German energy security and its implications on regional security

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THESIS

GERMAN ENERGY SECURITY AND ITS IMPLICATIONS ON REGIONAL SECURITY

by

Philemon Sakamoto

December 2016

Thesis Advisor: Robert E. Looney
Second Reader: Daniel Moran

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This thesis considers three notable developments in German energy policy: the Nord Stream 2 natural gas pipeline project between Russia and Germany, the decision to phase out nuclear energy, and European Union (EU) and German renewable energy policy agendas. The thesis uses EU and German policy pronouncements, press reports, and third-party analysis to understand the three policy developments and assess their effects. It establishes a "trilemma" framework that relates energy security with other energy objectives as well as a liberal international relations (IR) theory framework to relate energy policy to broader security and stability objectives. Through an analysis of the three policy measures, the thesis depicts the challenges associated with pursuing energy objectives and highlights contradictions where measures intended to increase energy security can actually act to undermine it. Furthermore, it explores the complex relationship between energy security and overall regional security and stability. Using a liberal framework, it illustrates how policies established to improve energy security may act to undermine broader regional stability and security objectives.

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GERMAN ENERGY SECURITY AND ITS IMPLICATIONS ON REGIONAL SECURITY

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Submitted in partial fulfillment of the
requirements for the degree of

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ABSTRACT

This thesis considers three notable developments in German energy policy: the Nord Stream 2 natural gas pipeline project between Russia and Germany, the decision to phase out nuclear energy, and European Union (EU) and German renewable energy policy agendas. The thesis uses EU and German policy pronouncements, press reports, and third-party analysis to understand the three policy developments and assess their effects. It establishes a "trilemma" framework that relates energy security with other energy objectives as well as a liberal international relations (IR) theory framework to relate energy policy to broader security and stability objectives. Through an analysis of the three policy measures, the thesis identifies the challenges associated with pursuing energy objectives and highlights contradictions where measures intended to increase energy security can actually act to undermine it. Furthermore, it explores the complex relationship between energy security and overall regional security and stability. Using a liberal framework, it illustrates how policies established to improve energy security may act to undermine broader regional stability and security objectives.

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ACKNOWLEDGMENTS

This research—and my time at the Naval Postgraduate School—has been tremendously enlightening and has served as a source of personal and intellectual growth. I repeat E. F. Schumacher's sentiments in Sovacool and Mukherjee's, "Conceptualizing and Measuring Energy Security: A Synthesized Approach," 2011 article in *Energy*: energy is "not just another commodity, but the precondition of all commodities, a basic factor equal with air, water, and earth." My studies have left me with a greater appreciation for the importance of energy and energy security; energy is truly of existential import to both state and society.

I am grateful for my time at NPS and am indebted to the faculty who have contributed to this research. Thank you, Professor Looney, for your direction, support, and for making this process as painless (and perhaps even enjoyable) as possible. Thank you, Professor Yost, for all of the time you lent in helping me to refine my topic and revise the text. Thank you, Professor Moran, for your insight and help in completing the process.

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I. INTRODUCTION

A. MAJOR RESEARCH QUESTION

This research studies key aspects of the German energy security equation. It attempts to ascertain the origins and motivators of elements in the German energy mix, considers the state of German energy security, and assesses the implications of German energy security strategy to overall regional security and stability.

B. SIGNIFICANCE OF THE RESEARCH QUESTION

Security of energy and security through energy have long been recognized as vital to national interests. The study of energy security often traces its roots back to First Lord of the Admiralty Winston Churchill's decision to transition the Royal British Navy from coal to oil on the eve of World War I. While Britain possessed reliable—and thus secure—sources of coal within its borders, it would gain a decided speed advantage over the Germans if it transitioned its ships to the less readily available—and secure—oil power.[1] Security of the supply of energy was thus recognized as an important and balancing consideration in national strategy, and energy security was thus linked with national security.

Two World Wars later, the European Union (EU) was founded on the recognition that energy concerns are linked to security. The Schuman Plan, introduced by French Foreign Minister Robert Schuman in 1950, conceived a supranational organization, the European Coal and Steel Community, which would pool the coal and steel production of the six founding countries: Belgium, France, Germany, Italy, Luxembourg, and the Netherlands.[2] While restoring Europe to prosperity and standardizing the means of production were among the goals of this plan, its primary objective was to improve security in the region. It reasoned that, with all of the means of weapons production under the control of a unified high authority, war within Europe (and specifically, between

[1] Daniel Yergin, "Ensuring Energy Security," *Foreign Affairs* 35 no. 2 (2006):69.

[2] "A Peaceful Europe—the Beginnings of Cooperation," European Union, last modified October 11, 2016, https://europa.eu/european-union/about-eu/history/1945-1959_en.

France and Germany) would be "not merely unthinkable, but materially impossible."[3] The plan wagered that security could be achieved through the integration and consolidation of energy in Europe.

Energy has come to underpin every aspect of life in modern society. Energy is used in transportation, the lighting of offices and schools, cooling and heating of homes, the manufacture of goods, and the growth and distribution of food. As the economist E. F. Schumacher stated, energy is "not just another commodity, but the precondition of all commodities, a basic factor equal with air, water, and earth."[4] Truly, as a precondition to all other aspects of economy and society, securing energy carries existential import.

Why study the energy security concerns of Germany? Since the inception of the Schuman Plan at the end of World War II, Germany has emerged as the central economic force in Europe and as a key player internationally. The German GDP, estimated at $3.46 trillion, is the fourth largest in the world.[5] Germany is seen as the sole force keeping the EU afloat during times of economic crisis and has enormous economic influence over the region and world.[6] Understanding the energy concerns of Germany bears great import to the region and world, then. The study of German energy security is of special interest because of the recent policy initiatives undertaken in Germany. German efforts at transitioning to renewable energy sources and decisions to abandon nuclear power will certainly have security ramifications regionally and worldwide.

A further significance of this research is regarding the relationship between energy security and overall security and stability. Is energy security a solitary objective, or should it be balanced with other fundamental state concerns? Where does energy

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3 "The Schuman Declaration," European Union, last modified January 12, 2015, http://europa.eu/about-eu/basic-information/symbols/europe-day/schuman-declaration/index_en.htm.

4 Benjamin K. Sovacool and Ishani Mukherjee, "Conceptualizing and Measuring Energy Security: A Synthesized Approach," *Energy* 36 (2011), 5343.

5 "GDP," World Bank, accessed November 9, 2016, http://data.worldbank.org/indicator/NY.GDP.MKTP.CD?name_desc=true.

6 Stuart Jeffries, "Is Germany too powerful for Europe?" *The Guardian*, March 31, 2013, http://www.theguardian.com/world/2013/mar/31/is-germany-too-powerful-for-europe.

security fit amidst the broader concerns of security and stability? This question then has relevance not just to Germany or Europe but globally as well.

C. LITERATURE REVIEW

Before considering German energy security, this research must establish the concept of energy security and how energy security relates to other factors of energy policy. We then consider theories on stability and security and finally survey any existing work on German energy security and the relationship between energy security and the broader security or stability question.

1. Energy Security

There is a sizeable body of literature regarding energy security. Considering the attention that energy security has received, it is surprising, however, that a unified understanding of energy security has yet to emerge.[7] Indeed, a fair amount of literature is devoted simply to surveying the disparate definitions of energy security. Sovacool, for instance, counts 45 separate definitions of the term in his research.[8] Granted, the definitions often contain similarities and generally include some variant of the core tenet of energy security: Daniel Yergin encapsulates energy security as "the availability of sufficient supplies at reasonable prices."[9]

Faas points out that energy security has often been conflated with security of supply and the availability of primary energy resources: namely, oil and natural gas.[10] He goes on to argue that it should take a more encompassing definition, to include the supply chains and infrastructure built around these energy resources.

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[7] Henryk Faas, Francesco Gracceva, Gianlucca Fulli, and Marcelo Masera, "European Security—A European Perspective," in *Energy Security—International and Local Issues, Theoretical Perspectives, and Critical Energy Infrastructures*, ed. Adriane Gheorghe and Liviu Muresan (Dordrecht, Netherlands: Springer, 2011), 10.

[8] Benjamin K. Sovacool, "Defining, Measuring, and Exploring Energy Security," in *Routledge Handbook of Energy Security*, ed. Benjamin K. Sovacool (New York: Routledge, 2011), 2.

[9] Daniel Yergin, "Ensuring Energy Security" *Foreign Affairs* 85, no. 2 (Mar.–Apr. 2006), 70.

[10] Faas, "European Security—A European Perspective," 11.

Others have taken more economic-based and theoretic views. Bohi and Toman, for instance, argue that changes in the price or availability of energy affect not only energy security but, more broadly, economic welfare.[11] The degree to which the government should intervene to promote energy security, then, depends on the existence of externalities that the market fails to account for on its own.

While most literature acknowledges that energy security relates to other national concerns, some even melds these varied issues into a broader definition of energy security. Bauman, for instance, defines internal policy, economics, geopolitics, and security policy as dimensions and contributing factors of energy security.[12] Similarly, Sovacool *et al.* define energy security as "how to equitably provide available, affordable, reliable, efficient, environmentally benign, proactively governed and socially acceptable energy services to end-users."[13] While the interrelatedness of energy security with all of these factors is well taken, melding the concepts into one encompassing definition of energy security tends to muddy the term and damage preciseness.

Energy security authors also concede that energy security and gaining energy security can mean different things to different countries. As Yergin points out, the traditional view of energy security as the availability of energy resources at affordable prices is primarily held by developed consumer-nations.[14] Energy-exporting countries, on the other hand, view energy security as the security of demand: ensuring future sales and prices through long-term contracts. For Russia, energy security appears to entail the nationalizing of the energy sector and controlling energy infrastructure. Developing nations like China and India take energy security to mean adapting to market dependence. Japan, because of its paucity of resources, finds energy security in diversifying energy imports and managing foreign investment. European nations find energy security to mean

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[11] Douglas R. Bohi and Michael A. Toman, *Economics of Energy Security* (Boston: Kluwer Academic Publishers, 1996), 1.

[12] Florian Baumann, "Energy Security as Multidimensional Concept" *Research Group on European Affairs N*o. 1 (2008), 4.

[13] Benjamin K. Sovacool, Ishani Mukherjee, Ira Martina Drupardy, and Anthony L. D'Agostino, "Evaluating Energy Security Performance from 1990 to 2010 for Eighteen Countries" *Energy* 36 (2011), 5846.

[14] Daniel Yergin, "Ensuring Energy Security," 70.

mitigating their dependence on natural gas, and the United States finds energy security in relinquishing its previous notions of energy independence.[15]

Esakova highlights the temporal nature of energy security. She argues that the understanding of energy security changes over time, as does the attention that it receives in the public discourse. The subject, for instance, went from being a relatively obscure "dead issue" in the 1990s to a primary interest in recent times. Supply challenges of consumer countries have prompt a "new energy security paradigm," and the nature of energy security concerns has changed.[16] Whereas energy security was primarily an issue of military readiness in the post-World War II era of the 1950s, security of supply took on greater societal significance with the Arab oil embargo and oil crisis of the 1970s, and came to be equated with energy independence.[17] In the 1980s and 1990s, Esakova points out that energy security took a more economic form, with countries focusing on protecting their economies from supply shocks. Recent changes in understanding have also caused energy security to encompass not only oil but also natural gas, electricity, and infrastructure. The changes are dependent on current events, and the terrorist attacks of September 11, 2001, have influenced the energy security discussion, as have tensions with Iran, attacks to facilities in Nigeria, natural disasters like hurricane Katrina in 2005, and Russian-Ukrainian tensions over natural gas in 2007.[18] Some even argue that conflict in the 21st century is defined as a war of resources, and that the quest for energy resources has precipitated much of the history of the era.[19]

When surveying the varied definitions of energy security, this thesis seeks to avoid the muddiness of conflating distinct themes into one encompassing term on the one hand while also acknowledging the position of energy security—the availability and affordability of adequate energy resources—among other energy policy objectives. To this end, the research will adopt the view of energy policy as a trilemma: a balance

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15 Yergin, "Ensuring Energy Security," 71.

16 Nataliya Esakova, *European Energy Security: Analysing the EU-Russia Energy Security Regime in Terms of Interdependence Theory* (Wiesbaden: Springer VS, 2012), 35.

17 Ibid.

18 Ibid.

19 Ibid.

between the competing concerns for energy security, equity, and environmental sustainability.[20] This framework, where trade-offs between competing concerns must be made, and where the pursuing of two objectives often comes at the expense of the third, helps to illustrate the difficulty in formulating energy policy. Reliable access to energy can conceivably be pursued in conjunction with cheaper prices (through expanding coal consumption, for instance), but is likely to come with increased Greenhouse Gas (GHG) emissions. Pursuing a reduction in GHG while still maintaining energy affordability, on the other hand, will likely come at the expense of energy security (as is witnessed by Europe's current reliance on Russian natural gas). Finally, while energy security and GHG emissions reductions can be pursued in tandem, they are likely to come at a high economic cost.[21]

These three objectives can themselves be subdivided into further more nuanced ones. Environmental sustainability, for instance, encompasses the pursuit of "renewable" energy sources whose harvest does not exceed regeneration. It also, as mentioned, entails the reduction of waste emissions like GHG that have been linked to global warming. Finally, sustainability also encompasses increased efficiency through more energy-efficient structures, decreases in consumption, and the use of novel approaches like load-control and time-of-use pricing.[22]

Energy equity concerns both affordability and price stability. Without stable prices, energy suppliers cannot accurately predict profitability and thus have difficulty making long-term infrastructure investments.

Finally, energy security entails the reliability and safety of infrastructure and energy sources within a state, but also speaks to external supply disruptions that might stem from natural events or political ones. These many aspects of energy security lead to

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[20] Joan MacNaughton, "World Energy Trilemma," World Energy Council, accessed March 18, 2016, https://www.worldenergy.org/work-programme/strategic-insight/assessment-of-energy-climate-change-policy/.

[21] Robert E. Looney, "Energy Security in Western Europe," in *Europa World online*, Routledge, accessed January 21, 2016, http://www.europaworld.com/entry/a1.

[22] Benjamin K. Sovacool and Marilyn A. Brown, "Competing Dimensions of Energy Security: An International Perspective," *Annual Review of Environment and Resources*, Volume 35 (2010): 84, doi:10.1146/annurev-environ-042509-143035.

different ways of addressing security concerns. Energy security might be furthered, for instance, through technological means like improving the reliability of transmission systems. It might be enhanced through encouraging liberal market institutions, diversifying energy suppliers and sources, or security measures that guard key infrastructure and assets from terrorism or attack. Maintaining reserve stockpiles has been a central tenet of the International Energy Association's (IEA) approach to energy security. Finally, energy security can be pursued through force or geopolitical maneuvering.

Germany (and the EU as a whole) has favored a liberal market-centered and socializing approach to achieving energy security. It has sought to reproduce its own internal energy market rules and legal norms in the countries that it trades with through "deep" economic ties in order to "liberate energy supply from the control … of unstable elites and cartels."[23] While the agenda has been derisively referred to as "regulatory imperialism" or "neo-Westphalian" soft-imperialism, it nonetheless is rooted in the liberal tenets of international relations and the efficacy of interdependence, democracy, and liberal institutions in enhancing security.[24] The next section will review the liberal theory of international relations in order to provide a basis for assessing German strategy with theory.

2. International Relations Theory

In assessing the implications of energy policy and the energy security stance of Germany in terms of a broader regional security objective, this research must turn to international relations theory and its predictions on security. The field of international relations can be generalized into two main bodies of theory: liberalism and realism.[25] This review turns first to realist theory. Realism itself can be further divided into three main schools: human nature realism, defensive (or structural realism), and offensive

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[23] Richard Youngs, *Energy Security: Europe's New Foreign Policy Challenge* (New York: Routledge, 2009), l6.

[24] Ibid., 18.

[25] John J. Mearsheimer, *The Tragedy of Great Power Politics* (New York: W.W. Norton & Company, 2014), 14.

realism. All of these schools agree on several key tenets: the state is the primary actor in international relations; the impetus for action lies not within the state and is not defined by the type of state, but rather by structural variables that exist outside of the state; and states are primarily concerned with power and the competition for it.[26] The schools differ in their views on why states seek power and how aggressively they pursue it. Human nature realists like Hans Morgenthau believe that the quest for power is an innate characteristic of mankind. This desire for power is reflected in states, which have an insatiable "lust" for power that invariably leads to a struggle for supremacy and to conflict.[27] In contrast, Kenneth Waltz, considered the founder of defensive realism, believes that structural factors are responsible for the quest for power. The anarchic system that defines international relations, while coming into existence through the individual actors of the system, itself becomes an impelling force that constrains and limits the behavior of the actors.[28] Waltz believes that states are self-interested and have self-preservation and the desire to maintain autonomy as their primary interest.[29] Waltz does not see aggression as inherent in the system, as the desire for self-preservation leads to defensive strategies on the part of states. John Mearsheimer, the originator of offensive realism, disagrees. He argues that states are not happy with a status quo, but rather constantly seek more power in order to improve their security equation.[30]

Herein we can see realist predictions on the state of international relations. Both offensive realists and human nature realists provide a gloomy outlook destined to be rife with conflict. Even Waltz, a defensive realist, sees the recurrence of war as symptomatic, as great powers seek to balance one another.[31]

Realist theory has limited predictive value, as it provides no prescriptions for effecting change in international relations. The causal agents for the bleak world outlook

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[26] Mearsheimer, *The Tragedy*, 18.

[27] Ibid., 19.

[28] Kenneth Waltz, *Theory of International Politics* (Reading, MA: Addison-Wesley Publishing Company, 1979), 102.

[29] Ibid., 113.

[30] Mearsheimer, *The Tragedy*, 21.

[31] Waltz, *Theory of International Politics*, 70, 204.

cannot be manipulated, and are either inherent in human nature or endemic in the system. While Waltz and Mearsheimer do describe circumstances that are relatively more stable, stability is dependent on systemic characteristics that are difficult to alter. Both assert, for instance, that bipolar worlds are more stable than multipolar worlds; even the Soviet Union contributed to security while it was in existence by managing its sphere of influence.[32] Achieving such a bipolar world, however, invariably involves conflict, and the balancing between the two great powers of the world will similarly still generate occasional conflict.

This research thus turns to liberal theory for guidance. Liberal theory does not postulate inherent and inexorable systemic tendencies, but even provides prescriptions for effecting improvements to security in world affairs. Our decision to use liberal theory as the basis for assessing security is also couched in the fact that Germany (and the EU) has largely adopted a liberal view of international relations. Not only was the EU formed along liberal notions of the efficacy of Inter-Governmental Organizations (IGOs) and the stabilizing force of democracy, but the EU has seen itself as a promoter of liberal norms, better governance, and protection of human rights abroad.[33] To this end, it has attempted to liberalize, or "Europeanize," the markets of its trading partners, developing a "deep trade agenda that [seeks] to address 'behind-the-border' issues in …non-European states."[34] Assessing security predictions based on liberal theory, then, would have the added advantage of serving as a "report card" on how well Germany and the other EU countries have done at their liberalizing objectives. The next section provides a review of liberal theory and its predictions and prescriptions for security, as encapsulated in Bruce Russett and John Oneal's book, *Triangulating Peace*.

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[32] Waltz, *Theory of International Politics*, 161.

[33] Youngs, *Energy Security-Europe's New Foreign Policy Challenge*, 44.

[34] Ibid.

3. Liberal Security Theory

The tenets of the liberal theory that the EU's market approach is derived from are encapsulated in Bruce Russett and John Oneal's *Triangulating Peace*.[35] The book provides a systematic study of the correlations between democracy, intergovernmental organizations (IGOs), economic interdependence, and peace. It begins with the observation that democracies do not fight, develops a theory that is rooted in Kant's seminal work *Perpetual Peace*, and tests the theory with a rigorous quantitative model built on 40,000 data points.[36] Russett and Oneal's work makes a bold conclusion that democracy, IGOs, and economic interdependence work together to reduce the likelihood of conflict. These variables, they indicate, strengthen each other and form virtuous circles that benefit even states outside the circles with relative peace.[37]

Liberal theory avers that form of government matters. Democracies gain their legitimacy from the people they serve and are more accountable to them. They maintain a system of checks and balances that prevent players from acting unilaterally. They exhibit a higher degree of transparency than their autocratic counterparts and thus do a better job at signaling intent to other international players. Transparency also makes them more trustworthy trade partners. Finally, democracies are more sensitive to human rights and to the costs of violence. All of these characteristics—both structural and cultural—act to make democracies more stable business partners and more secure.[38]

Liberal theory also touts the benefits of economic interdependence in promoting stability and security. High levels of interconnection increase the cost of conflict for all powers, even the stronger ones. Trade promotes development of international laws and organizations that constrain all participants.[39] Liberal theorists also point to the benefits of increased communication that are brought about by international trade; trade exposes

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[35]Bruce Russett and John Oneal, Triangulating Peace: Democracy, Interdependence, and International Organizations (New York: W.W. Norton & Company, 2001), 179.

[36] Ibid., 102.

[37]Ibid., 179.

[38]Ibid., 79.

[39]Ibid., 129.

citizens to perspectives of those living in other countries and promotes cross-cultural understanding.[40] According to liberal theory, "economic interdependence contributes to the construction of a 'security community'" and a common sense of identity.[41]

Finally, liberal theory also explains the role of IGOs in peace and stability. IGOs help to arbitrate conflicts and dissuade rule-breakers.[42] They support the creation of norms and of cooperation and coordination among members. In this sense, IGOs have a socializing function that spreads liberal and democratic ideals.

4. German Energy Security

a. German Energy mix

There is little debate with regard to the current energy mix in Germany; data can be easily obtained from intergovernmental agencies like the International Energy Agency (IEA), private associations like the *Arbeitsgemeinschaft Energiebilanzen*, or from state entities like the Federal Ministry for Economic Affairs and Energy.[43] AG Energiebilanzen, for instance, reports the primary energy consumption in Germany for the year 2015, as is noted in Figure 1. Trends are also readily available; Figure 2 from the IEA compares 2013 energy supply to previous years.

Similarly, German energy policy and strategy can be ascertained through several sources. The Federal Ministry of Economy and Energy publishes a comprehensive strategy for energy.[44] Its ten-point agenda, among other things, stresses the transition to more environmentally friendly and renewable energy sources, the strengthening of power grids, improved energy efficiency, and measures to ensure security of supply.

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[40] Ibid., 130.

[41] Ibid.

[42] Ibid., 163.

[43] "Germany," International Energy Agency, accessed November 9, 2016, https://www.iea.org; "Mediathek," Bundesministerium Fur Wirtschaft und Energie, accessed November 9, 2016, http://www.bmwi.de; "Daten und Fakten," AG Energiebilanzen, accessed November 9, 2016, http://www.ag-energiebilanzen.de.

[44] "Energy of the Future," Federal Ministry for Economic Affairs and Energy, accessed November 10, 2016, http://www.bmwi.de/EN/Topics/Energy/Energy-Transition/overall-strategy.html.

One can also gain insight into Germany's energy policy by consulting EU Commission agenda during the last German EU term of presidency at the beginning of 2007. As Umbach explains, the agenda set before the EU during this presidency emphasized energy security and climate change. The Energy Action Plan agreed upon in March of 2007 included steps to further liberalize gas and electricity markets, formulate a unified external energy policy, and ensure security of supply.[45]

Finally, the German *Bundestag* publishes press releases that explain their policies. Among other things, the Bundestag has used press releases to respond to criticism regarding the Nord Stream 2 pipeline project, affirming that the pipeline acts to promote energy security, is primarily a commercial venture, and does not violate EU sanctions or diversification goals.[46]

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45 Frank Umbach, "German Debates on Energy Security and Impacts on Germany's 2007 EU Presidency," in *Energy Security—Visions from Asia and Europe*, ed. Antonio Marquina (London: Palgrave MacMillan, 2008), 4.

46 "Antwort der Bundesregierung, Drucksache 18/6526," Bundestag, February 11, 2015, dip21.bundestag.de/dip21/.../1806526.pdf.

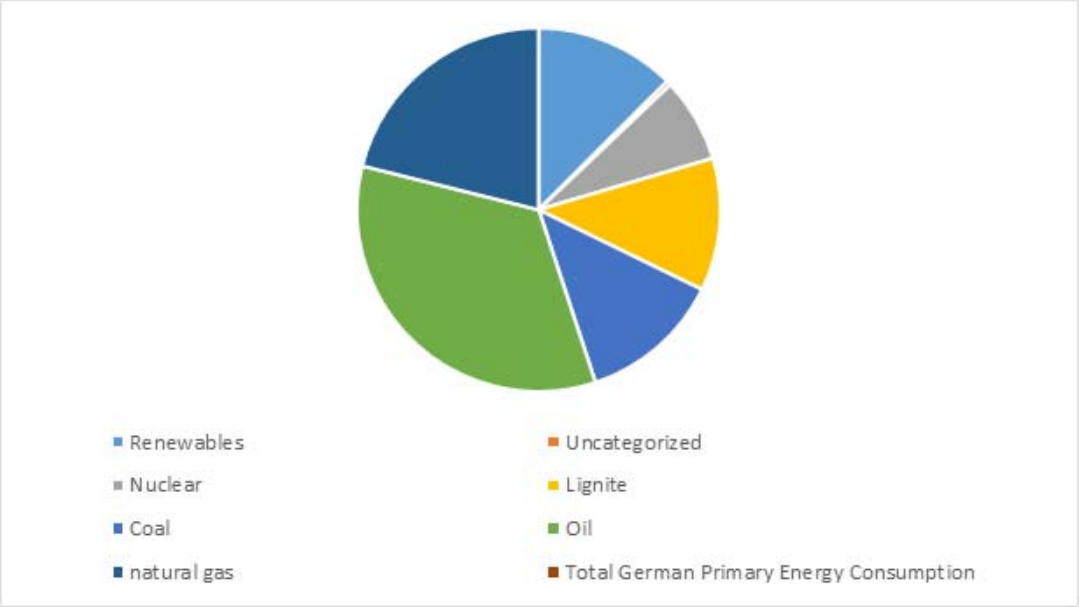

Figure 1. 2016 Total German Primary Energy Consumption[47]

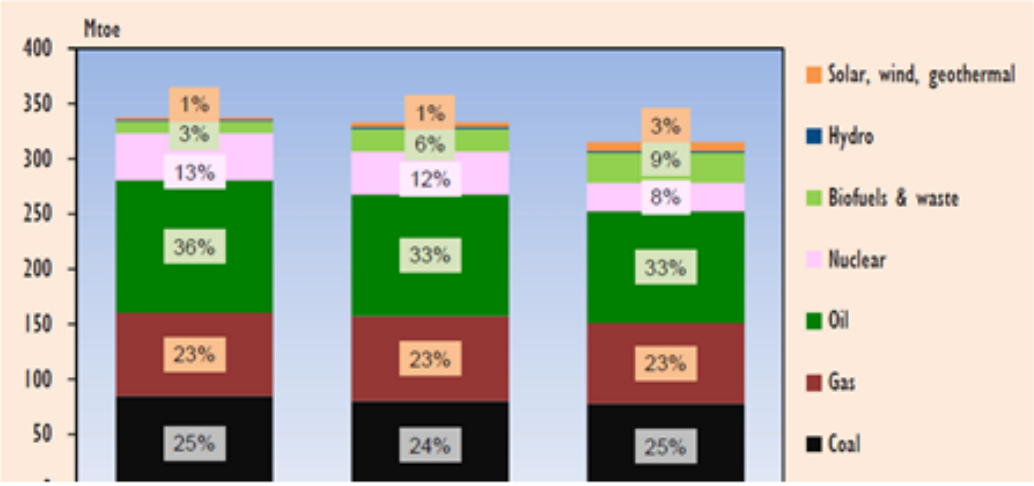

Figure 2. Total German Energy Supply[48]

47 Adapted from "AG Energiebilanzen Pressedienst 2016 no. 1," AGEB, March 18, 2016, http://www.ag-energiebilanzen.de/.

48 Source: "IEA Germany One-Pager," IEA, June 2014, https://www.iea.org/media/countries/slt/GermanyOnepagerJune2014.pdf.

b. German Energy Security

Debate does exist regarding what impacts German energy policy has to energy security and overall German stability. Many articles laud Germany's *Energiewende* and a successful transition to renewable and environmentally friendly energy sources.[49]

Others, however, point to increasing dependence on fossil fuel imports, a struggling traditional base power industry, the questionable viability of renewables in Germany, and rising energy costs.[50] These views will be considered in the body of this thesis.

5. Energy Security and Security

While energy security literature often treats energy security as an objective that is interlinked with efficiency and affordability, it rarely addresses the implications of energy security to broader security objectives or international relations theory. Looney describes virtuous trilemmas, where national security is incorporated as an objective to energy policy. He outlines the negative ramifications for climate change on national security, and the benefits of national policy that is less clouded by energy security motivations.[51]

Esakova incorporates international relations theory into her analysis of energy security, and applies the work of Keohane and Nye to the oil and gas markets. She argues

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[49] Sang-Chul Park and Dieter Eissel, "Alternative Energy Policies in Germany with Particular Reference to Solar Energy," *Journal of Contemporary European Studies* 18, no. 3 (2010): 323; Rolf Wustenhagen and Michael Bilharz, "Green Energy Market Development in Germany: Effective Public policy and emerging customer demand," *Energy Policy* 34 (2006): 1681; Lutz Mez, "Germany's Merger of Energy and Climate Change Policy," *Bulletin of the Atomic Scientists* 68, no. 6 (2015): 22.

[50] Ed Crooks, "Germans in Energy Scramble," *Financial Times*, January 13, 2010; Alice Bota, Matthias Krupa, and Michael Thumann, "Die Rohrbombe," *Zeit Online*, February 5, 2016, http://www.zeit.de/2016/06/nord-stream-2-deutschland-russland-pipeline/komplettansicht; Warren Dym, "A Tale of Three Pipelines: Nord Stream and the Primacy of Industry in Germany," Big Deal Energy (blog), September 26, 2015, http://warrendym.com/a-tale-of-three-pipelines-nord-stream-in-context/; "Europe's Gas Pipelines: The Abominable Gas Man," *The Economist*, October 14, 2010, http://www.economist.com/node/17260657.

[51] Robert E. Looney, "United States' Energy and Climate Transition: Partial Success Without a Plan," in Routledge Handbook on Transitions to Climate and Energy Security, ed. Robert E Looney, 25.

for the applicability of interdependence theory in these markets, and uses it to explain differences in energy relationships.[52]

Sovacool elucidates on the ways in which energy security affects the overall security equation. He provides examples where there was either a perceived or overt coercion through energy resources, and cites a Stanford study that refers to natural gas as the "gas weapon" because of its frequent use in manipulation.[53] He points to China's 1992 statement on its willingness to use force to assert its rights over oil and gas resources in the South China Sea, and even provides examples for how the quest to secure energy resources contributed to both World Wars and conflict during the Cold War.[54] Here he echoes historian Vaclav Smil, who argues that energy was related to almost every cross-border war in the 20th century. Sovacool goes further to connect energy and war, explaining how war is the most "concentrated and devastating" release of energy, requires the mobilization of energy resources, and often results in the disruption of energy.[55]

The aforementioned examples notwithstanding, current energy security literature fails to assess energy security principles of strategy against international relations or to make predictions on how these strategies will affect overall security. This thesis, in studying German energy policy and energy security concerns, will use liberal international relations theory to explore any relationships that may exist between energy security and overall security.

D. THESIS OVERVIEW

The thesis now continues by investigating three notable topics in the German energy mix: the proposed trans-Baltic natural gas pipeline connecting Russia to Germany, the Nord Stream 2; Germany's decision to phase-out nuclear energy; and German and EU efforts to transition to renewable and green energies. The three are major issues in

52 Esakova, *European Energy Security—Analysing the EU-Russia Energy Security Regime in Terms of Interdependence Theory*, 19.

53 Sovacool, "Defining, Measuring, and Exploring Energy Security," 10.

54 Ibid.

55 Ibid.

German energy policy and represent points of departure or transitions in German strategy. The Nord Stream 2 pipeline plan is controversial and appears to be inconsistent with EU policy, but it also highlights a consistent (and perhaps growing) trend of German reliance on natural gas imports. Germany's decision to abandon nuclear technology as a component of national energy supply is similarly controversial. It too has ramifications on German energy independence and thus security, and is also perceived to affect Germany's chances of succeeding with its *Energiewende*, or transition to renewable energies. Finally, the German (and EU) transition to renewable energy sources is a landmark event that carries significant implications to energy security. Germany stands as a pioneer of the move to renewable energies, and its success or failure has enduring implications to energy policies worldwide. The thesis will devote a chapter to each theme; it will introduce the theme, establish its significance, and assess its implications on German energy security and regional security and stability. The thesis will conclude by providing a consolidated outlook on German energy security and regional security and stability and will reiterate significant observations from the previous chapters.

II. NORD STREAM 2

A. INTRODUCTION

Nord Stream 2 AG, a consortium of five European companies and the Russian energy giant Gazprom, launched in November of 2015 with the goal of expanding the current Nord Stream natural gas pipeline.[56] The proposal will add two pipes spanning the Baltic Sea between Russia and Germany and will effectively double the output of the existing Nord Stream infrastructure that became operational in 2011.

The vocal criticism from certain European countries belies the apparent inclusiveness of the multinational venture. Shortly after announcement of Nord Stream 2's formation, ten EU nations submitted a letter to the European Commission that advised that the pipeline was contrary to EU interests and called for its further scrutiny.[57] The plan, at any rate, appears to fly in the face of EU sanctions against Gazprom that are still in place since Russia's invasion and annexation of Crimea in 2014.

In the face of such strong objection on the part of elements in the EU and at the risk of compromising the cohesiveness of EU international policy, why is Germany continuing to support construction of this pipeline? Why was the pipeline proposed in the first place? Who are the major stakeholders, what are their interests, and what will the overall effect be on German energy security and security as a whole for the region? This chapter considers the positions of the main stakeholders in this venture and assesses the effects of Nord Stream 2 on energy security in Germany and regional security in general. Specifically, it argues that while Nord Stream 2 is expected to increase energy security for Germany, its effects on regional security and stability are not as clear. The Nord Stream case reveals conflicts between energy security strategies and overall security interests. The chapter provides a brief overview of the Nord Stream project, elucidates

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[56] "Nord Stream 2," Nord Stream 2, accessed January 31, 2016, http://www.nord-stream2.com/.

[57] Barbara Lewis, "Ten EU Nations Say Nord Stream Gas Extension Not in EU Interests," Reuters, November 27, 2015, http://www.reuters.com/article/us-ukraine-crisis-nordstream-idUSKBN0TG0JX20151127.

the positions of the main stakeholders, and assesses the effects of Nord Stream on energy security and overall security using the previously laid out principles.

B. HISTORY

As mentioned earlier, the envisioned Nord Stream 2 pipeline is an extension to the Nord Stream (1) pipeline, which was built by a consortium of five shareholders: the Russian *Gazprom*, German companies *Wintershall* (a subsidiary of BASF) and E.ON, Dutch *Gasunie,* and French *Suez*.[58] The consortium was founded in 2005 and began construction in April 2010. The project consists of two 1,224 km strings that originate near the Russian Baltic city of Vyborg and terminate near the German coastal city of Greifswald.[59] The first string came online in November 2011 and the second string was commissioned less than one year later in October 2012. The two existing strings have a capacity of 55 billion cubic meters (bcm) of gas per year and cost 7.4 billion euros to construct.

According to Gazprom, Nord Stream shareholders were already assessing the viability of an expansion to the newly built pipeline in 2012. The proposed routes largely follow those taken by the original pipeline, and the Nord Stream 2 consortium hopes to use the original infrastructure as a benchmark for the proposed expansion.[60] The proposed expansion would add 55 bcm and effectively double capacity. The next section assesses the major stakeholders in the Nord Stream 2 project.

C. THE MAJOR PLAYERS

1. Russia

Despite being an expansion to an existing pipeline, Nord Stream 2 is nonetheless expected to cost 9.9 billion euros—over one billion euros more than its predecessor.[61]

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58 "Nord Stream," Nord Stream, accessed January 31, 2016, http://www.nord-stream.com/.

59 "Nord Stream," Gazprom, accessed January 31, 2016, http://www.gazprom.com/about/production/projects/pipelines/nord-stream/.

60 "About Us," Nord Stream, accessed January 31, 2016, http://www.nord-stream.com/about-us/.

61 Agata Loskot-Strachota, "The Case Against Nord Stream 2," *Energy Post*, November 23, 2015, http://www.energypost.eu/case-nord-stream-2/.

Total Russian gas export to Europe in 2014 was 147 bcm—roughly half the capacity of current pipelines to Europe and Turkey (307 bcm).[62] Why would Russia undertake this costly endeavor when ample capacity already exists?

The impetus lies in Ukraine's current status as a transit state for Russian gas; much Russian gas that is destined for Europe currently flows through Ukraine. Gazprom and the Ukrainian energy company Naftogaz have seen a rash of disputes over gas supply starting from the mid-2000s. The disputes culminated in Gazprom's cutting Ukrainian gas supplies in 2006 and 2009. Ukraine responded by siphoning gas that was destined for Europe, causing European customers to witness significant drops in supply. The episodes caused an outcry from Western European customers, and Gazprom was compelled to resume supply.

These gas disputes have led Gazprom to diversify its supply routes to Europe, and were the impetus for both Nord Stream and the since-discontinued South Stream pipelines.[63] Nord Stream has reduced Gazprom reliance on Ukraine as a transit state. The Ukrainian Ministry of Energy reported that the amount of Russian natural gas transiting its country has decreased by 28% in recent years.[64] While a significant portion of this can be attributed to the ongoing tensions between the two countries, Russia's continued ability to supply Europe in spite of these reductions is due in part to Nord Stream 1, and Nord Stream 2 will further reduce Russian reliance on Ukraine as a transit state.

A separate Russian incentive for the Nord Stream pipeline is the desire to better focus gas exports to Europe. The Ukrainian Corridor transits Slovakia onward to Austria, Hungary, Italy, and Slovenia.[65] A component of the Ukrainian corridor also transits south toward Romania and Moldova. Nord Stream allows Gazprom to direct more gas toward northern Europe and onward to the UK. Germany is the largest gas importer in Europe,

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62 "Gazprom Annual Corporate Brochure," Gazprom, 2014, http://www.gazpromexport.ru/en/presscenter/publications/#brochure.

63 "How the Game Is Played: The Life and Death of South Stream," *Stratfor*, September 17, 2015, https://www.stratfor.com/analysis/how-game-played-life-and-death-south-stream.

64 "Ukraine," Energy Information Agency, last updated September 2015, http://www.eia.gov/beta/international/analysis.cfm?iso=UKR.

65 Loskot-Strachota, "Case Against Nord Stream 2."

importing 86 bcm in 2014, and the UK is fourth, importing 42 bcm.[66] Increased capacity to this region is advantageous in light of expectations that gas production in Norway and the Netherlands will decline.[67]

2. Germany

a. Demand

As mentioned earlier, Germany is Europe's largest natural gas importer. It receives its gas from Russia (38%), Norway (22%), and the Netherlands (26%).[68] The natural gas consumption in Germany is entrenched; Germany first imported gas from the USSR in 1973 and completed an underwater pipeline to import Norwegian gas in 1977.[69] While Germany has undertaken an ambitious *Energiewende* program to increase the share of renewable energies, its dependence on natural gas is not likely to decline in the near term. German and EU environmental legislation has set emissions reduction targets for 2020 and beyond. Because natural gas produces roughly 40% of the carbon dioxide emissions of coal (it is thus known as a bridge fuel), it is likely to be favored over coal in the energy mix, and will likely play a large role in replacing the supply lost through the planned retirement of all of Germany's nuclear plants by 2022.[70] Liberalization of the energy market, another objective of EU energy policy, has also tended to favor natural gas, as the market favors the relatively low-cost gas to other long-term investment.[71] Finally, natural gas power plants can be switched from idle to high production in a

66 "International Energy Statistics," EIA, accessed March 19, 2016, http://www.eia.gov/cfapps/ipdbproject/IEDIndex3.cfm?tid=3&pid=26&aid=4.

67 "Historical and expected volumes of sales gas from Norwegian fields, 1985–2025," Norwegian Petroleum, data published 2014, http://www.norskpetroleum.no/en/?attachment_id=10939.

68 "Natural Gas Supply in Germany," Federal Ministry for Economic Affairs and Energy, accessed March 19, 2016, http://www.bmwi.de/EN/Topics/Energy/Conventional-energy-sources/gas.html.

69 John S. Duffield, *Fuels Paradise: Seeking Energy Security for Europe* (Baltimore: Johns Hopkins University Press, 2015), 163.

70 International Energy Agency, *Energy Policies of IEA Countries: Germany* (Paris: IEA, 2013), 52; "Nord Stream Environmental Impact Assessment: Documentation for Consultation under the Espoo Convention," Nord Stream, February 2009, https://www.nord-stream.com/download/document/69/?language=en.

71 Paul Belkin and Vince L. Morelli, *The European Union's Energy Security Challenges* (CRS Report No. RL33636) (Washington, DC: Congressional Research Service, 2007), 20.

relatively short time. Quick modulation supports the role of natural gas alongside renewable energies, which themselves tend to be cyclical (rising and falling with the sun and wind).[72]

With expectations that gas production will decline in Norway and the Netherlands, it is in Germany's interests to ensure the reliability of its Russian source. Russian gas is currently supplied via the Yamal pipeline that flows from Poland (via Belarus) and the Ukrainian Corridor network that runs from the Czech Republic (via Slovakia and Ukraine).[73] Diversifying supply routes, even if the source remains the same, would be advantageous, especially considering the disruptions caused by Ukrainian-Russian disputes.[74]

b. Politics

Of the German political parties, the SPD is often labeled as being pro-Russian.[75] Gerhard Schroeder, leader of the SPD and Chancellor during its coalition with the Greens from 1998–2005, favored a policy of Ostpolitik and was instrumental in supporting the early negotiations for Nord Stream. Likewise, current Minister of Economic Affairs and Energy and SPD member Sigmar Gabriel is seen as a strong defender of Russian ties and supports Nord Stream 2.[76] It must be said, however, that he works in a coalition government with the stronger CDU/CSU. The center-right CDU/CSU has been in power since 2005, and must also claim responsibility for Nord Stream, as it oversaw the commissioning of Nord Stream 1 and negotiations for Nord Stream 2. While the leader of the CDU, Chancellor Angela Merkel, and others in her party have taken a more critical

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72 Sören Amelang, "Germany's dependence on imported fossil fuels," Clean Energy Wire, February 11, 2016, https://www.cleanenergywire.org/factsheets/germanys-dependence-imported-fossil-fuels.

73 "Europe's Gas Pipelines: The Abominable Gas Man," *The Economist*, October 14, 2010, http://www.economist.com/node/17260657.

74 Warren Dym, "A Tale of Three Pipelines: Nord Stream and the Primacy of Industry in Germany," Big Deal Energy (blog), September 26, 2015, http://warrendym.com/a-tale-of-three-pipelines-nord-stream-in-context/.

75 "Nordstream 2: Unions-Außenpolitiker kritisieren deutsche Pipeline-Pläne," *Spiegel Online*, accessed March 19, 2016, http://www.spiegel.de/wirtschaft/soziales/nordstream-2-cdu-aussenpolitiker-kritisiert-pipeline-plaene-a-1068744.html.

76 Alice Bota, Matthias Krupa, and Michael Thumann, "Die Rohrbombe," *Zeit Online*, February 5, 2016, http://www.zeit.de/2016/06/nord-stream-2-deutschland-russland-pipeline/komplettansicht.

view of Russia, she has nonetheless backed the proposal, reasserting on several occasions that it is a business decision.[77] Similarly, the Bundestag announcement regarding Nord Stream also calls it a business decision and principally supports any diversification of energy supply.[78] Thus, while it might be argued that German policy toward Nord Stream 2 was politically influenced, the two major parties, which enjoy roughly 80% of Bundestag representation, have both at least tacitly approved of the plan. Of note, former Chancellor Schroeder accepted a job on the board of Nord Stream AG shortly after stepping down from his office in 2005. He has been strongly criticized over a conflict of interest.[79] Finally, the judiciary has also supported Russian business arrangements, and the German anti-monopoly court approved Gazprom acquiring a stake in German energy-sector firms VNG and Wingas.[80]

c. Business Interests

Two of the members of the Nord Stream 2 consortium, E.on and BASF Wintershall, are German companies. While the pipeline does give the companies access to cheaper gas by avoiding transit countries, the primary interest in the project is likely the reciprocal deals that are associated with it. European companies have long sought access to Russian gas fields. The Yuzhno Russkoye Field, one of the world's largest oil and gas fields, is the source for much of Nord Stream gas, and E.on and Wintershall each acquired a 25% stake in the production license and operations company.[81]

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77 Gabriele Steinhauser, "Germany's Merkel Defends Russian Gas Pipeline Plan," *Wall Street Journal*, December 18, 2015, http://www.wsj.com/articles/germanys-merkel-defends-russian-gas-pipeline-plan-1450447499.

78 "Antwort der Bundesregierung, Drucksache 18/6526," Bundestag, February 11, 2015, dip21.bundestag.de/dip21/.../1806526.pdf.

79 "Schroeder attacked over gas post," *BBC News*, updated December 10, 2015, http://news.bbc.co.uk/2/hi/europe/4515914.stm.

80 "Bundeskartellamt plans to clear Gazprom's acquisition of minority interest in VNG," Bundneskartellamt, January 13, 2012, http://www.bundeskartellamt.de/SharedDocs/Meldung/EN/Pressemitteilungen/2012/13_01_2012_Gazprom_VNG.html.

81 "Development & Production in Russia —Yuzhno Russkoye Gas Field," E.ON, accessed March 19, 2016, http://www.eon.com/en/business-areas/exploration-and-production/development-and-production/russia.html.

The degree to which business interests affect national policy in Germany cannot be completely ascertained. Special interests—especially from the energy sector—are said to have strong ties to the federal government, with energy companies enjoying close relationships with the Ministry of Economics. Friedemann Müller, a prominent energy analyst, has observed that the Ministry of Economics has been almost unreservedly committed to supporting German business interests.[82]

3. Eastern European States

Response to the Nord Stream 2 proposal has been overwhelmingly negative among the Eastern European states. EU members like Poland and Slovakia contest that the project contradicts EU energy law but also have personal interests at stake. Both nations are transit states for Russian natural gas—Poland hosts the Yamal pipeline and Slovakia the Bratstvo pipeline that also passes Ukraine—and stand to lose revenues if Russia diverts gas supplies to Nord Stream.[83] Of the 10 nations that signed a letter questioning the Nord Stream 2 pipeline, the majority are transit states, and all are heavily dependent on Russian gas imports.

This highlights another concern in the region: dependency on Russia for natural gas. According to a 2013 Gazprom-BP statistical review, 10 Eastern European countries import at least 60% of their national gas supply from Russia, and four—Estonia, Finland, Latvia, and Lithuania—are completely dependent on Russia for their gas needs.[84] Russia has traditionally capitalized on the high levels of dependence and energy isolation of these Eastern European countries by engaging in price-discrimination and other monopolistic practices.[85] Any reductions in gas transiting Eastern Europe, it is feared, will further isolate the region and make it subject to Russian manipulation. Radek Sikorski, then Polish foreign minister, even compared the Nord Stream agreement

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82 Duffield, *Fuels Paradise*, 189.

83 Bota, "Die Rohrbombe."

84 "Russian Gas Imports to Europe and Security of Supply," Clingendael International Energy Programme, accessed March 19, 2016, http://www.clingendaelenergy.com/files.cfm?event=files.download&ui=9C1DEEC1-5254-00CF-FD03186604989704.

85 Zeyno Baran, "EU energy security: time to end Russian leverage," *Washington Quarterly* 30, no. 4 (2007): 136, https://muse.jhu.edu/journals/wq/summary/v030/30.4baran.html.

between Russia and Germany to the 1939 Molotov-Ribbentrop Pact.[86] Finally, Italy also has expressed opposition to Nord Stream 2. Though it is less dependent on Russian natural gas than Germany, it decried a perceived double standard within the EU.[87] The pipeline that it had been negotiating with Russia, South Stream, encountered numerous obstacles within the EU and was ultimately abandoned.

4. The European Union

The 2006 and 2009 gas disputes and the current Russian-Ukrainian crisis elevated the importance of energy security within the EU. Security of natural gas supply is of particular concern; even though EU states import more oil (90%) than they do natural gas (60%), gas supply is perceived to be less secure due to the relatively few sources for gas and the complete dependence of some EU countries on Russian natural gas.[88]

In response to the crises, the EU Commission released an Energy Security Strategy (ESS) in 2014. The strategy included a series of "stress tests" to assess European resilience to Russian supply shocks ranging from one to six months.

The ESS also proposed five long-term solutions to EU gas dependency: increasing energy efficiency, increasing internal energy production (to include nuclear, sustainable fossil fuels, and renewable energies), completing the internal energy market, unifying external energy policy, and strengthening emergency plans.[89]

The goal to institute an internal energy market has been long-standing, and has included market liberalization measures such as those found in the EU Third Energy Package. The package requires the "unbundling" of energy suppliers from corporations

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[86] Andrew E. Kramer, "Russia Gas Pipeline Heightens East Europe's Fears," *New York Times*, October 12, 2009, http://www.nytimes.com/2009/10/13/world/europe/13pipes.html?_r=0.

[87] "Keep Calm and Carry On: EU Feuding Casts no Doubt on Nord Stream-2 Pipeline," *Sputnik News International*, updated January 31, 2016, http://sputniknews.com/business/20160131/1034003762/germany-nord-stream-pipeline.html.

[88] "Energy Security Strategy," European Commission, accessed March 19, 2016, https://ec.europa.eu/energy/en/topics/energy-strategy/energy-security-strategy.

[89] Ibid.

that operate energy infrastructure, prohibits monopolies, and requires third party access to infrastructure.[90]

The Commission recognized the importance of cohesion in the EU and that bilateral agreements negotiated by EU and non-EU countries could undermine EU strategy. To this end the ESS strengthened existing requirements for countries to report energy agreements (Intergovernmental Agreements, or IGAs) to the EU commission. While reporting requirements had already been in place since 2012, they were deemed as ineffective, as a study assessed that roughly one third of IGAs were not consistent with EU law and none had been successfully amended.[91]

That said, the Commission has demonstrated its strength at enforcing compliance with Third Energy Package market rules. Gazprom's plans to build the South Stream Pipeline connecting Russia to Europe via the Black Sea met stiff resistance in the EU, which found it in violation of Third Package requirements and began to investigate Gazprom over monopolistic practices.[92] Consequent to this investigation and general European backlash regarding the Ukrainian crisis, Russia abandoned the South Stream project in December 2014.[93]

Interestingly, the Nord Stream proposal, which was pursued during the same time period, did not receive the same scrutiny and instead was granted immunity from Third Package requirements through a designation as a Trans-European Network (TEN) pipeline.[94]

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[90] International Energy Agency, *Energy Policies of IEA Countries: European Union* (Paris: IEA, 2014), 36.

[91] "European Commission —Fact Sheet, Intergovernmental agreements in energy," European Commission, February 16, 2016, http://europa.eu/rapid/press-release_MEMO-16-309_en.htm; "European Commission —Fact Sheet, Why is the Commission proposing an Energy Union now? Why do we need an Energy Union?," European Commission, February 25, 2015, http://europa.eu/rapid/press-release_MEMO-15-4485_en.htm.

[92] "How the Game is Played: Life and Death of South Stream," *Stratfor*, September 17, 2015, https://www.stratfor.com/analysis/how-game-played-life-and-death-south-stream.

[93] "Gazprom Declares Termination of South Stream Agreement," Novinite.com, Jan 31, 2016, http://www.novinite.com/articles/172724/Gazprom+Declares+Termination+of+South+Stream+Agreement.

[94] Stratfor, "Life and Death of Southstream."

While the Commission still acknowledges overdependence on Russian gas imports—"we are still far too vulnerable," asserted European Commissioner for Climate Action and Energy Miguel Arias Canete—it seems to be taking the same approach to the expansion of the Nord Stream pipeline as it did to the original, and has echoed Chancellor Merkel's claims that Nord Stream 2 is a "commercial venture."[95] Still, it is reviewing Ukrainian complaints regarding the expansion and affirms that it will assess "the legal position" of the project.[96]

D. EFFECTS

The success of the Nord Stream 2 project is contingent on geopolitical developments and the consortium's ability to navigate the approval of Baltic countries, maintain backing within the German political system, and pass Eastern European and EU scrutiny. As it were, the Commission is currently reviewing a complaint from Ukrainian energy company Naftogaz.[97] Assuming the status quo, however, Nord Stream 2 is likely to pass the hurdles as its predecessor did. This section will assess the effects on energy security and overall security if Nord Stream 2 comes to fruition.

1. Energy Security

According to the tenets of energy security discussed earlier, Nord Stream 2 is expected to improve energy security for Germany. Even though the pipeline does not diversify gas supply, it does diversify supply routes. It not only protects Germany from supply interruptions that could come from the aging existing infrastructure, but it also disassociates German gas imports from political and business disputes between Ukraine and Russia. This benefit would be offset if the pipeline tied Germany to contracts that further increase its dependence on Russian gas, but this is unlikely, especially since

95 "State of the Energy Union 2015—Commission Staff Working Document," European Commission, November 18, 2015, https://ec.europa.eu/energy/sites/ener/files/documents/3_EESS.pdf

96 Kanter, James, "E.U. takes steps to reduce reliance on Russian gas," *International New York Times*, February 17, 2016, http://search.proquest.com/docview/1765453198?accountid=12702.

97 "EU to Study Naftogaz's Complaint Against Nord Stream 2," *Interfax: Russia & CIS Energy Daily*, February 2, 2016, http://search.proquest.com/docview/1762019509?accountid=12702.

Gazprom has agreed to sell its gas on the spot market.[98] Benefits of supply diversity would also be offset if Gazprom acts on its previously stated intention to halt gas transit through Ukraine by 2019.[99]

2. Security

a. Eastern European Stability

While Nord Stream 2 should act to improve energy security for Germany, it promises to decrease overall security for Germany and the region. This is largely because of its possible effects on Eastern Europe. With a combined capacity of 110 bcm, the resulting Nord Stream pipeline would be able to completely displace Ukrainian transit gas, which amounted to roughly 80 bcm in 2013.[100] If Russia acts on its earlier intention to halt Ukrainian transit gas, Ukraine can stand to lose 2 billion euros in royalties. This will further damage an already fragile economic and political situation in Ukraine, and Ukrainian Prime Minister Arseniy Yatsenyuk has called the pipeline "anti-Ukrainian."[101]

Perhaps more damaging would be Russia's ability to use gas as a hard power tool against Ukraine. Although it has already been perceived to do so in the earlier gas stoppages, Russia was limited by the political backlash from Western Europe. With no dependence on Ukrainian transit gas, Western Europe is less likely to respond to Russian manipulation of gas exports to Ukraine, giving Russia freer rein to use gas supply as a hard power tool. Gas dependence on Russia has already been perceived to stifle Western criticism of Russian antagonistic behavior toward its neighbors.[102] Direct Russian-German relations have isolated Eastern Europeans and made them reminiscence on the

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98 "Gazprom to Offer More Gas at Spot Prices Via Nord Stream II – Sources," *Reuters*, October 13, 2015, http://uk.reuters.com/article/russia-gazprom-spot-idUKL8N12D4HK20151013.

99 Elena Mazneva, "Russia Plans to End Ukraine Gas Transit for New Route After 2019," *Bloomberg*, April 13, 2015, http://www.bloomberg.com/news/articles/2015-04-13/russia-plans-to-end-ukraine-gas-transit-for-new-route-after-2019.

100 "Russian Gas Imports to Europe and Security of Supply—Fact Sheet," Clingendael International Energy Programme.

101 "Ukraine's PM Urges EC to Scrap Nord Stream 2 as 'Anti-European' Project," *Sputnik International*, January 2, 2016, http://sputniknews.com/business/20160201/1034045859/nord-stream-2-ukraine.html#ixzz42qes08VJ.

102 Baran, "EU energy security."

Motolov-Ribbentrop pact of World War II.[103] Further isolation is likely to propagate the perception of Eastern Europe as a "shatter belt" between Russia and Germany.[104]

Economic or political crises in Central Europe will likely have spill-over effects for Germany and the rest of Western Europe as will Russian aggression on its neighbors, and these will act to reduce regional security. According to the liberal model described earlier, reduced interdependence between Germany and its eastern neighbors, coupled with a sense of abandonment, could increase the likelihood of conflict between these two parties.

b. Direct German-Russian Ties

In contrast, Nord Stream 2 will deepen ties between Germany and Russia and reinforce German Ostpolitik. This comes at a time when Russian and Western relations have been strained, with Russian Prime Minister Medvedev even calling the situation emblematic of a "new Cold War."[105] According to liberal theory, the increased interdependence should act to reduce conflict between Germany and Russia and thereby improve security between Russia and the West. German-Russian interdependence will be heightened by German commercial stakes in Russian gas fields. These inroads might act to liberalize the traditionally closed Russian market, and theory predicts that liberal democratic countries are less prone to conflict.

There is contention as to whether resource-focused trade is beneficial for national economies or whether resource-driven relationships truly improve security.[106] Some argue that large resource reserves like those in Russia crowd out other sectors of a nation's economy. They assert that other sectors contribute more to jobs and

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103 Kramer, "Russia Gas Pipeline Heightens East Europe's Fears."

104 Anton Gosar, "The Shatter Belt and the European Core —A Geopolitical Discussion on the Untypical Case of Slovenia," *GeoJournal* 52, no. 2 (2000): 1, http://link.springer.com/article/10.1023%2FA%3A1013306804212.

105 Ray Sanchez, Nic Robertson, and Don Melvin, "Russian PM Medvedev Equates Relations With West to a 'New Cold War,'" *CNN*, updated February 15, 2016, http://www.cnn.com/2016/02/13/europe/russia-medvedev-new-cold-war/.

106 C.W., "What Dutch Disease Is, and Why It's Bad," *The Economist* (blog), November 5, 2014, http://www.economist.com/blogs/economist-explains/2014/11/economist-explains-2.

development, and thus a large resource market causes more harm than good. Furthermore, it is argued that resource endowments and resource-dependent trade have been detrimental to democracy in Russia.[107] A decrease in democracy, according to liberal theory, is expected to increase the likelihood of conflict between Russia and other countries, and would thus reduce security in the area.

c. National Interests Versus a Collective EU Identity

Liberal theory posits that Intergovernmental Organizations (IGOs) like the EU are stabilizing and thus improve security. Indeed, the period of post-WWII peace in Western Europe has been attributed to the EU, and the Nobel Committee even awarded the EU with its Peace Prize in 2012 for its contributions in transforming Europe into a "continent of peace."[108] While the EU has introduced mechanisms to oversee energy deals like Nord Stream 2, bilateral deals have been perceived as a Russian attempt to "divide and conquer" and unravel EU cohesion.[109] To the extent that bilateral deals like Nord Stream 2 undermine EU cohesion and damage EU ability to arbitrate energy decisions, they could reduce security in the region.

Bilateral agreements and the EU's perceived inconsistent handling of them (vis-à-vis Italy and South Stream) have acted to expose rifts within the EU. Nord Stream 2, in particular, has exposed the disparate interests of the Eastern European member states and Germany. If the pipeline project continues to polarize the EU members, this too will reduce security according to liberal theory.

3. Energy Security and Security

The previous section has outlined a few ways in which Nord Stream 2, while increasing German energy security, might decrease overall security. This section addresses a general conflict between energy security and security. As mentioned, energy

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107 M. Steven Fish, *Democracy Derailed in Russia: The Failure of Open Politics* (Cambridge, Cambridge University Press, 2005).

108 "European Union receives Nobel Peace Prize 2012," European Union, updated February 5, 2016, http://europa.eu/about-eu/basic-information/eu-nobel/index_en.htm.

109 Baran, "EU energy security."

security theory promotes the use of domestic energy sources as a means of increasing energy security. To this end, the ESS promotes the increased use of renewable energies to reduce dependence on natural gas imports. Measures like this one to increase energy self-sufficiency necessarily damage interdependence among countries, however, and thus act to increase the likelihood of conflict according to liberal IR theory. The measures are consistent with the tendency of nations to seek self-reliance during times of war, and lead to a situation where the costs of conflict are reduced.[110] They also resemble self-help strategies that are emblematic of realist IR theory, which tends to predict conflict as a general state of affairs.[111] As Russett and Oneal point out in their book, liberal or realist influences can prevail depending on the relative state of international affairs.[112] Adherence by countries to energy security tenets and other realist strategies, then, could shift world climate in a way that promotes realist outcomes.

E. CONCLUSION

Notwithstanding Chancellor Merkel's claims, the Nord Stream 2 project has triggered political tension since its inception. The successful construction of the pipeline will depend on the Nord Stream consortium's ability to navigate all of the stakeholders, including its opponents within the EU and Eastern Europe. If implemented, the pipeline will have significant implications for German and regional security and stability. While it might improve energy security for Germany, the overall impact on regional security is less clear. Further isolation of Eastern Europe promises to damage the economic and political situation there. Greater interdependence between Germany and Russia can improve Russia-Western relations and promote liberalization in Russia. Finally, bilateral deals like Nord Stream 2 undermine the EU energy strategy and demonstrate the limits of IGOs in managing traditionally national prerogatives. What effect Nord Stream 2 will have on regional security has yet to be seen, and this uncertain outcome highlights the complex relationship between energy security and overall security in general.

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110 Russett, *Triangulating Peace*, 127.

111 Thomas Hobbes, *The English Works of Thomas Hobbes of Malmesbury*, ed. Sir William Molesworth (London: Bohn, 1839) 85.

112 Russett, *Triangulating Peace*, 41.

III. NUCLEAR ENERGY

A. INTRODUCTION

On May 11, 2011, the German government decided to eliminate nuclear energy from the German energy mix, opting to shutter eight reactors immediately and committing to close nine remaining reactors by 2022. This phase-out plan constitutes a significant—and costly—policy shift for Germany. Nuclear energy has been an integral part of the German energy mix since the first Nuclear Power Plant (NPP) went online in 1968; 17 NPPs were providing for roughly 20% of the nation's electricity needs when the decision was made in 2011, and nuclear energy produced close to 30% of total output at its height in the 1990s.[113]

This is not to say that public opinion of nuclear energy has always been positive, and Germany is home to a long-standing and successful anti-nuclear grassroots movement. Furthermore, while the phase-out was obviously influenced by the nuclear catastrophe in Fukushima, Japan, two months earlier, it was set in motion much earlier. To be sure, the turnaround was actually a return to a previous phase-out plan agreed to by the then Red-Green governing coalition in 2002.

A thorough understanding of the context for the policy shift must thus include the origins of the German anti-nuclear energy movement, the consequent formation of the Green Party, and its development into a mainstream German political party and member of a coalition government. To be sure, anti-nuclear energy sentiments can be traced even further to the anti-nuclear weapons debate and German postwar political culture. This chapter traces the history—working backwards from Fukushima—of the anti-nuclear movement in Germany and compares German nuclear energy policy with that of its neighbors. It assesses the German Green Party's ascent from fringe movement to established party, and considers reasons for the party's success at affecting public policy. From this historical review, the chapter will make an assessment on the likelihood of

113 "Country Profiles," World Nuclear Association, updated March 2016, http://www.world-nuclear.org/information-library/country-profiles.aspx.

reinstating nuclear energy in Germany, and will then turn to the implications that the shuttering of nuclear power plants will have on German energy security as well as regional security.

B. ORIGINS OF ANTI-NUCLEAR SENTIMENT

1. Fukushima and Near-term Elections

While the nuclear meltdown at the Fukushima Daiichi Plant was not the sole cause for Germany's decision to phase out its nuclear energy operations, it certainly sped up the process. At the time of the accident, the CDU/CSU-FDP coalition led by Chancellor Angela Merkel had just ratified the 11th amendment of the Atomic Energy Act (AEA), extending the life of pre-1980 reactors by eight years and that of post-1980 reactors by 14 years.[114] Nuclear power was to be a bridge to a low-carbon future based on renewable energy, and extending the life of the reactors was expected to generate somewhere between 21 and 73 billion euros in additional profits from the plants.[115]

It must be said that the CDU/CSU-FDP-ratified amendment undid the compromise of the previous government led by a SPD-Green coalition, which limited the lifetimes of Germany's existing nuclear reactors in view of an eventual phase-out of nuclear energy. The public thus chafed at this unraveling of the long-negotiated SPD-Green compromise, and the CDU-FDP government suffered in terms of public approval ratings.

This, then, was the context of Chancellor Merkel's response to Fukushima. Following the accident, Merkel announced a three-month moratorium on nuclear power, an immediate decommissioning of seven pre-1980 plants, and a safety inspection on all remaining nuclear plants. In spite of the fact that the reactor safety commission, headed by former Environmental Minister Klaus Toepfer, determined that all plants were safe, it recommended the closure of the remaining nuclear plants within a decade.[116] A plan to

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[114] Jahn Detlef and Sebastian Korolczuk, "German Exceptionalism: the End of Nuclear Energy in Germany!" *Environmental Politics* 21, no. 1 (2012): 161, DOI:10.1080/09644016.2011.643374.

[115] Detlef, "German Exceptionalism," 161.

[116] Detlef, "German Exceptionalism," 161.

shutter all remaining plants by 2022 and effectively reinstate the SPD-Green compromise was put before the Bundestag and passed with 80% of the votes, and in August 2011 the 13th amendment of the AEA was ratified.

Acknowledgement of the efficacy of the Fukushima accident in prompting policy change in Germany must be framed by the fact that elections were to take place in three Bundesländer just two weeks after the accident. Research indicates that the nuclear issue, like most others, suffers from the rise and fall of a short public issue life-cycle, and the recency of an event affects the public's memory of it. Recent events are thus fresher in the collective public memory and more apt to affect voting decisions and policy.[117] Chancellor Merkel was compelled to respond strongly to the Fukushima accident both because of the public's negative reaction to her previous policy reversal and in order to shore up public support in view of the upcoming elections. As it turns out, the measure was too-little-too-late, and the CDU and SPD suffered in the regional elections.

The significance of the public issue life-cycle and near-term elections following the catastrophe is supported when Germany's policy response is compared to that of the United Kingdom, where there were no impending elections, and poor public opinion of nuclear energy did not effectuate a similar change in policy.[118]

2. The Green Party and the History of the Anti-Nuclear Movement

a. Nuclear Phase-Out Compromise

As mentioned, the German government under Chancellor Merkel's leadership had in 2010 reversed an earlier phase-out of nuclear energy—a move coined by the press as an "Ausstieg aus dem Ausstieg," or exit from the exit.[119] The original legislation was ratified by the upper house in the German Parliament in 2002 by the previous

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117 Christian Joppke, "Social Movements during Cycles of Issue Attention: The Decline of the Anti-Nuclear Energy Movements in West Germany and the USA," *The British Journal of Sociology* 42, no. 1 (1991): 45, http://www.jstor.org/stable/590834.

118 Bettina B. F. Wittneben, "The Impact of the Fukushima Nuclear Accident on European Energy Policy," *Environmental Science & Policy* no. 15 (2012): 2, DOI:10.1016/j.envsci.2011.09.002.

119 Marc Brost, Peter Dausend, and Tina Hildebrandt, "Ausstieg aus dem Ausstieg aus dem...," *Zeit Online*, March 24, 2011, http://www.zeit.de/2011/13/Regierungsvertrauen.

government, under a coalition between the Green Party and the Social Democratic Party of Germany (SPD) that lasted from 1998 to 2005.

The legislation, championed by the Green Minister for the Environment, Nature Conservation and Nuclear Safety, Jürgen Tritten, was a hard-fought consensus between hard-liners and more pragmatic members in the Green party, the SPD, and Nuclear Power Plant (NPP) operators.[120] Negotiated in the summer of 2000 and signed by members of the administration and industry the following June, the agreement capped the total lifetime hours of operation for the 19 active plants to 2,623 Terawatt hours, including a theoretical 11 years of operation for the NPP at Mülheim-Kärlich, which had stopped operations in 1988 for regulatory reasons stemming from concerns over earthquakes. Operating hours were allocated by NPP, with NPP Kraftwerk Neckarwestheim II receiving the longest allotment at 20 years. The hours could be reallocated among NPPs, however, and no absolute phase-out date was stipulated.

The agreement also called for the end of transporting spent nuclear fuel to reprocessing plants at La Hague, France, and Sellafield, Great Britain. It called on the NPPs to establish intermediate storage facilities for the spent fuel and to continue exploration for a final storage facility. The NPPs agreed to adhere to strict safety protocols like periodic inspections and agreed to greater coverage and increased premiums for accident insurance. Finally, the agreement stipulated that no additional NPPs would be built in Germany.[121]

b. Green-Red Alliance Government

To understand how this nuclear phase-out legislation entered into policy, we must consider how the Greens were able to enter government, for no other party had placed an anti-nuclear agenda so firmly in its platform. The 1998 to 2005 participation in government was not unique—coalition governments including Green parties were being elected into power in France and Finland around the same time, with governments in

120 Wolfgang Rüdig, "Phasing out nuclear energy in Germany," *German Politics* vol. 9, no. 3 (2000): 61, DOI: 10.1080/09644000008404607.

121 "Atomkonsens und seine Restlaufzeit," *Frankfurter Allgemeine Zeitung*, January 2, 2002, http://www.faz.net/aktuell/politik/dokumentation-atomkonsens-und-seine-restlaufzeit-147737.html.

Norway, Iceland, Denmark, Portugal, and Sweden to follow in subsequent years—but it did mark the first time that the Green party had entered into the Federal government in Germany.[122] While entry into government was an undeniable accomplishment, the Green Party actually lost seats in the Bundestag compared to the previous election—winning only 6.7% of the seats—and its entry into government was more attributable to the Christian Democratic Union's (CDU) decline and the SPD's consequent advance. A poor economy and high unemployment unseated the CDU/CSU-FDP government, ending a 16 year (1982-1998) era of CDU/CSU dominion, and gave the SPD enough seats in parliament to form a coalition government with the Green Party.[123] The Green Party's landing in government was not purely for reasons external to it; it has been a reliable participant in regional and national governments, regularly polling at 20% and winning more than 10% of the seats in the Bundestag in the last two election cycles.[124] The success of the Greens is reflective of the strength of the greater public sentiment toward ecology, and the history of the anti-nuclear movement can be traced alongside the history of the Green party.

c. History of the Greens and the Anti-Nuclear Energy Movement in Germany

It is argued that the anti-nuclear energy movement actually traces its roots to the United States, where local protests in 1958 against the planned construction of a NPP in Bodega Bay, California successfully halted the venture.[125] The first European demonstrations against nuclear power did not take place until 1971 and were actually held in France. Like the Bodega Bay protest, though, they were generally local initiatives assembled to combat the construction of specific plants. The movement made its first successful entry into German public policy debates with protests against the construction

122 Wikipedia, s.v. "Alliance '90/The Greens," accessed September 2, 2016, https://en.wikipedia.org/wiki/Alliance_%2790/The_Greens.

123 "Alliance '90/The Greens," Wikipedia.

124 Ibid.

125 Joachim Radkau, "Eine kurze Geschichte der Deutschen Antiatomkraftbewegung," Bundescentrale fur Politische Bildung, 11 October 2011, http://www.bpb.de/apuz/59680/eine-kurze-geschichte-der-deutschen-antiatomkraftbewegung?p=all.

of a NPP at Wyhl in 1975. The protesters were an odd alliance of local farmers and vintners joined by students from the nearby liberal hotspot of Freiburg.[126] Rather than receive their energy from the student protest movement of the time, protestors were said to have been inspired by a recent successful protest against a chemical plant across the border in Strasbourg.[127]

In any case, the success of the protests in halting the plans for the NPP were a strong boon to the anti-nuclear movement in Germany, which continued with protests throughout the country until its high point in the late 1970s. Following the nuclear accident at Three Mile Island in 1979, 200,000 protesters convened upon West Germany's seat of government in Bonn.[128]

It was this strength of the anti-nuclear movement that precipitated the creation of the Green Party in 1980. From that point the Green Party began a gradual transition from fringe group into an established mainstream party, and thus progressively changed its confrontational and obstructionist tactics—protests and the use of lawsuits and judicial injunctions to thwart planned NPPs or the transport of spent fuel—to more pragmatic ones, as witnessed by the 2002 phase-out plan.[129] The Party's popularity has surged and waned, buoyed by nuclear accidents and perennial issues like the transportation and storage of nuclear waste, but support has steadily increased. It has achieved continuous representation in the Bundestag since 1983 and has even won 10% of the seats in the past two elections; it now stands as one of the strongest Green parties in the world.[130]

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126 Isabelle de Pommereau, "How Germany's Greens rose from radical fringe to ruling power," *Christian Science Monitor*, March 28, 2011, http://www.csmonitor.com/World/Europe/2011/0328/How-Germany-s-Greens-rose-from-radical-fringe-to-ruling-power.

127 Ibid.

128 Felix Werdermann, "Die größten Energie-Demos aller Zeiten," Klimaretter.info, May 28, 2011, http://www.klimaretter.info/protest/hintergrund/8705-die-groessten-anti-atom-demos-aller-zeiten; Kerstine Appunn, "The history behind Germany's nuclear phase-out," Clean Energy Wire, July 24, 2015, https://www.cleanenergywire.org/factsheets/history-behind-germanys-nuclear-phase-out.

129 Rudig, "Phasing out Nuclear Energy in Germany," 47.

130 "Welcome to the website of the Green Parliamentary Group in the German Bundestag," Bundnis 90/Die Gruenen Bundesfraktion, accessed September 3, 2016, https://www.gruene-bundestag.de/service-navigation/english.html; Detlaf Jahn and Sebastian Korolczuk, "German Exceptionalism: The End of Nuclear Energy in Germany!" *Environmental Politics* 21, no.1 (2012): 159.

3. Nuclear Weapons and the Peace Movement

a. Postwar Political Culture

The anti-nuclear energy movement is often linked to the peace movement and anti-nuclear weapons movement that predated it. Anti-war and anti-nuclear weapon sentiment is attributed, in part, to a political culture that emerged in Germany following World War II. The ignominy and shame felt by Germany following the fall of Nazi rule caused Germans to discredit their cultural heritage and left them without a political identity, territorial nationalism, national sovereignty, or cultural pride.[131] This caused the budding West German country to cleave both to international organizations (NATO and the UN) for security and a protector (the United States) for identity.[132] Furthermore, the trauma from the experiences of the war engendered a strong anti-military and anti-war sentiment within the populace.

b. Kampf dem Atomtod

Ironically, it was aligning under the United States and its NATO Allies and deriving security from them that afforded West Germany the avenue to rearm, and the Bundeswehr was formed on November 12, 1955, half a year after West Germany's official accession into NATO in May 1955.[133] The West German public's anti-militarization backlash to the rearmament came to a fore and merged with anti-nuclear sentiment in 1957 when then-Chancellor Adenauer made clear that his rearmament plans included outfitting the one-year old Bundeswehr with nuclear weapons. His intentions were all the more incendiary when he notoriously discounted nuclear weapons as "natural extensions of artillery."[134] This assertion, along with a critical response from renowned German physicists—which came to be known as the Gottingen Manifesto—unleashed the

131 John S. Duffield, "Political Culture and State Behavior: Why Germany Confounds Neorealism," *International Organization* vol. 53, no. 4 (1999): 779; Harald Mueller and Thomas Risse-Kappen, "Origins of Estrangement: the Peace Movement and the Changed Image of America in West Germany," *International Security* vol. 12, no. 1 (1987): 73.

132 Mueller, "Origins of Estrangement," 72.

133 Ian Q. R. Thomas, *The Promise of Alliance: NATO and the Political Imagination* (Lanham, MD: Rowman & Littlefield Publishers, 1997), 47.

134 Axel Schildt, "Die Friedensbewegung 1958," *Spiegel Online*, April 16, 2008, http://www.spiegel.de/einestages/50-jahre-friedensbewegung-a-946874.html.

latent angst in the German populace and became the source for the first wide-spread extra-parliamentary opposition to the Federal Republic of Germany. Demonstrating under the auspices of the "Kampf dem Atomtod," or "fight against nuclear death," protesters assembled throughout the Federal Republic, with some 200,000 gathering in Hamburg.[135] While the demonstrations were largely supported by the opposition party, the SPD, they garnered support from the churches and unions as well, and their ranks included members from all sectors of society.[136] To be sure, the movement had the support of the larger West German populace, and a poll conducted in 1958 reported that 83% of citizens were against the installation of nuclear missile launchers in West Germany.[137]

c. Nuclear Battleground

It must be mentioned that a considerable factor for West German angst concerning the nuclear armament of West Germany—especially with tactical nuclear weapons—was the realization that Germany would be the first victim of these weapons. Germany, as a divided nation hosting forces from two competing superpowers, would be the battleground for any confrontation between the two, and the nuclear weapons hosted on German territory by both sides would be employed within its borders at the cost of German lives.

This foreboding was reawakened when détente broke down in the late 1970s and the North Atlantic Council approved a plan to deploy a new generation of intermediate range cruise and ballistic missiles in Europe.[138] West Germans (along with other Western Europeans) saw in then-President Reagan's off-the-cuff suggestions of a "limited" nuclear war the United States' intention to confine a nuclear confrontation between the USSR and the U.S. to Europe.[139] Protests against the deployment of Pershing II missiles

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[135] Britta Probol, "Kampf dem Atomtod!" *Norddeutscher Rundfunk*, March 26, 2010, http://www.ndr.de/kultur/geschichte/chronologie/kampfdematomtod2.html.

[136] Schildt, "Die Friedensbewegung."

[137] Probol, "Kampf dem Atomtod."

[138] Thomas, *Promise of Alliance*, 111.

[139] Bernard Gwertzman, "Reagan Clarifies His Statement On Nuclear War," *The New York Times*, October 22, 1981, http://www.nytimes.com/1981/10/22/world/reagan-clarifies-his-statement-on-nuclear-war.html.

were inspired by visions of such a "Euroshima," and were widespread throughout northern Europe. Incidentally, the anti-war and anti-nuclear protests of the early 1980s coincided with the Green Party's first entry into the German parliament.[140]

d. Qualifying the Connection

The connection between the anti-nuclear weapons and anti-nuclear energy movements is not clear-cut. While the anti-nuclear weapons movement has its roots in the 1950s, the anti-nuclear energy movement did not take shape until the 1970s. The anti-nuclear weapons movement was initially limited to the application of nuclear technology in war, and there was widespread political and social approval for civil applications of nuclear technology in the 1950s. Conceptions of a peaceful nuclear era in which all of humanity could exist in prosperity were propagated at the UN "Atoms for Peace" Conference in 1955, and this conception received little criticism in West German society.[141] Even the SPD, which was said to have orchestrated the demonstrations of the *Kampf dem Atomtod*, stood squarely behind the civil uses of nuclear energy, and physicist Max Born, who was among the 18 physicists to publish the Gottinger Manifesto, saw in nuclear technology hope for a "paradise on earth."[142]

There is nonetheless a link between the anti-war, anti-nuclear weapons, and anti-nuclear energy movements. To be sure, these issues were merged into the Green Party's platform, and the Party, which was primarily responsible for the incorporation of nuclear phase-out plans into legislation, took form in the midst of the anti-nuclear peace demonstrations of the 1980s. It was also through the nuclear weapons debate that the West German populace was conditioned to mistrust a government that it perceived it could do little to influence, as will be explored in the next section.

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[140] "Protest In Britain Stretches 14 Miles," *The New York Times*, April 2, 1983, http://www.nytimes.com/1983/04/02/world/protest-in-britain-stretches-14-miles.html.

[141] Schildt, "Die Friedensbewegung."

[142] Ibid.

C. COMPARISONS AND POLITICAL OPPORTUNITY THEORY

To get a better impression of the significance of Germany's plan to phase out nuclear power, Germany must be compared to its peers in Europe. Not only must public opinion be compared among the European countries, but the relative strength of anti-nuclear movements should be assessed, along with their abilities to affect change in national policy. Public opinion in itself is not a good measure of political outcomes, as it must be effectively mobilized and harnessed to effect changes in policy. This section will now compare Germany's public opinion, mobilization, and public policy regarding nuclear power with those of its European neighbors, and will then consider a major theory for why outcomes in Germany differed from those of its neighbors.

1. Public Opinion

Public opinion on nuclear energy in the EU is subject to periodic polls. Since its inception in 1973, the EU Public Opinion Analysis Sector has performed several "Eurobarometer" polls of the populations of its member countries on the issue of nuclear energy and safety, with the most recent poll being published in 2010, when the debate regarding extending the life of NPPs was a hot topic in Germany.[143] It must be noted that this latest poll was published prior to the nuclear accident in Fukushima, and public perceptions across Europe are likely to have become more unfavorable to nuclear energy since then. This poll nonetheless provides insight on general trends in German and European opinion prior to the accident.

Public issue life-cycle notwithstanding, the most recent Eurobarometer poll revealed that opinion regarding nuclear energy has proven to be slow-changing. Most Europeans believed that nuclear power had merit, especially in promoting energy independence: 68% believed that it improved energy security, and 51% believed it helped with affordable prices, while only 46% believed that it helped limit climate change. Respondents in Germany tended to be on the middle-of-the-road with all of these questions, with 72% agreeing that nuclear energy helped limit dependence on fuel

[143] TNS Opinion and Social, "Eurobarometer 324: Europeans and Nuclear Safety," European Commission, 2010, 3, http://ec.europa.eu/public_opinion/archives/eb_special_339_320_en.htm.

imports.[144] In general, respondents from countries with existing nuclear programs tended to consider themselves more knowledgeable on nuclear matters, were more likely to have formulated an opinion about nuclear issues, and tended to have more favorable opinions on the merits of nuclear energy.

That being said, already as of 2010, the majority of respondents were in favor of maintaining (as opposed to increasing) or decreasing nuclear energy (73%). Interestingly, Germany was one of only two countries (Hungary being the other) where the number of respondents that favored decreasing the share of nuclear energy increased from the previous survey in 2006. Even then, 37% of the German populace was in favor of reducing the share of nuclear energy, while the EU average was slightly less at 34%.

In conclusion, while Germany posted results that were slightly less favorable to nuclear energy than would be expected of a country with a considerable share of power from nuclear energy, it tended to have middle-of-the-road responses when compared to EU averages.

2. Policy

Germany is by no means unique in its decision to phase-out nuclear energy. The first country to make a decision against nuclear energy was Austria, which instituted a still-standing ban on nuclear energy in 1978, shortly before its one NPP was scheduled to go online. Italy, similarly, decided by referendum to close its four NPPs following the Chernobyl catastrophe. A plan to reintroduce nuclear power into the country's energy mix was put forth by then-Prime Minister Berlusconi but was overwhelmingly rejected by a referendum in 2011. More recent policy decisions to phase out nuclear energy have been made in Belgium and Switzerland. Belgium currently plans to phase out its NPPs by 2025 and Switzerland by 2034. The stakes for both of these countries are similar to those for Germany, as Belgium's seven NPPs currently produce 54% of its electricity and Switzerland's five plants produce 34% of its electricity.

144 TNS Opinion and Survey, "Eurobarometer 2010," 17.

Table 1. European Policy Summary on Nuclear Energy[145]

Pro-Nuclear	
Britain	15 NPPs with plans for next generation. 1 NPP under construction, but controversial and experiencing financing difficulties
Czech Republic	6 NPPs with more planned
Finland	4 NPPs producing 30% of electricity with 5th planned
France	58 NPPs with plans for 2. National Assembly voted to limit nuclear share to 50% by 2025 (currently 75%)
Lithuania	1 NPP planned
Netherlands	1 NPP and 1 planned. 1994 bill to close plant was reversed in 2005.
Poland	Reaffirmed 2005 plans to add nuclear by 2025
Romania	2 NPPs with 2 more planned
Slovakia	4 NPPs with 2 planned
Slovenia	1 NPP but considering more
Sweden	Planned phase-out after 3-Mile Island, but reversed decision. 9 NPPs producing 40% of national supply with 2/3 public support
Anti-nuclear	
Austria	Built plant in 1978 but never operated after ban on nuclear energy.
Belgium	7 NPPs producing 54% of electricity. 2003 phase out plan will shutter last plant by 2025 with no replacement.
Italy	Closed 4 NPPs after post-Chernobyl referendum. Berlusconi plan to reintroduce nuclear power was overwhelmingly rejected by 2011 referendum. 10% of electricity is imported from foreign NPPs
Spain	7 NPPs built in 1980s with no replacement plans, will reach end of license in 2020s
Switzerland	5 NPPs producing 34% of electricity will be retired by 2034. 2013 poll reported 68% supported continued operation

In general, however, most European countries that have nuclear power as part of their energy mixes are maintaining the status quo (or expanding the share of nuclear), and several countries are planning to add nuclear energy into their energy mixes (see Table 1). Both Lithuania and Poland, for instance, plan to build NPPs (with Poland's expected to go online in 2025), and France is wholly committed to nuclear energy with 58 NPPs and plans to build two more (though a recent measure approved by the National Assembly will reduce nuclear power from 75% of electricity generation to 50% by 2025). While Sweden planned a phase-out of nuclear energy following the 3-Mile Island meltdown, this decision was reversed and continued operation of its nine NPPs is supported by two-thirds of its populace.

While Germany's plan to phase-out nuclear power is not unique, it does counter the general continued political support for nuclear power in Europe, and represents the

[145] Adapted from "Country Profiles," World Nuclear Association, updated March 2016, http://www.world-nuclear.org/information-library/country-profiles.aspx.

hastiest retreat from nuclear energy, especially considering Germany's previous commitment to nuclear power. While Swiss and Belgian NPPs produced greater shares of their countries' electricity supplies, Germany's total capital investment in nuclear energy far exceeds that of both of these countries (Germany will close more plants than these two countries combined), Germany will be the first of these three to completely close its NPPs, and Germany's plans are the only ones that include closing plants prematurely, prior to their 40-year life expectancies.[146]

3. Opportunity Theory

What then can explain the success of Germany's Green Party in passing legislation for a quick phase-out of nuclear energy in Germany, when German public opinion is only middle-of-the-road when compared with the rest of Europe? How could the German Green Party so effectively mobilize and capitalize on nuclear incidents outside of Germany, when other European countries were arguably witnesses to the same events and objective conditions? To answer this question we turn to Political Opportunity Theory.

Political Opportunity Theory posits that the strategies protest movements will use and their chances for success are dependent on the political opportunities available to them: resources, institutional arrangements, and precedents for protest that then act to assist or thwart the movement.[147] Chances for movement success are not dependent purely on grievances or on popular support, then, but also on the political opportunities afforded to the movement. As Koopmans and Duyvendak explain, grievances themselves are not sufficient; they must be given meaning by human agents, and a movement must successfully capitalize on grievances to mobilize public will.[148] Koopmans and Duyvendak demonstrate that while nuclear disasters like Chernobyl arguably affected the

[146]"Country Profiles," World Nuclear Association; Robert Marquand, "Across Europe, Japan Crisis Provokes Nuclear Rethink," *Christian Science Monitor*, March 16, 2011, http://www.csmonitor.com/World/Europe/2011/0316/Across-Europe-Japan-crisis-provokes-nuclear-rethink.

[147]Herbert P. Kitschelt, "Political Opportunity Structures and Political Protest: Anti-Nuclear Movements in Four Democracies," *British Journal of Political Science* vol. 16, no. 1 (1986): 58.

[148] Ruud Koopmans and Jan Willem Duyvendak, "The Political Construction of the Nuclear Energy Issue and its Impact on the Mobilization of Anti-Nuclear Movements in Western Europe," *Social Problems* vol. 42, no. 2 (1995): 248.

countries of Western Europe equally, and while the populations in the Western European countries were subject to the same grievances concerning nuclear energy, the anti-nuclear movements in the countries differed in their effectiveness at bringing about policy change because of the political opportunities afforded to them.[149] Kitschelt identifies the institutional differences that affect a movement's political opportunities and the strategies that correspond to each of the differences. He categorizes regimes as either open or closed and weak or strong.[150]

Closed regimes are generally characterized by few political parties, the centralization of decision-making in the executive and not the legislature, the inaccessibility of decision-makers to interest groups, and the absence of mechanisms to aggregate demands and incorporate them into policy. In these regimes, interests that are in power are free to form cartels that are resistant to opposing interests. Pro-nuclear interests dominated the French government, and anti-nuclear views found no champion in the bipolar political terrain of 1980s or any mechanism with which to effect policy change. West Germany at this time was similarly controlled by a pro-nuclear government and its two relatively closed major parties also afforded the anti-nuclear movement minimal access to the policy-making process.[151] In open regimes, decision-making authority is more subject to constituency pressure, and opposing views are more likely to gain a voice in the political process. Kitschelt uses Sweden's fractionated party structure that emphasizes consensus-building as an example here.

Strong regimes are ones in which the state is highly effective at implementing policy changes. They are centralized, exercise much control over market participants, and are unencumbered by strong independent judiciaries. Here again, the French government, with its power vested heavily in a centralized executive and with much influence over business and society, serves as an example of a strong government; it was because of the strong executive branch that he created that President de Gaulle could so fully implement

149 Ibid., 249.

150 Kitschelt, "Political Opportunity Structures and Political Protest," 58.

151 Rüdig ("Phasing out nuclear energy in Germany," 49) argues that the both the Federal Ministry of Atomic Affairs of 1956 and the Federal Ministry for Environment, Nature Protection, and Reactor Safety of 1986 essentially served the interested of the nuclear industry.

his nuclear vision for the country. Germany, by contrast, is a relatively weak regime, as its federal system creates a diffuse power structure and its independent judiciary provides a strong check on the government's power.

The anti-nuclear movement in France, because of France's closed government, was left with a confrontational strategy, and attempted to effect policy change primarily by way of protests. While it was quite active and arguably effective at mobilizing the populace, it was ultimately unsuccessful at effecting change in the face of such a strong regime. In comparison, while West Germany's regime was similarly closed and also instigated a confrontational and adversarial strategy on the part of the anti-nuclear movement there, this strategy achieved more success because of the weak and diffuse regime it met. Protests in West Germany were less likely to be met by a strong police force, and were more likely to be cast in a positive light in the media. The German Green Party learned early on that litigation and judicial injunctions in the courts were an effective means of thwarting the construction of NPPs.[152]

Strong governments also limit access of opposition voices by controlling the public discourse. This became evident in the aftermath of the nuclear meltdown at Chernobyl. Thus, while the pro-nuclear French government was able to dominate the narrative in the media and convince the public of the reliability of its safety measures following the meltdown, the similarly pro-nuclear West German federal government was thwarted from doing so by state and local governments that cancelled sporting events and ordered produce to be discarded.[153]

It is evident, then, that the success of the Green Party in effecting change was at least in part due to the institutional framework that it was confronted with. A closed regime fueled popular protest and prompted a confrontational strategy while the weakness of the regime afforded it relative success.[154] As Koopmans and Duyvendak

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[152] Kitschelt, "Political Opportunity Structures and Political Protest," 71.

[153] Koopmans, "The Political Construction," 241.

[154] This, incidentally, might be said of the nuclear weapons issue as well, as Chancellor Adenauer's closed government may have, in part, fueled the anti-nuclear weapons movement of the 1950s. In this case, however, nuclear weapons did nonetheless find their way onto West-German territory by way of a nuclear-sharing arrangement with NATO.

explain, movement success in turn acts to affect public opinion, which promotes future chances for success. The Green movement in West Germany was able to capitalize on the Chernobyl disaster more than comparable movements in France in part because it had just successfully mobilized against the construction of a reprocessing plant a year earlier in Wackersdorf.[155] Movement successes reaffirmed the public's conviction that nuclear energy must in fact be undesirable, and this consolidation of public support further emboldened the anti-nuclear-energy movement.

It was perhaps this progressive strengthening that afforded the Green Party its inroad into government and allowed it to transition from a fringe opposition movement into a recognized and established political party. This transition into government and the transition of the German government from a relatively closed one to a more open one necessitated a change in strategy on the part of the Green movement, and explains the more conciliatory approach taken by the party in its negotiations with the nuclear sector when drafting its phase-out plan in 2002.[156]

D. NUCLEAR PHASE-OUT AND GERMAN ENERGY SECURITY

Considering Germany's history, the rising influence of the Green Party, the support of the German populace, and the policies of all the major parties on both sides of the political spectrum, the German nuclear phase-out is unlikely to be reversed again. Indeed, the phase-out is no longer considered controversial in German politics, and it receives little attention in the media or in parliament. It is by and large a *fait accompli;* the German people have moved on.[157] While this may be so, Germany nonetheless cannot "move on" from the consequences of the phase-out. Germany must face its implications with regard to energy security.

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155 Ibid., 239.

156 Kitschelt, "Political Opportunity Structures and Political Protest," 66; Rüdig, "Phasing out nuclear energy in Germany," 61.

157 Jens Thurau, "Opinion: Fukushima 5 years on —'The Germans are crazy,'" *Deutsche Welle*, March 10, 2016, http://www.dw.com/en/opinion-fukushima-5-years-on-the-germans-are-crazy/a-19109743.

Nuclear energy can be seen as occupying an energy trilemma sweet-spot. It touts relatively low energy costs and low GHG emissions, and provides relative energy security for the countries that employ it.[158] 2013 U.S. Energy Information Association (EIA) figures place the levelized cost of nuclear energy on par with traditional thermal energy sources at 10 to11 cents per kWh. In comparison, on-shore wind costs were 8.7 cents per kWh, photovoltaic was 14 cents per kWh, and offshore wind was 22.2 cents per kWh.[159] In terms of carbon emissions, the 2014 United Nations (UN) Intergovernmental Panel on Climate Change found that electricity from nuclear energy does not directly emit GHG, and even when considering life cycle carbon emissions (which include GHG emissions during plant construction and resource extraction, enrichment, and disposal), nuclear energy exhibits the lowest GHG footprint of any source save wind.[160]

Perhaps more than for its ecological or economical attributes, nuclear energy first gained popularity for its energy security advantages. As the World Nuclear Association highlights, France and Japan turned to nuclear energy in the context of the first oil shock of 1973 and with the intention of protecting themselves from the unreliable and insecure oil market.[161] In contrast to the then-unstable oil market, the market for uranium was perceived as relatively stable. Uranium, the fuel most commonly relied upon for nuclear energy, could be obtained from diverse geographical regions and from countries (such as Canada and Australia) that were relatively stable.[162] Furthermore, uranium, by virtue of its low relative price, high density, and long useful life, could be stockpiled much more readily than fossil fuels. To illustrate, while three million tons of coal are required to

158 "Life cycle Greenhouse Gas Emissions," National Renewable Energy Laboratory, last updated July 13, 2016, http://www.nrel.gov/analysis/images/lca_harm_over_1.png.

159 "The Economics of Nuclear Power," World Nuclear Association, updated July 2016, http://www.world-nuclear.org/information-library/economic-aspects/economics-of-nuclear-power.aspx.

160 Intergovernmental Panel on Climate Change 2014, *Climate Change 2014—Mitigation of Climate Change* (New York: Cambridge University Press, 2014), 548, http://www.ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc_wg3_ar5_full.pdf; It should be noted, however, that GHG, a common ecological measure of energy sources, does not capture the potential environmental hazards associated with nuclear material, and the report does identify this concern.

161 "Energy Security," World Nuclear Association, updated April 2014, http://www.world-nuclear.org/information-library/economic-aspects/energy-security.aspx.

162 "Uranium Production Figures: 2004–2014," World Nuclear Association, updated July 2015, http://www.world-nuclear.org/information-library/facts-and-figures/uranium-production-figures.aspx.

power a 1,000 MWe power plant for one year, only 30 tons of fabricated nuclear fuel are required to do the same.[163]

In this context, Germany's nuclear phase-out, irrespective of which source is used to replace it, can be regarded as decreasing German energy security. Replacing nuclear energy with traditional fossil fuels—in addition to hampering German transition goals—will increase German dependence on imports. Replacing nuclear energy with renewable energies, while not directly increasing import-dependency, poses other concerns that are addressed in the next section.

The nuclear phase-out decreases energy security in another respect. NPPs are generally seen as reliable sources for base-load supply. They are relatively better at providing steady output, and thus have a stabilizing influence on the electrical grid, which is vulnerable to sudden swings in load or demand. This reliability contrasts with more intermittent energy sources—especially renewable energy sources, to be described in the next section. The 2011 report of the German Federal Network Agency, BNetzA, thus pointed out that the nuclear phase-out would lead to vulnerabilities in Germany's grid and to an increased need for costly interventions on the part of network operators.[164]

There is at least one positive security aspect to the nuclear phase-out: the removal of NPPs and nuclear fuel as targets of terrorist attack. While NPPs are not necessarily more vulnerable than other components of the energy infrastructure, they might be perceived as having greater strategic value to would-be terrorists, and thus they have been traditionally more apt to raise public anxiety.[165] It is unclear whether the absence of NPPs from the German power grid would decrease the likelihood of terrorist attack, but their absence might nonetheless assuage public concerns over energy security. Nonetheless, this thesis still deems the nuclear phase-out as decreasing German energy security.

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163 Ibid.

164 "Press Conference of 27 May 2011," Bundesnetzagentur, updated May 27, 2011, http://www.bundesnetzagentur.de/SharedDocs/Downloads/EN/BNetzA/PressSection/ReportsPublications/2011/110527PressConferenceNuclearPowerMoratoriumpdf.pdf?__blob=publicationFile.

165 Intergovernmental Panel on Climate Change 2014, 551.

E. NUCLEAR PHASE-OUT AND REGIONAL SECURITY

This thesis now considers regional security and stability, again relying on the liberal framework of democracy, interconnectedness, and IGOs to promote regional stability and security.

1. Democracy

a. Political dynamics in Germany

As this case demonstrates, while energy issues are influenced by politics, they may also influence politics. As indicated earlier, the Green Party's success is due in large part to the nuclear issue. This section attempts to clarify the effects that nuclear energy and the rise of the Green Party have had on German politics, and what this means for democracy in Germany.

For over thirty years after the reestablishment of the German state (first, as the Federal Republic of Germany, or West Germany), German politics were effectively defined by a two-party system, with the government being alternately controlled by one of the two dominant center-left and center-right parties—the SPD and the CDU (joined later by the CSU). These two parties were accompanied by the smaller but also centrist Free Democratic Party (FDP). Because the dominant parties rarely enjoyed majorities in parliament (the CDU/CSU had an absolute majority in 1957–1961) until 1998, the larger parties usually formed coalitions with the FDP and even, in three instances (1965-1969, 2005–2009, and since 2013), formed "grand coalitions" with one another in order to form a government. This has led to Germany's nick-name of the "Grand Coalition State," and has created a centripetal tendency in politics that brought party platforms toward the center and encouraged across-the-aisle cooperation.[166]

The Green Party's 1998 entry into a left-leaning government with the SPD upset this traditional balance. In recent years, the traditional parties have been joined by a number of new parties. Parties like the Pirate Party (2006), the Left (2007), the Alternative for Germany (2013), and Alliance for Progress and Renewal (2015) have all

166 Manfred G. Schmidt, "Germany—the Grand Coalition State," in *Comparative European Politics*, 3rd ed., ed. Josep M. Colomer (London: Routledge, 2008), 72.

emerged since the Greens' entry into government. To some extent these parties were encouraged into existence by the success of the Green Party (which, as was noted earlier, owes its success, in part, to the nuclear issue). While all these parties are relatively minor and generally enjoy little representation in the federal parliament (save for the Greens and the Left, which have significant representation), their representation has trended upwards, with the Alternative for Germany (AfD) winning double-digit percentages in several state parliaments and even displacing the traditional dominant parties to win second place in both Saxony-Anhalt and Mecklenburg Western-Pomerania in 2016.

The emergence of these new and more polarized parties has been accompanied with a drop in representation for the traditional centrist parties, with the FDP, for the first time since 1949, altogether losing representation in the federal parliament in 2013.

The full impact of these developments on German politics has yet to be seen. While the emergence of a multi-party system appears to favor Chancellor Merkel and the status quo for the time being, the centripetal tendency in German politics may be increasingly replaced with a centrifugal one.[167] If left or right-leaning coalitions like the Red-Green coalition of 1998–2005 become more commonplace, even the centrist parties may begin to drift toward the political poles in order to accommodate this social trend.

What impact will these developments have on German and regional security? Considering our liberal framework, what do the developments bode for democracy in Germany? On the one hand, the presence of more parties in the Bundestag might be seen as improving the degree to which political institutions reflect the diverse interests of the society they represent, and thus strengthening democracy in Germany. To be sure, it was not until the Green Party emerged as a player in German politics that the anti-nuclear energy sentiments of the German people came to be reflected in politics with a party focused predominantly on nuclear issues. On the other hand, an increasingly divided political sphere does not bode well for a smoothly functioning government. As the ideological gap between left and right segments of the political spectrum increases, the

167 "German Politics is turning into a Six Party System," *The Economist*, September 19, 2016, http://www.economist.com/news/europe/21707383-weak-winners-and-populist-upstarts-berlins-election-german-politics-turning-six-party.

ability for cooperation and compromise amongst the players might wane. Political theorists point out that compromise is an imperative in a functioning democracy, and that legislation would not pass and the government would not function without it.[168] If the changing political dynamics in Germany undermine the functioning of democracy, they would, according to the liberal framework posed earlier, decrease security and stability.

b. Costs

The costs of the nuclear phase-out and may also have implications for democracy in Germany. The immediate economic costs of the phase-out have been assessed in terms of lost revenues by the NPPs. As noted earlier, it had been estimated that utility companies would have received somewhere between 21 and 73 billion euros in additional profits with the 2010 decision to extend the lives of the NPPs; this estimate approximates the revenues lost by shuttering the plants ahead of schedule. The four utility companies that operate Germany's NPPs have filed over 30 lawsuits and constitutional complaints totaling over 20 billion euro in an effort to recoup some of these lost profits, as they argue that the phase-out decision was unfair and unconstitutional.[169]

While not as easily quantifiable, an assessment of the economic costs of the phase-out should also consider the lost jobs associated with shuttering NPPs and the effective elimination of an entire industry. While Germany's two largest energy companies reported that they could cut as many as 14,000 jobs because of the phase-out, the final number of jobs lost is likely to be much higher.[170] Siemens, which built all of Germany's existing plants as well as others worldwide, announced its intention to stop

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168 Jonathan Rauch, "How American Politics Went Insane," *The Atlantic*, October 2016, http://www.theatlantic.com/magazine/archive/2016/07/how-american-politics-went-insane/485570/; Amy Gutmann and Dennis Thompson, "The Case for Compromise," *Harvard Magazine*, July-August 2012, http://harvardmagazine.com/2012/07/the-case-for-compromise.

169 "Atomkonsens und seine Restlaufzeit," *Frankfurter Allgemeine Zeitung*, January 2, 2002, http://www.faz.net/aktuell/politik/dokumentation-atomkonsens-und-seine-restlaufzeit-147737.html; "Nuclear Power in Germany," World Nuclear Association, updated October 2016, http://www.world-nuclear.org/information-library/country-profiles/countries-g-n/germany.aspx; Kerstine Appunn, "Managing the nuclear legacy—a project into the next century," Clean Energy Wire, October 12, 2015, https://www.cleanenergywire.org/dossiers/challenges-germanys-nuclear-phase-out.

170 "Germany's planned nuclear phase out sparks job loss talks," *Deutsche Welle*, December 12, 2011, http://www.dw.com/en/germanys-planned-nuclear-phaseout-sparks-job-loss-talks/a-15595808.

building NPPs shortly after the German phase-out was announced.[171] In addition to construction and operation, training, research, and technology jobs will also no doubt be cut as the energy sector is restructured.

In addition to the aforementioned costs, one must consider the cost of decommissioning the power plants, processing the nuclear waste, and transporting nuclear waste to final storage facilities. While these costs would have eventually been borne regardless of the phase-out, they have been concentrated and accelerated by it. Estimates of the costs of dismantling range widely, and experts admit that Germany lacks the technical and economic experience to fully assess the costs.[172] If past and ongoing experience serves as an example, decommissioning and dismantling operations have been underway since the Rheinsberg NPP went offline in 1990 and are expected to continue until 2025. Estimates for the total expense of these operations amount to 600 million euros.[173] With more than 20 NPPs needing dismantling by 2022, costs will assuredly reach into the billions, and operations will likely continue until at least 2050. Processing and storage of the waste, too, will certainly amount to billions of euros and take years to accomplish. A final repository for heat-producing high-level waste, for instance, will not likely be found until 2031, after which it will likely not be ready to start accepting shipments until 2050.

Clean-up costs were expected to be borne by the energy corporations, which were mandated to set aside a fund in anticipation of this. With clean-up expected to exceed the 38 billion euros in the fund, and owing to the poor financial state of the energy corporations, it is expected that the costs will ultimately be borne by the government and by society at large. Michael Mueller of the parliament's Final Repository Search Commission stated that costs would rise to 50 billion or 70 billion euros in the near-term, and estimates have been made of a 170 billion euro price tag by 2099.[174] Add to this the

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171 Judy Dempsey, "Siemens Abandoning Nuclear Power Business," *New York Times*, September 18, 2011, http://www.nytimes.com/2011/09/19/business/global/19iht-siemens19.html.

172 Appunn, "Managing the nuclear legacy."

173 Ibid.

174 Ibid.

cost of replacing the electricity-generation capacity lost through the phase-out—which Siemens in one estimate placed at a whopping 1.7 trillion euros—and the German tax-payer will most definitely feel the effects of the phase-out for decades to come.[175]

What will the effect of this debt be on democracy in Germany? While it is beyond the scope of this thesis, there is ample research correlating economic down-turns (which this debt aggregation might trigger) and the breakdown of democracy in a country.[176] If debt from the nuclear phase-out contributes to a significant down-turn in Germany's economy that in turn triggers a breakdown of democracy, liberal theory predicts that the net effect will be a corresponding breakdown in regional stability and security.

2. Interconnectedness and IGOs

That Germany's response to the Fukushima disaster—like that of the other EU nations—was largely an independent decision not made in concert with the EU or its neighbors underlines the reality that the EU does not create energy policy and that decisions affecting energy remain squarely at the national level.[177] If anything, the German phase-out decision contradicted the wishes of the EU. In light of the German decision, then-climate Commissioner Connie Haageland urged the EU to stay the course, asserting that continued reliance on nuclear energy was vital to the EU's achieving of its GHG emissions goals.[178] The Fukushima crisis laid bare cleavages in energy policy within the EU. Not only did other EU nations not follow Germany's path toward a nuclear-free energy mix, but groups of countries, including the Visegrad countries of Eastern Europe and even more broadly twelve states throughout the Union, have since

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175 Christoph Steitz, "Siemens puts cost of nuclear exit at 1.7 trillion euros," *Reuters*, January 17, 2012, http://www.reuters.com/article/us-siemens-energy-idUSTRE80G10920120117.

176 Mark J. Gasiorowski, "Crisis and Political Regime Change: An Event History Analysis," *American Political Science Review* vol. 89, issue 4 (December 1995): 882, https://www.cambridge.org/core/journals/american-political-science-review/article/economic-crisis-and-political-regime-change-an-event-history-analysis/11C9EEC4005FFE27B06A49AB60489722.

177 Bernd Riegert, "Opinion: Nuclear power uproar a waste of energy," *Deutsche Welle*, May 18, 2016, http://www.dw.com/en/opinion-nuclear-power-uproar-a-waste-of-energy/a-19264626.

178 "Hedegaard backs nuclear to meet EU climate targets," Business Green, March 23, 2011, http://www.businessgreen.com/bg/news/2036332/hedegaard-backs-nuclear-meet-eu-climate-targets.

joined to announce their continued support for nuclear energy.[179] These differences of opinion are underpinned by fundamental national concerns, as the Visegrad countries are counting on nuclear energy to reduce their dependence on Russian natural gas.[180]

The apparent autonomy with which energy policy is made should not be understood to imply that energy policy has no consequences outside of the national level. Indeed, as the EU becomes more and more interconnected, instabilities, like those created by Germany's nuclear phase-out can propagate throughout the grid and affect neighboring countries. Increases in damaging loop flows and required interventions have been attributed by Germany's neighbors to its energy policy (the effects of Germany's *Energiewende* are discussed in further detail in the following chapter), and as noted in the previous chapter, unilateral or bilateral energy decisions can act to undermine greater EU goals. To the extent that the German nuclear phase-out reinforced the practice of nationalizing energy policy at the expense of EU climate and energy initiatives, it can be seen as undermining the EU as an IGO and therefore detracting from regional security and stability.

F. CONCLUSION

The 2011 decision to phase-out nuclear energy has roots that stretch back to Germany's postwar political culture. Its roots extend to the German peace movement and follow the rise of the Green Party from a grassroots protest movement to an established party. The party was able to mobilize and magnify anti-nuclear energy sentiment because of political opportunity structures presented to it in the German political system. Perhaps it was because of its success that these opportunity structures evolved, and Germany went from being a regime dominated by three long-established parties to one that included the Green Party in the policy-making apparatus. So too did the Green Party's strategy shift from a confrontational one to a pragmatic one based on consensus-building.

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179 "Nuclear Power in the European Union," World Nuclear Association, updated October 2016, http://www.world-nuclear.org/information-library/country-profiles/others/european-union.aspx.

180 Ibid.

The pro-nuclear voice, now in opposition, is unlikely to find the same path to success enjoyed by the Green Party, and another attempt to reverse the phase-out plan is not likely. The CDU/CSU, the SPD, and the ever-strengthening Green Party have all signed off on the phase-out, which is backed by an anti-nuclear populace that has been encouraged by the Green Party and like-minded policy advocates to mobilize against nuclear energy. Germany's trajectory to a nuclear-free future is set, and Germany must deal with the consequences.

While the ultimate impacts of the phase-out are yet to be seen, its rising costs could decrease democratic stability in Germany and thus decrease regional security. Furthermore, the possibility of a further polarization of politics in Germany—which has at least some foundation in the phase-out issue—may also have negative influences on democracy and thus security. Finally, Germany's phase-out plan reaffirmed energy policy as a national prerogative, and the undermining of the EU energy agenda and supranational authority weakens the EU's position and also—per liberal theory—acts to decrease stability and security.

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IV. RENEWABLE ENERGY

A. INTRODUCTION

In this chapter we turn to Germany's relationship to perhaps the most significant Western European IGO, the European Union (EU), and the growing implications this relationship has had on energy and energy security matters. The EU was founded on the recognition that energy concerns are linked to security. The Schuman Plan, introduced by French Foreign Minister Robert Schuman in 1950, conceived a supranational organization, the European Coal and Steel Community, which would aggregate the coal and steel production of the six original countries: Belgium, France, Germany, Italy, Luxembourg, and the Netherlands. While restoring Europe to prosperity and standardizing the means of production were among the goals of this plan, its primary objective was to improve security in the region. It reasoned that with these fundamental means for weapons production under the control of a single high authority rather than any one country, war in Europe (and specifically between France and Germany) would be "not merely unthinkable, but materially impossible."[181] In this respect it was correct; Europe has continued to integrate itself through the EU, and peace and relative prosperity have reigned on the continent in the sixty-plus years since the Plan's inception.

Energy security and security through energy have continued to be central to the EU. Along with a progressively increasing voice in energy matters, the EU has assumed more responsibility in climate matters related to the Union. It soon became evident that climate change and energy concerns were intimately related, and energy policies established by the EU more and more reflect this growing linkage. In lockstep with the EU, Germany too has increased its focus on climate, famously declaring a shift to renewable energies, the *Energiewende*.

This chapter considers Germany's relationship with the EU as it relates to climate and energy matters. It begins with an overview of EU and German green energy policy

[181] European Union, "The Schuman Declaration," European Union Institutions, updated January 12, 2015, http://europa.eu/about-eu/basic-information/symbols/europe-day/schuman-declaration/index_en.htm.

and then discusses the ramifications of these policies to energy security and overall regional security. Specifically, the chapter argues that the shift in energy policy toward environmental concerns has had several negative effects on energy security and more broadly on security in and around the EU.

B. EU GREEN ENERGY POLICIES

EU climate policy began to form in the late 1980s, when climate concerns first gained traction. Through the Single European Act of 1987 the European Economic Community was granted the authority to establish environmental policy.[182] Three pillars of EU climate policy were established: emissions reductions, sustainability, and efficiency increases.[183]

Concrete policy obligations were established when EU members signed the UN Kyoto Protocol on Climate Change in 1997. The EU agreed to an 8% reduction in emissions from 1990 levels and launched the European Climate Change Program to explore ways to reduce emissions.

In addition to the Kyoto Protocol, the EU has established three other binding emissions commitments, with the major one being the 2020 Climate and Energy Package, which bound the EU to ambitious emissions and demand reductions of 20% and to establish a gross final production share of renewables of 20%.[184]

Along with setting binding environmental objectives, the EU environmental policy also established a framework for achieving these objectives. Most notably, the EU implemented an Emissions Trading Scheme (ETS) that has been in force since 2005. Rather than tax emissions, the scheme gives emission allowances to major carbon-intensive sectors. The Scheme has grown in size, and in 2012 encompassed roughly 40%

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[182] Benjamin Görlach, Matthias Duwe and Nick Evans, "Frameworks for Regional Cooperation: the EU," in *Routledge Handbook on Transitions to Climate and Energy Security*, ed. Robert E Looney, 2.

[183] EU Climate and Energy Policy, European Commission, updated November 8, 2015, http://ec.europa.eu/research/energy/eu/index_en.cfm?pg=policy-energy-and-climate-policy.

[184] Emissions reductions from 1990 levels and demand reductions from 2007 projections. The transit sector emission reduction goal was 10%

of GHG emissions in the EU. Proceeds from credit auctions are reinvested in low-carbon demonstration projects and other environmental programs.

Also noteworthy are the EU's efforts to establish a common energy grid. Article 194 of the Treaty of the Functioning of the European Union (TFEU), in addition to giving the EU a legal base for establishing energy policy, promoted the interconnection of energy networks—a recognized prerequisite to the successful incorporation of renewable energies into the energy mix.

C. GERMAN GREEN ENERGY POLICIES

We next turn to German green energy policies. While German policies may be said to have been greatly influenced by EU policy, the reverse is also true, and Germany used its 2007 presidency of the EU to reinvigorate EU focus on renewable energies.[185] It placed energy security and climate change as two of the most important items on the EU agenda, and it was in 2007 that the EU 2020 Climate and Energy Package targets were set.[186] Furthermore, German national energy policy began to incorporate renewable energies and institute an *Energiewende*, or "energy transition," relatively early on, and it was thus seen as pioneering the transition to renewable and low-carbon technologies.[187]

German legislative promotion of renewable energies can be traced back to the Electricity Feed-in Law (*Stromeinspeisungsgesetz*) of 1991, which ensured that renewable energies had access to the grid and established a Feed-in Tariff (FIT) whereby utilities were required to pay a premium to purchase electricity from renewable energy providers. The premiums were pegged off of the previous year's average electricity price, and varied depending on the renewable energy source—wind and solar power received preferential treatment with a FIT pegged at 90% of the average electricity price. This

185 Sybille Röhrkasten and Kirsten Westphal, "Energy Security and the Transatlantic Dimension: A View From Germany," *Journal of Transatlantic Studies* 10, no. 4 (2012): 328.

186 "2020 Climate and Energy Package," European Commission, updated October 18, 2016, http://ec.europa.eu/clima/policies/strategies/2020/index_en.htm.

187 Umbach, "German Debates on Energy Security and Impacts on Germany's 2007 EU Presidency," 4.

tariff was passed on to consumers, and no government funds were used to finance renewable energy construction.[188]

The Electricity Feed-in Law was superseded by the Renewable Energies Act (EEG) of 2000, which built upon existing legislation and corrected perceived flaws.[189] Because FIT remunerations had been perceived as too volatile, they were instead pegged on an absolute value that was based on the production cost plus profit, and were thus greatly increased. The new FIT targeted specific technologies, with solar energy receiving a FIT equivalent to eight times its production cost and wind energy receiving a FIT equivalent to four times its production cost. Furthermore, because the FIT was seen as unfairly penalizing regional grid operators with high concentrations of renewable energies, a national EEG surcharge was instituted whereby all households were subject to the same surcharge. Finally, because it was feared that the ever-increasing surcharge would threaten certain energy-intensive industries, these industries were exempted from the EEG, and only required to pay 5 cents per kWh.[190]

Since its enactment in 2000, there have been several amendments to the EEG, with the most recent one occurring in 2014. The amendments revise FIT policy as well as targets for the market share of renewable energy, and the 2014 amendment instituted policy aimed at limiting the costs and growth of renewable energies.[191] Overarching energy strategy was encapsulated in the 2010 Energy Concept, which set forth a vision for the German energy market where renewable energies were the "cornerstone" and were facilitated by increases in energy efficiency, a transition away from a fossil fuel-based transportation system, a strengthened grid, and, controversially, the use of nuclear energy as a "bridging technology."[192] As mentioned in the previous chapter, an extension

188 "Electricity Feed-In Law of 1991," International Energy Agency, updated March 14, 2013, http://www.iea.org/policiesandmeasures/pams/germany/name-21002-en.php.

189 "Renewable Energy Act," International Energy Agency, updated October 8, 2014, http://www.iea.org/policiesandmeasures/pams/germany/name-21295-en.php.

190 Ibid.

191 Ibid.

192 "Energy Concept 2010," Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety, September 28, 2010, http://www.bmwi.de/English/Redaktion/Pdf/energy-concept,property=pdf,bereich=bmwi,sprache=en,rwb=true.pdf.

to the lives of existing NPPs was intended to offset the cost for the energy transition, but was overturned after the disaster at Fukushima the following year, and an absolute nuclear phase-out date of 2022 was set. Importantly, the Energy Concept also established German targets on emissions, consumption, and the share of renewable energies in supply. GHG emissions were to be cut by 40% from 1990 levels by 2020 and 80% by 2050. Renewable energies were to constitute at least 18% of gross final energy consumption and 35% of gross final electricity consumption by 2020. Finally, gross energy consumption would be 20% lower than 2008 levels and 50% lower by 2050.[193] Gross electricity consumption would be 10% lower than 2008 levels.

D. POLICY EFFECTS

1. Emissions, Consumption, and Renewable Energies

While there have been criticisms of its effectiveness, German and EU environmental policy has undoubtedly had an impact on energy consumption and emissions. Notably, the EU announced a decoupling of GHG emissions and economic growth: while 2012 real GDP was 45% higher than in 1990, GHG emissions decreased by 19.2%.[194] This section details Germany-specific results.

In 2011, renewable energy contributed to 35.1 million tons of oil equivalent (Mtoe) energy, or 11.3% of the Total Primary Energy Supply (TPES). This marks a 200% increase over the 10.8 Mtoe produced in 2000. During this same time period, total energy consumption declined by 7.4%, with marked decreases occurring in coal and nuclear energy consumption. Renewable energy enjoyed gains in share of electricity production as well: 22% of total supply was provided by renewables, with 8.1% of that coming from wind power and 7.3% from biofuels and waste. While wind power was more instrumental in delivering electricity, biofuels and waste were utilized more for heat production and transport.[195]

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[193] Ibid.

[194] "Progress on resource efficiency and decoupling in the EU‐27," European Environment Agency, June 2, 2014, http://www.eea.europa.eu/publications/progress-on-resource-efficiency-and#tab-news-and-articles, 21.

[195] International Energy Agency, *Energy Policies of IEA Countries: Germany*, 113.

How does Germany stand with regard to its production, efficiency, and emissions targets? According to the *Federal Ministry of Economic Affairs and Energy Fourth Energy Transition Monitoring Summary*, renewables covered 13.5% of gross final energy consumption and 27.4% of gross final electricity consumption in 2014.[196] Extrapolating on current trends, both 2020 goals for renewable shares of gross final energy and electricity consumptions will be met.

In terms of energy consumption, 2014 gross energy consumption was only 8.7% lower than 2008 levels, and electricity consumption only 4.6% lower. According to a recent Deutsche Bank report, Germany is thus likely to miss its efficiency goals barring any significant changes.[197] The report highlights the challenges of the original efficiency targets, as they were made irrespective of population growth and achieving them will depend on technological improvements. Furthermore, the gross electricity consumption decrease is particularly challenging, as emissions and efficiency goals in both the transportation and heating sectors are predicated on a shift of consumption in these sectors to the electricity sector.[198]

Finally, with respect to emissions, Germany in 2014 reported a 27% decrease in GHG when compared with 1990 levels. The BMWi admits that maintenance of the current trend will result in an emissions reduction of 33 to 34% by 2020—short of the 40% goal.[199] While the BMWi report asserts that further regulations adopted in 2014 will help to fill the gap, the Deutsche Bank report is more skeptical. It points to the fact that many of the post-1990 decreases in GHG emissions were the result of structural shifts resulting from German reunification, and that emissions reductions have tapered off in recent years.[200] As mentioned in the previous chapter, the GHG-friendly NPPs that are

196 "The Energy of the Future Fourth Energy Transition Monitoring Report," Federal Ministry for Economic Affairs and Energy, November 2015, https://www.bmwi.de/English/Redaktion/Pdf/vierter-monitoring-bericht-energie-der-zukunft-kurzfassung,property=pdf,bereich=bmwi2012,sprache=en,rwb=true.pdf, 6.

197 Eric Heymann, "German 'Energiewende': Many targets out of sight," ed. Lars Slomka, Deutsche Bank Research, June 2, 2016, www.dbresearch.com, 9.

198 Ibid.

199 "The Energy of the Future Fourth Energy Transition Monitoring Report," 15.

200 Heymann, "German Energiewende," 3.

being phased-out will likely need to be replaced, at least in part, by more carbon-intensive fossil fuels-burning plants. Furthermore, to the extent that renewable energies are replacing capacity once supplied by the NPPs, they are not acting to decrease net electricity emissions for the country.[201] Finally, the Deutsche Bank report again points to the need for uncertain technological advances in energy storage and energy efficiency in order to meet the emissions targets and effect the transition.[202]

Table 2. German Energy Statistics[203]

		1990	2011	2012
NET IMPORTS	Coal	123.13	145.82	150.64
	Oil	799.06	900.33	907.58
	Natural Gas	163.87	355.16	348.57
CONSUMPTION %	Coal	10.6	3.4	3.3
	Oil	44.5	42.4	41.2
	Gas	20.0	21.9	22.7
ELECTRICITY GENERATION %	Coal	40.0	26.5	28.1
	Oil	8.7	2.2	2.2
	Gas	7.5	21.4	17.8
	Nuclear	30.9	27.8	27.0
	Wind	—	5.5	6.3
TFC/GDP		0.11	0.08	0.08
TFC/CAPITA		2.36	2.27	2.25
ENERGY-RELATED CO2 EMISSIONS[204]		4067.8	3547.7	3504.9

2. Costs of the *Energiewende*

An important effect of EU and German environmental policies is on the price of energy. Because of the fear of "carbon leakage," carbon intensive industries that are vulnerable to migrating out of the EU because of energy prices have their emissions credits provided free of charge. Similarly, the German government offers industries that it

201 Will Boisvert, "Green Energy Bust in Germany," *Dissent Magazine*, Summer 2013, https://www.dissentmagazine.org/article/green-energy-bust-in-germany.

202 Ibid., 4.

203 Adapted from International Energy Agency, *Energy Policies of IEA Countries: Germany* (Paris: IEA, 2013).

204 In Million Tons of CO2

desires to protect exemption from feed-in-tariffs beyond a certain level of consumption.[205] In this way, protected industries benefit doubly by avoiding the costs of renewable energy but still enjoying the lower wholesale prices of energy that have resulted from increased supply.

The exemption of vulnerable industries that are protected because of national interests has meant that much of the costs of the feed-in-tariffs and emissions credits have passed through to household consumers. These costs are reflected as taxes, levies, and network costs, which have increased more than tenfold from 1998 levels, with the EEG surcharge constituting 21% of household electricity bills and taxes comprising another 23%.[206] The average cost of electricity for a family of three has increased by 70% during this same timeframe, and the World Nuclear Association reports that from 2005 to 2014, residential electricity prices in Germany increased by more than the average U.S. total residential electricity cost, and German residents now pay roughly twice what French residents do for electricity.[207]

While proponents of the *Energiewende* point to recent drops in the EEG surcharge and wholesale energy prices as indications that electricity costs are beginning to moderate, both the wholesale price and EEG surcharge are expected to increase through 2025, with the Karlsruhe Institute of Technology predicting that wholesale prices will increase 70% by 2025.[208]

Furthermore, wholesale prices and the EEG surcharge constitute only a portion of the cost of the *Energiewende*. The decentralization of the grid due to renewable energies, as well as the regional concentration of these energies—with a much of the wind energy coming from the north—necessitates a significant expansion of the German power grid.

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[205] International Energy Agency, *Energy Policies of IEA Countries: Germany*, 28.

[206] "Nuclear Power in Germany," World Nuclear Association.

[207] Ellen Thalman, "What German Households Pay for Power," *Clean Energy Wire*, January 22, 2016, https://www.cleanenergywire.org/factsheets/what-german-households-pay-power; "Nuclear Power in Germany," World Nuclear Association.

[208] "Renewable Energy Surcharge in 2016: Facts and background," Federal Ministry for Economic Affairs and Energy, October 15, 2015, https://www.bmwi.de/English/Redaktion/Pdf/renewable-energy-surcharge-in-2016-facts-and-background,property=pdf,bereich=bmwi2012,sprache=en,rwb=true.pdf; "Energiewende," *The Economist*, July 28, 2012, http://www.economist.com/node/21559667.

Studies indicate that Germany must build or upgrade 5,157 miles of transmission lines in order to properly connect renewable energies, and this is expected to cost 20 billion euros by 2022.[209]

To this must be added the cost of energy efficiency measures like retrofitting buildings with upgraded insulation. Even market inefficiencies induced by the EEG cost money; it is estimated that the costs of redispatching traditional power plants (effectively paying them to throttle their output during renewable energy surges) will total 30 billion euros between 2016 and 2025.[210]

All of these considerations substantiate estimates for the *Energiewende*; KfW Bankengruppe estimates the cost to be 262 billion euro by 2022, and in 2013 Minister of for the Environment said the cost could amount to one trillion euro by 2030. Add to this the costs associated with dismantling the country's nuclear infrastructure (described in the foregoing chapter), and it becomes evident just how costly the transition will be.[211]

3. Energy Imports and Natural Gas Dependence

Another effect of EU and German environmental measures is a decline in the extraction and use of indigenous energy resources such as the relatively dirty but abundant Lignite. Because renewable energies are as of yet incapable of providing all of Germany's energy needs, Germany must rely more and more on energy imports to fill the gap. This is compounded with a concurrent move away from nuclear energy, which has traditionally satisfied up to 30% (Table 2) of the country's electricity needs. Germany has increasingly favored natural gas as an alternative for three major reasons. Natural gas is considered a bridge between fossil fuels and renewable energy sources because of its relatively lower GHG emissions.[212] Second, liberalization of the energy market, another objective of EU energy policy, has also tended to favor natural gas, as the market favors

209 "Energiewende," *The Economist*, July 28, 2012, http://www.economist.com/node/21559667.

210 "Nuclear Power in Germany," World Nuclear Association.

211 Ibid.

212 IEA, *Germany*, 52.

low-cost solutions vice long term investment.[213] Finally, natural gas power plants can be switched from idle to high production in a relatively short time. Quick modulation supports the role of natural gas alongside renewable energies, which themselves tend to be cyclical (rising and falling with the sun and wind).[214]

Because of Germany's limited indigenous natural gas resources, increased gas demand has been satisfied by imports. Of the 91 billion cubic meters of natural gas consumed by Germany in 2013, nearly 90% was imported. Furthermore, natural gas imports are primarily piped to Germany from three major suppliers: Russia (39%), Norway (30%), and the Netherlands.[215]

E. RENEWABLE ENERGIES AND ENERGY SECURITY

The energy trilemma outlined in the literature review would lead one to predict that pursuing renewable energies is compatible with energy security. Renewable energies, while relatively more costly, should decrease dependence on other forms of energy, lead to reduced import dependence, and thus increase energy security. In practice, as we have seen in the Germany case study, renewable energies, when coupled with GHG reduction objectives, have led to an increased reliance on energy imports. This is expected to be replicated throughout the EU, as energy imports are expected to constitute 65% of EU energy needs by 2030.[216] More troubling for energy security, however, is the decreasing diversity of energy types used (because of the move away from coal and nuclear power) and increased reliance on few energy suppliers.

1. Russian Reliability

As mentioned in the previous section, Germany imports roughly 30% of its natural gas from Russia. Germany is not an isolated case: 6 EU members import natural

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[213] Paul Belkin and Vince L. Morelli, *The European Union's Energy Security Challenges* (CRS Report No. RL33636) (Washington, DC: Congressional Research Service, 2007), 20.

[214] Sören Amelang, "Germany's dependence on imported fossil fuels," Clean Energy Wire, February 11, 2016, https://www.cleanenergywire.org/factsheets/germanys-dependence-imported-fossil-fuels.

[215] Ibid.

[216] Belkin, *The European Union's Energy Security Challenges,* 6.

gas exclusively from Russia and three—Latvia, Lithuania, and Estonia—rely on a single pipeline and provider for this natural gas.[217]

Relying on a single provider for energy needs violates principles of energy security. The dependence specifically on Russia is particularly troubling for two reasons. While Russia has the largest proven gas reserves (1,688 trillion cubic ft), its gas production was nonetheless expected to peak in 2010.[218] This is in part because of a lack of spending on infrastructure that is not likely to change soon owing to Russia's unwillingness to give foreign companies access to invest in its natural gas fields.

Perhaps more troubling, Russia's halting of energy exports—twice in Ukraine (2006 and 2009) and once to Belarus (2007)—highlighted concerns about its reliability as a trading partner and demonstrated its willingness to exercise energy resources as a hard-power tool. Energy politics have increasingly set the context for Russia-West relations, and interpretations of Russian aggression (i.e., vis-à-vis Georgia in 2008 and Ukraine in 2014) are often couched in terms of energy.[219]

2. Renewable Energy Reliability and Viability of a Traditional Base

A separate way in which renewable energies adversely affect energy security is in the unpredictable and unreliable nature of their sources. Renewable energies rely on natural phenomena such as sunlight and wind in order to function, and therefore fluctuate greatly in their output levels. Critics of German solar energy often cite an unfavorable climate and frequent cloud cover (as much as 6/8 of the year) as a reason that solar energy is not viable in Germany.[220] Wind energy is similarly unpredictable and is often

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[217] International Energy Agency, *Energy Policies of IEA Countries: European Union*, 47.

[218] Kevin Rosner, "The European Union: On Energy, Disunity," in *Energy Security Challenges for the 21st Century: A Reference Handbook*, ed. Gal Luft and Anne Korin (Santa Barbara: ABC-CLIO, 2009), 166.

[219] Rosner, "Disunity," 166; Michael B Kelley, "This Is The Gas Pipeline Map That Shows Why The Crisis In Ukraine Affects All Of Europe," Business Insider, March 3, 2014, http://www.businessinsider.com/heres-one-economic-reason-russias-invasion-of-crimea-pulls-in-europe-2014-3.

[220] Alex Grimm, "Cloudy Germany unlikely hotspot for solar power," *Reuters*, July 30, 2007, http://www.reuters.com/article/us-germany-solar-idUSL2389939520070730.

strongest in areas removed from population, requiring costly transit infrastructure.[221] Germany's increased dependence on intermittent renewable energies decreases German energy security and necessitates the use of back-up energies as mentioned in the previous section.

The presence of renewable energies, coupled with EU and German incentive schemes, has deteriorated the viability of existing traditional energy bases. Because renewable energies do not expend fuel, the marginal cost of renewable energy is virtually nonexistent. This, along with EU and German incentives, allows renewable energy to be sold cheaply on the wholesale market, and causes transmission companies to prefer it. The result is decreased usage of traditional power plants. Whereas conventional power plants historically operated 6,000-7,000 hours in Germany, they now function in a "back-up" capacity, running an average of 2,000-3,000 hours per year. This "merit-order-effect" was an intended consequence of *Energiewende* policy, but has greatly challenged the viability of traditional power plants, the financing of new ones, and has ultimately decreased energy security.[222]

F. RENEWABLE ENERGIES AND SECURITY—A LIBERAL VIEW

1. Interdependence and Loop Flows

As mentioned earlier, the introduction of renewable energies required simultaneous investment into the underlying distribution grid both within and without Germany. The resulting higher degree of integration, and the presence of an energy market that spans the borders of the EU nations, increases the expectation of security based on the liberal framework set forth earlier in this paper. In this way, EU energy policy has succeeded at deepening the interdependence among member states, and is expected, therefore, to reduce conflict amongst the Union.

There are, however, costs to increased interconnectedness, and the EU's vision for a single energy market is meeting resistance in perhaps its biggest testbed. The Austria-

221 David Milborrow, "Energy Costs from European Wind Farms" *ternational Journal of Solar Energy* 18, no. 2: 73.

222 Rohrkasten, "Energy Security and the Transatlantic Dimension," 335.

Germany energy market, established in 2002, is the only larger transnational trading zone in Europe, and allows buyers throughout the zone equal access to electricity produced within it. During surges in the electricity production of renewable energies, wholesale prices for electricity drop, and the consequent increased demand throughout the zone—sometimes as high as 10 gigawatts (GW)—quickly overwhelms the inadequate 5.5 GW of network capacity connecting the two countries.[223]

Electricity, which travels along the path of least resistance, thus finds circuitous routes, or "loop flows," through neighboring countries like Poland and the Czech Republic in order to reach its destination in Austria. A study funded by four neighboring states reported of instances where half of the flow between Austria and Germany transited via loops through neighboring countries.[224] Inadequacy of transmission lines between the productive wind farms in northern Germany and the industry-heavy southern Germany is also blamed for loop flows.[225] These unscheduled loop flows create disruptive congestion in the neighboring countries, and many of Germany's neighbors have begun to install "phase-shifters" at their borders to limit cross-border flow. The increasing frequency of loop flows also prompted Poland to request that EU grid regulator ACER assess the costs of the flows.[226] The ACER report, released in 2013, noted that supply imbalances and deviations in flow were posing a threat to energy supply security, and a subsequent European Commission report recommended that the Austria-Germany trading zone be split at times.[227]

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223 Jakob Schlandt, "Grid Authority Considers Split Austrian-German Electricity," Clean Energy Wire, June 17, 2015, https://www.cleanenergywire.org/news/grid-authority-considers-split-austrian-german-electricity-market.

224 "Unplanned Flows in the CEE Region," joint study by CEPS, MAVIR, PSE, and SEPS, January 2013, 35, www.pse.pl/uploads/pliki/Unplanned_flows_in_the_CEE_region.pdf.

225 Jakob Schlandt, "Grid Authority Considers Split."

226 Jakob Schlandt, "Europe's Largest Electricity Market Set to Split," Clean Energy Wire, September 24, 2015, https://www.cleanenergywire.org/news/europes-largest-electricity-market-set-split.

227 "Loop Flows Workshop—High-Level Conclusions," Agency for the Cooperation of Energy Regulators, July 16, 2013, 1, https://ec.europa.eu/energy/sites/ener/files/documents/201310_loop-flows_study.pdf; "Loop Flows—Final Advice," Thema Consulting Group, October 2013, https://ec.europa.eu/energy/sites/ener/files/documents/201310_loop-flows_study.pdf.

The potential split of the Austria-Germany trading zone is a blow to the EU's plan for a common electricity market, as is the installation of phase-shifters to limit cross-border flows. Loop flows highlight the physical constraints to market integration, the present inability of the market to incentivize grid expansion, and the ability for instability generated by renewable energies to propagate across an interconnected system. Loop flows also hint at a more fundamental limitation. Energy policy remains a national prerogative, and the lack of coordination among EU members will continue to plague EU integration efforts and the interconnectedness of member states. If interconnectedness continues to be hampered by barriers like loop flows, the result could be a decrease in regional security.

2. EU as an IGO

The added competencies of environmental and energy policy have strengthened the EU as an IGO, and also increase the expectation of security per liberal interdependence theory. Energy forums provide another venue for EU member dialogue, mitigating conflict and promoting a socializing effect among EU members. Shared ownership in a collective environmental and energy policy, too, should act to improve unity within the EU.

These liberal benefits of EU policy might not be shared with outside entities, however. Russia has largely appeared threatened by EU energy legislation. EU unbundling and reciprocity rules have been perceived as targeting Russian national energy giant Gazprom, and Russia has responded with attempts to undermine the EU through long-term bilateral contracts with EU members.[228] While the effects of EU energy policy have yet to fully establish themselves, they might result in increased conflict with EU trading partners and thus decrease regional security.

3. An Alternative View—The Undoing of the EU?

The German renewable energy transformation might prove unrepresentative of the rest of the Union. Lying in the center of the EU, it was easy for Germany to integrate

228 Youngs, *Europe's New Foreign Policy Challenge*, 39.

with its neighbors' networks and thus boost cross-border energy sales. It had the strongest and largest economy of all of the EU countries and was thus well-positioned to take on the added costs of implementing EU green energy obligations. Political currents within the country shed the nuclear alternative and made the transition to renewable energies relatively easy.

This could not be said of all EU countries. The energy question has revealed the different interests and abilities of the EU member countries. Other countries have had various commitments to existing energy sources—France to nuclear, and the Eastern European members to coal and natural gas—and were reluctant to part from them. While EU policy included the assurance that member countries would have autonomy in determining national energy mixes, they were nonetheless bound to GHG and renewables targets, and their existing commitments affect their ability to satisfy the EU mandates.

Alternate and competing policies introduced at the national levels have hurt EU unity. Germany's Feed-in-Tariff scheme has interacted negatively with EU-level policy. Germany also, along with France, favors the continued use of bilateral energy agreements, whereas the United Kingdom has sought deeper reliance on energy markets. The varying policies and interests have resulted in a lack of cohesion within the EU and in the EU's external market policies.[229] The disunity highlights the desire for autonomy in critical areas such as energy security. Members, for instance, have been hesitant to share information regarding infrastructure vulnerabilities with one another, and the national policies indicate a "renationalization of energy policies."[230] Furthermore, EU cohesion is being attacked from without, as Russia continues to undermine EU policy and pursue bilateral relations with member states (as can be argued with Nord Stream). Disunity in the EU caused by green energy policies has the potential of decreasing regional security.

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229 Ibid.

230 Rosner, "Disunity," 170; Camilla Bausch, Ennid Roberts, Lena Donat, and Christine Lucha, *European Governance and the Low-Carbon Pathway: Analysis of Challenges and Opportunities Arising from Overlaps between Climate and Energy Policy as Well as from Centralisation of Climate Policies* (Berlin: Ecologic Institut, 2014), 62, http://cecilia2050.eu/publications/254.

4. Energy Poverty

The cost of green energy initiatives has been largely borne by individual consumers. These costs disproportionately affect the poor, who already spend a larger portion of their income on energy. The rapidly rising energy costs have brought many in the EU into energy poverty. According to a study funded by the European Commission, nearly 11% of EU citizens were not able to keep their homes adequately warm in 2012, and a similar percentage reported issues with paying utility bills on time. Energy poverty is regionally concentrated, and affects the southern and eastern member states disproportionately; while energy poverty affects fewer in Germany, rates average closer to 20% for countries such as Portugal, Romania, Cyprus, Hungary, and Bulgaria.[231] One of the effects of increased energy prices—namely, a reduction in consumption (or increase in efficiency, as it is coined)—might be touted as a success but also indicates the growing concern of energy poverty.

While energy poverty might not be as present a concern for Germany as it is for Germany's southern and eastern neighbors, Germany's emissions goals are more ambitious than those of its neighbors, and energy prices will continue to rise. Combined with costs associated with the nuclear phase-out, debt and energy poverty will likely become increasing concerns in Germany.

The added toll of green energy policies, combined with already depressed economies in many of the hardest-hit countries, has great security implications for member countries and the EU as a whole, and has the potential to foment civil unrest and political upheaval.

G. CONCLUSION

Germany and the EU have made progress in share of renewable energies on the grid, but barring any significant developments, Germany is likely to fall short of consumption and emissions goals, and it has saddled itself with increasing energy costs

[231] Steve Pye, Audrey Dobbins, Claire Baffert, Jurica Brajković, Ivana Grgurev, Rocco De Miglio, and Paul Deane, "Energy poverty and vulnerable consumers in the energy sector across the EU: analysis of policies and measures," Insight_E, May 2015 Policy Report, 15, https://ec.europa.eu/energy/sites/ener/files/documents/INSIGHT_E_Energy%20Poverty%20-%20Main%20Report_FINAL.pdf.

and debt. While German and EU green energy policies would have been expected to increase energy security, they have actually acted to decrease energy security and overall security and stability in a number of respects. Germany, as an example, is now more dependent on energy imports than ever, and these imports are coming from fewer and less reliable sources. The unreliability inherent in renewable energies and their decreasing the viability of existing energy sources further decreases energy security in Germany. While increasing interdependence and a strengthened institutional framework should act as a stabilizing force within the EU, this could be offset by a backlash at the consequences of an increased share of renewables on the grid. Furthermore, to the extent that strengthening EU authority on energy issues is perceived as threatening to outside entities, it may also instigate conflict from without. All-the-while, growing disunity of interest, financial capacity, and internal policy threatens EU fabric from within. Finally, rising energy poverty rates and nation debt loads have the potential to foment unrest and political upheaval throughout Germany and the EU.

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V. CONCLUSION

As the German case demonstrates, energy security is a complex matter. Initiatives like Nord Stream 2 and Germany's *Energiewende* transition to renewable energies were intended to improve energy security but may have unintended consequences that actually decrease it. Nord Stream 2 increases German natural gas import capacity, but therefore has the potential effect of making Germany more reliant on Russian imports, thus making it susceptible to Russian manipulation. Renewable energies were expected to make Germany less dependent on fossil fuel imports but may not achieve this effect, especially if Germany becomes more dependent on back-up natural gas power plants for dispatch needs. Furthermore, renewables introduce reliability—and thus security—problems of their own, with energy supply becoming dependent on intermittent weather patterns. As we have seen, the transition to renewables may also have a negative impact on energy security by its threatening the economic viability of traditional power sources that the grid cannot yet part with.

Pursuing energy security involves trade-offs. It is not a unitary objective, and exists in a "trilemma" with the other energy objectives of efficiency and ecology. Renewables, for instance, which are touted to improve energy security (albeit debatably) and reduce GHG emissions, have done so at increased energy costs to households. Even nuclear energy, which is championed as the perfect mix of low GHG emissions and costs and high security, has security risks and environmental hazards of its own, and Germany will undoubtedly spend the next century paying for the dismantling of its nuclear infrastructure and mitigating its environmental effects.

Then there are the not-so-straight-forward implications of energy security on overall regional stability and security. While Germany may increase its energy security by installing the Nord stream 2 pipelines, bypassing Eastern European pipelines will likely deteriorate the economic situations in these countries and will make them more susceptible to Russian influence and aggression, and these two effects may decrease security for the region. The incredible costs of both the nuclear phase-out and EU-wide transition to renewable energies will increase concerns of energy poverty and expose the

region to increased risks of economic downturn, which in turn may threaten democracy and thus security and stability in the region.

Energy policy reveals the limits of the EU's influence. While the liberal ideals upon which the EU were founded have been indicated in the 70 years of relative peace that Europe has enjoyed since the founding of the IGO, the EU's vision for an "ever closer union" appears to be bumping into popular and political unwillingness for further integration. Vital national interests like energy policy, it seems, remain squarely as national prerogatives. This is demonstrated in the bilateral Nord Stream 2 negotiations as well as in Germany's unilateral decision to abandon nuclear energy. Furthermore, even though Germany's *Energiewende* is consistent with EU-wide goals, the policies introduced with the German EEG act have been seen as undermining EU-wide initiatives like the ETS. Continued attempts at integrating the Union may thus have the opposite effect of pulling it further apart (as we have seen with EU migration policy), and an institution founded on the principle of energy security might be undone because of it. The weakening of the EU will—according to liberal theory—likewise weaken stability and security in the region.

Finally, while politics constrain energy policy, the case of the nuclear phase-out serves as an example in which energy issues can influence political dynamics. The nuclear issue was crucial to the Green Party's rise as a mainstream party. While the final impact on German political dynamics of this development has yet to be seen, the rise of the Green Party and other parties after it may destabilize German democracy if the result is a further polarization of the German political system.

LIST OF REFERENCES

A.G. Energiebilanzen. "A.G. Energiebilanzen e.V." Accessed May 20, 2016. http://www.ag-energiebilanzen.de.

———. "AG Energiebilanzen Pressedienst 2016 no. 1." http://www.ag-energiebilanzen.de/.

Amelang, Soren. "Germany's Dependence on Imported Fossil Fuels." Clean Energy Wire. February 11, 2016. https://www.cleanenergywire.org/factsheets/germanys-dependence-imported-fossil-fuels.

Appunn, Kerstine. "Managing the Nuclear Legacy- a Project into the Next Century." Clean Energy Wire. October 12, 2015. https://www.cleanenergywire.org/dossiers/challenges-germanys-nuclear-phase-out.

———. "The History Behind Germany's Nuclear Phase-Out." Clean Energy Wire. July 24, 2015. https://www.cleanenergywire.org/factsheets/history-behind-germanys-nuclear-phase-out.

Baran, Zeyno. "EU Energy Security: Time to End Russian Leverage." *Washington Quarterly* 30, no. 4 (2007): 131–144.

Baumann, Florian. "Energy Security as Multidimensional Concept." *Research Group on European Affairs* no. 1 (March 2008): 4–14.

Bausch, Camilla, Ennid Roberts, Lena Donat, and Christine Lucha. *European Governance and the Low-Carbon Pathway: Analysis of Challenges and Opportunities Arising from Overlaps between Climate and Energy Policy as Well as from Centralisation of Climate Policies*. Berlin: Ecologic Institut, 2014.

BBC News. "Schroeder Attacked Over Gas Post." December 10, 2015. http://news.bbc.co.uk/2/hi/europe/4515914.stm.

Belkin, Paul and Vince L. Morelli. *The European Union's Energy Security Challenges*. Washington, DC: Congressional Report Service, 2007.

Bohi, Douglas R. and Michael A. Toman. *Economics of Energy Security*. Boston: Kluwer Academic Publishers, 1996.

Boisvert, Will. "Green Energy Bust in Germany." *Dissent* 60, no. 3 (2013): 62–70.

Bota, Alice, Matthias Krupa, and Michael Thumann. "Die Rohrbombe." *Die Zeit*, February 5, 2016. http://www.zeit.de/2016/06/nord-stream-2-deutschland-russland-pipeline/komplettansicht.

Brost, Marc, Peter Dausend, and Tina Hildebrandt. “Ausstieg Aus Dem Ausstieg Aus Dem... “ *Zeit Online*, March 24, 2011. http://www.zeit.de/2011/13/Regierungsvertrauen.

Bundeskartellamt. “Bundeskartellamt Plans to Clear Gazprom’s Acquisition of Minority Interest in VNG.” Last modified January 13, 2012. http://www.bundeskartellamt.de/SharedDocs/Meldung/EN/Pressemitteilungen/2012/13_01_2012_Gazprom_VNG.html.

Bundesministerium fur Wirtschaft und Energie. “Energy Concept 2010.” September 28, 2010. http://www.bmwi.de/English/Redaktion/Pdf/energy-concept,property=pdf,bereich=bmwi,sprache=en,rwb=true.pdf.

———. “Energy of the Future.” Accessed May 20, 2016. http://www.bmwi.de/EN/Topics/Energy/Energy-Transition/overall-strategy.html.

———. “Natural Gas Supply in Germany.” Accessed March 19, 2016. http://www.bmwi.de/EN/Topics/Energy/Conventional-energy-sources/gas.html.

———. “Renewable Energy Surcharge in 2016: Facts and Background.” October 15, 2015. https://www.bmwi.de/English/Redaktion/Pdf/renewable-energy-surcharge-in-2016-facts-and-background,property=pdf,bereich=bmwi2012,sprache=en,rwb=true.pdf.

———. “The Energy of the Future Fourth Energy Transition Monitoring Report.” November 2015. https://www.bmwi.de/English/Redaktion/Pdf/vierter-monitoring-bericht-energie-der-zukunft-kurzfassung,property=pdf,bereich=bmwi2012,sprache=en,rwb=true.pdf.

Bundestag. “Antwort Der Bundesregierung.” Accessed May 20, 2016. http://dip21.bundestag.de/dip21/btd/18/065/1806526.pdf.

Business Green. “Hedegaard Backs Nuclear to Meet EU Climate Targets.” March 23, 2011. http://www.businessgreen.com/bg/news/2036332/hedegaard-backs-nuclear-meet-eu-climate-targets.

C. W. “What Dutch Disease is, and Why it’s Bad.” *The Economist*, November 5, 2014. http://www.economist.com/blogs/economist-explains/2014/11/economist-explains-2.

ČEPS, MAVIR, PSE and SEPS. “Joint Study by ČEPS, MAVIR, PSE and SEPS Regarding the Issue of Unplanned Flows in the CEE Region.” January 2013. www.pse.pl/uploads/pliki/Unplanned_flows_in_the_CEE_region.pdf.

Christian Science Monitor. “Across Europe, Japan Crisis Provokes Nuclear Rethink.” March 16, 2011. http://www.csmonitor.com/World/Europe/2011/0316/Across-Europe-Japan-crisis-provokes-nuclear-rethink.

Clingendael International Energy Program. “Russian Gas Imports to Europe and Security of Supply.” Accessed March 19, 2016. http://www.clingendaelenergy.com/files.cfm?event=files.download&ui=9C1DEEC1-5254-00CF-FD03186604989704.

Crooks, Ed. “Germans in Energy Scramble.” *Financial Times*, January 13, 2010. http://www.ft.com/intl/cms/s/0/3be6ab96-ffe3-11de-ad8c-00144feabdc0.html#axzz49dGYoMHh.

de Pommereau, Isabelle. “How Germany’s Greens Rose from Radical Fringe to Ruling Power.” *Christian Science Monitor*, March 28, 2011. http://www.csmonitor.com/World/Europe/2011/0328/How-Germany-s-Greens-rose-from-radical-fringe-to-ruling-power.

Dempsey, Judy. “Siemens Abandoning Nuclear Power Business.” *New York Times*, September 18, 2011. http://www.nytimes.com/2011/09/19/business/global/19iht-siemens19.html.

Deutsche Welle. “Germany’s Planned Nuclear Phase Out Sparks Job Loss Talks.” December 12, 2011. http://www.dw.com/en/germanys-planned-nuclear-phaseout-sparks-job-loss-talks/a-15595808.

Duffield, John S. *Fuels Paradise: Seeking Energy Security in Europe, Japan, and the United States*. Baltimore: Johns Hopkins University Press, 2015.

———. “Political Culture and State Behavior: Why Germany Confounds Neorealism.” *International Organization* 53, no. 04 (1999): 765–803.

Dym, Warren. “A Tale of Three Pipelines: Nord Stream and the Primacy of Industry in Germany.” *Big Deal Energy*, 2015. http://warrendym.com/a-tale-of-three-pipelines-nord-stream-in-context/.

Economist. “Energiewende.” July 28, 2012. http://www.economist.com/node/21559667.

———. “Europe’s Gas Pipelines: The Abominable Gas Man.” October 14, 2010. http://www.economist.com/node/17260657.

———. “German Politics is turning into a Six Party System.” September 19, 2016. http://www.economist.com/news/europe/21707383-weak-winners-and-populist-upstarts-berlins-election-german-politics-turning-six-party.

Energy Daily. “EU to Study Naftogaz’s Complaint Against Nord Stream 2.” *Interfax: Russia & CIS* February 2, 2016.

Energy Information Agency. “International Energy Statistics.” Accessed March 19, 2016. http://www.eia.gov/cfapps/ipdbproject/IEDIndex3.cfm?tid=3&pid=26&aid=4.

———. “Ukraine.” September 2015. http://www.eia.gov/beta/international/analysis.cfm?iso=UKR.

Eon. “Development & Production in Russia—Yuzhno Russkoye Gas Field.” Accessed March 19, 2016. http://www.eon.com/en/business-areas/exploration-and-production/development-and-production/russia.html.

Esakova, Nataliya. *European Energy Security: Analysing the EU-Russia Energy Security Regime in Terms of Interdependence Theory*. Wiesbaden: Springer Science & Business Media, 2013.

European Commission. “Energy Security Strategy.” Accessed March 19, 2016. https://ec.europa.eu/energy/en/topics/energy-strategy/energy-security-strategy.

———. “EU Climate and Energy Policy.” Last modified November 8, 2015. http://ec.europa.eu/research/energy/eu/index_en.cfm?pg=policy-energy-and-climate-policy.

———. “European Commission—Fact Sheet, Intergovernmental Agreements in Energy.” Accessed February 16, 2016. http://europa.eu/rapid/press-release_MEMO-16-309_en.htm.

———. “Progress on Resource Efficiency and Decoupling in the EU 27.” June 2, 2014. http://www.eea.europa.eu/publications/progress-on-resource-efficiency-and#tab-news-and-articles, 21.

———. “State of the Energy Union 2015- Commission Staff Working Document.” November 18, 2015. https://ec.europa.eu/energy/sites/ener/files/documents/3_EESS.pdf.

European Union. “The Schuman Declaration.” Last modified November 17, 2016. http://europa.eu/about-eu/basic-information/symbols/europe-day/schuman-declaration/index_en.htm.

———. “A Peaceful Europe- the Beginnings of Cooperation.” Last modified November 17, 2016. https://europa.eu/european-union/about-eu/history/1945-1959_en.

———. “Energystat.” Accessed June/5, 2016. http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Gross_inland_consumption_of_energy,_1990%E2%80%932013_(million_tonnes_of_oil_equivalent)_YB15.png.

———. “European Commission—Fact Sheet, Why is the Commission Proposing an Energy Union Now? Why do we Need an Energy Union?” February 25, 2015. http://europa.eu/rapid/press-release_MEMO-15-4485_en.htm.

———. “European Union Receives Nobel Peace Prize 2012.” Last modified November 17, 2016. http://europa.eu/about-eu/basic-information/eu-nobel/index_en.htm.

Faas, Henryk, Francesco Gracceva, Gianluca Fulli, and Marcelo Masera. “European Security–A European Perspective.” In *Energy Security*, edited by Adrian Gheorghe and Liviu Muresan, 9–21. Netherlands: Springer, 2011.

Fish, M. Steven. *Democracy Derailed in Russia: The Failure of Open Politics*. Cambridge: Cambridge University Press, 2005.

Frankfurter Allgemeine Zeitung. “Atomkonsens Und Seine Restlaufzeit.” January 2, 2002. http://www.faz.net/aktuell/politik/dokumentation-atomkonsens-und-seine-restlaufzeit-147737.html.

Gasiorowski, Mark J. “Economic Crisis and Political Regime Change: An Event History Analysis.” *American Political Science Review* 89, no. 04 (1995): 882–897.

Gazprom. “Gazprom Annual Corporate Brochure.” 2014. http://www.gazpromexport.ru/en/presscenter/publications/#brochure.

———. “Nord Stream.” Accessed January 31, 2016. http://www.gazprom.com/about/production/projects/pipelines/nord-stream/.

Görlach, Benjamin, Matthias Duwe, and Nick Evans. “Frameworks for Regional Cooperation: The EU.” In *Handbook of Transitions to Energy and Climate Security*, edited by Robert E. Looney, 79-96. London: Routledge, 2016.

Gosar, Anton. “The Shatter Belt and the European Core-A Geopolitical Discussion on the Untypical Case of Slovenia.” *Geojournal* 52, no. 2 (2000): 107–117.

Green Party. Last Modified September 3, 2016. https://www.gruene-bundestag.de/service-navigation/english.html.

Grimm, Alex. “Cloudy Germany Unlikely Hotspot for Solar Power.” *Reuters*, July 30, 2007, http://www.reuters.com/article/us-germany-solar-idUSL2389939520070730.

Gutmann, Amy and Dennis Thompson. “The Case for Compromise.” *Harvard Magazine* (July-August 2012).

Gwertzman, Bernard. “Reagan Clarifies His Statement on Nuclear War.” *The New York Times*, October 22, 1981. http://www.nytimes.com/1981/10/22/world/reagan-clarifies-his-statement-on-nuclear-war.html.

Heymann, Eric. *German ‘Energiewende’: Many Targets Out of Sight*. Edited by Lars Slomka. Deutsche Bank Research, 2016.

Hobbes, Thomas. *The English Works of Thomas Hobbes.* Edited by William Molesworth. London: Longman, Brown, Green, and Longmans, 1845.

Intergovernmental Panel on Climate Change. *Climate Change 2014–Impacts, Adaptation and Vulnerability- Regional Aspects*: Cambridge University Press, 2014.

International Energy Agency. "Germany One-Pager." June 2014. https://www.iea.org/media/countries/slt/GermanyOnepagerJune2014.pdf.

———. "Electricity Feed-in Law of 1991." Last modified March 14, 2013. http://www.iea.org/policiesandmeasures/pams/germany/name-21002-en.php.

———. "International Energy Agency." OECD. Accessed May 20, 2016. https://www.iea.org.

———. Energy Policies of IEA Countries: European Union. Paris: OECD, 2014.

———. Energy Policies of IEA Countries: Germany. Paris: OECD, 2013.

Jahn, Detlef and Sebastian Korolczuk. "German Exceptionalism: The End of Nuclear Energy in Germany!" *Environmental Politics* 21, no. 1 (2012): 159–164.

Jeffries, Stuart. "Is Germany Too Powerful for Europe." *The Guardian*, March 31, 2013. http://www.theguardian.com/world/2013/mar/31/is-germany-too-powerful-for-europe.

Joppke, Christian. "Social Movements during Cycles of Issue Attention: The Decline of the Anti-Nuclear Energy Movements in West Germany and the USA." *British Journal of Sociology* (1991): 43–60.

Kanter, James. "E.U. Takes Steps to Reduce Reliance on Russian Gas." *International New York Times*, February 17, 2016. http://search.proquest.com/docview/1765453198?accountid=12702.

Kelley, Michael B. "This is the Gas Pipeline Map that Shows why the Crisis in Ukraine Affects all of Europe." *Business Insider*, March 3, 2014. http://www.businessinsider.com/heres-one-economic-reason-russias-invasion-of-crimea-pulls-in-europe-2014-3.

Kitschelt, Herbert P. "Political Opportunity Structures and Political Protest: Anti-Nuclear Movements in Four Democracies." *British Journal of Political Science* 16, no. 01 (1986): 57–85.

Koopmans, Ruud and Jan Willem Duyvendak. "The Political Construction of the Nuclear Energy Issue and its Impact on the Mobilization of Anti-Nuclear Movements in Western Europe." *Social Problems* 42, no. 2 (1995): 235–251.

Kramer, Andrew E. “Russia Gas Pipeline Heightens East Europe’s Fears.” *New York Times*, October 12, 2009. http://www.nytimes.com/2009/10/13/world/europe/13pipes.html?_r=0.

Lewis, Barbara. “Ten EU Nations Say Nord Stream Gas Extension Not in EU Interests.” *Reuters*, November 27, 2015. http://www.reuters.com/article/us-ukraine-crisis-nordstream-idUSKBN0TG0JX20151127.

Looney, Robert E. “Energy Security in Western Europe.” *Europa World online*. Accessed January 21, 2016. http://www.europaworld.com/entry/a1.

———. “United States’ Energy and Climate Transition: Partial Success without a Plan.” In *Handbook of Transitions to Energy and Climate Security*, edited by Robert E. Looney, 205-222. London: Routledge, 2016.

Loop Flows- Final Advice: Thema Consulting Group, 2013. https://ec.europa.eu/energy/sites/ener/files/documents/201310_loop-flows_study.pdf.

Loop Flows Workshop- High-Level Conclusions: Agency for the Cooperation of Energy Regulators, 2013. https://ec.europa.eu/energy/sites/ener/files/documents/201310_loop-flows_study.pdf.

Loskot-Strachota, Agata. “The Case Against Nord Stream 2.” *Energy Post*, November 23, 2015. http://www.energypost.eu/case-nord-stream-2/.

MacNaughton, Joan. “World Energy Trilemma.” World Energy Council. Accessed March 18, 2016. https://www.worldenergy.org/work-programme/strategic-insight/assessment-of-energy-climate-change-policy/.

Mazneva, Elena. “Russia Plans to End Ukraine Gas Transit for New Route after 2019.” *Bloomberg*, April 13, 2015. http://www.bloomberg.com/news/articles/2015-04-13/russia-plans-to-end-ukraine-gas-transit-for-new-route-after-2019.

Mearsheimer, John J. *The Tragedy of Great Power Politics.* New York: WW Norton & Company, 2001.

Mez, Lutz. “Germany’s Merger of Energy and Climate Change Policy.” *Bulletin of the Atomic Scientists* 68, no. 6 (2012): 22–29.

Milborrow, David. “Energy Costs from European Wind Farms.” *International Journal of Solar Energy* 18, no. 2 (1996): 73–81.

Mueller, Harald and Thomas Risse-Kappen. “Origins of Estrangement: The Peace Movement and the Changed Image of America in West Germany.” *International Security* 12, no. 1 (1987): 52–88.

National Renewable Energy Laboratory. “Life Cycle Greenhouse Gas Emissions.” Last modified July 13, 2016. http://www.nrel.gov/analysis/images/lca_harm_over_1.png.

New York Times. “Protest in Britain Stretches 14 Miles.” April 2, 1983. http://www.nytimes.com/1983/04/02/world/protest-in-britain-stretches-14-miles.html.

Nord Stream. “Nord Stream.” Accessed January 31, 2016. http://www.nord-stream.com/.

———. “Nord Stream Environmental Impact Assessment: Documentation for Consultation Under the Espoo Convention.” Nord Stream. February 2009. https://www.nord-stream.com/download/document/69/?language=en.

Norskpetroleum. “Historical and Expected Volumes of Sales Gas from Norwegian Fields, 1985–2025.” 2014. http://www.norskpetroleum.no/en/?attachment_id=10939.

Novinite. “Gazprom Declares Termination of South Stream Agreement.” January 31, 2016. http://www.novinite.com/articles/172724/Gazprom+Declares+Termination+of+South+Stream+Agreement.

Park, Sang-Chul and Dieter Eissel. “Alternative Energy Policies in Germany with Particular Reference to Solar Energy.” *Journal of Contemporary European Studies* 18, no. 3 (2010): 323–339.

Probol, Britta. “Kampf Dem Atomtod.” *Norddeutscher Rundfunk*, March 26, 2010. http://www.ndr.de/kultur/geschichte/chronologie/kampfdematomtod2.html.

Pye, Steve and Audrey Dobbins. *Energy Poverty and Vulnerable Consumers in the Energy Sector Across the EU: Analysis of Policies and Measures*: Insight_E, 2015.

Radkau, Joachim. “Eine Kurze Geschichte Der Deutschen Antiatomkraftbewegung.” In *Biotechnologie-Kommunikation*, 191–202. Bonn: Springer, 2011.

Rauch, Jonathan. “How American Politics Went Insane.” *The Atlantic,* October 2016. http://www.theatlantic.com/magazine/archive/2016/07/how-american-politics-went-insane/485570/.

Reuters. “Gazprom to Offer More Gas at Spot Prices Via Nord Stream II – Sources.” October 13, 2015. http://uk.reuters.com/article/russia-gazprom-spot-idUKL8N12D4HK20151013.

Riegert, Bernd. “Opinion: Nuclear Power Uproar a Waste of Energy.” *Deutsche Welle*, May 18, 2016. http://www.dw.com/en/opinion-nuclear-power-uproar-a-waste-of-energy/a-19264626.

Röhrkasten, Sybille and Kirsten Westphal. "Energy Security and the Transatlantic Dimension: A View from Germany." *Journal of Transatlantic Studies* 10, no. 4 (2012): 328–342.

Rosner, Kevin. "The European Union: On Energy, Disunity." In *Energy Security Challenges for the 21st Century,* 160–173. Santa Barbara: ABC CLIO, 2009.

Rüdig, Wolfgang. "Phasing Out Nuclear Energy in Germany." *German Politics* 9, no. 3 (2000): 43–80.

Russett, Bruce M. and John R. Oneal. *Triangulating Peace: Democracy, Interdependence, and International Organizations*. New York: Norton, 2001.

Sanchez, Ray, Nic Robertson, and Don Melvin. "Russian PM Medvedev Equates Relations with West to a 'New Cold War.'" *CNN*, February 15, 2016. http://www.cnn.com/2016/02/13/europe/russia-medvedev-new-cold-war/.

Schildt, Axel. "Die Friedensbewegung 1958." *Spiegel Online*, April 16, 2008. http://www.spiegel.de/einestages/50-jahre-friedensbewegung-a-946874.html.

Schlandt, Jakob. "Europe's Largest Electricity Market Set to Split." Clean Energy Wire. September 24, 2015. https://www.cleanenergywire.org/news/europes-largest-electricity-market-set-split.

———. "Grid Authority Considers Split Austrian-German Electricity." June 17, 2015. https://www.cleanenergywire.org/news/grid-authority-considers-split-austrian-german-electricity-market.

Schmidt, Manfred G. "The Grand Coalition State." *Political Institutions in Europe* (1996): 62–98.

Smedley, Tim. "Goodbye Nuclear Power: Germany's Renewable Energy Revolution." *The Guardian*, May 10, 2013. https://www.theguardian.com/sustainable-business/nuclear-power-germany-renewable-energy.

Sovacool, Benjamin K. "Defining, Measuring, and Exploring Energy Security." In *The Routledge Handbook of Energy Security,* edited by Benjamin K. Sovacool, 1–42. New York: Routledge International Handbooks, 2011.

Sovacool, Benjamin K. and Ishani Mukherjee. "Conceptualizing and Measuring Energy Security: A Synthesized Approach." *Energy* 36, no. 8 (2011): 5343–5355.

Sovacool, Benjamin K., Ishani Mukherjee, Ira Martina Drupady, and Anthony L. D'Agostino. "Evaluating Energy Security Performance from 1990 to 2010 for Eighteen Countries." *Energy* 36, no. 10 (2011): 5846–5853.

Sovacool, Benjamin K. and Marilyn A. Brown. "Competing Dimensions of Energy Security: An International Perspective." *Annual Review of Environment and Resources* 35 (2010): 77–108.

Spiegel. "Nordstream 2: Unions-Außenpolitiker Kritisieren Deutsche Pipeline-Pläne." December 19, 2015. http://www.spiegel.de/wirtschaft/soziales/nordstream-2-cdu-aussenpolitiker-kritisiert-pipeline-plaene-a-1068744.html.

Sputnik International. "Ukraine's PM Urges EC to Scrap Nord Stream 2 as 'Anti-European' Project." January 2, 2016. http://sputniknews.com/business/20160201/1034045859/nord-stream-2-ukraine.html#ixzz42qes08VJ.

Sputnik News International. "Keep Calm and Carry on: EU Feuding Casts no Doubt on Nord Stream-2 Pipeline." January 31, 2016. http://sputniknews.com/business/20160131/1034003762/germany-nord-stream-pipeline.html.

Steinhauser, Gabriele. "Germany's Merkel Defends Russian Gas Pipeline Plan." *Wall Street Journal*, December 18, 2015. http://www.wsj.com/articles/germanys-merkel-defends-russian-gas-pipeline-plan-1450447499.

Steitz, Christoph. "Siemens Puts Cost of Nuclear Exit at 1.7 Trillion Euros." *Reuters*, January 17, 2012. http://www.reuters.com/article/us-siemens-energy-idUSTRE80G10920120117.

Stratfor. "How the Game is Played: The Life and Death of South Stream." September 17, 2015. https://www.stratfor.com/analysis/how-game-played-life-and-death-south-stream.

Thalman, Ellen. "What German Households Pay for Power." Clean Energy Wire. January 22, 2016. https://www.cleanenergywire.org/factsheets/what-german-households-pay-power.

Thomas, Ian Q. R. *The Promise of Alliance: NATO and the Political Imagination*. Lanham, UK: Rowman & Littlefield Publishers, 1997.

Thurau, Jens. "Opinion: Fukushima 5 Years on—'The Germans are Crazy.'" *Deutsche Welle*, March 10, 2016. http://www.dw.com/en/opinion-fukushima-5-years-on-the-germans-are-crazy/a-19109743.

TNS Opinion and Social. "Eurobarometer 324- Europeans and Nuclear Safety."2010. http://ec.europa.eu/public_opinion/archives/eb_special_339_320_en.htm.

Umbach, Frank. "German Debates on Energy Security and Impacts on Germany's 2007 EU Presidency." In *Energy Security*, edited by Antonio Marquina, 1–23. New York: Palgrave Macmillan, 2008.

Waltz, Kenneth N. *Theory of International Politics*. Reading, MA: Addison-Wesley Publishing Company, 1979.

Werdermann, Felix. "Die größten Energie-Demos Aller Zeiten." Klimaretter. May 28, 2011. http://www.klimaretter.info/protest/hintergrund/8705-die-groessten-anti-atom-demos-aller-zeiten.

Wittneben, Bettina BF. "The Impact of the Fukushima Nuclear Accident on European Energy Policy." *Environmental Science & Policy* 15, no. 1 (2012): 1–3.

World Bank. "GDP." Accessed November 9, 2016. http://data.worldbank.org/indicator/NY.GDP.MKTP.CD?name_desc=true.

World Nuclear Association. "Country Profiles." Accessed November 9, 2016. http://www.world-nuclear.org/information-library/country-profiles.aspx.

———. "The Economics of Nuclear Power." Accessed November 9, 2016. http://www.world-nuclear.org/information-library/economic-aspects/economics-of-nuclear-power.aspx.

Wüstenhagen, Rolf and Michael Bilharz. "Green Energy Market Development in Germany: Effective Public Policy and Emerging Customer Demand." *Energy Policy* 34, no. 13 (2006): 1681–1696.

Yergin, Daniel. "Ensuring Energy Security." *Foreign Affairs*, April 2006. https://www.foreignaffairs.com/articles/2006-03-01/ensuring-energy-security.

Youngs, Richard. *Energy Security: Europe's New Foreign Policy Challenge.* New York: Routledge, 2009.

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