Spring 2018

U.S. Regulatory Regimes and Offshore Energy Production

Jeffery R Ray

Available at: https://works.bepress.com/jeffery_ray/8/
BUFFALO ENVIRONMENTAL LAW JOURNAL

CLIMATE SYMPOSIUM EDITION

ARTICLES

U.S. REGULATORY REGIMES AND OFFSHORE ENERGY PRODUCTION
Jeff Ray

DETHRONING STATE SECURITY: INTRODUCING A HUMAN SECURITY PERSPECTIVE TO ABSORB THE DANGERS OF CLIMATE CHANGE TO THE SELF-DETERMINATION OF ISLAND STATE INHABITANTS
Anemoon Soete

THE CLIMATE JUSTICE MOVEMENT IN WESTERN NEW YORK
Sam Magavern & Lynda Schneekloth

TO KILL A MIGRATORY BIRD: HOW INCIDENTAL TAKES BY COMMERCIAL INDUSTRY ACTIVITY SHOULD BE REGULATED BY A NEW CIVIL PENALTY REGIME, NOT THE CURRENT MBTA
Brittany E. Barbee

POLICY MELTDOWN: HOW CLIMATE CHANGE IS DRIVING EXCESSIVE NUCLEAR ENERGY INVESTMENT
Ashley Hardy & Dontan Hart
BUFFALO ENVIRONMENTAL LAW JOURNAL

CLIMATE SYMPOSIUM EDITION

ARTICLES

U.S. Regulatory Regimes and Offshore Energy Production
   Jeff Ray
   1

Dethroning State Security: Introducing a Human Security Perspective to Absorb the Dangers of Climate Change to the Self-determination of Island State Inhabitants
   Anemoon Soete
   27

The Climate Justice Movement in Western New York
   Sam Magavern & Lynda Schneekloth
   59

To Kill a Migratory Bird: How Incidental Takes by Commercial Industry Activity Should Be Regulated by a New Civil Penalty Regime, Not the Current MBTA
   Brittany E. Barbee
   91

Policy Meltdown: How Climate Change Is Driving Excessive Nuclear Energy Investment
   Ashley Hardy & Dontan Hart
   137

SUNY BUFFALO SCHOOL OF LAW
STATE UNIVERSITY OF NEW YORK
This paper shows that offshore wind is an emerging key resource that should comprise a greater portion of our national energy fuel mix. Energy security, as a new process of security to our economic and military might in the modern world, has become an intrinsic issue of national security. ¹ This paradigm is constrained by the knowledge and experience regarding the harmful effects of producing energy. The harm not only to human health and safety, but also to substantive sections of the respective environment and ecology that is geographically situated in proximity to extraction or production locations. Perhaps the most relevant representation of the potential for harm to human health, safety, and environmental impact is shown through the avoidable 2010 offshore Macondo disaster otherwise known as the Deepwater Horizon.²

Environmentalists and environmental agencies have worked tirelessly to achieve an effective environmental regime in the United States. Their efforts have paid dividends with regard to lowering incidents and setting guidelines for maximum dioxide levels in producing energy. Given the recent political shifts in the U.S. that now threaten these advances, this paper responds to this dynamic and engages in a scholarly review and commentary on existing policy.

INTRODUCTION

The United States has a mature legal system in general. Nonetheless, the argument surrounding renewable energy lacking an appropriate regulatory framework has surfaced.\(^3\) This paper will provide a brief review of existing energy sources and conduct an analysis regarding the offshore regulatory capabilities of the United States, focusing on offshore wind energy.

The analysis is confined to current viable, substantive and contentious issues. This paper does not assert this analysis as comprehensive in nature. Nonetheless, this analysis is important to present an assessment of the United States’ energy security in the context of the ever-present issues of climate change, economic and political stability, and the maintenance of the United States’ quality of life for its citizenry.

In order to keep this analysis manageable, the research presented will limit the substantive discussion on renewable energy to wind energy. It is conceded that various forms of offshore energy sources such as hydrokinetic and floating solar platforms have potential for production usage.\(^4\) However, after a substantial survey of scholarly materials on offshore renewable energy, the compilation of reviewed materials suggests that offshore wind is currently the most widely implemented offshore renewable energy source due to its economic and technical viability. Therefore, the discussion of offshore renewables within this paper will be focused on offshore wind.

First this paper will provide a general survey fuel sources starting with coal. As a, relatively, highly regulated and major fuel source in the United States energy mix, coal will have a relatively substantive survey within this paper. Second, oil is briefly discussed as a fuel source in this paper. The extent of coverage in the oil survey is minimal due to its nominal, and fleeting, presence in the United States energy fuel mix. Third, natural gas is covered relatively substantively as a majority stakeholder in the United States energy fuel mix.

---


States energy fuel mix and still appears to be growing. Fourth, the paper covers nuclear energy as a fuel mix; discussing the relevant regulatory agency and primary concerns related thereto. Fifth, wind energy is covered as a fuel source. As the focal point of this paper, offshore wind is surveyed more intensely than the other fuel mixtures. Sixth, an analysis is undertaken regarding United States policy on energy fuel mixtures; focusing on water consumption, water quality or water pollution concerns. Finally, selected environmental laws are analyzed.

I. REGULATORY REVIEW OF THE EXISTING ENVIRONMENTAL ENERGY REGIME

A. Coal

Globally, coal is the dominant fuel source for electricity production.5 The United States possesses over 200 years of this fuel mix at current expenditure rate.6 Regulatory concerns regarding coal in areas of environmental importance are either focused on surface mining or combustion of coal for electricity.

The Surface Mining Control and Reclamation Act of 1977 ("SMCRA") was the first major surface mining law that created a regulatory agency to enforce the provisions thereof. The SMCRA required mines to be substantially restored to their original state—to the extent possible—after mining ceases. The Office of Surface Mining Reclamation and Enforcement was placed as the enforcement agency by the SMCRA. The Office’s viability has been criticized by preeminent academics for its impotency due to inconsistent funding and administrative struggles potentially arising out of a lack of solid leadership.7

Environmental issues surrounding production and use of coal are substantial. Northern Appalachia is being irreparably scarred

5 INTERNATIONAL ENERGY AGENCY, KEY WORLD ENERGY STATISTICS 24 (2012 ed. 1997).
7 Id. at 311.
from mountain top removal. One political scientist placed substantial blame upon a lack of enforcement or noncompliance with the SMCRA in Kentucky and West Virginia resulting in environmental devastation notwithstanding the codification of SMCRA.

Underground mining comprises just as much of the coal industry as surface mining—particularly so in the Appalachia. Underground mining is regulated by the Mine Safety and Health Act of 1977 that made substantive amendments to the 1969 Coal Act and created an oversight agency, the Mine Safety and Health Administration. Nearly three decades later, the Mine Improvement and New Emergency Response Act made several changes to the Mine Safety and Health Act that created a more robust safety planning mechanism and eased tensions for first responders.

Combustion of coal for energy production has two major environmental concerns. First, air quality issues, more colloquially termed air pollution, are inherent in the combustion of coal. When combusted, coal produces, inter alia, carbon dioxide, nitrogen oxide and sulphur dioxide. More importantly, the quantity of volatile organic compounds released is approximately twice that of coal’s competing fuel mix—natural gas. The primary U.S. regulatory mechanism with regard to air quality is the Clean Air Act, enforced by the Environmental Protection Agency.

---

14 Id.
The second issue involved in the combustion issue for coal for energy production is water quality or water pollution issues. Power generation plants in the United States produce between “125 and 130 million tons of toxic ash and sludge.”

Rosenbaum notes that the regulation of this harmful slurry has been in an area of twilight under existing law—making enforcement troublesome. However, in recent years, the U.S. Environmental Protection Agency has set new studies and rules; the final rule is purported to address the technical facets with regard to landfills and surface containment—perhaps too early to make a credible determination on the viability of the rule. Much of the danger of coal slurry lies in its chemical makeup, known to contain arsenic, copper, cadmium, chromium, barium, mercury, lead, and thallium.

While the science-based equation of switching coal usage to natural gas is fairly straightforward, there are other socio-economic issues at play. For example, a diverse fuel mix bolsters energy security by preserving production capabilities in the event one source is not available. Local employment is also a concern. As this author has observed, the move away from coal also puts unique strains on the micro level for mining communities in the even their local mines are shuttered. There is nothing wrong with seeking to move to a more sustainable and environmentally safe fuel source than coal. However, this author has observed no comprehensive or extensive enough program to transition local mining economies by providing acceptable and respectable replacement skills for those workers.

B. Oil

Oil is used in the production of electricity via petroleum coke. The impetus behind using oil to generate electricity is all but gone as electricity production via oil in the U.S. is down to 1% of

---

16 Rosenbaum, supra note 6, at 313.
17 Id.
electricity produced.\textsuperscript{20} The U.S. Environmental Protection Agency has expressly acknowledged the complete lack of national emission standards regarding petroleum coke.\textsuperscript{21} Petroleum coke is, instead, regulated by state variations of the National Ambient Air Quality Standards.\textsuperscript{22} Given the nominal prospect of substantive future use of petroleum coke in electricity generation, this paper will not provide a further analysis of this fuel source.

C. Natural Gas

The Federal Regulatory Commission (FERC) is responsible for monitoring and enforcing natural gas in interstate commerce is the United States.\textsuperscript{23} The Department of Energy Organization Act created the FERC in 1977 and empowered the organization through several subsequent legislative acts.\textsuperscript{24} Among those acts are the 1938 Natural Gas Act, the 1978 Natural Gas Act, and the Gas Wellhead Decontrol Act.\textsuperscript{25} The post 2000 shale gas industry has provided the United States with a substantive energy fuel reserve.\textsuperscript{26} A concomitant benefit with the increase in recoverable reserves for this fossil fuel is that natural gas has a substantively reduced greenhouse gas footprint than other fossil fuels such as coal.\textsuperscript{27} While the global energy demand is


\textsuperscript{22} \textit{Id.}

\textsuperscript{23} \textit{The Market under Regulation}, NAT. GAS (last updated Sept. 20, 2013), http://naturalgas.org/regulation/market/.

\textsuperscript{24} \textit{Id.}


\textsuperscript{27} Jenner, \textit{supra} note 26, at 443–45.
expected to rise "by more than 50% by the year 2030" and the fuel mix to support this demand is expected to be comprised of an 80% share of fossil fuels.\textsuperscript{28} Relative to other fossil fuels, natural gas' reduced environmental impact makes it a natural fit to meet growing energy demand as it is presently anticipated.

There are socio-economic issues regarding natural gas that both provide impetus for production and resistance of production in the same turn. On the macro socio-economic level, natural gas combustion provides similar electricity production compared to coal, yet produces demonstratively less greenhouse gases when compared to coal.\textsuperscript{29} However, on the micro socio-economic level, natural gas production, specifically the industry game changing method of hydraulic fracturing, also known as "fracking," induces resistance from many communities.\textsuperscript{30} Some concerns such as contamination of water tables in these communities may be overstated when viewed with the current best practices;\textsuperscript{31} while other concerns such as causality with regard to earthquakes are being reevaluated as having more of a causal link to fracking than initially thought.\textsuperscript{32}

Natural gas is a fossil fuel that is in abundance in North America.\textsuperscript{33} The combustion process causes significantly less long-term air pollution than its counterpart fossil fuels. Groundwater and surface water contamination potential can be reduced significantly with industry best practices. Geo-seismic stimulation is a matter that although recent data shows as a minimal concern, the most recent

\footnotesize
\textsuperscript{29} Jenner, supra note 26, at 145–46.
\textsuperscript{32} \textit{Earthquakes Induced by Fluid Injection FAQs}, U.S. GEOLOGICAL SURV., https://www2.usgs.gov/faq/categories/9833/3428 (last updated Nov. 16, 2016).
\textsuperscript{33} G8 Summit, supra note 28.
research in seismicity indicates a scholarly need for further analysis to incorporate ongoing data into collective analysis.

D. Nuclear

Nuclear power comprises nearly twenty percent of the United States’ electricity production. The nuclear energy industry is regulated by direct legislative statutes and overseen by the Nuclear Regulatory Commission. By reputation, the Nuclear Regulatory Commission is in the top echelon of regulatory agencies. Unless there is an accident or breach in handling of the fuel source, nuclear energy produces very little lifetime carbon dioxide emissions, but does require substantial water consumption or water withdrawal. However, water discharged from the cooling systems of nuclear power plants can cause sudden thermal increases that can cause lethal impacts to aquatic life near the discharge site. While this increase of thermal divergence may sound like a nominal issue, the sudden heating of a marine environment creates an inhospitable environment for marine life in close enough proximity to be impacted.

One also cannot discount public opinion issues regarding nuclear energy. Nuclear power plants may no longer have substantial resistance from what is referred to as the NIMBY or “Not In My Back Yard” effect, as one poll suggests. However, some suggest that the NIMBY sentiment regarding necessary nuclear waste

---

produced is still strong.\textsuperscript{37} Even though this ideology suppressed production of nuclear power plants for decades in the United States, the question now is if the United States has reaffirmed its interest in nuclear power.\textsuperscript{38} Professor Rabe from the University of Michigan noted that it is not surprising that an energy source that comprises one-fifth of the United States’ energy fuel mix is not going to be shut off too quickly. However, Professor Rabe also noted that the waste will be problematic due to its long half-life and extreme radioactive toxicity.\textsuperscript{39}

E. Wind

The United States has a mature onshore wind regime. The onshore wind generators are permitted and overseen by the Department of Interior.\textsuperscript{40} Onshore wind energy produces 11,000MWh of installed capacity for the United States power grid annually.\textsuperscript{41}

In contrast, the United States’ offshore wind regime is in its infantile stage as the first offshore wind farm connected to the grid in the United States occurred December 12, 2016.\textsuperscript{42} The first offshore wind farm in the United States was off the coast of Rhode Island and has an installed capacity of 30MW.\textsuperscript{43}


\textsuperscript{40} Id.


\textsuperscript{42} Id.

There are a handful of applications being sought for building offshore wind farms in the United States via obtaining an initial lease. The Bureau of Offshore Energy Management has identified areas for renewable offshore commercial energy development. In fact, there were some blocks off the coast of Florida that were recently up for bidding.

Perhaps the best measurement of success in the offshore wind industry could be the European Union. The European Union has been building offshore wind farms since 1991. Currently, the European Union has over 12,631 MW of installed capacity. With fields that dwarf the output of the Rhode Island wind farm, the European Union is seeing the continuation of massive investments in offshore wind energy.

The United States offshore wind energy production is quasi-regulated by legislative statutes and overseen by the Bureau of Offshore Energy Management, with overlap from other agencies. The suggestion of “quasi-regulation” is used to connote that there are statutes that speak directly to renewable energy, such as wind, but offshore wind is regulated just as much, if not more, by indirect environmental legislation.

Legislative statutes that govern offshore wind are a variation of the offshore oil and gas regime. As this author has previously noted for oil and gas, and is just as important to offshore wind

---

generation, the key offshore regulatory mechanisms are: the Coastal Zone Management Act (CZMA); the National Environmental Policy Act (NEPA); the Submerged Lands Act; the Magnuson-Stevens Fishery Conservation and Management Act; the National Marine Sanctuaries Act; Marine Mammal Protection Act; Endangered Species Act; the 1982 United Nations Convention on the Law of the Sea; and the Energy Policy Act of 2005.

A comprehensive analysis of the above statutes is beyond the scope of this paper. However, the NEPA, the Energy Policy Act of 2005, and the CZMA are appropriate for further attention in a later section of this paper.

II. POLICY REVIEW

A. Fuel Mix and Concerns

The United States’ energy policy mix has changed substantively over the past ten years. The substantial increase in hydraulic fracturing and concomitant increase in shale gas production has prompted a shift toward the use of inexpensive shale gas to replace other energy sources and meet additional energy production needs. Since 2010, onshore renewable energy has also made substantial strides in the national fuel mix. However, offshore renewable energy sources have only just surpassed the embryonic stage and perhaps now constitute an infantile industry.

---

56 Id. at 16.
57 Id. at 12, 16.
2016 Electricity Generation by Fuel Source

- Natural Gas: 34%
- Nuclear: 20%
- Coal: 30%
- Petroleum: 1%
- Solar: 1%
- Other: >1%
- Renewables (excl. hydroelectric, wind and solar): 2%
- Wind: 6%
- Hydroelectric: 6%
The underdeveloped state of U.S. offshore renewable energy regulation pales in comparison to the comprehensive legal regime present in the European Union.58 The European Union has been utilizing offshore wind energy since 1991 and currently has an installed capacity of over 12,000MW.59 The European offshore wind energy industry has made 60 substantial gains in installed capacity in recent years and every indication shows that investors are continuing to show interest in the offshore wind development within the European Union.61

There are two primary environmental issues regarding water when discussing energy production.62 First, there is the issue of water consumption and scarcity.63 Second, there is the issue of water quality, also known as water pollution.64 Here, there are interesting findings, particularly with water usage.

One comprehensive review of usage by U.S. Gallon per MWh of power produced shows that wind energy is the least water use intensive method of energy production.65 For comparison, primary sources of fuel, such as coal, have the potential for varied impacts on water. Depending whether the coal is surface mined or mined from underground, the water consumption averages between

60 See generally Meldrum et al., infra note 74.
64 Id.
22 U.S. Gallons per MWh to 56 U.S. Gallons per MWh. The processing and transportation of coal was determined to consume a median of 18 U.S. Gallons per MWh. In addition, the cooling of coal fired power plants requires “hundreds to thousands of gallons withdrawn and consumed per MWh.”

Mitigating the impacts of coal by coal-ash handling, pollution scrubbing, and desulfurization uses 155 to 297 U.S. Gallons per MWh. By comparison, natural gas generally uses less water over its lifetime while nuclear energy uses substantially more water over its lifetime than coal.

The fuel source with the lowest water usage in the Meldrum study was wind power. Wind power was found to withdraw a modest 26 U.S. Gallons of water per MWh and use or consume approximately 1 U.S. Gallons of water per MWh. It is conceded that water usage is not the sole determining variable in what fuel source is utilized, yet water usage is an important variable from an environmental standpoint. With regard to the environmental perspective, wind power is the optimal fuel source.

---

66 Id. at 5.
67 Id. at 7.
68 Id.
69 Id.
70 Id. at 8–10.
71 Id. at 12.
After review of water usage concerns, the next logical issue to discuss regarding offshore energy is water pollution. For this discussion selected laws regarding offshore environmental protection will be discussed.\(^{72}\)

### B. Selected Laws

The National Environmental Policy Act is a seminal environmental law in the United States.\(^{73}\) The Act was drafted and passed in response to a significant outcry after an oil spill off the

\(^{72}\) See generally id.

coast of Santa Barbara, California. One of the important aspects of the NEPA is that it created the Council on Environmental Quality along with requirements for environmental impact statements in order to proceed with projects on federal lands or waters that may have substantial adverse environmental impacts.

The Coastal Zone Management Act attempts to merge federal and state interests in offshore endeavors. According the CZMA, coastal states maintain higher level of authority for the first three miles from their coast with some exceptions to waters in the Gulf of Mexico that are extended out to approximately nine nautical miles. While the entirety of a wind farm may be beyond the three mile CZMA delimitation, there will be a transmission line, similar logistically and legally to that of an oil pipeline, and potentially other support equipment that will be within the CZMA area, requiring certain considerations to be given to the respective state’s coastal zone management plan.

It is worth note that the NEPA and the CZMA, which guide offshore wind were both enacted to primarily regulate the oil and gas industry and these statutes are the progeny of the Truman Proclamation. Given recent congressional deadlock, extending the coverage of these laws to offshore wind may be the only viable method available to establish an effective offshore wind energy legal regime in the United States.

---

75 42 U.S.C § 4321 et seq.
76 Marc J. Hershman et al., The Effectiveness of Coastal Zone Management in the United States, 27 Coastal Mgmt. 113, 114 (1999).
80 Rinfret, supra note 73, at 75.
Regulation from federal agencies and presidential executive orders have formed the bulk of new environmental laws for the past few decades.\textsuperscript{81} Some of these executive orders have been criticized for being watered-down versions of the originally proposed orders. However, many pundits have accepted compromise as the political cost of doing business.\textsuperscript{82} Under the Trump Administration, it has become clear that the inefficiency and volatility of such a mechanism is an untenable method for long term regulatory success, as can be shown through the multiple executive orders attempting to undo previous presidential executive orders throughout the first nine months of 2017.\textsuperscript{83}

Beyond the general environmental regulatory regime, there are a few laws that specifically address offshore wind energy. Two of the key laws regarding offshore wind include the Energy Policy Act of 2005 and the National Environmental Policy Act of 1969.

The Energy Policy Act of 2005 was a long overdue addition to United States’ renewable regulatory regime. One substantial benefit that this law provided to the renewable industry is the various assessments that were prompted that effectively attempt to inventory the United States’ renewable energy resources.\textsuperscript{84} This inventory was an important step toward advancing renewable resources onshore and offshore a financial standpoint.

A major factor in developing any energy infrastructure is financial viability. Once funds are sunk into an energy project, they are sunk for decades. However, in the renewable sector, one has to take a more pragmatic view. Prior to sinking funds into a project, there must be an investor prepared to utilize funds to advance a project. There are many difficulties to market entry and earning sufficient return on investment in an industry dominated by the fossil fuel sector. Yet, the resource inventory provides a foundation

\textsuperscript{81} Id.

\textsuperscript{82} Id. at 74–79.

\textsuperscript{83} The Washington Times Advocacy Department, President Trump's first 100 days on energy and the environment, THE WASHINGTON TIMES (May 1, 2017), http://www.washingtontimes.com/news/2017/may/1/president-trumps-first-100-days-on-energy-and-the-

\textsuperscript{84} 42 U.S.C. § 15851 (2005).
of known data points to reduce uncertainty and foster a more secure investment, particularly in the offshore industry where there is historically little data to provide investors with stable financial predictions within the U.S. context.

Another benefit of the Energy Policy Act 2005 is that it stabilized a provision that provided an incentive structure for renewable energy programs. This seemed promising, except the financial incentives in the legislation ended before there was a viable offshore project eligible to receive them. By comparison, the United Kingdom has sustained its incentives for renewables and has implemented costs offsets levied against entrenched industries. This shows that government support of the renewable industry may be required for long term in the growth of the sector.

The National Environmental Policy Act of 1969 was a foundational piece of environmental legislation enacted as the result of an oil spill off the coast of Santa Barbara. The NEPA placed a duty upon the federal government to ensure an environmental impact statement for all “major Federal actions significantly affecting the quality of the human environment.” As aptly stated by one scholar, “[l]arge-scale renewable projects have impacts comparable to any other large-scale industrial project, and they should not receive an automatic pass on environmental requirements.”

The sole operating offshore windfarm in the United States put forth an environmental report indicating only nominal short-term

---

87 See, Electricity Act 1989, c. 29 at 3, 18, 53, 67, 68, 157, 224, 229 (Gr. Brit.) (legislation that privatized electricity supply industry in Great Britain and established a licensing regime and a regulator for this industry).
89 42 U.S.C. § 4332 (2) (c) (2012); see also 40 C.F.R. § 1501.2 (2010).
disruptions—mainly during construction.\textsuperscript{91} The same environmental report included a substantial section regarding impediments or resistance in visual aesthetics resulting from the construction of the windfarm.\textsuperscript{92} The environmental report found these impacts to be minor in nature and perhaps the local population would not even consider the windfarm as a negative impact in visual aesthetics in the area nor a substantial harm to the local or transitory avian population.\textsuperscript{93}

C. Socio-Political

Donald Trump has stepped into the lime-light as President of the United States. One of his flag banners has been to be a champion of the coal industry.\textsuperscript{94} In his short tenure as President, Trump has made several decisions that have had a substantive impact on the United States’ environmental regime.\textsuperscript{95} As Professor James Van Nostrand indicated in an interview, even though there may be an impact on the energy regime, the regulatory restraints are not the sole nemesis of the coal industry—market forces are stacking against coal in the United States electricity market.\textsuperscript{96} While there are energy security benefits of coal and a definite place for it in the near to moderate future in the United States, this author has to agree with the Professor that market forces are not going to permit the coal industry to power the United States electrical grid as it once did it its proverbial glory days. Said another way, coal no longer is the only thing that keeps the lights on—a turn of phrase on a widely known coal-town motto that suggests coal is the primary American electricity producing fuel source, into the current recognition of King

\textsuperscript{91} Deepwater Wind, Block Island Windfarm and Block Island Transmission System Environmental Report/ Construction and Operations Plan 1–7 (Tetra Tech EC, Inc. 2012).
\textsuperscript{92} Id. at 1–197.
\textsuperscript{93} Id.
\textsuperscript{95} The Washington Times Advocacy Department, supra note 83.
\textsuperscript{96} Id.
Coal's waning dominance where he has lost his crown and although he may stay in the royal court of energy production, he will never again be the sole king.

President Trump is not the first, nor will he be the last, to make significant changes to the national energy policy. Gerald Ford was a strong proponent of oil, coal and deregulation of the fossil fuel industry. Ronald Reagan used his first term to unravel or defund many of the environmental policies set by his predecessor Jimmy Carter. Rinfret and Pautz have stated that George W. Bush and his counterpart Dick Cheney focused nearly entirely on the advancement of fossil fuels.

The U.S. environmental regime has been built primarily on soft law for decades due to congressional gridlock. Because so much of recent U.S. environmental law has been advanced by regulations and executive orders, it is vulnerable to recension by President Trump and set the U.S. back decades in regulatory advancement. Framed alternatively, President Trump's attention and effort on the energy sector, playing a possibly supportive role in developing all forms of energy could benefit the United States at this time. However, fossil fuels must be exploited with reasonableness, sustainability, pragmatism and a genuine eye toward human well-being and environmental safety.

D. Socio-economics

If one views the lack of offshore renewable energy in the United States as a result of an investor security issue, a curious paradigm emerges. It has long been recognized that investors need stability in their investments. In fact, there are entire legal doctrines

---

97 Rinfret & Pautz, supra note 73, at 82–87.
98 Id. at 82–83.
99 Id. at 83–84.
100 Id. at 84.
101 Id. at 85.
102 Id. at 89.
that balance investor stability and consumer protections.\(^{103}\) In embryonic or infantile industries, financial stimuli and stability have been accepted as a necessity to foster innovation and spur the industry by providing sufficient financial stability to be conceived and to grow. In the United States, the Internal Revenue Code is used to provide incentives to industries that the government wishes to breath proverbial life into being.\(^{104}\) As Klass and Wisman note, the United States government invests substantial amounts into industry, joint research and development projects.\(^{105}\) Another governmental incentive for renewables in recent years has been the Renewable Portfolio Standards—a regulation that requires that a certain percentage of energy production be sourced through renewable energy methods.\(^{106}\)

The legal structures around offshore renewables in the United Kingdom should inform the development of the same in the United States. The regime in the United Kingdom indicates that a sufficient mixture of feed-in-tariffs, oil and gas levies, and other financial incentives are necessary for the cultivation and maturation of the offshore renewable industry.\(^{107}\) While the United States has previously instituted incentives for renewables, the United Kingdom appears to have an advantage with its advancements in offshore wind.

There are quasi-governmental and private economic stimuli that could be utilized for offshore renewables in the United States. One such stimuli used in the United Kingdom, but not exclusively thereto, is long-term contracts creating an obligation to buy a certain amount of energy upon the commissioning of the windfarm, otherwise known as power-purchasing agreements.\(^{108}\) This is a


\(^{105}\) Id.

\(^{106}\) Id.

\(^{107}\) See generally Electricity Act 1989, supra note 87.

mechanism that could assist in alleviating some of the risk for the large-scale investment that is a sunk cost up front.\textsuperscript{109}

Another European law worth mentioning is the Third Energy Package.\textsuperscript{110} This piece of legislation diversified energy production for the European Union by being the penultimate legislative mechanism for fully unbundling the EU electricity regime, provided substantive renewable energy portfolio requirements, and establishing a carbon trading system. Some authors noted the substantial risks that were taken with the dramatic change in the energy regime under the Third Energy Package because unbundling alone is a massive undertaking.\textsuperscript{111} Nevertheless, the Third Energy Package has been hailed for its push toward renewable energy in establishing required renewable energy portfolios and a phased carbon trading system; perhaps its biggest accomplishment was in keeping investors soothed in the midst of substantive change.\textsuperscript{112}

E. Energy Security

Energy security is the idea of integration across multiple areas to create energy reliability and stability that make a degree of stability. Those areas can include infrastructure, supply of fuel, durability in relation to wear and tear and intentional harm, system

\textsuperscript{109} Id.


\textsuperscript{112} Jeffery R. Ray, \textit{supra} note 103, at 874.
reliability, and a functioning investment and finance sector. These guideposts present a functioning format for discourse on offshore wind’s role in energy security.

Offshore wind is an emerging source of energy within the United States. Therefore, the level of infrastructure is inherently lacking as it has yet to be built. Nevertheless, the infrastructure for offshore oil and gas has demonstrated technical and economic ability and feasibility for several decades.

The supply of fuel for offshore wind is, by definition, unlimited in duration. There are over 4,000 gigawatts (GW) of potential installed capacity for offshore wind on the United States offshore continental shelf. Even though there is an unlimited durational supply of wind to power turbines, the wind does not always blow. Thus, there will be intermittency issues with this fuel source, however, the intermittency issue can be mitigated with energy storage devices.

From an energy security perspective, offshore wind has many advantages to merit a substantive increase in the national energy fuel mix. There is an ample supply of fuel for offshore wind; the potential capacity represents substantial growth potential. There are some negatives as well. It is difficult to store electricity once it is produced. However, recent advancements in utility scale batteries may offset the negative intermittency to at least a neutral point or a negative that could be alleviated with proper planning and

---


financing.\textsuperscript{117} Offshore wind has been successfully installed off the coast of Rhode Island, so technical and financial feasibility and has been demonstrated and shows it is possible in certain areas.\textsuperscript{118} While the United States may have some lessons to learn regarding offshore wind, it is slowly gaining momentum and should attempt to learn from nations like the United Kingdom which have a more mature offshore wind industry in order to exploit the vast resource potential in the United States’ waters.

\section*{Conclusion}

Offshore wind energy is an emerging key resource that should have a greater portion of our national energy fuel mix. As discussed above, wind energy uses substantially less water than other forms of energy production. Further, there is ample supply of this renewable resource off the coasts of the United States. With advances in energy storage, it appears that the time is right for the United States to take the training wheels off of its energy policies and wade into deeper waters.

The socio-political tendencies in the United States may cause environmental concern from environmentalists and academics. However, the political winds increasingly appear to be prevailing in favor of offshore wind. Nevertheless, it truly remains to be seen if the current administration is up to the task of promoting offshore renewable energy.

The United States could use a more substantive boost to grow the infantile offshore renewable industry. Something more than tax incentives and renewable portfolio standards are needed for at least the initial build out of offshore renewable energy. Perhaps

\textsuperscript{117} See Int’l Energy Agency [IEA], Tracking Clean Energy Progress 2016: Energy Technology Perspectives 2016 Excerpt IEA Input to the Clean Energy Ministerial, at 56 (2016) (discussing economic benefits of increased battery storage capacity).

aligning incentives closer to the feed-in tariffs of the United Kingdom for a period of time could be an effective measure.