A CASE STUDY ON THE POLITICS BEHIND SUSTAINABLE ENERGY POLICY: GERMANY'S "ATOM-MORATORIUM" AND "ENERGIEWENDE"

RICHARD J. SCHELL

I. INTRODUCTION

Nuclear power has been of particular importance to European countries due to its low cost and atmospheric emissions that are almost inexistent when compared to fossil fuels. However, the dangers of a possible Chernobyl or a Fukushima like incident occurring in Germany—a country slightly larger than New Mexico—have also been a part of the discussion surrounding this particular energy source. Alongside this is the fact that, although nuclear energy does produce cleaner emissions, power plants produce more hazardous waste in depleted radioactive material that cannot be disposed easily. As a result of these

difficulties, pro-environment groups question the role of nuclear power in European economies.[1]

Although anti-nuclear forces have enjoyed marked recent success, this has not always been the case. The movement was unable to garner a majority of people to support the abolition of nuclear power, even as the Chernobyl disaster spread radioactive material throughout Europe. It took the meltdown in Fukushima to spur the following generation—one much more environmentally conscious—to call for the closing of nuclear plants.[2] Following intense political discussion, both on the merits of the issue and on the German government's own role in executing policy, Chancellor Merkel announced a nuclear moratorium: the "Atom-Moratorium."[3] Declaring that closing down every nuclear plant would be too costly, the German government avowed that older plants' closings would be accelerated and that no new nuclear plants would be built.[4]

Although the German government made plans to increase exploitation of alternative energy sources, particularly, renewable energy sources, it had not planned for the immediate closing of seven nuclear power plants. These were originally intended to be phased out during the latter half of the 2010s.[5] The government, therefore, recurred to massive investments, both short and long-term in order to shore up its energy productions. These actions have been called the "Energiewende" within and outside of Germany.[6] In hindsight, the German government's decision to invest in renewable energy and to shut down nuclear power plants has been vindicated in the sense that the infrastructure is already in place for a sustainable energy economy, demonstrable by the country becoming a net energy exporter now in comparison to its neighbors, who are particularly reliant on fossil fuels like coal, oil, and particularly, Russian gas.[7]

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[1] Joachim Radkau, *Eine kurze Geschichte der deutschen Antiatomkraftbewegung*, BUNDESZENTRALE FÜR POLITISCHE BILDUNG (Nov. 10, 2011), http://www.bpb.de/apuz/59680/eine-kurze-geschichte-der-deutschen-antiatomkraftbewegung?p=all.

[2] Cristoph Twickel, *Deutsches Anti-AKW-Gefühl: Im Land der Mahnbürger*, DER SPIEGEL (Mar. 15, 2011, 5:18 p.m.), http://www.spiegel.de/kultur/gesellschaft/deutsches-anti-akw-gefuehl-im-land-der-mahnbuerger-a-750990.html.

[3] Sebastian Fischer & Philipp Wittrock, *Schwarz-gelbe Atomwende: Die neue Anti-AKW-Bewegung*, DER SPIEGEL (Mar. 15, 2011, 7:13 p.m.), http://www.spiegel.de/politik/deutschland/schwarz-gelbe-atomwende-die-neue-anti-akw-bewegung-a-751078.html.

[4] *Schwarz-gelbe Wende: Merkel klemmt sieben Reaktoren ab–vorerst*, DER SPIEGEL, (Mar. 15, 2011, 11:52 a.m.), http://www.spiegel.de/politik/deutschland/schwarz-gelbe-wende-merkel-klemmt-sieben-reaktoren-ab-vorerst-a-751039.html.

[5] *Id.*

[6] *Introduction*, AGORA ENERGIEWENDE, http://www.agora-energiewende.de/en/die-energiewende/introduction/.

[7] *Deutschland exportierte auch 2012 mehr Strom als es importierte*, STATISTISCHES BUNDESAMT (Apr. 2, 2013), https://www.destatis.de/DE/PresseService/Presse/Pressemitteilungen/2013/04/PD13_125_51pdf.pdf?__blob=publicationFile.

The purpose of this paper is to examine the nature of the debates surrounding the implementation of public policy, specifically within the energy sector utilizing the Moratorium and Energiewende as a case study for such a purpose. Hopefully, it will serve as a roadmap to others seeking to further a similar conversation within their own society. In doing so, these participants would be able to view the debate within a factual framework and be able to understand the intricacies involved in a debate of such magnitude and to tailor their own political strategies with such complications in mind.

II. THE ESTABLISHMENT OF NUCLEAR POWER PLANTS AND THE ORIGINS OF ANTI-NUCLEAR ACTIVISM

In order to begin ascertaining the reasons behind the German public's antipathy towards nuclear energy, we must first head back to the 1970s when nuclear power plants now subject to the Moratorium were built. These developments were initially perceived as a way to stave off the oil crisis that had occurred earlier in the decade.[8] With the rising price of fossil fuels due to the formation of OPEC, the need to use other energy sources was paramount to the continued economic expansion of West Germany. Construction of these nuclear power plants began in the 1970s and continued into the 1980s and the present.[9] The development and operation of power plants proceeded uninterruptedly, with the older plants running concurrently with the new, up to the Atom-Moratorium.[10]

At the time when nuclear power came in vogue, environmentalist began to worry about the possible repercussions of a nuclear disaster and began to coalesce into non-partisan grassroots movements.[11] Their fears included the possibility of a reactor meltdown scarring the environment for generations and the disposal of radioactive energy.[12] Unlike the United States, where radioactive waste can be safely locked in the middle of the desert, Europe is much more densely populated and lacks such open places. Consequently, a fault or defect in waste disposal would negatively affect many more people forcing them from their homes and denying the use of already developed land. Other concerns stemmed from a more political dimension. Some of the movement's participants, influenced by Marxist thought, clamored for a more equitable and fair political

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[8] *Ölkrise und Kernkraft*, DIE ZEIT (May 8, 1987), http://www.zeit.de/1987/20/oelkrise-und-kernkraft.

[9] *Kernkraftwerke in Deutschland*, KERNENERGIE.DE, http://www.kernenergie.de/kernenergie/themen/kernkraftwerke/kernkraftwerke-in-deutschland.php.

[10] *Der Einstieg zum Ausstieg aus der Atomenergie*, DEUTSCHER BUNDESTAG (2012), https://www.bundestag.de/dokumente/textarchiv/2012/38640342_kw16_kalender_atomaustieg/208324.

[11] Radkau, *supra* note 1.

[12] Brian Martin, *Opposing Nuclear Power: Past and Present*, 26 SOC. ALTERNATIVES (NO. 2) 43 (2007), http://www.bmartin.cc/pubs/07sa.pdf.

environment.[13] They began to see the establishment and enshrinement of big energy developments as a means through which a bourgeois establishment was allowed to maintain itself.[14]

Although these people engaged in massive and highly visible protests against nuclear power,[15] they were unsuccessful in curbing the use of nuclear power.[16] Economic considerations won out due to the lack of alternate energy sources to substitute nuclear power. Interest in these movements plateaued, but they were able to maintain a lasting presence within the socio-political argument. The Chernobyl incident helped keep these movements relevant and spurred the creation of the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety.[17] The thought of nuclear waste contaminating farmland became one of the narratives behind which environmentalists began to rally. Not only did this allow environmentalists to secure their position in national politics, but to also consolidate and join forces with other political movements, particularly those on the left.[18]

In tandem with the grassroots movement, new political parties began to spring up around Europe focused on an environmental message. These "green" parties made environmentalism the core tenet of their manifestos. The abolishment of nuclear power, alongside other hot-button issues like reducing carbon emissions, global warming, and conservationism, became one of their chief concerns and most visible causes.[19] In Germany, however, the Green party has been unable to cement itself as a leading political voice at the national level.[20] Since reunification, aside from the Gerhard Schröder government of 1998 to 2005, in which the Greens participated as junior coalition partner, Germany has been

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[13] *Id.*

[14] *Die Zertrümmerung der Anti-AKW-Bewegung in bunte Teilchen*, 23 MARXISTISCHE STUDENTEN ZEITUNG (1978), http://msz1974-80.net/AntiAKW.html.

[15] One of the most notorious of these protests was the 1977 protest in Hamelin, Lower Saxony, where protesters bloodily, yet unsuccessfully, protested against the construction of Grohnde Nuclear Power Plant. *Böses Massaker*, DER SPIEGEL (March 28, 1977), http://www.spiegel.de/spiegel/print/d-40941633.html. Another such incident was the 1981 protest in Brockdorf, Schleswig-Holstein, where protesters sought to bring awareness to the problems of nuclear waste disposal. Twenty-two were reported injured. John Tabliabue, *West Germans Clash at Site of A-Plant*, THE NEW YORK TIMES (March 1, 1981), http://www.nytimes.com/1981/03/01/world/west-germans-clash-at-site-of-a-plant.html.

[16] This is exemplified by the construction of the protested reactors, including the one at Grohnde.

[17] *Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit*, PRESSEAUSWEIS.DE, http://www.presseausweis.de/service/bundespolitische-organe/bundesministerium-fuer-umwelt-naturschutz-und-reaktorsicherheit/geschichte.

[18] This is very nicely exemplified with the history of the Green Party in Germany (Die Grünen), which is actually the merger of three different political parties: Die Grünen, the Grünen Aktion Zukunft, and the East German Bündnis 90.

[19] In Germany, one of the more notable manifestos is the Grünen Aktion Zukunft's (GAZ) *Das Grüne Manifest*, published in 1978. The GAZ would later merge into Die Grünen.

[20] Serkan Agci, *Geschichte*, BUNDESZENTRALE FÜR POLITISCHE BILDUNG (Feb. 22, 2010), http://www.bpb.de/politik/grundfragen/parteien-in-deutschland/42151/geschichte.

ruled by either center-right or center coalitions led by Christian Democrats Helmut Kohl and Angela Merkel. The Greens have had greater success in state elections, where they have been junior coalition members in multiple regional governments.[21]

III. THE FUKUSHIMA DISASTER & THE ATOM-MORATORIUM

A. Catastrophic Nuclear Meltdown

The Fukushima Disaster was the result of a cataclysmic earthquake-tsunami event that crippled the Fukushima Daiichi Nuclear Power Plant. An earthquake initially ravaged the power plant, leaving it in a state of vulnerability to a rapidly approaching tsunami that flooded five of six reactors. As a result of these events, the plant's electrical systems completely blacked out. This left the reactors without any means of regulating their internal temperatures, and they only grew hotter.[22] Workers were unable to cool down the reactors through alternative means, which resulted in an unavoidable nuclear meltdown, far worse than Chernobyl in terms of gross nuclear material.[23] Land surrounding the power plant had to be evacuated due to the high levels of radiation. Ground water in certain regions was also affected by the contamination, being deemed undrinkable and not fit for human use otherwise. Additionally, radioactive material was spewed into the Pacific, much of which contaminated the local wildlife, including fisheries. This nuclear material has also coalesced into a plume that is currently on its way to the United States' West Coast, although the possibility of harm this last case has been deemed negligible.[24]

Much of the post-mortem reports dealt with the plant's security measures and its preparedness for natural disasters. Examples of mismanagement include not heeding warnings on tsunami preparedness, malfunctioning electrical equipment, and poorly built infrastructure that was prone to flooding.[25]

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[21] Die Grünen are currently junior coalition partners in the governments of Lower Saxony, Bremen, Thuringia, North Rhine-Westphalia, and Rhineland-Palatinate. They are the senior coalition partner in Baden-Württemberg.

[22] *Timeline for the Fukushima Daiichi nuclear power plant accident*, OECD-NEA (Mar. 7, 2012), https://www.oecd-nea.org/press/2011/NEWS-04.html.

[23] *Id.*

[24] James Conca, *Radioactive Fukushima Waters Arrive at West Coast of America*, FORBES (Mar. 16, 2014), http://www.forbes.com/sites/jamesconca/2014/03/16/radioactive-fukushima-waters-arrive-at-west-coast-of-america/.

[25] *Fuel storage, safety issues vexed Japan plant*, REUTERS (Mar. 22, 2001) http://uk.reuters.com/assets/print?aid=UKL3E7EM23620110322; *Operator of Fukushima Nuke Plant Admitted to Fake Repair Records*, HERALD SUN (Mar. 20, 2011, 6:33 p.m.), http://www.heraldsun.com.au/news/special-features/operator-of-fukushima-nuke-plant-admitted-to-faking-repair-records/story-fn858jk3-1226024977934?nk=023977a3dbb45ab8ed0a7f123c0f7917; *Japan, TEPCO ignored atomic accident risks due to 'myth of nuclear safety': Report*, NEWSTRACK INDIA (July 23, 2012),

Additionally, many in the public—when comparing the Fukushima incident to the geographical conditions in Germany—do not take into account the geographical placement of the plant. Due to its location in the Ring of Fire, the Fukushima reactor was much more prone to extreme tectonic activity than any building located in Central Europe and its location on the coastline also makes it more vulnerable to tsunamis.

B. The Reaction within Germany and the Adoption of the Moratorium

As a result of this mounting political pressure, Angela Merkel and her cabinet ordered the closure of every one of Germany's nuclear power plants.[26] During their closures, they were investigated by government officials, who evaluated the plants' risk status. This was quantified by evaluating the condition of the plants' infrastructure and also evaluating these plants' vulnerabilities to outside forces, such as possible terrorist attacks—including 9/11 style airplane attacks—and natural catastrophes—ranging from a mild heatwave to an earth-shattering quake.[27] The conclusions led to the closing of the seven oldest power plants, which lacked the baseline safeguards as measured in the inspections.[28] The other plants, however, were allowed to resume operations. These newer nuclear reactors will be indefinitely shut down by 2022, though kept in a state of limbo as possible reserve energy sources in the event that they are needed again.[29]

Another development included the establishment of an ethics commission to decide on the future of the German energy industry, with particular emphasis on renewables and the risks posed by the continued operation of nuclear power plans.[30] Although the commission did not opine as to whether nuclear energy developments ought to be encouraged or not, it did produce some worry in nuclear power supporters. It stated that nuclear power is a rational course of acting when handled and that there are particular safeguards in place that ought to be followed and, where possible, nuclear power producers ought to also

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http://www.newstrackindia.com/newsdetails/2012/07/23/330-Japan-TEPCO-ignored-atomic-accident-risks-due-to-myth-of-nuclear-safety-Report.html.

[26] Fischer & Wittrock, *supra* note 3.

[27] *AKW-Experten machen sich auf die Suche nach dem Risiko*, DIE ZEIT (Mar. 31, 2011), http://www.zeit.de/politik/deutschland/2011-03/roettgen-reaktorsicherheitskommission-moratorium.

[28] *Merkels Atom-Moratorium: Sieben Kernkraftwerke gehen vorerst vom Netz*, FRANKFURTER ALLGEMEINE ZEITUNG (May 15, 2011, 4:46 p.m.), http://www.faz.net/aktuell/wirtschaft/unternehmen/merkels-atom-moratorium-sieben-kernkraftwerke-gehen-vorerst-vom-netz-1613287.html.

[29] *Einigung im Kanzleramt: Atomausstieg bis 2022*, FRANKFURTER ALLGEMEINE ZEITUNG (May 30, 2011, 12:00 p.m.), http://www.faz.net/aktuell/2.2032/einigung-im-kanzleramt-atomausstieg-bis-2022-1637930.html.

[30] *Deutschlands Energiewende — Ein Gemeinschaftswerk für die Zukunft*, ETHIK-KOMMISSION SICHERE ENERGIEVERSORGUNG (May 30, 2011), http://www.bmbf.de/pubRD/2011_05_30_abschlussbericht_ethikkommission_property_publicationFile.pdf.

always adopt the safest course possible in conducting their business.[31] Moreover, it placed particular emphasis on the fact that nuclear fallout and contamination can become an international problem due to weather patterns, as was the case with Chernobyl. In such instances, energy producers must also conduct themselves responsibly and with particular care to prevent another international catastrophe.[32]

The commission also opined as to fossil fuels and their place in a non-nuclear world. Although the commission agreed that they are readily available energy sources, it took issue specifically with coal. The report claims that coal is in itself a naturally inefficient fuel source, and that the carbon emissions produced by clean coal are unsustainable.[33] As a result, the report points towards renewable energy as the ideal future, identifying wind and hydroelectric energy as the most efficient and desirable sources thereof.[34]

IV. THE POLITICAL DEBATE SURROUNDING THE MORATORIUM

A. Whether the Government Could Unilaterally Impose the Moratorium

Right-wing politicians deemed the German government's actions unconstitutional because it lacked the consent of parliament.[35] They argued that Merkel's decision was also extrajudicial because the parliamentary majority previously voted down legislation of the same nature and Merkel contravened the legislative body's will.[36] Additionally, given that the German Atomic Law only allows for closure of a power plant for an illegal act or in the face of a pressing state interest, the German government would have been legally barred from acting, as these politicians saw neither element proven at the time of enacting the moratorium.[37] There were also additional constitutional issues involved regarding Germany's federalist structure—nuclear power supporters argued that the

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[31] *Id.*
[32] *Id.*
[33] *Id.*
[34] *Id.*
[35] *Lammert zweifelt an Rechtmäßigkeit*, SÜDDEUTSCHE ZEITUNG (Apr. 27, 2011), http://www.sueddeutsche.de/politik/bundestagspraesident-vs-bundeskanzlerin-lammert-zweifelt-an-rechtmaessigkeit-des-atom-moratoriums-1.1072637.
[36] *Id.*
[37] *See* Gesetz über die friedliche Verwendung der Kernenergie und den Schutz gegen ihre Gefahren [AtG] [Act on the Peaceful Use of Nuclear Energy and Protection against its Dangers], Dec. 23, 1959, BUNDESGESETZBLATT Teil I [BGBL. I] at 59 814 (Ger.) http://www.gesetze-im-internet.de/bundesrecht/atg/gesamt.pdf. *See also* Gesetz zur geordneten Beendigung der Kernenergienutzung zur gewerblichen Erzeugung von Elektrizität [AtomG 2002] [Act on the Orderly Termination of the Use of Nuclear Energy for the Commercial Generation of Electricity], Apr. 22, 2002, BUNDESGESETZBLATT Teil I [BGBL. I] at 26 1351 (Ger.).

different German states ought to have had the exclusive power to decide whether the power plants should be closed or not.[38]

Additionally, the power plants' private operators were distraught at what they deemed an act that impaired existing contractual obligations. They saw the government's actions in closing the plants pending investigation and also closing the older plants as an unjust and unlawful taking of a proprietary interest.[39] Two power plant operators sued, and—although they were not allowed to reopen and recommence their plant's operations—the courts held that they were entitled to legal damages.[40] The Federal Administrative Court, which is the court of last instance for this particular claim, held that the German government, in ordering the closure of these plants, while the operators were still operating them, had interfered with their existing contractual rights and impaired their proprietary interest in the power plants.[41]

Supporters of the German government's position argued in the contrary, that the measures imposed by Merkel were themselves grounded upon the law, notwithstanding the opposition's concerns that the Atom Law required an amendment before being able to act. In this case, the Fukushima disaster, coupled with the public concern over nuclear power plants, was enough to demonstrate that there was a pressing state interest justifying intervention. On top of this—although the possibility of damaging private property interests was high—the necessity of acting and putting the public's concerns at ease was enough to justify state action.

B. Whether this Decision Was Just a Political Move by the Government

Merkel was criticized by many of her opponents for deciding to impose the moratorium with regional elections approaching.[42] At that point in time, regional elections for some of the German states were one to two weeks away. Given that the absolute majority of the populace supported a stop to nuclear power generation, many interpreted Merkel's actions as pandering.[43] This is particularly so because the ruling coalition had previously vetoed legislation from the opposition that attempted to do exactly what she had done on her own. Allegations of hypocrisy were thrown at the government.

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[38] *Lammert zweifelt an Rechtmäßigkeit*, *supra* note 35.
[39] Bundesverwaltungsgericht [BVerwGE] [Federal Administrative Court], Dec. 20, 2013, 7 B 19.13, http://www.bverwg.de/entscheidungen/verwandte_dokumente.php?ecli=201213B7B19.13.0.
[40] *Id.*
[41] *Id.*
[42] Lena Jakat & Oliver Das Gupta, *Regierung geht in Deckung, Opposition frohlockt*, DIE SÜDDEUTSCHE ZEITUNG (Apr. 27, 2011, 8:03 p.m.), http://www.sueddeutsche.de/politik/bruederle-das-moratorium-und-der-wahlkampf-regierung-geht-in-deckung-opposition-frohlockt-1.1076659.
[43] *Id.*

C. Whether the Moratorium Would Lead to Increases in Energy Costs and on Dependency on Energy Imports

The other important aspect argued by the opposition was that, in enacting the moratorium, energy prices would soar due to decreased production and that such decreased production would force Germany to acquire energy from other markets.[44] In fact, politicians and economists warned that the moratorium itself would exacerbate the domestic energy market as long as it was in effect and that increased prices would continue to be present as a result of that initial shortfall. Germany would, consequently, be forced to spend €93.5 billion in fossil fuel imports in 2012.[45]

Additionally, warnings were also issued as to possible legal liability for closing down the plants without a pressing state interest. Putting forward that a State act based on nebulous legal foundations would directly harm private enterprises, opponents of the moratorium warned that any action could result in protracted litigation that would conclude with the State having to pay damages to the affected power plants. In fact, this is precisely what has occurred with regards to a couple of these power plants.[46]

Proponents of alternative energy would argue that price is not as high of an issue as traditional energy supporters would argue it to be because, in calculating energy prices, one is directly comparing the upfront cost of establishing an entirely new economic model compared to one that is fully realized. The costs are much lower for exploiting a coal dig, given that the equipment to mine the coal, and the skills required are already available, compared to creating a windfarm, where the requisite turbines are much newer technology and there are less qualified people to operate them by virtue of their novelty. Furthermore, renewable energy supporters like to argue that finite resources like fossil fuels have a price based on the supply and demand. On the topic of energy independence, supporters of the moratorium like to point out that the moratorium did not significantly harm German interests. In fact, a year after the moratorium went into effect, reports came out stating that Germany had become an energy exporter.[47] This is especially significant considering that they

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[44] Stefan Schultz, *Ökostrom-Umlage: Netzagentur kritisiert Entlastungen für Industrie*, DER SPIEGEL (May 15, 2012), http://www.spiegel.de/wirtschaft/netzagentur-kritisiert-verguenstigungen-fuer-stromintensive-unternehmen-a-833299.html.

[45] Frank-Thomas Wenzel, *Abhängig von Öl und Kohle*, BERLINER ZEITUNG (Sep. 20, 2013), http://www.berliner-zeitung.de/wirtschaft/energiewende-abhaengig-von-oel-und-kohle,10808230,24386982.html.

[46] Bunesverwaltungsgericht [BverwGE] [Federal Administrative Court], Dec. 20, 2013, 7 B 19.13, http://www.bverwg.de/entscheidungen/verwandte_dokumente.php?ecli=201213B7B19.13.0.

[47] *Deutschland exportierte auch 2012 mehr Strom als es importierte*, STATISTICHES BUNDESAMT (Apr. 2, 2013), https://www.destatis.de/DE/PresseService/Presse/Pressemitteilungen/2013/04/PD13_125_51pdf.pdf?__blob=publicationFile.

dealt with the 2012 Cold Wave, in which temperatures across Europe plummeted, forcing people to spend more on heating.

V. ENERGIEWENDE

Even before the Fukushima disaster, the Federal Government had already been planning a sustainable energy platform. In order to continue to foster economic growth within the country, policymakers reasoned that Germany had to detach itself from continued reliance on finite energy sources. The Fukushima disaster, however, forced their hand. Whereby the plan was to slowly phase out existing energy sources, it had to be altered as a result of the moratorium because nuclear power did not factor into the initial economic plans to phase out the usage of fossil fuels. In fact, this circumstance would lead to the increase in fossil fuel consumption in the short term. According to the AG Energiebilanzen, a dependence of the Deutsches Institut für Wirtschaftsforschung, nuclear energy production went from 10.8% to 7.7% of total energy production from 2010 to 2013. At the same time, black coal, brown coal, and natural gas consumption rose to substitute the shortfall. Renewable energy also had a slight rise.[48]

A. Short-Term Fossil Fuel Exploitation

As a result of the sudden shut down of nuclear reactors, Germany found itself strained in terms of energy.[49] As a short-term solution, the exploitation of fossil fuel developments was continued.[50] This included building new natural gas pipelines to Eastern Europe and establishing a closer relationship with Russia, the European Union's greatest energy trading partner. However, this merely provided an abatement of the current energy shortage and was not a means towards sustainable development, thus forcing the government to extend its efforts elsewhere.[51]

In any case, environmental protection efforts have not been entirely ignored through the expansion of fossil fuel usage. Much of these efforts were focused on expanding natural gas production because it is a much cleaner fossil fuel than coal. Moreover, an interesting particularity arises when evaluating these events. Although the government had been investing more in fossil fuels, the amount of coal used, specifically, the dirtier brown coal, did not significantly increase as a result of the moratorium.

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[48] *Auswertungstabellen zur Energiebilanz Deutschland*, AG ENERGIEBILANZ E.V., (Sep. 15, 2014), http://www.ag-energiebilanzen.de/index.php?article_id=29&fileName=ausw_10092014_05112014_ov.pdf.

[49] Henning Gloystein & Jackie Cowhig, *Analysis: German nuclear U-turn means jump in emissions*, REUTERS (Apr. 4, 2011), http://www.reuters.com/article/2011/04/04/us-germany-energy-coal-idUSTRE7331BF20110404?feedType=RSS&feedName=everything&virtualBrandChannel=11563.

[50] *Id.*

[51] *Id.*

B. Long-Term Renewables Strategy

Due to environmental and economic reasons, continued reliance on fossil fuels has been regarded as unsustainable.[52] Increasing carbon emissions has become an almost taboo action in the European Union, while the continent as a whole lacks worthwhile reserves of fossil fuels. Because of this, the Federal Government has adopted policy advocating for the development of a sustainable energy market through the adoption of renewable energy sources.[53]

Among the problems facing this movement is the associated cost involved. In much the same way as the transition to nuclear energy necessitated large amounts of capital investments for building power plants, the infrastructure needs for renewable energy are also apparent.[54] Although the maintenance and upkeep of renewable energy infrastructure is most definitely not entirely similar to the burden suffered by power plant operators, there is still a large upfront cost involved in the initial construction of such infrastructure.

Other considerations involve the oft-unreported harm caused by renewable energy sources. Wind farms are particularly relevant to this situation. These are necessarily placed in regions through which wind currents run. Given their placement in such areas and that many birds actually fly through these same currents, the birds end up getting mauled by wind farms.[55] Another factor to consider is land use. Wind farms also have to be of a certain size in order to produce enough energy to meet society's demands. Unlike a power plant, which is a relatively compact building, these have to be spread out, providing each wind turbine sufficient access to aeolic forces.[56] These same concerns apply when dealing with solar panels, which has led to their installation in more creative ways such as on the roofs of buildings or making roads built of solar panels.

In any case, the German government has seen fit to hedge its bets with this secondary model. In claiming that the issue was not entirely about cost, other key words have sprung up. One of the most important of these is innovation. The government is hoping that, as it invests in renewable energy, luring inventors and researchers to Germany, it can also foster a new technological boom within the

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[52] *Deutschlands Energiewende – Ein Gemeinschaftswerk für die Zukunft*, *supra* note 30.

[53] Annalena Baerbock, *Ran an die Kohle*, DIE ZEIT (Sep. 25, 2014), http://www.zeit.de/2014/40/fossile-energien-klimaschutz.

[54] *See* Evan Jones & Joseph Eto, *Financing End-Use Solar Technologies in a Restructured Electricity Industry: Comparing the Cost of Public Policies*, LAWRENCE BERKELEY NAT'L LAB. (Sep. 1997), http://emp.lbl.gov/sites/all/files/REPORT%20lbnl%20-%2040218.pdf, at 41-50.

[55] Rose Eveleth, *How Many Birds Do Wind Turbines Really Kill?*, SMITHSONIAN (Dec. 16, 2013), http://www.smithsonianmag.com/smart-news/how-many-birds-do-wind-turbines-really-kill-180948154/.

[56] Darren Quick, *Less is more for cost-efficient wind farms*, GIZMAG (Jan. 23, 2011), http://www.gizmag.com/less-is-more-for-more-cost-efficient-wind-farms/17659/.

country.[57] Another important keyword would be sustainability. The government is not merely looking at what would be an easy way to invest money; rather it is foreseeing a long-term development plan, such that by investing in renewable energy henceforth, it could also establish a long-term based system almost entirely on renewable energy.[58] Furthermore, the externalities associated with a system based on renewable energy are definitely recognized in this system, such that value is accorded to comforts such as a cleaner environment and energy independence instead of simply focusing on the bottom line.

C. The "Erneubaren-Energien Gesetz" of 2014[59]

This particular law establishes the German government's policy towards the development of renewable energy sources. This policy is exemplified by a series of milestones related to the production of renewable energy. Renewable energy should be about 40–45% of Germany's total energy by 2025, 55–60% by 2035, and 80% by 2050. Additionally, carbon emissions should be less than in 1990. In order to reach that goal, this law has a series of curious provisions, such as section 37, paragraph 2 of the law. This piece stipulates a charge of €0.0624/kWh to all consumers during 2014.[60] The proceeds from this fee would then be pooled together and utilized to subsidize and incentivize the development of renewable energy production. Section 41 of the law establishes a procedure through which private enterprises may petition to be exempted from these fees. Another provision, which ties into this scheme of incentives, is an energy resale scheme within the law. Consumers who produce more energy than consumed—particularly with the aid of renewable resources—are allowed to either resell the energy at a fixed rate or they are allowed to participate in a type of energy exchange, through which they can set their own prices. This last measure is particularly important to the small entrepreneur and to the common citizen simply looking to make some money on the side. Yet, while they may earn profits, they are also doing so through the adoption of environmentally sound activities that also propagate an environmentally-conscious message.

D. Corporations Shift to Renewable Energy

One of the most unlikely standard bearers for the German government's efforts is E.on, an energy production company that operates multiple nuclear

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[57] *Ziele der Energiewende*, BUNDESMINISTERIUM FÜR BILDUNG UND FORSCHUNG, http://www.buergerdialog-bmbf.de/energietechnologien-fuer-die-zukunft/300.php.

[58] *Id.*

[59] Erneubare-Energien-Gesetz [EEG 2014] [Renewable Energy Act], July 21, 2014, BGBL. I at 1066 (Ger.) http://www.gesetze-im-internet.de/bundesrecht/eeg_2014/gesamt.pdf.

[60] *Energielexikon: Was ist die EEG-Umlage und wie funktioniert sie?*, BUNDESNETZAGENTUR (May 6, 2013), http://www.bundesnetzagentur.de/cln_1411/DE/Sachgebiete/ElektrizitaetundGas/Verbraucher/Energielexikon/energielexikon-node.html.

reactors and employs approximately 40,000 people within Germany.[61] The company, seeing the financial incentives available through clean energy initiatives, plans to cut its nuclear power enterprises and focus solely on natural gas and on renewable energy. The reasoning for this is that the energy market will greatly change throughout the next years and the older power plants do not fit into the new model that is much more consumer driven.[62] However, their departure from the traditional market is also creating additional complications. One of the biggest questions is what to do with the now-abandoned power plants, and, if they are to be demolished or repurposed, who would be asked to finance such an undertaking: consumers, the government, or E.on?[63]

However, this corporate shift is not merely restricted to domestic enterprises. International enterprises are also taking advantage of the renewables-friendly climate. The Australian energy firm Ceramic Fuel Cells, which has invented a novel electrical generator that could dramatically reduce household electricity consumption, has also recently migrated to Germany.[64] This company left Australia because Germany had made €16 billion available in commercial subsidies, while Australia lacked a similar program.

E. Democratizing the Energy Debate

Another aspect of the Energiewende, dating from the origins of the anti-nuclear movements, is the desire to have a more democratic discussion of the relevant issues. Examples of this include establishing a locally-owned wind farm. Compared to a multinational oil corporation, this would definitely make the people closer to those who are influential in crafting policy. Individual-driven reforms, such as placing solar panels on the roof of one's house would also help to include the citizenry as an active participant in the reform. In fact, the EEG considers this latter step specifically in that it authorizes the creation of shared energy communities, powered by solar panels.[65]

Furthermore, the government charging a fee to each end consumer ensures financial barriers are eased by distributing risk through the populace, instead of concentrating the gatekeeping to traditional financial institutions. In fact, these developments that allow smaller entities to participate in the energy

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[61] *Strategiewechsel bei E.on: Die Angst vor der atomaren Bad Bank*, DER SPIEGEL (Dec. 1, 2014), http://www.spiegel.de/wirtschaft/unternehmen/gruene-warnen-e-on-vor-atomarer-bad-bank-a-1005932.html.

[62] *Id.*

[63] *Id.*

[64] Emily Stewart, *Germany's Renewable Energy Incentives and Regulations Attracting Australian Companies*, THE BUSINESS (Oct. 28, 2014, 10:58 p.m.), http://www.abc.net.au/news/2014-10-28/australian-green-energy-company-forced-offshore/5849082.

[65] Burghard Flieger, *Mit Bürgerengagement zur Energiewende*, DEUTSCHER NATURSCHUTZRING (Oct. 2011), http://www.dnr.de/publikationen/umwelt-aktuell---archiv-2011/102011/mit-buergerengagement-zur-energiewende.html.

reform are also changing the means to finance these projects. Given the financial incentives from generating surplus electricity from renewable sources, these lesser participants are now allowed to finance their undertakings through the energy market itself, without needing to recur to traditional sources of funding like a commercial loan.[66] Consequently, the barriers of entry in the industry are significantly reduced.

F. Opposition

The opposition to the Energiewende is composed of those who are in favor of a more laissez-faire perspective on energy matters. They refuse regulation on energy products claiming that doing so would be more harmful to economic development than simply letting the market run its course. In an interview with *Der Spiegel*, former Shell CEO Jeroen van der Veer argued that the increased use of renewables will not eclipse traditional fossil fuels.[67] He also argued that new technological advances will arise that will enable us to burn coal and oil cleaner.[68] Additional advances in technology would enable companies like Shell to more easily access previously unapproachable oil deposits, such as the Canadian Oil Sands. He dismissed current efforts to switch to renewables, specifically emphasizing that solar technology is not nearly efficient enough to be widely adopted and requires continued refinement.[69]

On the other side of things, others argue that the switch to renewables is being disproportionately shouldered by the people who contribute about ten times more to subsidies than larger businesses.[70] This has also resulted in a disproportionate number of industries seeking to be exempted from paying the subsidy, which weakens the program's liquidity.[71] As a result, rates would have to go up to cover for the now-exempted parties. Another criticism has been levied at

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[66] Henrik Paulitz, *Dezentrale Energiegewinnung - Eine Revolutionierung der gesellschaftlichen Verhältnisse*, IPPNW, http://www.ippnw.de/atomenergie/energiewende/artikel/b93f91816b/dezentrale-energiegewinnung-eine-r.html.

[67] Matthias Streitz & Daniel Puntas Bernet, *Ölmulti Shell: "Die klassische Solartechnik ist eine Sackgasse"*, DER SPIEGEL (June 6, 2007), http://www.spiegel.de/wirtschaft/oelmulti-shell-die-klassische-solartechnik-ist-eine-sackgasse-a-486715.html.

[68] *Id.*

[69] *Id.*

[70] Stefan Schultz, *Ökostrom-Umlage: Netzagentur kritisiert Entlastungen für Industrie*, DER SPIEGEL (May 15, 2012), http://www.spiegel.de/wirtschaft/netzagentur-kritisiert-verguenstigungen-fuer-stromintensive-unternehmen-a-833299.html.

[71] Manfred Schäfers, *Abschlag auf die Stromrechnung*, FRANKFURTER ALLGEMEINE ZEITUNG (Aug. 30, 2012), http://www.faz.net/aktuell/politik/energiepolitik/erneuerbare-energien-abschlag-auf-die-stromrechnung-11873749.html. *See also* Johannes N. Mayer & Bruno Burger, *Kurzstudie zur historischen Entwicklung der EEG-Umlage*, FRAUNHOFER ISE (July 14, 2014), http://www.ise.fraunhofer.de/de/downloads/pdf-files/data-nivc-/kurzstudie-zur-historischen-entwicklung-der-eeg-umlage.pdf.

the regressive nature of the fee itself. Being a flat fee, it affects the poor more than the rich.[72]

VI. CONCLUSION

As a case study on the political process, the Moratorium and Energiewende are absolutely fascinating. This is one of those few instances where one can see a very clear meshing of different disciplines including science, economics, political science, and law coming together and interacting in a way that makes them almost indistinguishable from each other in the sequence of events. In a way, these events are indicative of the need for multiple perspectives in an area as controversial and as multi-disciplinary as economic development and policy, even more so when taking into account environmental concerns.

In fact, that multi-perspective analysis is quite well realized in the interaction between the many different parties to this tale. At the very least, here in America, it is almost unthinkable for a right-wing government to adopt environmentally friendly measures that are—when taking only the bottom line into account—hurtful to consumers. However, the ability to see beyond the bottom line and take into account economic externalities, while also seeking to establish an economically sound developmental strategy, demonstrates the intelligence of adopting, reconciling, and implementing seemingly contradictory points of view. It is with this perspective in mind that Germany is poised for a great future. It is also with such an open mind and a desire to reach for economic progress that we must emulate their audacity and take the plunge to succeed on our own merits.

[72] Thiemo Heeg, *Arme zahlen mehr für die Energiewende*, FRANKFURTER ALLGEMEINE ZEITUNG (Apr. 24, 2012), http://www.faz.net/aktuell/politik/energiepolitik/erneuerbare-energien-arme-zahlen-mehr-fuer-die-energiewende-11729060.html.