁴⁹ China has suggested replacing the dollar with its yuan as the international reserve currency, but this would require turning the yuan into a convertible currency that's value would be dictated by the

43. *Id.*

44. *Id.*

45. *A Biography of Osama Bin Laden*, FRONTLINE, <http://www.pbs.org/wgbh/pages/frontline/shows/binladen/who/bio.html> (last modified 2001). According to a biography of Osama bin Laden given to PBS by a source close to him, bin Laden reacted to the Iraqi invasion of Kuwait by advising the King on how to defend the Kingdom against Iraqi forces using the Arab Mujahedeen. He expected a call to mobilize his men and equipment but received "news which [transformed] his life completely. The Americans are coming." *Id.*

46. GASOLINE PRICES, *supra* note 19.

47. Gleb Bryanski, *Rouble Rally on Oil Poses Risk to Russia Recovery*, REUTERS, June 1, 2009, <http://www.reuters.com/article/GCA-Oil/idUSTRE5501MD20090601>.

48. *Id.*

49. *Ahmadinejad: Remove US Dollar as Major Oil Trading Currency*, XINHUA, Nov. 18, 2007, available at http://www.chinadaily.com.cn/world/2007-11/19/content_6264602.htm.

market—a loss of control China may be unwilling to accept.⁵⁰ It could also mean investment losses by the Chinese because of their large dollar holdings,⁵¹ and it could hurt Chinese domestic industries that have benefited from an artificially weak yuan that makes it difficult for U.S. companies to tap into the Chinese market.⁵²

Because other countries are concerned about the dollar's role in oil transactions, the U.S. must be cognizant that its monetary policy has ramifications in many areas, including its energy policy. If the dollar is replaced by the European euro or the Chinese yuan, then the price America pays for imported oil will be impacted by a currency value over which the U.S. may have limited control. Just as other countries today must worry about U.S. monetary policy affecting the price they pay or the revenue they receive for crude oil, the U.S. would face that same concern if another country could alter the value of its currency to advance a domestic agenda and, thereby, cause U.S. energy costs to increase. Moreover, if the dollar is replaced, and the demand for U.S. dollars lessens, the U.S.'s ability to sell debt instruments and the interest rate Americans would have to pay will be negatively impacted. Because the dollar's value has impact well beyond the U.S. economy, this could mean that in situations where a purely domestic agenda would be advanced by a devalued dollar, U.S. foreign policy/energy policy might require a stronger dollar.

2. Using Energy Policy to Reduce Other Countries' Ability to Influence U.S. Actions

Normally foreign policy is thought of as a means to a positive end. For example, resolution of conflict through diplomacy or negotiation of a trade agreement would involve influencing other nations to act in a way consistent with U.S. interests. Foreign policy can also have a defensive role when it reduces another country's ability to control U.S. behavior. The Cuban Missile Crises is an excellent example. Had the Soviet Union been allowed to keep nuclear weapons in Cuba, it could have used the threat of a nuclear missile strike as leverage in future confrontations. But because the U.S. successfully forced their removal, the Soviet's ability to influence U.S. actions was reduced. Energy policy can also be used to remove other country's influence over U.S. policy and, thereby, strengthen national security.

50. Steve Levine, *China's Yuan May Challenge Mighty Dollar: China Chafes at its Dollar-Dependency, and May Do Something about It*, MSNBC, May 28, 2009, <http://www.msnbc.msn.com/id/30963545>.

51. *Id.*

52. Anthony Faiola & Zachary A. Goldfarb, *China Tops Japan in U.S. Debt Holdings*, WASH. POST, Nov. 19, 2008, available at <http://www.washingtonpost.com/wp-dyn/content/article/2008/11/18/AR2008111803558.html>.

The U.S. imports more than 50% of its oil.⁵³ Without this oil the economy would falter. Fortunately there are many exporting nations, and the ability of any one to dictate U.S. actions has its limits. But if OPEC's members collectively decided not to sell to the U.S., it would have a significant impact upon the economy and, therefore, they collectively have some influence over U.S. actions. However, even if producing nations are willing to sell all of the oil that the U.S. is willing to buy, the U.S. still risks foreign influence on its decision-making. Foreign earnings from oil are heavily invested in American economic assets, sometimes bringing them under de facto foreign control.⁵⁴ To the extent that the U.S. is required to borrow to pay for imported oil, the U.S. surrenders control over its own affairs because of the necessity of keeping creditors happy. For example, China now owns nearly 10% of the U.S.'s national debt.⁵⁵ This gives China extraordinary sway over the American economy. If the Chinese decided to move out of U.S. bonds, the U.S. government could be forced to raise interest rates.⁵⁶ All China needs to do is agree to simply hold the debt that they have previously purchased to provide consideration for future agreements—which is a nice way of saying that the mere threat to sell their bond holdings could be sufficient to influence U.S. future decision-making.

One way to reduce the risks inherent with importing oil is to import less. The three principal ways to accomplish this are: (1) increasing domestic production; (2) conserving energy usage; and (3) replacing oil with alternative forms of energy. In 2008, when oil prices were well above \$100 a barrel, increasing domestic production by allowing additional drilling on federal lands was the subject of much debate. Because of the 2008 election results and the significant decrease in oil prices in 2009, that issue has largely disappeared from public discussion. Conservation efforts also have been affected by price declines, but this issue is still part of the public dialogue because the federal government has recently taken steps to promote conservation by requiring more fuel-efficient vehicles.

When we think of conservation, we typically think of its impact on the environment but it also has a national security impact. Former U.S. Congressman and political commentator Joe Scarborough recently noted that “an America that conserves energy will be an America that weakens its enemies. Tyrants who run Iran, Russia, and Venezuela will find their jobs more difficult once Americans become less dependent on foreign

53. See ENERGY BASICS 101, *supra* note 3. In 2006 the U.S. consumed 20,687,000 barrels of oil per day. Of this, 10,118,000 barrels were imported. The largest supplier was Canada, which exported 2,353,000 barrels per day to the U.S. *Id.*

54. John P. Holdren, *Commentary on Part VI*, in ENERGY & SECURITY TOWARD A NEW FOREIGN POLICY STRATEGY 554 (Jan H. Kalicki & David L. Goldwyn eds., 2005).

55. Faiola & Goldfarb, *supra* note 52.

56. *Id.*

oil.”⁵⁷ The dollars the U.S. sends overseas to pay for imported oil empower the recipients. Anything that reduces the flow of those dollars lessens the opportunity for those who wish ill upon the U.S. to use the country’s own dollars against it.

The U.S. has dramatically increased its energy efficiency over the last few decades.⁵⁸ Energy conservation efforts will continue both individually, as Americans buy energy-efficient items to save money or to protect the environment, and in response to governmental actions such as new vehicle fuel efficiency standards; but no one seriously argues that conservation alone will make the U.S. energy independent. However, alternative energy sources are being promoted as solutions to both environmental and national security concerns. Fossil fuels are a finite resource and sooner or later they will be consumed. Not only must they be replaced just to maintain the current way of life, but also there is a “to the victor go the spoils” component in the quest to find viable alternative energy sources. The nations that control the new energy technologies will have the same control over the world’s economy that oil producing countries have now.

There are several state and federal programs designed to promote alternative energy sources and alternative fuels. A summary of federal and Texas incentives, grouped by energy source, is provided below. For each, a discussion of other potential policy implications is included.

a. Nuclear Energy

Nuclear energy has been a divisive issue, and many Americans are adamantly opposed to the construction of nuclear power plants because of safety concerns. Other nations, such as France, have aggressively pursued nuclear energy development.⁵⁹ The history of nuclear energy in the U.S. is not encouraging, but its future may be more promising. The first operable nuclear power plant opened in 1956.⁶⁰ Initially, there was some enthusiasm for nuclear power in the U.S., and several reactor orders were placed between 1966 and 1974.⁶¹ But following the Three Mile Island accident in 1979, safety concerns became more prominent.⁶² In an ironic twist of fate, the movie *China Syndrome*, a story about a

57. JOE SCARBOROUGH, *THE LAST BEST HOPE* 100 (2009).

58. Between 1950 and 2000 energy efficiency improved 49%. TOTAL ENERGY, *supra* note 2.

59. *Nuclear Power in France*, WORLD NUCLEAR ASS’N, Oct. 2009, <http://www.world-nuclear.org/info/inf40.html>. France generates 75% of its electricity with nuclear power plants. *Id.*

60. This was at Calder Hall in England. *Outline History of Nuclear Energy*, WORLD NUCLEAR ASS’N, Oct. 2009, <http://www.world-nuclear.org/info/inf54.html>.

61. *Id.* The total number of operable reactor units in the U.S. reached its peak at 112 in 1990. ENERGY INFO. ADMIN., HISTORY OF ENERGY IN THE UNITED STATES: 1635–2000: NUCLEAR, <http://www.eia.doe.gov/emeu/aer/eh/nuclear.html> [hereinafter NUCLEAR].

62. *Nuclear Power in the USA*, WORLD NUCLEAR ASS’N, Nov. 12, 2009, <http://www.world-nuclear.org/info/inf41.html>.

reporter and cameraman who discover safety cover-ups at a nuclear power plant, had been released 11 days previously.⁶³ Whether the movie shaped the public's reaction to the accident, or whether the accident merely increased ticket sales, can be debated—but for many reasons, including public opposition, plants became significantly more costly to build.⁶⁴ Nuclear power eventually lost favor within the industry, and, by 2000, 124 unit orders had been cancelled.⁶⁵ The plants currently in operation are aging. Also by 2000, 28 once-operable units had been shut down permanently.⁶⁶ The EIA predicts that 27% of the generating capacity that exists at the end of 2009 will be retired by 2020 and that no new plants will be constructed in the interim.⁶⁷

The public, however, may be more willing to consider nuclear power today. There have been no major accidents in the U.S. for many years, and the public is increasingly aware of environmental issues associated with other forms of electricity generation. Recently, public opposition to new coal-fired plants in Texas led to TXU's decision to cancel 8 of 11 proposed new plants.⁶⁸ When President Bush signed the Energy Policy Act of 2005 ("EPAct"),⁶⁹ he noted that no nuclear plant had been ordered since the 1970s.⁷⁰ However, he contended that nuclear plants are far safer than ever before and that nuclear power is good for the environment. The bill he signed provides several incentives for new plant construction, and he predicted that new plant construction would start by the end of the decade.

For policymakers, once a decision is made to promote nuclear energy, the challenge is how to convince electricity generators to build new nuclear power plants. Generators have seen, and in many cases experienced, the incredible cost, risk, and difficulty of not only building a plant built but also acquiring the requisite permits. The stories of cost overruns, public opposition, and protracted regulatory reviews—frequently made even more difficult by retroactive regulation changes during the permitting process—are legion. Because of the time involved in permitting and building a facility, there will be considerable turnover on any elected body in the interim. There is no guarantee that prior to a

63. CHINA SYNDROME (IPC Films 1979).

64. NUCLEAR, *supra* note 61.

65. *Id.*

66. *Id.*

67. *Id.*

68. *Morning Edition: Coal-Fired Plants Scrapped as Part of Utility Deal* (NPR radio broadcast Feb. 27, 2007), available at <http://www.npr.org/templates/story/story.php?storyId=7615613>.

69. Energy Policy Act of 2005, Pub. L. No. 109-58, 119 Stat. 594 (2005) (codified as amended in scattered sections of 42 U.S.C.).

70. George W. Bush, 43rd President of the U.S., Remarks on Signing the Energy Policy Act of 2005 in Albuquerque, New Mexico (Aug. 8, 2005), available at <http://www.gpo.gov/fdsys/pkg/WCPD-2005-08-15/pdf/WCPD-2005-08-15-Pg1263-2.pdf>.

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new plant coming on-line, the elected officials who are encouraging new nuclear growth today will not be replaced by other officials less favorably predisposed to nuclear power. If so, delay could result. Furthermore, financing and liability insurance are also legitimate concerns in today's economic environment. It would be easy, and imminently understandable, for a generator to take a wait-and-see approach. If someone else successfully builds a plant, others would have the benefit of their experience to better estimate the costs and risks associated with a new project.

Recognizing this, the EAct provides a number of incentives to encourage nuclear energy growth. The Secretary of Energy can enter into contracts with sponsors of nuclear facilities that obligate the Secretary to pay the costs of delay caused by preoperational hearings, litigation, and the failure of the Nuclear Regulatory Commission ("NRC") to adhere to schedules.⁷¹ Costs that result from the sponsor's failure to follow applicable laws and regulations, events within the sponsor's control, and normal business risks are ineligible for this treatment.⁷² This support is limited. A covered facility must have a reactor design that was approved after December 31, 1998.⁷³ Up to six such facilities are eligible for standby support. The first two reactors to receive a combined license and begin construction may receive up to 100% of the costs of delay limited to \$500 million per contract.⁷⁴ The next four reactors are eligible for up to 50% of the covered costs of delay limited to \$250 million per contract.⁷⁵ The Secretary of Energy can also guarantee loans of up to 80% of a project's construction costs.⁷⁶

Congress also provided tax incentives for new nuclear plants. The Secretary of the Treasury is statutorily authorized to extend a production tax credit of 1.8¢ per kilowatt-hour ("kWh") of electricity for the first 6,000 megawatt-hours ("MWhs") produced by new facilities during the first eight years of operation.⁷⁷ The credit is subject to a \$125 million annual cap, and the facility must be placed in service before January 1, 2021.⁷⁸ Additionally, Congress enacted measures to ensure liability coverage for all nuclear plants in the event of an accident.⁷⁹ Finally, Congress removed the NRC's authority to conduct antitrust reviews of the applications for nuclear reactor licenses.⁸⁰ This provision removes a

71. EAct § 638(c)(1)(a), (b).

72. *Id.* § 638(c)(2).

73. *Id.* § 638(a)(1).

74. *Id.* § 638(d)(2).

75. *Id.* § 638(d)(3).

76. *Id.* § 1703(b)(4).

77. *Id.* § 1306(a).

78. *Id.*

79. *Id.* §§ 601–606.

80. *Id.* §625.

potential challenge to an application and should reduce the risk and potential for delay associated with an application.⁸¹

In 1989 the NRC restructured its two-step licensing process by merging the construction permit and the operating license into a single license, the “combined license.”⁸² The intent of the change was to “improve regulatory efficiency and add greater predictability to the process.”⁸³ The change should reduce some of the risk for potential nuclear power plant investors. Previously, an investor could obtain a construction permit and incur the considerable cost of building a plant including interests costs on borrowed money but have no assurance when, if ever, the plant would be certified for operations and, therefore, begin earning revenue. Delays not only increased interest costs, but also they introduced risk because of the possibility of intervening regulatory changes.⁸⁴ The NRC also adopted a standard plant design certification process.⁸⁵ The NRC can now approve a nuclear power plant design, independent of an application to construct or operate a plant.⁸⁶ A design certification is valid for 15 years from the date of issuance but can be renewed for an additional 10 to 15 years.⁸⁷ Currently, there are four certified designs and four other designs under review.⁸⁸

Whether and to what extent these initiatives will work remains to be seen. It is clear, however, that nuclear energy can be a major source of electricity. France derives over 75% of its electricity from nuclear power plants.⁸⁹ It made the decision to pursue nuclear energy after the 1973 oil

81. See Lynne Holt et al., *(When) to Build or Not to Build?: The Role of Uncertainty in Nuclear Power Expansion*, 3 TEX. J. OIL GAS & ENERGY L. 174, 208 (2008).

82. 10 C.F.R. §§ 52.00-.41 (2007).

83. OFF. OF PUB. AFFAIRS, U.S. NUCLEAR REGULATORY COMM’N, NUCLEAR POWER PLANT LICENSING PROCESS 1 (2005), <http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/licensing-process-bg.pdf>.

84. See NAT’L COUNCIL ON ELECTRICITY POWER, STATE POLICIES FOR FINANCING ELECTRICITY RESOURCES, VOL. 1: PAYING FOR POWER PLANTS IN RESTRUCTURED STATES 28 (2007), <http://www.ncouncil.org/Documents/FINALPayingPowerPlants.pdf>. Changing NRC regulations was one of the reasons attributed to the failure of the William H. Zimmer nuclear power station in Moscow, Ohio to receive an operating license. U.S. Senator Jim Bunning for Kentucky testified that building a nuclear power plant is a “horrendous undertaking,” and until the EPAct there was no certainty that the rules would not change between the time the plant was started and finally completed. *Russian Uranium Antidumping Investigation Before the Senate Energy and Natural Resources Committee*, 110th Cong. 23 (2008) (statement of Sen. Bunning). The plant was converted from a nuclear plant to a coal-fired plant.

85. 10 C.F.R. §§ 52.54(a), 52.55 (2007).

86. *Id.*

87. *Id.*

88. Those designs are the Advanced Boiling Water Reactor (“ABWR”), System 80+, Advanced Passive 600 (“AP600”), and Advanced Passive 1000 (“AP1000”). Four other designs are under review: AP1000 Amendment, Economic Simplified Boiling-Water Reactor (“ESBWR”), U.S. Evolutionary Power Reactor (“U.S. EPR”), and U.S. Advanced Pressurized-Water Reactor (“US-APWR”). U.S. Nuclear Regulatory Comm’n, Design Certification Applications for New Reactors, <http://www.nrc.gov/reactors/new-reactors/design-cert.html> (last visited Nov. 16, 2009).

89. *Nuclear Power in France*, *supra* note 59.

embargo.⁹⁰ France has few natural energy resources and was hit hard by the embargo since it imports almost all of the fossil fuels it consumes.⁹¹ By making nuclear energy a national priority and standardizing plant design, France was able to build several plants and to use the lessons learned in one plant to facilitate the construction and operation of the others.⁹² France is proof that large-scale use of nuclear energy is possible, both technologically and politically, but it is also evidence that a significant national commitment is necessary to achieve this solution.

b. Renewable Energy

Renewable energy sources, including wind, solar, and biomass, recently have received considerable attention from the public, media, and state and federal governments. Wind power particularly has seen tremendous recent growth in Texas. Nationally, the EIA predicts that wind-generated electricity will supply 2.5% of the electricity generated in the U.S. by 2030.⁹³ It also predicts that renewable electricity generation will collectively account for 14.2% of total U.S. electricity production by 2030.⁹⁴

The continued growth of renewable energy depends upon a variety of conditions, but cost and governmental mandates are among the most important.⁹⁵ The federal government and several states have mandates requiring renewable energy production.⁹⁶ For 2009 at least 11.1 billion gallons of renewable fuels must be blended into motor fuel sold in the U.S.⁹⁷ This level is increased annually through 2022 when the requirement is 36 billion gallons. The statute also requires that a portion of this be satisfied with advanced biofuels, cellulosic biofuels, and biomass-based diesel.⁹⁸ These mandates have been effective. In fact, the EIA attributes most of the renewable energy growth in the U.S. to them.⁹⁹

90. John Palfreman, *Why the French Like Nuclear Energy*, FRONTLINE, 2008, <http://www.pbs.org/wgbh/pages/frontline/shows/reaction/readings/french.html>.

91. *Id.*

92. *Id.*

93. ENERGY OUTLOOK, *supra* note 29, at 50.

94. *Id.*

95. For a discussion of the state and federal incentives and mandates for the development of alternative energy see Girard P. Miller, *Developers See Green and Neighbors See Red: A Survey of Incentives and Mandates for the Development of Alternative Energy and the Unfolding Challenges*, 3 TEX. J. OIL GAS & ENERGY L. 117 (2008).

96. According to the EIA, the principal reason for renewable electricity generation growth is the federal renewable fuels mandate, but state requirements and tax incentives have played and will continue to play a significant role as well. ENERGY OUTLOOK, *supra* note 29, at 74. As of November 2008, 28 states had adopted renewable energy portfolio standards programs. *Id.* at 75.

97. 42 U.S.C. § 7545(o)(2) (2006).

98. *Id.* § 7545(o)(2)(B)(i)(II)–(IV) (2006). “Advanced biofuels” are defined to include ethanol derived from cellulose, hemicellulose, or lignin; ethanol derived from sugar or starch (other than corn starch); ethanol derived from waste material, including crop residue, other vegetative waste material, animal waste, food waste, and yard waste; biomass-based diesel; bio-gas (including landfill gas and sewage waste treatment gas) produced through the conversion of

Several states have also encouraged renewable energy growth.¹⁰⁰ Texas has adopted a goal of having 5,880 megawatts of generating capacity from renewable energy technologies by January 1, 2015 and 10,000 megawatts by January 1, 2025.¹⁰¹ The State will achieve this through the use of renewable energy credits (“RECs”). The Public Utility Commission of Texas allocates these depending upon the retailer’s market share. Retailers can satisfy their requirement by generating the required electricity using renewable energy technology, by purchasing electricity generated by renewable energy technology, or by purchasing RECs. Because these mandates represent legislatively chosen levels, future renewable energy growth is, at least in part, a function of what is politically feasible. Technology and economics are vitally important, but committed political leadership can achieve greater progress than might otherwise occur.

Ultimately, economics is the single most important variable. Even though mandates are effective, in the long-term renewable energy production must be cost-effective. This can happen naturally if fossil fuel costs increase or technology advances make renewable energy production less expensive. Alternatively, government action could make fossil fuels more expensive through taxes or alternative energy less expensive with financial incentives. To date, the U.S. has pursued subsidy policies. For example, the federal government provides a production tax credit of 2.1¢ per kWh for wind and solar energy projects.¹⁰² Because a tax credit has value only if the business earns a profit, and because the current economic situation has created significant financial uncertainties, the federal government also has a grant program. The Treasury Department can give wind, biomass, geothermal, and solar projects a grant of up to 30% of the property’s value in lieu of tax credits.¹⁰³ For consumers, “a federal-level investment tax credit is available [for the] purchase [of] small wind turbines for home, farm, or business use. Owners of small

organic matter from renewable biomass; butanol or other alcohols produced through the conversion of organic matter from renewable biomass; and other fuel derived from cellulosic biomass. *Id.* § 7545(o)(1)(B).

99. ENERGY OUTLOOK, *supra* note 29, at 74.

100. Several states have adopted mandatory renewable portfolio standards. For a description of these see PEW CENTER ON GLOBAL CLIMATE CHANGE & THE PEW CENTER ON THE STATES, CLIMATE CHANGE 101: STATE ACTION, <http://www.pewclimate.org/docUploads/Climate-101-LocalBlueline.pdf> (last visited Nov. 16, 2009). For a more thorough discussion of these state efforts, see Miller, *supra* note 95, at 123–36.

101. TEX. UTIL. CODE ANN. § 39.904(a) (Vernon 2007).

102. See I.R.C. § 45 (2007). The credit also applies to closed-loop and open-loop biomass, geothermal, small irrigation power, municipal solid waste, qualified hydropower production, and marine and hydrokinetic renewable energy. *Id.*

103. Union of Concerned Scientists, Clean Energy: Production Tax Credit for Renewable Energy, http://www.ucsusa.org/clean_energy/solutions/big_picture_solutions/production-tax-credit-for.html (last visited Nov. 16, 2009).

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wind systems with 100 kilowatts of capacity or less can receive a credit for 30% of the total installed cost of the system.”¹⁰⁴

Production tax credits are not the only vehicle for making alternative energy sources price-competitive. During the most recent Texas legislative session, Senator Kirk Watson introduced a measure that would have provided tax incentives to manufacturers of renewable energy equipment in Texas.¹⁰⁵ The advantage of this approach is two-fold. First, it encourages incipient activity. Production tax credits benefit generators that would otherwise realize taxable income. This can occur only after an alternative energy program is designed, constructed, and successfully operated. Equipment manufacturing, on the other hand, is an initial activity and a tax incentive for manufacturers is not subject to the same financial preconditions as a production tax credit. Second, by incentivizing manufacturing it encourages more complete development of the alternative energy sector in Texas and it provides a potential benefit to Texas even for projects ultimately located in other states. Moreover, even though Senator Watson’s proposal would not have provided a direct financial incentive to electricity generators, presumably they would have enjoyed an indirect benefit in the form of lower equipment costs.

The government can also assist alternative energy development by funding research. The University of Texas recently received two research grants from the U.S. Department of Energy (“DOE”) to study energy-related issues.¹⁰⁶ One team will study materials that have the potential to revolutionize the capture and storage of solar energy.¹⁰⁷ The other will study ways to contain greenhouse gases.¹⁰⁸ Government-funded research can not only assist private industry with new discoveries that will make alternative energy more practical and cost-effective but also provide practical training to tomorrow’s engineers and scientists. For example, the students participating in the solar panel study will acquire hands-on training in the solar energy industry. Additionally, because the research is government-funded, and teaching is one of its goals, researchers can take more risks in their study and not limit themselves to projects with a high probability of returning a profit in the near-term. Start-up alternative energy producers simply cannot afford this luxury. Hopefully, broader areas of inquiry will lead to new technology breakthroughs.

104. Am. Wind Energy Ass’n, Legislative Priorities, <http://www.awea.org/legislative/#PTC> (last visited Nov. 16, 2009).

105. S.B. 541, 81st Leg., R.S. (Tex. 2009). The measure passed the Senate but was not voted upon in the House before the regular session ended. *See id.*

106. Mark Lisher, *UT Professors’ Teams to Explore Crucial Questions about Energy*, AUSTIN AM. STATESMAN, June 16, 2009, available at <http://www.statesman.com/news/content/news/stories/local/2009/06/16/0616grants.html>.

107. *Id.*

108. *Id.*

The ultimate benefit of having a viable renewable energy alternative is clear. Renewable energy is good for the environment and a domestically-based renewable energy sector is good for the U.S. economy. The public policy challenge for policymakers is determining how much to invest in renewable energy and how best to maximize the return from that investment. Tax credits have made wind projects profitable, but they cost tax payers. In a perfect world, tax credits would provide a short-term incentive, allow a new industry to develop, and lapse as soon as that industry is self-supporting. The risk is that the new industry never becomes self-supporting and that it dies after the subsidies expire, or that the government is forced to continue to subsidize it for the foreseeable future. While mandates have successfully increased the amount of electricity generated from alternative energy sources, it is a safe bet that any increased costs are being passed on to the consumer, and that until alternative energy electricity generation becomes cost-effective, Americans will all pay more for electricity.

c. Alternative Motor Fuels

Nuclear, solar, and wind power are used to create electricity. Because the U.S. consumes so much electricity, each is a vital source of supply. But until electrically-powered cars become a viable alternative, they will not dramatically reduce U.S. need for imported oil. Some have, therefore, looked for alternative forms of automotive fuel. These alternatives include propane, ethanol, and liquefied natural gas (“LNG”). Each has its advantages, each involves public policy tradeoffs, and each receives federal subsidies.

The federal government provides a 50¢ per gallon tax credit for propane used in motor vehicles.¹⁰⁹ The federal government also subsidizes biofuels. A 45¢ production subsidy is available for each gallon of ethanol blended with gasoline.¹¹⁰ A \$1.00 tax credit per gallon is available for blenders of biodiesel and a 10¢ per gallon credit is available for small agri-biodiesel producers.¹¹¹ The government also protects local ethanol production by imposing an import tariff of 54¢ per gallon on importers of ethanol and an ad valorem tariff of 2.5% as well as by mandating the

109. R.R. Comm’n of Tex., 50¢ Per Gallon Federal Tax Credit for Propane Used in Motor Vehicles, http://www.propane.tx.gov/rebate_program/rebatepdfs/motor-fuel-taxcredit-FAQ.pdf (last visited Nov. 16, 2009).

110. CONG. BUDGET OFF., THE IMPACT OF ETHANOL USE ON FOOD PRICES AND GREENHOUSE-GAS EMISSION 3 (Apr. 2006), available at <http://www.cbo.gov/ftpdocs/100xx/doc10057/04-08-Ethanol.pdf> [hereinafter IMPACT OF ETHANOL USE].

111. 26 U.S.C. § 40A(b)(1)–(4) (2006). Biodiesel means the monoalkyl esters of long chain fatty acids derived from plant or animal matter. Agri-biodiesel means biodiesel produced from virgin oils. *Id.* § 40A(d). A small agri-biodiesel producer is a person who has a productive capacity not in excess of 60 million gallons. *Id.* § 40A(e). This credit is scheduled to expire on December 31, 2009. *Id.* § 40A(g).

annual use of 20.5 billion gallons of biofuels by the year 2015.¹¹² These subsidies can be expensive. The ethanol subsidy, for example, cost the federal government \$3 billion in 2007.¹¹³ But it is also effective. In 2008 the U.S. consumed 9 billion gallons of ethanol that was produced from 3 billion bushels of corn.¹¹⁴

The Congressional Budget Office (“CBO”) estimates that the use of ethanol reduced gasoline consumption by 4% in 2008.¹¹⁵ This advances national security interests because the U.S. is less dependent upon others for its energy supplies and because fewer dollars will be flowing offshore to pay for imported oil. One could expect resistance from oil-producing countries; however, the increased use of biofuels carries other significant foreign policy problems.

Some have warned that ethanol production is generating global food insecurity on an unprecedented scale.¹¹⁶ Most ethanol in the U.S. is produced from domestically grown corn.¹¹⁷ In fact, one-quarter of the corn grown in the U.S. today is used to produce ethanol.¹¹⁸ The concern is that as more grain is converted into ethanol, less grain will be available for flour—causing a direct increase in the cost of products like bread, pasta, and tortillas as well as an indirect increase in the cost of meat and poultry products due to the increased cost of livestock feed.¹¹⁹ The CBO estimates that the increased use of ethanol accounted for 10–15% of the increase in food prices between April 2007 and April 2008.¹²⁰

The U.S. may be willing to accept these increased costs because of the improved national security. Others are not so fortunate. Rising food prices in poorer countries will result in more hungry and malnourished people.¹²¹ In the U.S., food purchases for consumption at home constitute 6% of the average household budget.¹²² Conversely in India, the average

112. IMPACT OF ETHANOL USE, *supra* note 110.

113. *Id.* at 2.

114. *Id.*

115. *Id.* at vii.

116. See Lester R. Brown, *Why Ethanol Production Will Drive World Food Prices Even Higher in 2008*, EARTH POL’Y INST., Jan. 24, 2008, available at <http://www.earth-policy.org/Updates/2008/Update69.htm>.

117. IMPACT OF ETHANOL USE, *supra* note 110, at vii.

118. *Id.*

119. See Brown, *supra* note 116.

120. IMPACT OF ETHANOL USE, *supra* note 110, at 6. The CBO noted that food prices increased 5.1% measured by the consumer price index during this period. See also Andrew Martin, *The International Food Policy Research Institute in Washington Places the Percentage of Increase at between a Quarter and a Third*, N.Y. TIMES, Apr. 15, 2008, available at <http://www.nytimes.com/2008/04/15/business/worldbusiness/15food.html>.

121. See Brown, *supra* note 116.

122. IMPACT OF ETHANOL USE, *supra* note 110, at 10.

household spent more than 32% of its household budget for food.¹²³ The U.N.'s Food and Agriculture Organization estimates that prices for food commodities increased by 135% between January 2000 and April 2008.¹²⁴ The World Bank estimates that food prices increased by 83% over the last three years.¹²⁵ To place these increases in perspective, consider what impact an 83% increase over three years in the average American's house payment would have on the country.

Foreign leaders facing pressure at home because of higher food prices are asking the U.S. to reconsider its ethanol policy.¹²⁶ Higher food prices have led to riots in some countries and have contributed to leadership changes in others such as Haiti.¹²⁷ Despite this pressure, many people tied to corn in the U.S. are happy because of the increased demand for corn.¹²⁸ Together, this higher demand, federal ethanol subsidies, and import tariffs creates a constituency. Like all other constituencies, it can be expected to exert its influence on Washington. The evidence to date suggests that this constituency has sufficient influence to unite members on both sides of the aisle to fight new regulation of the biofuels industry.¹²⁹

LNG is currently being used as an alternative fuel for heavy duty vehicles like buses, delivery trucks, and garbage trucks.¹³⁰ LNG is one of the cleanest-burning fuels available, can be produced from domestic natural gas supplies, and is less expensive than gasoline.¹³¹ Interestingly, one of the countries to make the most use of LNG is Iran. Starting in 2008, President Ahmadinejad required 60% of all new cars to run on both gasoline and natural gas.¹³² Even though Iran has large crude oil reserves, it must import refined oil. By shifting to LNG, Iran reduced the risk that embargos related to its nuclear program will impact its economy.¹³³

Qualifying alternative fuel vehicles purchased or placed into service between January 1, 2005, and December 31, 2010 may be eligible for a

123. DEP'T OF AGRIC., ECON. RESEARCH SERV., FOOD CPI, PRICES AND EXPENDITURES: EXPENDITURES ON FOOD, BY SELECTED COUNTRIES (2007) (briefing, updated Dec. 19, 2008), available at www.ers.usda.gov/Briefing/CPIFoodAndExpenditures/Data/2007table97.htm.

124. U.N. FOOD & AGRIC. ORG., FOOD OUTLOOK: GLOBAL MARKET ANALYSIS—THE FAO PRICE INDEX (2008), available at www.fao.org/docrep/010/ai466e/ai466e16.htm.

125. Andrew Martin, *Fuel Choices, Food Crises, and Finger-Pointing*, N.Y. TIMES, Apr. 15, 2008, available at <http://www.nytimes.com/2008/04/15/business/worldbusiness/15food.html>.

126. *Id.*

127. *Id.*

128. *Id.*

129. See Stephen Power, *Lawmakers in Farm Belt Try to Steer Climate Bill*, WALL ST. J., June 12, 2009, available at <http://online.wsj.com/article/SB124476424454208299.html>.

130. Jennifer Olvera, *Five Things You Need to Know About Liquefied Natural Gas (LNG)*, GREEN CAR, July 3, 2008, available at <http://www.greencar.com/articles/5-things-need-liquefied-natural-gas-lng.php>.

131. *Id.*

132. Steven Milloy, *Pickens' Natural-Gas Nonsense*, FOXNEWS, Sept. 12, 2008, <http://www.foxnews.com/story/0,2933,420941,00.html>.

133. *Id.*

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federal income tax credit of up to \$4,000.¹³⁴ Vehicles placed into service before January 1, 2005 may be eligible for a \$2,000 clean-fuel vehicle tax deduction.¹³⁵ To be eligible, the vehicle must be capable of operating only on LNG, liquefied petroleum gas, compressed natural gas, hydrogen, or any liquid at least 85% methanol by volume.¹³⁶

Electricity is also being explored as an alternative fuel. In the near future, General Motors is expected to sell an electric car, the Chevy Volt. It is predicted to cost \$40,000 per vehicle and the government has promised a \$7,500 subsidy to make it more price-competitive.¹³⁷ Hybrids have been available for a few years now. The federal government offered a tax credit of \$3,400 for hybrids purchased or placed in service after December 31, 2005.¹³⁸ This credit was limited to the first 60,000 eligible vehicles sold by a given manufacturer.¹³⁹ Thus as of the end of 2009, it may no longer be available for some manufacturers.

If the U.S. successfully develops alternative motor fuels, this could reduce the need for imported oil. Unfortunately there are tradeoffs. There are technical issues to be solved before electric-only cars can be competitive with gas-powered vehicles. The Volt is reportedly only capable of traveling 40 miles before switching to its gas engine.¹⁴⁰ It uses a lithium battery.¹⁴¹ The U.S. imports lithium from Bolivia.¹⁴² Thus, the U.S. may be replacing a dependence upon unstable Middle Eastern governments with a dependence on an unstable Bolivian government.¹⁴³ Because most electricity is generated from coal, if the U.S. increases electricity demand, more carbon dioxide ("CO₂") is released. If the U.S. eliminates or reduces the need to stop at gas stations, the government will have to decide how to replace road taxes that are currently collected at the pump when gasoline is purchased.¹⁴⁴ If the U.S. increases ethanol production, particularly ethanol produced from corn, poorer people in third-world countries will starve. Solutions to motor fuel needs should, therefore, be part of a broader policy decision-making process.

134. U.S. Dep't of Energy Office of Energy Efficiency and Renewable Energy and the U.S. Environmental Protection Agency, *New Energy Tax Credits for Alternative Fuel Vehicles*, http://www.fueleconomy.gov/feg/tax_afv.shtml (last visited Nov. 16, 2009).

135. *Id.*

136. *Id.*

137. Bob Brooks, *Troubles with the Chevy Volt Plague the U.S. All-Electric Outlook*, *BIOFUELS DIGEST*, June 5, 2009, available at <http://www.biofuelsdigest.com/blog2/2009/06/05/troubles-with-the-chevy-volt-plague-the-us-all-electric-outlook>.

138. U.S. Dep't of Energy Office of Energy Efficiency and Renewable Energy and the U.S. Environmental Protection Agency, *New Energy Tax Credits for Hybrids*, http://www.fueleconomy.gov/feg/tax_hybrid.shtml (last visited Nov. 16, 2009).

139. *Id.*

140. *See* Brooks, *supra* note 137.

141. *Id.*

142. *Id.*

143. *Id.*

144. *Id.*

III. ENERGY POLICY AND ENVIRONMENTAL CONCERNS

Becoming greener, both at home and at work, is fashionable—at least in the minds of Madison Avenue advertisers. Commercials increasingly extol the value of their product by noting how green it is. Being environmentally friendly and proactive, however, is not without cost. Kermit the Frog is famous for his song, “(It’s Not Easy) Bein’ Green.”¹⁴⁵ Strictly speaking, Kermit’s concern may not have been over the difficulty of being environmentally-friendly, but his thesis is true nonetheless. Environmental protection measures, including energy-related measures, involve a cost-benefit analysis. At an individual level the costs may be minimal because purchasing energy-efficient appliances and vehicles may actually save money. But if we are to take serious steps to clean the environment, the choices will not be so easy because the costs are real. For example, Americans use coal to generate electricity because it is the cheapest way to do so. There are several alternatives to coal, but to change means, at minimum, that electricity bills will increase. When the consequential effects of higher electricity rates are taken into account, the costs can be considerable. That does not mean that we should not be concerned about the environment—far from it. What it means is that our efforts should be considered.

A. Global Warming

The U.S. Supreme Court waded into the energy policy versus environmental policy fray in *Massachusetts v. Environmental Protection Agency* (“EPA”).¹⁴⁶ Petitioners, a group of States, local governments, and private organizations, alleged that the EPA had abdicated its responsibility under the Clean Air Act to regulate the emissions of four greenhouse gases, including CO₂ from motor vehicles. The relevant provision of the Clean Air Act provides:

The [EPA] Administrator shall by regulation prescribe (and from time to time revise) in accordance with the provisions of this section, standards applicable to the emission of any air pollutant from any class or classes of new motor vehicles or new motor vehicle engines, which in his judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare.¹⁴⁷

145. KERMIT, *Bein’ Green*, on BEST OF THE MUPPETS (Walt Disney Records 2005).

146. 549 U.S. 497 (2007).

147. 42 U.S.C. § 7521(a)(1) (2006).

The Clean Air Act defines “air pollutant” to include “any air pollution agent or combination of such agents, including any physical, chemical, biological, radioactive . . . substance or matter which is emitted into or otherwise enters the ambient air.”¹⁴⁸

The Court first had to determine if petitioners had standing. A five-to-four majority concluded that at least Massachusetts did. Justice Stevens wrote for the majority and found that Massachusetts had shown that EPA’s refusal to regulate greenhouse gas emissions presented a risk of harm that was actual and imminent and that there was a substantial likelihood that the judicial relief it was requesting would prompt the EPA to take steps to reduce that risk.¹⁴⁹ Justice Stevens also found that U.S. motor-vehicle emissions make a meaningful contribution to greenhouse gas concentrations and global warming.¹⁵⁰ Justice Stevens noted that the petitioners’ unchallenged affidavits documented global sea levels rose somewhere between 10–20 centimeters over the twentieth century as the result of global warming and that rising seas had begun to swallow Massachusetts’s coastal land.¹⁵¹ Justice Stevens also cited evidence that the U.S. transportation sector emitted more than 1.7 billion metric tons of CO₂ in 1999 and that this accounted for more than 6% of worldwide emissions.¹⁵²

The Court then turned to the merits of the litigation and with “little trouble” concluded that the EPA was authorized to regulate greenhouse gas emissions from new motor vehicles in the event that it formed the judgment that such emissions contributed to climate change.¹⁵³ The Court traced legislative and scientific developments from the late 1970s and found a growing consensus that CO₂ emissions were affecting climate change and that these emissions should be addressed.¹⁵⁴ The Court noted that the EPA itself had previously concluded that it had the authority to regulate CO₂ emissions.¹⁵⁵

The EPA had denied the petitioners’ rulemaking petition because it had changed its position on whether the Clean Air Act gave it the authority to issue mandatory regulations to address global climate change, and because even if it had the authority, it would be unwise to do so at the present time.¹⁵⁶ The Court disagreed with the EPA and concluded that substances such as CO₂, methane, nitrous oxide, and

148. *Id.* § 7602(g) (2006).

149. *Massachusetts*, 549 U.S. at 521.

150. *Id.* at 525.

151. *Id.* at 522.

152. *Id.* at 524.

153. *Id.* at 528.

154. *Id.* at 507-09 (citing the National Climate Program Act, 15 U.S.C. § 2901 (2006) and the Global Climate Protection Act of 1987, 15 U.S.C. § 2921 (2006)).

155. *Id.* at 510.

156. *Id.* at 511.

hydrofluorocarbons were within the statute's definition of air pollution and, therefore, within the EPA's authority to regulate.¹⁵⁷

The Court did recognize the overlap between environmental policy and energy policy. The EPA had argued that it could not regulate CO₂ emissions from motor vehicles because doing so would require it to tighten mileage standards, a responsibility Congress had assigned to the Department of Transportation ("DOT").¹⁵⁸ The Court rejected this argument finding that the EPA's responsibility to protect the public's health and welfare and DOT's mandate to promote energy efficiency may overlap, but there was "no reason to think the two agencies cannot both administer their obligations and yet avoid inconsistency."¹⁵⁹

The EPA responded to the Supreme Court's decision on April 24, 2009, with proposed endangerment and cause or contribute findings.¹⁶⁰ EPA is proposing to find that atmospheric greenhouse gases endanger the public health and welfare, that concentrations of greenhouse gases are at unprecedented levels, that these levels are the result of human emissions, and that they are very likely the cause of climatic changes. The EPA is also proposing to find that the combined emissions of CO₂, methane, nitrous oxide, and hydrofluorocarbons from new motor vehicles are contributing to the mix of greenhouse gases in the atmosphere and that they are endangering public health and welfare.

The EPA's proposal does not include any standard. If the EPA determines that atmospheric greenhouse gases may reasonably be anticipated to endanger public health or welfare and that emission of an air pollutant from new motor vehicles or engines causes or contributes to this pollution, it must issue standards under the Clean Air Act.¹⁶¹ However, other political events may make the EPA a follower rather than a leader. On May 19, 2009 President Obama announced new nationwide rules for automobile emissions and mileage standards.¹⁶² Under these standards, cars and light trucks must be 30% cleaner and more fuel-efficient by 2016 than they are today. The administration estimates that this new requirement will cost consumers an extra \$1,300 per vehicle, but that it will cut greenhouse gas emissions by more than 900 million tons.¹⁶³

157. *Id.* at 528–29, 532.

158. *Id.* at 531–32.

159. *Id.* at 532 (citing 42 U.S.C. § 7521(a)(1) (2006) for EPA's health and welfare responsibility and 42 U.S.C. § 6201(5) (2006) for DOT's efficiency mandate).

160. Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act; Proposed Rule, 74 Fed. Reg. 18,886 (Apr. 24, 2009).

161. *Id.* at 18,888.

162. *Obama Unveils MPG Rule, Gets Broad Support*, MSNBC, May 19, 2009, <http://www.msnbc.msn.com/id/30810514/>.

163. *Id.*

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As of the end of 2009, various proposals to address greenhouse gas emissions with a “cap and trade” program are being debated in Washington. These proposals have generated considerable interest and debate. Proponents have described such a policy as “the most powerful, comprehensive, and fair policy solution for addressing our enormous shared challenge of climate change.”¹⁶⁴ Others warn that it will impose substantial costs on all American households while providing trivial improvements for the environment.¹⁶⁵ It is impossible to discuss a specific proposal in this article, but the general policy implications of a cap and trade program can be reviewed.

The CBO reviewed the effects of a cap and trade program designed to reduce CO₂ emissions.¹⁶⁶ It concluded that the costs of such a program would be borne primarily by consumers via higher electricity and gasoline costs and that the impact would be regressive because poorer households spend a larger percentage of their income on energy than wealthier households.¹⁶⁷ A Texas study considered the potential impact of CO₂ emission limits and concluded that the efforts necessary to reduce carbon emissions from electric generation would increase a typical consumer’s monthly bill by \$17–27.¹⁶⁸ The CBO also concluded that workers and investors in the coal industry and in other energy-intensive industries would experience losses.¹⁶⁹ It identified one policy decision involving a trade-off between reducing the cost of the emission cap to the economy and reducing specific sectors’ or households’ economic burden: how allowances are allocated. If the allowances are sold, the proceeds can be used to decrease the budget deficit, strengthen the economy, and lessen the policy’s total economic cost. If they are given away to affected energy producers, their burden would be lessened, but consumers would receive no benefit.¹⁷⁰

Under any scenario, a cap-and-trade program is expected to place additional pressure on the federal budget. The government is an energy consumer. If energy costs increase, governmental expenditures increase.

164. Power-Link America, Inc., *Cap and Trade 101: A Climate Policy Primer*, GREEN ENERGY NEWS BULL. BOARD, <http://power-linkamerica.com/GREENNEWSBULLETIN.html>.

165. Martin Feldstein, *Cap-and-Trade: All Cost, No Benefit*, WASH. POST, June 1, 2009, available at <http://www.washingtonpost.com/wp-dyn/content/article/2009/05/31/AR2009053102077.html>.

166. CONG. BUDGET OFF., TRADE-OFFS IN ALLOCATING ALLOWANCES FOR CO₂ EMISSIONS 1 (Apr. 25, 2007), available at http://cbo.gov/ftpdocs/80xx/doc8027/04-25-Cap_trade.pdf.

167. *Id.* at 1–2. The CBO estimated that a 15% cut in CO₂ emissions would cost the average household in the lowest one-fifth of the income distribution about 3.3% of its average income. A household in the top quintile would pay about 1.7% of its average income. *Id.* at 2.

168. ERCOT, ANALYSIS OF POTENTIAL IMPACTS OF CO₂ EMISSIONS LIMITS ON ELECTRIC POWER COSTS IN THE ERCOT REGION 2 (2009), available at http://www.ercot.com/content/news/presentations/2009/Carbon_Study_Report.pdf.

169. CONG. BUDGET OFF., *supra* note 166, at 1.

170. *Id.* at 4–5.

Because higher energy costs will lead to a decline in the production of some goods and services, governmental revenues would also decrease due to lowered corporate profits.¹⁷¹ Tax policy issues are discussed elsewhere, but it should be noted that fossil fuels are a significant source of tax revenue. If a cap and trade policy successfully lessens fossil fuel consumption, those tax revenues will decrease. Most, if not all, commercially-viable alternative energy sources receive government subsidies. If a cap and trade policy successfully promotes greater use of those alternative sources, subsidy costs will increase.

A cap and trade policy could have positive energy policy results by making alternative energy sources more price-competitive.¹⁷² For capital-intensive projects, such as nuclear power plants, this could be significant.¹⁷³ Because nuclear energy is domestically produced, greater reliance on nuclear energy could make the U.S. less dependent upon foreign energy producers, and it could reduce the U.S. trade deficit balance.

As far back as the 1973 oil embargo, some have advocated reducing U.S. oil dependence to achieve greater national security. As concerns over the environment increase, greater support for energy independence can be seen amongst those who see alternatives to fossil fuels as an essential part of an environmental protection policy. The good news is that there are ways to reduce fossil fuel consumption and increase national security, such as with nuclear energy. The bad news is that these alternative energy sources will most likely cost additional money and that this increased cost could have a detrimental impact upon the U.S. economy unless they are part of a coordinated effort by the world's largest economies.

B. *Environmental Problems with Renewable Energy*

One way to improve the environment is by encouraging the use and development of renewable energy sources such as wind and solar. Texas has become a national leader in wind energy.¹⁷⁴ According to the State Energy Conservation Office ("SECO"), Texas is now "the leading wind state in the U.S., accounting for close to one-third of the nation's total

171. *Id.* at 4.

172. *Id.* at 5. Electricity generators that use nuclear energy or hydropower would not incur any additional costs because they release no greenhouse gases, and, therefore, any increase in electricity costs would increase their profits.

173. See Holt et al., *supra* note 81, at 194 (noting the potential cost benefits to nuclear facilities using advanced technology of stringent climate protections policies but cautioning that other significant uncertainties make such projections difficult).

174. State Energy Conservation Office, Texas Wind Energy, http://www.seco.cpa.state.tx.us/re_wind.htm. (last visited Nov. 16, 2009).

installed wind capacity.”¹⁷⁵ In fact, Texas has more installed wind capacity than all but five countries worldwide.¹⁷⁶ Some have high hopes for continued wind energy development. The DOE forecasts that wind could provide as much as 20% of the country’s electrical needs by 2030.¹⁷⁷ Others, however, question the wisdom of wind energy—frequently because of environmental concerns—or support wind energy in general but object to any facilities being built near them. This is frequently referred to as “NIMBY,” or “not in my backyard.”

An early example of both environmental and NIMBY objections occurred in connection with a proposed wind farm in the Nantucket Sound off the coast of Massachusetts. Cape Wind Associates (“Cape Wind”) submitted an application to the U.S. Army Corps of Engineers (“Army” or “Corps of Engineers”) for a permit to construct and operate an offshore data tower in an area of Nantucket Sound known as Horseshoe Shoals. The proposed tower was to consist of a platform and a fixed monopole approximately 170 feet high, supported by three steel piles driven into the ocean floor. Cape Wind intended to use this tower to gather data for use in determining the feasibility of locating a wind farm consisting of 170 turbines on Horseshoe Shoals. The turbines would be within the view of the wealthy Cape Cod resort region of Massachusetts.¹⁷⁸ The Corp of Engineers issued the requested permit.¹⁷⁹

The decision of the Corp of Engineers to issue the permit spawned subsequent litigation. First, an environmental group filed suit in state court against Cape Wind arguing that it had failed to obtain a state permit.¹⁸⁰ Cape Wind removed the suit to federal court. The federal district court granted Cape Wind’s motion to dismiss.¹⁸¹ The First Circuit affirmed, finding that Massachusetts did not have regulatory authority over the project because it was to be located on the outer Continental

175. Amy Stansbury, *TECO-Westingshouse Breezes into Wind Turbine Industry*, Community Impact, Feb. 6, 2009 (citing State Energy Conservation Office, *supra* note 174), available at <http://impactnews.com/round-rock-pflugerville/local-news/3171-teco-westingshouse-breezes-into-wind-turbine-industry>.

176. RYAN WISER & MARK BOLINGER, U.S. DEP’T OF ENERGY, ANNUAL REPORT ON U.S. WIND POWER, INSTALLATION, COST, AND PERFORMANCE TRENDS: 2007 (May 2008), available at <http://www1.eere.energy.gov/windandhydro/pdfs/43025.pdf>. Texas had a total capacity of 4,446 MWs. This places it behind only Germany (22,277), U.S. (16,904), Spain, (14,714), India (7,845), and China (5,875). *Id.* at 5–6.

177. Press Release, U.S. Dep’t of Energy, Wind Energy Could Produce 20 Percent of U.S. Electricity by 2030 (May 12, 2008), available at <http://www.energy.gov/news/6253.htm>.

178. Kevin McNicholas, *Big U.S. Offshore Wind Farm Wins Crucial Permit*, REUTERS, May 21, 2009, <http://www.reuters.com/article/GCA-GreenBusiness/idUSTRE54K6EK20090521?sp=true>.

179. *See Alliance to Protect Nantucket Sound, Inc. v. U.S. Dep’t of the Army*, 398 F.3d 105, 107–08 (1st Cir. 2005).

180. *See Ten Taxpayer Citizens Group v. Cape Wind Assocs.*, 373 F.3d 183, 185–86 (1st Cir. 2004).

181. *Id.* at 186.

Shelf, more than three miles from the Massachusetts shoreline.¹⁸² Next, a residents' association filed suit against the Army challenging its decision to issue a permit.¹⁸³ The district court granted the Army's motion for summary judgment and the First Circuit affirmed.¹⁸⁴

The dispute continued in the court of public opinion, and it divided many environmentalists. Amongst those in opposition was U.S. Senator Edward Kennedy who complained that the project would kill birds, endanger sea life, and impact the area's tourism and fishing industries.¹⁸⁵ Massachusetts's Governor Deval Patrick has championed the project as part of an effort to make the state an alternative energy leader.¹⁸⁶ The dispute has, at times, put environmentalists in direct public conflict. Robert F. Kennedy, Jr., participated in an event for the Alliance to Protect Nantucket Sound, a group which opposes the wind farm, by riding in a sailboat.¹⁸⁷ A Greenpeace vessel approached his boat while carrying a banner that read, "Bobby, you're on the wrong boat."¹⁸⁸

This is not the only wind farm drawing environmental challenges. The Redington Wind Farm, a proposed project in western Maine, drew objections from environmentalist because of its potential impact on wildlife. An alliance of area ranchers and environmental organizations in Texas tried unsuccessfully to block a private wind farm near the Laguna Madre, contending that the projects were being built in violation of the Coastal Zone Management Act and the Texas Coastal Management Program.¹⁸⁹ However, other environmentalists, including the Conservation Law Foundation, have answered that the dangers of global warming from fossil fuel use are a much larger threat to the environment than commercial wind turbines.¹⁹⁰

Many of the NIMBY challenges to wind farms are due to their appearances. Commercial wind turbines are large structures. Because of the tall towers, long blades, and blinking lights, many consider them an

182. *Id.* at 190.

183. *Alliance to Protect Nantucket Sound*, 398 F.3d at 105.

184. *Id.* The project has received a composite certificate from the Massachusetts Energy Facilities Board. *Massachusetts Energy Board Votes to Approve Cape Wind "Composite Certificate,"* REUTERS, Mar. 13, 2009, <http://www.reuters.com/article/pressRelease/idUS176100+13-Mar-2009+BW20090313>. It is now up to the federal government to decide whether to issue a lease for the project. *See Obama Faces Choice on Cape Cod Wind Farm*, MSNBC, Jan. 26, 2009, <http://www.msnbc.msn.com/id/28860081/>.

185. McNicholas, *supra* note 178.

186. *Id.*

187. Amanda Little, *RFK Jr. and Other Prominent Enviros Face Off Over Cape Cod Wind Farm*, GRIST, Jan. 12, 2006, <http://www.grist.org/article/capecod/>.

188. *Id.*

189. *Coastal Habitat Alliance v. Patterson*, 601 F. Supp. 2d 868 (W.D. Tex. 2008). The court dismissed the suit for lack of jurisdiction finding that the plaintiffs lacked standing. *Id.* at 870.

190. John Richardson, *Wind Power Divides Environmentalists*, PORTLAND PRESS HERALD/MAINE SUNDAY TELEGRAM, June 9, 2007, available at <http://pressherald.maine.com/news/environment/012730.html>.

eyesore and a threat to neighboring land values. In *Rankin v. FPL Energy, LLC*, a group of neighboring landowners contended that a large commercial wind farm was a nuisance.¹⁹¹ One of the issues was whether a nuisance claim could exist based upon the wind farm's visual impact. Texas law defines "nuisance" as "a condition that substantially interferes with the use and enjoyment of land by causing unreasonable discomfort or annoyance to persons of ordinary sensibilities."¹⁹² The plaintiffs produced evidence that the presence of numerous 400-foot-tall wind turbines had permanently and significantly diminished the area's scenic beauty and their enjoyment of their property.¹⁹³ The court held that the aesthetic impact of a lawfully operated wind farm did not constitute a nuisance.¹⁹⁴

Ironically, an energy source many support as a vehicle for reducing greenhouse gas emissions and combating global warming, may be a victim of climate change. A recent study suggests that average and peak wind speeds have noticeably slowed since 1973, especially in the Midwest and in the East.¹⁹⁵ Other areas, including West Texas, have not experienced as significant a decrease.¹⁹⁶ Scientists have suggested that climate change is responsible for decreased winds because the poles have warmed and there is a smaller temperature differential between the poles and the equator.¹⁹⁷ As this temperature gap decreases, so too does the difference in air pressure.¹⁹⁸ Air pressure differences are a driver for high winds. If this driver is decreased, wind speeds decrease.¹⁹⁹

Solar energy has also encountered environmentally-based objections. Concerns have been raised over land disturbance, visual impacts, and the use of potentially hazardous materials.²⁰⁰ Others question whether the

191. 266 S.W.3d 506, 508 (Tex. App.—Eastland 2008, pet. denied). The author of this article was the author of that opinion.

192. *Schneider Nat'l Carriers, Inc. v. Bates*, 147 S.W.3d 264, 269 (Tex. 2004).

193. *Rankin*, 266 S.W.3d at 511. One plaintiff contended the impact was more than aesthetics. The plaintiff argued that:

[S]he and her husband had purchased their land to build a home and to have a place 'for strength, for rest, for hope, for joy, for security-for release.' They had plans for building and operating a small bed and breakfast but cancelled those plans in response to the wind farm. [She] characterized the presence of the wind farm as 'the death of hope.'

Id.

194. *Id.* at 512–13.

195. Seth Borenstein, *The Dying of the Winds: Study Hints at Reduced Wind Speed in US, may be a Problem for Turbines*, ABC NEWS, June 10, 2009, <http://abcnews.go.com/Technology/GlobalWarming/wireStory?id=7800447>.

196. *See id.*

197. *See id.*

198. *See id.*

199. *See id.*

200. SOLAR ENERGY DEV. PROGRAMMATIC ENVTL. IMPACT STATEMENT, SOLAR ENERGY GUIDE: SOLAR ENERGY DEVELOPMENT ENVIRONMENTAL CONSIDERATIONS (2009), <http://solareis.anl.gov/guide/environment/index.cfm>.

high temperatures associated with solar energy facilities will pose environmental or safety risks.²⁰¹ In 2008 the U.S. government put a hold on new solar energy projects on public land for two years to allow it the opportunity to study environmental impacts from sun-driven plants.²⁰² More recently, U.S. Senator Dianne Feinstein objected to the construction of solar projects in the Mojave Desert.²⁰³ Conservationists have contended that this development will harm the region's tortoise population.²⁰⁴ California's Governor Arnold Schwarzenegger responded that if a solar power plant cannot be located in the Mojave Desert then, "I don't know where the hell we can put it."²⁰⁵

A related concern is water. Solar energy plants traditionally use water as a coolant.²⁰⁶ Air-cooled options exist but they are more costly and they need more land.²⁰⁷ In some areas, there simply may not be enough water available to operate a traditional plant or the political opposition aroused by water concerns may prevent a permit from being issued. In those areas air-cooled plants may not be economically viable because of the increased cost or politically viable because of the increased land usage. Consequently, areas that might be considered ideal for solar energy development could be effectively eliminated from consideration because of environmental concerns.

If history is a guide, continued experience with wind and solar energy will make them more efficient and environmentally friendly. But because they require access to the wind and sun, they must be located outdoors and in plain sight. Because they are most efficient when closest to the energy demand, they are most economically placed in someone's backyard. Overcoming the predictable NIMBY challenges will require case-by-case consideration and resolution.

C. Conventional Oil and Gas Production

Conventional oil and gas exploration and development activities have an environmental impact. Most wells are drilled, produced, and plugged without significant impact. But to even drill a well requires construction

201. *Id.*

202. Catherine Elsworth, *U.S. Halts Solar Energy Projects Over Environment Fears*, DAILY TELEGRAPH, June 27, 2008, <http://www.telegraph.co.uk/earth/earthnews/3345683/US-halts-solar-energy-projects-over-environment-fears.html>.

203. Associated Press, *Feinstein: Don't Spoil Our Desert with Solar Panels*, FOXNEWS, Mar. 21, 2009, <http://www.foxnews.com/politics/2009/03/21/feinstein-dont-spoil-desert-solar-panels/>.

204. *Id.*

205. *Id.*

206. Associated Press, *Environmental Concerns Threaten Solar Power Expansion in California Desert*, FOXNEWS, Apr. 18, 2009, <http://www.foxnews.com/story/0,2933,517053,00.html>.

207. *Id.*

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of a road and drilling pad, the movement of heavy equipment, and normally the construction and use of a mud pit. If the well is successful, salt-containing produced fluids must be handled. We traditionally think of the potential environmental impact of lost oil but most Texas oil fields produce more brine than oil.²⁰⁸ As a field matures this brine production can increase until the field “waters out.”²⁰⁹ This occurs when the amount of brine produced so far exceeds the amount of oil produced that it is no longer economical to operate. Because of its high salt content, brine is a highly corrosive material. It must be separated, stored, and then transported—all of which occurs on or near the surface. If brine is spilled, for example because of equipment failure or accident, it can kill any vegetation and sterilize the soil. An environmentally-friendly policy would encourage spill avoidance and the surface remediation of spills and abandoned well sites. Clearly, both are laudable goals but they carry broader policy concerns because of their costs and potential economic impact.

All things being equal, an operator will continue to produce a well so long as it is profitable to do so.²¹⁰ Oil and gas are commodities, and, therefore, operators have little control over the prices they receive. They do, however, have control over their expenses. An operator motivated purely by profit would spend as little as possible on equipment maintenance and surface remediation. Even an operator interested in operating as responsibly as possible must necessarily be cognizant of its expenses because as soon as expenses are allowed to exceed revenue, wells must be plugged.

Environmental problems caused by oilfield activities can cause significant environmental concern. For example, the Exxon Valdez spill wrought havoc on hundreds of miles of Alaskan coastline.²¹¹ For purposes of this discussion consider two more routine environmental policy issues: (1) damage models for surface contamination, and (2) restoration of the surface after plugging a well. Both provide the opportunity to weigh

208. Brine is water containing more dissolved inorganic salt than typical seawater. Schlumberger, Oilfield Glossary, <http://www.glossary.oilfield.slb.com/Display.cfm?Term=brine> (last visited Nov. 17, 2009).

209. See *Amoco Prod. Co. v. Alexander*, 622 S.W.2d 563 (Tex. 1981) (suit by royalty owners over actions by an operator that they contended accelerated their lease being watered out).

210. In Texas a lease typically continues after the expiration of its primary term so long as it is producing in paying quantities. Texas courts have adopted a two-part test for determining whether a lease is producing in paying quantities: (1) Did the lease yield a profit over a reasonable period of time; and (2) Would a reasonably prudent operator continue to operate the well in the manner in which it was being operated for the purpose of making a profit and not merely for speculation. *Clifton v. Koontz*, 160 Tex. 82, 88–89, 325 S.W.2d 684, 690–91 (1959).

211. On March 24, 1989 the *Exxon Valdez* ran aground on Bligh Reef in Prince William Sound, Alaska. Almost 11 million gallons of crude oil were released, and over 1,100 miles of Alaskan shoreline were impacted. Thousands of animals including sea otters, harbor seals, and sea birds were killed. Cutler J. Cleveland, *Exxon Valdez Oil Spill*, THE ENCYCLOPEDIA OF EARTH, http://www.eoearth.org/article/Exxon_Valdez_oil_spill.

conflicting public policy concerns: Do we promote the environment and, if so, at what cost and for whom; or Do we promote increased production and, if so, what environmental harm are we willing to incur?

Assume that an operator has a waterflood and is using brine produced from its lease to operate that project. The operator separates brine from the oil, transports it via pipeline to a collection facility, later transports it via pipeline to an injection well, and then reinjects it into the producing formation. Assume further that because of the operator's negligence, there is an equipment failure, brine is spilled, and several acres of the landowner's surface are contaminated. What are the damages?

An environmentalist might ask what would be necessary to repair the spill site so that the surface is restored to its prior use. Logically this makes sense because it places the surface owner in the same position he occupied before the spill and it provides a financial incentive for operators to avoid future spills. But before requiring the operator to remediate the spill, an economist might wonder what the remediation will cost and how much did the spill cause the landowner's property to devalue. This too is logical because it makes no sense to spend, for example, \$10,000 an acre remediating a spill site if the land before the spill was worth only \$200 an acre.

Texas law favors the economist's viewpoint by asking if the repairs are economically feasible.²¹² In *Primrose Operating Co. v. Senn* the court considered the proper damage model for surface contamination caused by salt water spills.²¹³ The landowner's ranch covered 23,000 acres. Primrose owned oil and gas leases on 3,000 of these acres. It implemented a waterflood using brine produced on the lease. Several flowlines developed leaks and ten acres were contaminated. The landowner sought remediation damages and produced evidence that it would cost \$2,110,000 to dig up the contaminated soil, haul it to a dirt farm, and replace the contaminated dirt with clean soil.²¹⁴ There was conflicting evidence of the value of the entire ranch and whether the cost to remediate the spills should be deducted from the appraised value. The landowner had prepared financial statements listing the ranch's value at \$3–\$4 million, and the ranch had been appraised at between \$4.02–\$4.80 million.²¹⁵ The court held that it was uneconomical to spend \$2 million

212. See, e.g., *North Ridge Corp. v. Walraven*, 957 S.W.2d 116, 119 (Tex. App.—Eastland 1997, pet. denied) (holding that remediation costs that exceeded the value of the entire tract by more than six times are not economical as a matter of law).

213. 161 S.W.3d 258 (Tex. App.—Eastland 2005, pet. denied). The author was one of Primrose's trial counsel.

214. *Id.* at 262.

215. *Id.* at 262–63. The landowner's experts contended that any cost to cure the ten acres should be deducted from these appraised values.

remediating ten acres and that the proper measure of damages was any diminution in the ranch's fair market value attributable to the spills.²¹⁶

Similar issues can arise when considering the operator's surface restoration obligation. Operators are required to plug dry or inactive wells within one year after drilling or operations cease.²¹⁷ It is well-settled that, in the absence of an express or implied provision in a lease requiring surface restoration, the operator has no duty to the surface owner to restore the surface to the condition it was in before the well was drilled.²¹⁸ Not only does the operator have no duty to restore the surface, it has no duty to remove oilfield materials such as concrete derrick corners, concrete pumping unit bases, and miscellaneous pieces of pipe and concrete.²¹⁹ This result might strike some as harsh, but in practice it is typically offset by surface damage payments made before the well is drilled or by payments made as part of a surface use agreement.²²⁰

Because surface damage models and surface restoration requirements involve conflicting interests, there is no single right answer. For example, New Mexico by statute requires operators to restore the surface affected by oil and gas operations to its prior condition.²²¹ This duty is not tempered by the land's fair market value. The statute provides: "An operator shall reclaim all the surface affected by the operator's oil and gas operations."²²² That can prove expensive. In the Louisiana case *Corbello v. Iowa Production Co.* an operator was contractually required to restore the surface.²²³ A jury found that the cost to restore a 120-acre tract was \$33 million. The tract, if restored, would be worth only \$108,000.²²⁴ The Louisiana Supreme Court held that the lessee's remediation obligation was not tethered to the property's market value, and it affirmed the jury verdict.²²⁵

Texas could impose greater environmental obligations upon operators, but to do so would impose additional costs. When operational expenses are increased, the most obvious impact is upon low-producing wells, typically referred to as stripper wells.²²⁶ Because these wells produce less

216. *Id.* at 264. Because the landowner produced no diminution evidence beyond testimony that the ranch's appraised value should be reduced by the cost to cure, the court reversed a judgment in the landowner's favor and rendered judgment that the landowner take nothing. *Id.*

217. 16 TEX. ADMIN. CODE § 3.14(c)(1) (2009).

218. *Warren Petrol. Corp. v. Monzingo*, 157 Tex. 479, 480–81, 304 S.W.2d 362, 362–63 (1957).

219. *See Exxon Corp. v. Pluff*, 94 S.W.3d 22, 29–30 (Tex. App.—Tyler 2002, pet. denied).

220. That practice did not inure to the landowner's benefit in *Pluff* because he acquired his interest long after the wells had been drilled. *See id.*

221. N.M. STAT. § 70-12-4(c) (Supp. 2009).

222. *Id.*

223. 850 So.2d 686, 693–94 (La. 2003).

224. *Id.* at 692.

225. *Id.* at 693.

226. A *stripper well* is an oil well producing less than ten barrels per day or a natural-gas well producing less than 60,000 cubic feet per day. Kevin Parker, *Current and Future Prospects for*

income, they have less capacity to absorb increased expense. One could argue that because they are low-producers, any governmental action that increases operational costs and results in stripper wells being plugged carries inconsequential costs; however, production data indicates otherwise.

Domestic stripper wells produce approximately 900,000 barrels of oil per day or 15% of U.S. total domestic production.²²⁷ The oil produced from stripper wells is approximately equal to the amount of oil imported from Saudi Arabia.²²⁸ In 2006 stripper wells constituted over 75% of the oil wells in Texas and accounted for over 25% of the oil produced.²²⁹ They also constituted over 50% of the gas wells in Texas and were responsible for approximately 6% of the gas produced.²³⁰ A policy that increases operational costs will make it uneconomical to operate many of these wells. As these wells are plugged, domestic production decreases. This means lower tax revenue and potentially higher unemployment. It also means lost resource development opportunities. When a well is plugged, less than 50% of the oil in the reservoir has been produced. But even though most of the oil remains, it is financially unfeasible to re-drill and attempt to produce from the same formation.²³¹

The response to this argument is that operators may have a financial disincentive to protect the environment. Assume that a well is being operated on land costing \$200 per acre. The operator is operating a waterflood using lease-produced brine and has run polyethylene flowlines between its wells and surface facilities. One of these lines develops a small hole. The landowner might prefer that the entire line be replaced to lessen the risk of additional spills. However, the line could be easily and less expensively repaired with a clamp. If the operator's exposure is limited to \$200 per acre, and no one leak is expected to damage much property, replacing the line and thus avoiding continued leaks may never be the right economical decision.

If, on the other hand, an operator's duty is measured without regard to the property's value, other economic incentives may prevent damaged property from being remediated. Assume that a landowner has a single asset, a 120-acre tract of land. Prior to a major spill his land is worth

Stripper Wells, E&P MAGAZINE, Jan. 5, 2009, available at <http://www.epmag.com/Magazine/2009/1/item26683.php>.

227. Energy Info. Admin., Oil Market Basics: Supply, http://www.eia.doe.gov/pub/oil_gas/petroleum/analysis_publications/oil_market_basics/supply_text.htm (last visited Nov. 16, 2009).

228. Parker, *supra* note 226.

229. There were 104,724 stripper wells, and they produced 88,257.60 thousand barrels ("Mbbbl"). Energy Info. Admin., Texas Distribution of Wells by Production Rate Bracket, http://www.eia.doe.gov/pub/oil_gas/petroleum/tx_table.html (last visited Nov. 16, 2009).

230. There were 54,381 stripper wells and they produced 392,597.90 million cubic feet ("MMcf") of gas. *Id.*

231. Parker, *supra* note 226.

\$108,000 but after the spill is worthless. Assume further that the landowner owes the bank \$50,000 and that it would cost \$33 million to remediate the spill. Prior to the spill the landowner has a positive net worth of \$58,000 (\$108,000 - \$50,000). Immediately after the spill his net worth is -\$50,000 (\$0 - \$50,000). If he takes the \$33 million and does nothing, his net worth is \$32.95 million (\$33,000,000 - \$50,000). If he takes the \$33 million and remediates his property, his net worth is back to \$58,000. Under these facts the property will never be remediated. The landowner can purchase another similar tract, pay off his bank loan, and still have approximately \$32 million in the bank.

For the foreseeable future we will continue to rely upon conventional energy sources such as oil and gas and the process of discovering, producing, and transporting them will carry an environmental cost. The challenge for policymakers will be to adopt policies that balance the desire to maximize production and protect the environment without providing disincentives that lead to unintended consequence.

IV. ENERGY POLICY AND ECONOMIC CONCERNS

During the Civil War there were some steam-powered vehicles, such as trains and ships, but for the most part the armies walked or rode horses and were resupplied by horse or mule-drawn wagons. After the war, most soldiers returned home to a farm where a horse or mule pulled a plow and their house was heated and their meals were cooked with firewood. Globally, the U.S. was a relatively unimportant player in world affairs. By the end of World War II, the U.S. had become a global superpower. The war itself was won in no small part due to the U.S.'s industrial capacity, which allowed mass production of bombers, war ships, and tanks. The reasons for this ascendancy from an unimportant, agriculture-based economy to an industrialized major world power are many and varied, but the ability to harness and utilize energy is undoubtedly a key cause.

Between the Civil War and World War II, U.S. consumption of energy per capita tripled.²³² The internal combustion engine was developed and with it came cars, trucks, and planes—and the factories necessary to mass produce them. Farming was revolutionized by tractors, cotton gins, and irrigation. The economy grew dramatically. It did not hurt that the U.S. had a large domestic oil and gas industry that until the 1950s produced all of the oil the country needed.²³³ However, since 1994 the U.S. has

232. INTRODUCTION, *supra* note 1.

233. TOTAL ENERGY, *supra* note 2.

imported more oil than it has produced, and since 1970 domestic production has declined.²³⁴

The amount Americans pay for energy, and whether that energy is produced domestically or abroad, has economic consequence. Higher energy prices can slow economic growth and lower energy prices can act as a stimulant. Energy prices also have broader economic consequence because of their impact on monetary policy. Moreover, economic policies can have reciprocal impacts on energy policy by making various forms of energy more or less price-competitive.

A. Impact of Energy Prices on Economic Growth and Monetary Policy

High energy prices, specifically high oil prices, negatively impact the economy in a variety of ways. Money spent to fill the family car with gasoline cannot be used to purchase other consumer products. Transportation becomes more expensive, and any product with a transportation component (and what does not have one?) reflects this. Families, businesses, and governmental agencies cut back on travel, purchases, or other expenditures to compensate for higher fuel prices. Businesses impacted by these cutbacks must then make cutbacks of their own to compensate for decreased revenues. Cumulatively, these cutbacks can have significant economic impact.

A prime example of high energy prices negatively impacting gross domestic product (“GDP”) occurred in 1973.²³⁵ OPEC nations stopped exporting oil to the U.S. as punishment for American support of Israel.²³⁶ Oil prices quadrupled and oil supplies in the U.S. became scarce.²³⁷ The U.S. economy slipped into its longest recession since World War II.²³⁸ In 1979 supply disruptions due to the Iranian Revolution led to a price spike, and the economy fell into another recession.²³⁹ Recessions also followed Iraq’s invasion of Kuwait in 1990 (when the price of crude doubled) and the sudden increase from \$25.50 a barrel to \$36.00 a barrel in 2000.²⁴⁰

234. ENERGY INFO. ADMIN., HISTORY OF ENERGY IN THE UNITED STATES: 1635–2000: PETROLEUM, <http://www.eia.doe.gov/emeu/aer/eh/petro.html>. In 1970 the U.S. produced 9.4 million barrels of oil per day. *Id.*

235. *1970s Oil Crisis*, RECESSION.ORG, <http://recession.org/history/1970s-oil-crisis> (last visited Nov. 17, 2009).

236. *Id.*

237. *Id.*

238. Justin Lahart, *Crying Over Crude*, CNN, Mar. 3, 2003, <http://money.cnn.com/2003/02/27/markets/oileffects/index.htm>.

239. *Id.* This recession was also impacted by the Federal Reserve’s tight money policy that had been implemented to curb inflation. *1980’s Recession*, RECESSION.ORG, <http://www.recession.org/history/1980s-recession> (last visited Nov. 17, 2009).

240. Lahart, *supra* note 238.

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There is no easy and accurate model for predicting the economic impact of an energy price hike because so many other factors are present. The CBO has identified three principal means by which higher energy prices impact the U.S. economy.²⁴¹ First, higher prices for imported energy siphons off buying power as U.S. residents pay more for energy imports. This causes a short-term decline in demand for U.S. goods and services and temporarily dampens investment and other spending. Second, income and wealth within the U.S. shifts to energy producers and energy asset owners. Third, large and sudden price changes lessen consumer spending in the short-term if consumer confidence is impacted.²⁴² Even if consumers proceed with a major purchase, a price hike could impact that decision. For example, a family might purchase a fuel-efficient car rather than an SUV. These changes could have localized impact even if the total level of consumer spending remained unchanged.²⁴³

Recent history illustrates the difficulty of modeling the impact of energy price hikes. The 1973 price hikes had a significant economic impact. After the fact, this was attributed to the U.S. economy being at a weak point in the business cycle, monetary policymakers' inability to control inflation in the immediately preceding years, and the fact that the U.S. economy's structure in 1973 made it less able to respond to price shocks.²⁴⁴ Conversely, in 2006 economists opined that price hikes had resulted in a much smaller impact—a decrease of only 1% in the GDP.²⁴⁵ High consumer confidence was given as a reason that the economy, at least through 2006, had successfully absorbed higher energy prices.²⁴⁶ Economists noted that if the public believes a price increase is temporary, they are inclined to dip into savings to continue their accustomed spending.²⁴⁷

We know with the benefit of hindsight that the economists were too optimistic in 2006 and that consumer confidence does not last forever. It will be some time before economists are able to measure all of the variables and then explain, just as they have for the 1973 recession, why the U.S. economy suffered such significant losses in 2008 and 2009. But it is not too early to say that monetary policy was a crucial factor because it

241. See CONG. BUDGET OFF., THE ECONOMIC EFFECTS OF RECENT INCREASES IN ENERGY PRICES (2006), available at <http://www.cbo.gov/ftpdocs/74xx/doc7420/07-21-Energy%20DIST.pdf> [hereinafter ECONOMIC EFFECTS].

242. *Id.* at 6.

243. *Id.*

244. *Id.* at 15.

245. *Id.* at 6. Higher prices typically have a greater impact on the standard of living. *Id.*

246. *Id.* at 8.

247. Ben S. Bernanke, Governor, Fed. Reserve Board, Remarks at the Distinguished Lecture Series at Darton College, Albany, Ga.: Oil and the Economy (Oct. 21, 2004), available at <http://www.federalreserve.gov/Boarddocs/speeches/2004/20041021/default.htm>.

always plays a role whenever energy prices spike as they did in 2006–2008.

In 2006 the CBO felt that monetary policy improvements were a major reason why the economy was able to weather energy price hikes.²⁴⁸ It cited studies that concluded the 1973–1975, the 1980, and the 1981–1982 recessions were attributable to monetary policy rather than energy price shocks.²⁴⁹ In an ironic twist, it also attributed the economy’s performance to reduced regulation writing:

Regulation of the economy was generally more pervasive in the past than it is now. In particular, two areas of economic regulation in the 1970s—petroleum markets and housing finance—increased the damage to the economy when energy prices rose. Restrictions in those areas have since been altered; in addition, many other economic regulations have been modified or eliminated since the late 1970s, and those changes may have helped to partially insulate today’s economy from energy price shocks. Examples of such alterations are the deregulation of the transportation sector in the 1970s and 1980s and changes in financial regulations over the past 25 years.²⁵⁰

Like so many others, the CBO failed to foresee the 2008 financial collapse. A complete discussion of the causes of that collapse or of the appropriate financial regulatory framework for the future is beyond the scope of this article, but undoubtedly easy credit can at least hide the immediate impact of higher energy prices.

In 2006 consumer spending was unimpacted because “improvements in mortgage finance, including home-equity lines of credit and easier refinancing, encouraged households to use the equity in their homes to maintain their spending when the growth of household real income slowed.”²⁵¹ Today we realize that too much credit was extended, that people purchased homes they could not afford, and that an unsustainable housing bubble was created in some parts of the country. We also realize

248. ECONOMIC EFFECTS, *supra* note 241, at 20.

249. *Id.*; see Bradford De Long, *America’s Peacetime Inflation: The 1970’s*, in 30 REDUCING INFLATION: MOTIVATION AND STRATEGY 247 (Christina D. Romer & David H. Romer eds., 1997); Ben Bernanke et al., *Systematic Monetary Policy and the Effects of Oil Price Shocks*, 1 BROOKINGS PAPERS ON ECON. ACTIVITY 91 (1997); Robert B. Barsky & Lutz Kilian, *Do We Really Know That Oil Caused the Great Stagflation? A Monetary Alternative* (Nat’l Bureau of Econ. Research, Working Paper No. 8389, 2001), available at <http://papers.nber.org/papers/w8389>.

250. ECONOMIC EFFECTS, *supra* note 241, at 22. Current Treasury Secretary Timothy Geithner was cited for the proposition that capital ratios and earnings in the banking industry were high before the recent increase in energy prices and that strength resulted in a banking industry that could cushion the adverse effects of the energy price shock. *Id.* at 24 (citing Timothy F. Geithner, Remarks before the Economic Club of New York: Perspective on the U.S. Financial System (May 27, 2004), available at www.ny.frb.org/newsevents/speeches/2004/gei040527.html).

251. ECONOMIC EFFECTS, *supra* note 241, at 26.

that we had become too confident in our ability to manage risk. The CBO cited securitization, credit derivatives, and interest-rate swaps as positive alternatives to traditional banking because they enhanced risk management.²⁵² Few would still characterize these positively.

This is not to suggest a “but for” conclusion. Easy credit may have done nothing more than defer the pain associated with higher energy prices if it allowed people or businesses to postpone hard decisions. If a price hike is truly temporary, easy credit may allow spreading the cost increase over a longer period of time, thereby softening the blow. Perhaps the U.S. may have even weathered this storm if housing prices had not collapsed. But as history has shown, energy price spikes will eventually have some economic impact because of the adjustments that they cause individuals and businesses to make and because of the resulting consequences of those adjustments. Monetary policy should, therefore, reflect this.

Higher energy prices have a tax-like effect on the economy and they create inflationary pressure.²⁵³ The traditional response to inflationary pressure is to tighten the money supply. However, higher prices can slow consumer spending²⁵⁴ and delay business investment.²⁵⁵ The traditional response to slower consumer spending is to increase monetary supply.²⁵⁶ Thus, if inflationary pressure is due to higher energy prices, the appropriate response may not be higher interest rates—or at least not the interest rate increase a sudden rise in the consumer price index (“CPI”) would otherwise bring about—but to focus on policies that lower energy costs.²⁵⁷ When the economy is in a recession following a surge in energy prices, increasing the money supply is not the only vehicle for stimulating the economy: a drop in energy prices will have the same effect—without

252. *Id.*

253. See Edward M. Gramlich, Governor, Fed. Reserve Board, Address at the Annual Economic Luncheon, Federal Reserve Bank of Kansas City: Oil Shocks and Monetary Policy (Sept. 16, 2004), available at <http://www.federalreserve.gov/Boarddocs/speeches/2004/20040916/default.htm> (explaining that high oil prices act like a tax because they deprive people of spending power).

254. ECONOMIC EFFECTS, *supra* note 241, at 5.

255. *Economist: Oil Prices Hurt GDP*, DAYTON BUS. J., Sept. 5, 2008, available at <http://dayton.bizjournals.com/dayton/stories/2008/09/01/daily32.html>.

256. An example of this is currently on display. In January of 2009 the federal funds rate ranged 0–0.25%. Ron Krasny, *US RATE FUTURES-Price in Hike in Fed Funds in Early 2010*, REUTERS, June 5, 2009, <http://www.reuters.com/article/marketsNews/idUSCHB00260220090605>.

257. The CBO believes the Federal Reserve has earned credibility as inflation fighters, citing its actions 1980–1982, 1988–1989, and in 1984. Consequently, the CBO projects that households, businesses, and investors are less likely to anticipate inflation increases and that higher energy prices are less likely to lead to wage-price spirals. ECONOMIC EFFECTS, *supra* note 241, at 22 (citing Ben Bernanke, Chairman, Fed. Reserve Board, Address at the Center for Economic Policy Studies, Woodrow Wilson School of Public and International Affairs: The Benefits of Price Stability (Feb. 24, 2006), available at www.federalreserve.gov/boarddocs/speeches/2006/200602242/default.htm) (stating that these wage-price spirals made it more difficult for the Federal Reserve to manage inflation in the 1970s)).

the risk of creating inflationary pressure. Finally, if consumers have responded to higher prices by dipping into savings or by borrowing rather than by reducing consumer spending on other items, policymakers should be cognizant that this cannot be maintained indefinitely and that eventually consumer spending will reflect the higher prices.

B. Green Jobs

During the most recent election cycle, many politicians jumped on the green jobs bandwagon. Depending upon whom you asked, green jobs could single-handedly pull America out of the recession, keep jobs from being exported overseas, or reduce U.S. dependence on foreign oil—all while cleaning the environment.²⁵⁸ In the abstract no one would argue with any of these goals. In the real world no one would expect Washington to produce a magical solution that simultaneously solves economic, national security, and environmental problems, let alone a solution that has no side effects. But before asking What's the catch?, we must first decide, What is a green job?

Currently, there is no universal definition of green-collar jobs. They most commonly refer to employment directly related to environmental protection and energy security, but other, broader, definitions exist.²⁵⁹ For example, Washington State University considers a job green if it has a positive impact on the environment.²⁶⁰ Some would qualify that definition by adding the requirement that the job pay a decent wage and provide sufficient benefits to support a family.²⁶¹ If one considers only the environmental impact of an occupation, Why we would distinguish between high-paying and low-paying jobs? A cynical answer might be that it makes imminent political sense to do so, but as a practical matter we should always strive to create the best possible jobs, and it will be easier to achieve public support when we do. Finally, some have defined green-collar jobs as those that genuinely contribute to a more sustainable world.²⁶²

Without a common definition of green-collar jobs, it is more difficult to weigh proposed policy decisions—if for no other reason than we cannot agree how many green-collar jobs we have now or how many jobs would be created (or lost) by any particular action. Trying to define this on an

258. Paula Hendricks, *Cracking the Mystery of Green Jobs*, GREENBIZ, Apr. 29, 2009, <http://www.greenbiz.com/blog/2009/04/29/cracking-mystery-green-jobs>.

259. Alan Durning, *Green-Collar Jobs, Defined and Counted*, GREENBIZ, May 7, 2009, <http://www.greenbiz.com/news/2009/05/07/green-collar-jobs-defined-and-counted>.

260. *Id.*

261. Bryan Walsh, *What Is a Green-Collar Job, Exactly?*, TIME, May 26, 2008, available at <http://www.time.com/time/health/article/0,8599,1809506,00.html>. Phil Angelides, a 2006 California gubernatorial candidate utilized this definition. *Id.*

262. GoodWork Canada, *What Is a Green Job?*, <http://www.planetfriendly.net/green-job.html> (last visited Nov. 17, 2009).

ad-hoc basis risks public debate becoming sidetracked and the winner being determined by who set the bar rather than by who cleared it. Of course, taking no action until a definition is reached is even more unacceptable.

A working definition is needed because without one, disparate groups working toward the same goal can actually take inconsistent—if not conflicting—action. Presumably, everyone would agree that people who design and install solar energy equipment are green-collar workers.²⁶³ But is the truck driver who delivered the equipment—while driving a diesel-powered eighteen-wheeler, green? If so, is he not green when next week he delivers furniture? If the presence of a diesel-powered truck is problematic, then how do we distinguish between the solar energy company's accountant and an accountant working for Exxon? Does it matter if the Exxon accountant drives a hybrid and successfully implemented a recycling program at work, while the solar accountant drives an SUV and never recycles?

The risk of inconsistent or conflicting action is demonstrated by these questions. If we define green-collar jobs by looking solely at the employer's purpose, we could promote individual behavior inconsistent with environmental protection. If we look solely at the individual, we could promote industries without consideration of their environmental impact.

As an alternative to a single definition, the Australia Conservation Foundation proposed differentiating between shades of green.²⁶⁴ A "deeper green" would refer to jobs in: "[r]enewable energy—invention, manufacturing, distribution, and installation; [w]ater savings and recycling—[g]reen plumbers and new water saving infrastructure; sustainable, water-smart farming and forestry; [g]reen design, building, and construction; [g]reen services in auditing, accrediting, accounting, banking, and trading; [and] [p]ublic transportation and clean car design, construction, manufacture, and operation."²⁶⁵ "Lighter green" represents: "[p]urchasing officers who implement a sustainable purchasing policy; [o]ffice managers who help reduce energy waste; [m]ining workers who help save fuel or rehabilitate land; a building cleaner who uses environmentally friendly products and reduces waste; [and] a chef who chooses locally grown, environmentally-friendly produce."²⁶⁶

An additional alternative is to define green-collar jobs by locale. The logic of this approach is two-fold. On a local level, a green job should

263. Hendricks, *supra* note 258.

264. Austl. Conservation Found., Green Jobs Facts Sheet, http://www.acfonline.org.au/articles/news.asp?news_id=1963 (last visited Nov. 17, 2009).

265. *Id.*

266. *Id.*

have both an economic and environmental impact. The environmental needs and the available workforce's job skills are decidedly different in rural West Virginia than in New York City. Building or improving a mass transit system and training people to work in it would have significantly more value in a large metropolitan area than in a rural area.²⁶⁷ Conversely, a program in West Virginia that trains former coal miners to operate heavy equipment and then employs them in a project to remediate an abandoned coal mine would have significant value economically and environmentally—even though the operation of the same heavy equipment elsewhere would never be considered a green job.

The challenge for policymakers is to first determine what a green-collar job is. When this is accomplished we can then assess what, if any, governmental action is appropriate. If, for example, green-collar jobs are available but there are insufficient trained workers, educational programs would be appropriate. If there are trained workers but no jobs, economic incentives for employers may be necessary.

We should also consider the employment impact of major energy decisions. Replacing coal-fired plants with cleaner alternatives will help the environment, but it will also result in fewer jobs in the coal industry. It is not, therefore, sufficient to simply decide to replace a coal-fired plant. We should also consider how we will address the unemployment needs that our decision will occasion. On a national level this can be a significant issue. The National Association of Manufacturers estimates that encouraging green jobs via cap and trade proposals will ultimately cost the nation four million jobs by 2030.²⁶⁸ But on the local level, energy-related decisions can be not only significant but also devastating if the affected jobs constitute a significant percentage of the local employment.

C. Reverse Impacts

Traditionally, we consider the impact of energy prices on the economy rather than the effect of the economy on the energy sector. As shown previously, price increases—particularly rapid price increases—harm economic growth. Because energy consumption is so integrally tied to our daily activities, it makes sense that we would respond to dramatic energy price increases by modifying our activities so that we use less energy and,

267. There are many forms of mass transit and some are more environmentally-friendly than others, but mass transit systems are generally considered green because they are cleaner than the automobile traffic they replace. See generally Stephanie Corson, *Private Transportation vs. Mass Transit: The Environmental Aspects*, MASS TRANSIT IN TAMPA: OTHER CITIES ARE DOING IT—WHY NOT US? (1998), available at <http://www.cas.usf.edu/philosophy/mass/Stephanie.html>. This is not, however, a universally held view. See, e.g., *Think Twice About "Green" Transport*, *Say Scientists*, WORLD NEWS AUSTRALIA, June 8, 2009, available at <http://www.sbs.com.au/news/article/1024892/Think-twice-about-'green'-transport>.

268. Walsh, *supra* note 261.

conversely, that we would take advantage of energy price decreases by using more energy or by spending our savings elsewhere.

Since 1980 U.S. energy use per capita has remained relatively stable, at 310–360 million Btu per person per year.²⁶⁹ The spread can be explained by price changes. When energy prices are high, Americans' energy use has tended more toward the former figure. When energy prices are low, energy usage has moved toward the latter figure.²⁷⁰ When sufficient people make the same decision, the economy will reflect this increased or decreased activity. However, there are reciprocal impacts as well, and the current economic crisis is driving energy policy in ways beyond gross revenues.

Nationwide, there were approximately 2,000 active drilling rigs in September 2008. By April 2009 there were less than 1,000—a 50% drop.²⁷¹ This decreased activity has led to numerous job cuts by service companies.²⁷² Besides the economic impact of higher unemployment, fewer active drilling rigs today mean fewer oil wells and less production tomorrow. This can result in a boomerang effect for gasoline prices and production costs. When the economy recovers and gasoline demand rises, there will be less domestic production available to meet it. A supply shortage will increase gasoline prices until domestic production increases. Of course, sudden increases in activity can also lead to shortages of trained workers and equipment and cause producers' costs to rise.

Energy production and distribution is typically a capital-intensive venture. This makes access to financing a critical necessity.²⁷³ Oil and natural gas production requires wells, pipelines, and refineries. Alternative energy sources require capital investment as well. Wind turbines and solar panels must be constructed and power lines installed. Nuclear power requires the construction of power plants and waste storage facilities. Hybrid and electrically-powered cars will require additional research and new or retooled manufacturing facilities. Consequently, like so many other areas of the U.S. economy, a chicken and egg situation exists. A healthy economy needs a healthy energy industry. A healthy energy industry needs a healthy economy, both for its demand and for its capital.

269. ENERGY OUTLOOK, *supra* note 29.

270. *Id.*

271. Ben Casselman, *Drilling Slump Batters Halliburton's Profit*, WALL ST. J., Apr. 21, 2009, at B3, available at <http://online.wsj.com/article/SB124022533490234591.html>.

272. *Id.* As of the writing of the article, Halliburton had laid off 2,000 people, or 12% of its North American work force. Schlumberger had laid off 5,000 people.

273. ENERGY OUTLOOK, *supra* note 29.

V. ENERGY POLICY AND TAX ISSUES

The energy decisions individual consumers make have tax impacts. If Americans use a subsidized energy source it increases governmental costs. If Americans use a taxed energy source it increases governmental revenue. In turn, tax policy can influence consumer energy decisions by making energy sources more or less expensive. Besides the obvious need to consider the direct impact of tax-related legislation, this can also result in unintended consequence. For example, assume that as part of an environmental-protection program the federal government encourages consumers to purchase hybrid or all-electric automobiles with a subsidy and that the program works. Hybrid and all-electric vehicle sales increase and gasoline consumption decreases. Hopefully this will result in a cleaner environment, but in the short-term governmental expenditures will increase and governmental revenues will decrease.

A. Federal Taxes

In 2007 taxes were second only to the cost of crude oil for the price of a gallon of gas.²⁷⁴ Federal excise taxes were 18.4¢ per gallon and state excise taxes averaged 21.5¢ per gallon.²⁷⁵ President Obama's recent initiative to increase vehicle fuel efficiency by 30% by 2016 means, all things being equal, that federal and state excise tax receipts will decrease 30% by 2016. That prediction may prove optimistic if car makers successfully develop more all-electric vehicles. Greater fuel efficiency will hardly discourage Americans from driving. Thus, even though tax receipts can be expected to decrease, the need for road and bridge construction will not, and governments will have to replace the lost revenue with new or higher taxes, cut spending by the amount of the lost revenue, or run a deficit.

National energy policies designed to encourage alternative energy development typically have a negative tax impact. For example, in 2007 the ethanol tax credit cost \$3 billion.²⁷⁶ This was, however, effectively offset by tariffs on imported ethanol.²⁷⁷ The U.S. charges importers of ethanol a tariff of 54¢ per gallon and an ad valorem tariff of 2.5% of the value of the imported ethanol.²⁷⁸ Unfortunately, the tax credits the U.S. provides, such as for hybrid automobiles and for nuclear plant

274. GASOLINE PRICES, *supra* note 19.

275. *Id.*

276. ENERGY INFO. ADMIN., FEDERAL FINANCIAL INTERVENTIONS AND SUBSIDIES IN ENERGY MARKETS 2007, at 14 (2008), <http://www.eia.doe.gov/oiaf/servicerpt/subsidy2/pdf/subsidy08.pdf>.

277. IMPACT OF ETHANOL USE, *supra* note 110, at 2.

278. *Id.* Countries that participate in the Caribbean Basin Initiative are exempt from the tariff. *Id.*

construction, are not offset by tariffs. Thus, the more successful the alternative energy policy, the greater its tax impact.

It is easy to observe direct taxes on energy-related transactions and tax subsidies for alternative energy sources. But there are other relationships between tax policy and energy policy that are less obvious. As noted previously, the CBO estimates that increased use of ethanol has resulted in food price increases of 10–15%.²⁷⁹ That increase resulted in increased federal spending for the Supplemental Nutrition Assistance Program (formerly the Food Stamp program) and child nutrition programs by an estimated \$600–\$900 million in fiscal year 2009.²⁸⁰ Food price increases also increased the CPI, which requires cost-of-living adjustments to programs such as Social Security, military and civilian retirement, and Supplement Security Income.²⁸¹ Governmental entities have their own transportation costs. From U.S. Navy aircraft carriers conducting combat missions in the Gulf to school buses transporting kids, governmental entities large and small are energy consumers. When their energy costs rise, taxes have to be raised, travel curtailed, or budgets reallocated. When their energy costs decrease, the opposite holds true.

B. State Taxes

The State of Texas heavily taxes the oil and gas industry. Severance taxes are levied at market value with a rate of 4.6% imposed for all oil produced and a 7.5% rate for all natural gas produced.²⁸² Consumers are taxed 20¢ per gallon when they purchase gasoline or diesel.²⁸³ For fiscal year 2007, the State of Texas collected more than \$3 billion in motor fuels taxes, nearly \$2 billion in natural gas production taxes, and over \$800 million in oil production taxes.²⁸⁴ This represented 4%, 2.5%, and 1.1% respectively of the State's revenue for the year.²⁸⁵ Because of higher oil prices, Texas's revenue increased in 2008. The State collected more than \$3 billion in motor fuels taxes, almost \$2.7 billion in natural gas production taxes, and over \$1.4 billion in oil production taxes.²⁸⁶ This represented 3.6%, 3.1%, and 1.7% respectively of the State's revenue.²⁸⁷

279. *Id.* at 6.

280. *Id.* at 11–12.

281. *Id.* at 1, 11.

282. TEX. TAX CODE ANN. §§ 201.051, 201.052(a), 202.051, 202.052(a) (Vernon 2008).

283. *Id.* §§ 162.101, 162.102, 162.201, 162.202.

284. SUSAN MCCOMBS, TEX. COMPTROLLER OF PUB. ACCOUNTS, TEXAS NET REVENUE BY SOURCE: FISCAL 1978–2007 (2007), http://www.window.state.tx.us/taxbud/revenue_hist.html.

285. *Id.*

286. SUSAN MCCOMBS, TEX. COMPTROLLER OF PUB. ACCOUNTS, TEXAS NET REVENUE BY SOURCE: FISCAL 2008 (2008), <http://www.window.state.tx.us/taxbud/revenue.html>.

287. *Id.*

The State also taxes:

- Anyone in the business of providing oil well services such as shooting, fracturing, acidizing, surveying, or formation testing;²⁸⁸
- Every gallon of liquefied gas (butane, propane, compressed natural gas) used as a motor fuel;²⁸⁹
- Automotive oil;²⁹⁰
- All crude oil and condensate transferred from or to vessels at a maritime terminal (the Coastal Protection Fee);²⁹¹
- Motor Fuel Transporters;²⁹² and
- The withdrawal of petroleum products into cargo tanks (Petroleum Products Delivery Fee).²⁹³

Just as the federal government must consider the tax impacts of future energy development, so too must the State be mindful that as the U.S. successfully transitions away from fossil fuels these revenues will decrease. Replacing these lost revenues with comparable taxes on the new energy sources is a logical choice, but if that alternative energy source is price competitive only because of its favorable tax treatment, the State may have to look elsewhere for replacement revenues.

C. Using Tax Policy to Implement Energy Policy

This article has discussed governmental subsidies that are designed to promote alternative forms of energy. The same result can be achieved in reverse. Gasoline prices in Europe are considerably higher than in the

288. TEX. TAX CODE ANN. §§ 191.081–191.083 (Vernon 2008). The tax is imposed on anyone in the business of providing certain well services and who owns, controls, or furnishes the tools, instruments, and equipment used in providing wells service; or uses any chemical, electrical, or mechanical process in providing service at any oil or gas well during and in connection with the drilling and completion, or reworking or reconditioning, of the oil or gas well.” *Id.* Taxable services include cementing the casing seat, shooting the formation, fracturing the formation, acidizing the formation, and surveying or testing the formation. *Id.*

289. TEX. TAX CODE ANN. §§ 162.301–162.302 (Vernon 2008). The tax is 15¢ per gallon. *Id.* The federal government, however, provides a 50¢ per gallon tax credit for propane used in motor vehicles. R.R. Comm’n of Tex., *supra* note 109.

290. 34 TEX. ADMIN. CODE § 3.701 (2009). A fee is imposed on the first sale of automotive oil delivered to a location in Texas and sold to a purchaser who is not an automotive oil manufacturer or distributor; and on oil imported into Texas for sale, use, or consumption. *Id.* The tax is 1¢ per quart imported or sold in Texas. *Id.*

291. 34 TEX. ADMIN. CODE § 3.692 (2009). The tax rate on returns for transfer after September 1, 2005, is 1.333¢ per barrel of crude oil or condensate. *Id.* For transfers prior to September 1, 2005, the tax is 4¢ per barrel of crude oil or condensate. *Id.*

292. *See* TEX. TAX CODE ANN. § 162.114 (Vernon 2008). A sole owner, partnership, corporation, or other organization transporting gasoline or diesel fuel as a motor fuel transporter by means of truck, railroad tank car, or marine vessel outside the bulk transfer/terminal system is liable for the tax. *Id.*

293. 34 TEX. ADMIN. CODE § 3.151 (2009). The tax varies depending upon the net total gallons withdrawn. For less than 2,500 gallons the tax is \$3.75, for 2,500 but less than 5,000 gallons the tax is \$7.50, for 5,000 but less than 8,000 gallons the tax is \$11.75, for 8,000 but less than 10,000 gallons the tax is \$15.00, and for each 5,000 gallon increment on 10,000 gallons or more the tax is \$7.50. *Id.*

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U.S.—not because the gas itself costs more, but because of their higher taxes.²⁹⁴ In the summer of 2008 when Americans were paying \$3–4 a gallon, Europeans were paying \$8–10.²⁹⁵ Some, such as journalist and columnist Thomas Friedman, have advocated that the U.S. adopt a similar approach, suggesting to raise gas taxes until gas is so expensive that people alter their behavior to adjust to the higher prices.²⁹⁶ Under this proposal, the government would pick a floor price, (in Friedman’s case it was \$4 a gallon), and the gas tax would be adjusted monthly to ensure that gas prices never fell below this floor.²⁹⁷ To ease the regressive effect of such a tax, he suggested reducing payroll taxes for poorer people or having the government repurchase their gas guzzlers using the new tax revenues.²⁹⁸

Raising gasoline prices high enough undoubtedly will affect consumer behavior. One need only consider the impact \$4 gas had on American driving habits and on the popularity of fuel-efficient vehicles to consider the impact \$8–10 gas would have. Texans might decide that there are vehicles other than pickups and SUVs.²⁹⁹ The average American would drive less, mass transit would become more popular, and the demand for more fuel-efficient vehicles would increase. But Friedman’s proposal gives no attention to its impact upon the economy. It would be a mistake not to consider the drag effect of a sudden and significant gas price hike, especially with the economy in a recession.³⁰⁰ It would also be a mistake to believe that reduced payroll taxes alone will offset the regressive effect of European-style gas taxes. Even if a poor family does not own a car and, therefore, buys no gas directly, everything they purchase that has a transportation component will cost more. Unemployed poor people, or people working on a cash basis, would receive no benefit from reduced payroll taxes, and underemployed poor people may not make sufficient income for reduced taxes to offset their increased costs.

In Europe, the governments’ intentions were to reduce the demand for gasoline by making it more expensive. The same approach could also be

294. James Martin, *Gas Prices in Europe—European Gasoline and Diesel Prices*, ABOUT.COM, http://goeurope.about.com/od/transportation/a/gas_prices.htm (last visited Nov. 17, 2009).

295. Energy Info. Admin., *Weekly Retail Premium Gasoline Prices (Including Taxes)*, <http://www.eia.doe.gov/emeu/international/gas1.html> (last visited Nov. 17, 2009).

296. See Thomas L. Friedman, *Truth or Consequences*, N.Y. TIMES, May 28, 2008, available at <http://www.nytimes.com/2008/05/28/opinion/28friedman.html>.

297. *Id.*

298. *Id.*

299. In the interest of full disclosure, the author drives a Ford Explorer—his third.

300. In fairness to Mr. Friedman, his proposal was published before the current economic crisis had taken hold, but others have continued to call for this type of tax. See Scott Whitlock, *ABC’s Diane Sawyer Pleads for European-Style Gas Tax*, MEDIA RESEARCH CENTER, May 19, 2009, <http://www.mrc.org/biasalert/2009/20090520045045.aspx> (noting that during an interview with Carol Browner, Assistant to the President for Energy and Climate Change, Diane Sawyer asked six times why the administration was not considering a European-style gas tax).

used to discourage a particular method of energy consumption. If, for example, the federal government wanted to reduce the demand for SUVs, it need only tax them. The advantage of this approach is that it has no direct cost to the government. The difficulty is the political cost of adopting a new tax, particularly if the taxed item is popular.

If, or when, the U.S. transitions to alternative energy sources, tax policy will need adjustment. To see this, assume that the federal government taxes all coal mined in the U.S. and that this tax is assessed when the coal is produced. If, because of environmental policies, coal is replaced with an alternative energy source to generate electricity, coal production tax revenues will decrease. Assume further that policymakers determine that this revenue must be replaced. If the alternative energy source receives a federal subsidy, it would be impractical to replace the coal-production tax with a like tax on the alternative energy source. If policymakers determine that the new tax revenues should, if possible, still come from energy transactions, one option is to simply change where in the transaction the tax is assessed. For example, rather than tax the materials used to produce electricity, tax the produced electricity.

Because this would be a new tax, the political cost could be significant. No tax is ever popular among the people being taxed. This one could face additional opposition. As noted previously, poorer households spend a larger percentage of their income on energy than higher income households. A tax assessed on electricity bills would, therefore, be regressive. Moreover, that tax would presumably be separately identified on the consumer's bill. Thus, unlike gasoline taxes which are largely invisible to the average consumer because they are subsumed into the price of gasoline, this tax would be highly visible.

VI. CONCLUSION

Energy policy may be among the most complicated governmental policies because it impacts, and is in turn impacted by, so many other policies. Changing energy policy impacts tax revenue. Changing monetary policy changes the price paid for energy. Promoting cleaner environmental policies harms the economy. At the beginning of this article, I noted that the U.S. has no specifically denominated national energy policy. Instead, U.S. energy policy has largely been the product of other policies. Clearly the U.S. can continue to pursue that path, and in all likelihood the lights will continue to come on and Americans will still travel. But the U.S. can also do better. A comprehensive energy policy that is integrated with broader economic, financial, and environmental policies will maximize U.S. interests and resources. The ultimate decisions I leave to the elected officials and the political process because any choice necessarily involves striking balances between competing

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interests, but I would respectfully suggest that it is appropriate to make these decisions now.