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Power Shift: Germany's Energy Transition

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Abstract:

This project is an analysis of the German energy transition, called the Energiewende, and the dual power shift that is underway in the country's electric sector. It is both a physical shift from conventional fossil fuels to renewable energy, as well as a socio-political shift in power from centralized utilities to community ownership of energy. The project examines three policy mechanisms — the feed-in tariff, emissions trading, and auctions — through the lens of ordoliberalism, a German variant of economic liberalism that believes in state intervention to maximize fair market competition. Using qualitative research of Anglophone sources, this project draws most heavily upon the book *Energy Democracy: Germany's Energiewende to Renewables* by Craig Morris and Arne Jungjohann. The project argues that the power shift in Germany, while vastly changing the ownership and diversity of electricity sources, is not truly democratizing the energy sector.

Executive Summary

This project examines the energy transition underway in Germany, called the Energiewende, and the various power shifts involved in this movement towards a low-carbon energy sector. The Energiewende is a national movement towards an efficient, low-carbon energy sector, shifting from fossil fuels to renewable energy while phasing out nuclear energy. Officially implemented into federal policy in 2010 and pushed further by the Fukushima nuclear disaster in 2011, the Energiewende has its roots in the anti-nuclear movement of the 1970s. The determination of communities and municipalities to phase out nuclear and take control of energy production has shaped the transition — causing the loosening of the stranglehold of monopolies on the energy sector. Shifting from large, centralized power plants to decentralized generation has given renewable energy, namely wind and solar, more access to the grid. But this power shift is only possible because the German state intervened in the market, enacting policies that both empower its citizenry and enable preservation of the environment.

Using qualitative research, I have analyzed a body of Anglophone scholarship as it relates to the organization and ownership of the Energiewende, as well as the history of energy policy in Germany. I have also studied the ideology of German ordoliberalism and applied it to the energy sector. A variant of neoliberalism, ordoliberalism believes in using state intervention to create market conditions that maximize fair competition, and in doing so can prevent undesirable market outcomes such as pollution. Ordoliberalism is implicit in the policy actions taken by the German state. These policy actions have facilitated renewable energy growth by giving them the support to compete with conventional fossil fuels. Remarkably, renewable energy production has overwhelming been led by community initiatives and localized ownership of energy.

As a result of feed-in tariffs and the EU's liberalization of electricity and gas in the 1990s, German consumers have more say in not only who supplies their energy, but also how it is produced. The result is greater market competition that functions within the constraints of capitalism; Germany is essentially a case study for the application of ordoliberal theory in the energy sector. It is a market-based solution to the problem of mitigating climate change and providing a framework for sustainability.

Central to this paper is the phenomenon of a power shift. But power has a dual meaning in this context: the physical supply of power that produces electricity, and the social and political power that enables influence over the behavior of a people. In Germany, the former is a power shift from fossil fuels and nuclear to renewables like wind and solar. The latter is a power shift from utilities to citizens, many of whom are fighting for control over electricity production and pushing the physical shift in power. This brings me to the central question of my research: does ordoliberalism aid or inhibit the power shift inherent in the Energiewende?

Germany's Energiewende, though far from complete, is showing the world that a major industrial nation can make the transition to a renewable energy sector — and it can do so while strengthening communities and engaging with the public. This paper is significant because it adds to the limited body of research for an Anglophone audience that focuses on the social power shifts in the Energiewende. It also highlights the role that ordoliberal policies have played in facilitating the energy transition. In this paper, I provide anecdotal evidence that people have led Germany's power shift and that policy action came only after grassroots momentum. By sharing the successes in German communities and villages, it is my hope that the Energiewende can inspire those unfamiliar with its story. Furthermore, the energy transition's chronology reveals

inspiring triumphs and hard-won victories in spite of corporate and political resistance. The paper is organized as follows:

Chapter one analyzes European sentiments towards nuclear energy, proving that Germany is by no means the first or only country to decide to phase it out. Instead, it argues that Germany is unique in its social power shift. It concludes by examining three different definitions of energy democracy.

Chapter two introduces ordoliberalism and its origins, and compares its philosophy to that of neoliberalism. It concludes by describing how ordoliberalism provided the framework for small players to compete with large utilities in the electric sector, reducing monopoly control.

Chapter three focuses on the grassroots movements that have shaped the Energiewende. Beginning with nuclear protests in the 1970s, this chapter outlines the bottom-up actions taken by Germans to shift power from utilities to themselves, either by producing their own energy or even buying back their electric grid. Early wind innovators, a small anti-nuclear group turned energy company, and solar campaigners are featured in the latter part of the section. This chapter highlights the decentralization of power from utilities to communities.

Chapter four focuses on three policy mechanisms used in Germany: feed-in tariffs, emissions trading, and auctions. Each is a product of economic liberalism, however they differ in important ways. While the feed-in tariff is an application of ordoliberalism, emissions trading and auctions are more free-market. In 2017, the feed-in tariff is being replaced by a system of auctions, which may have grave implications for the future of the Energiewende. Other challenges for the longer term include Germany's progress towards meeting its renewable goals, and its continued reliance on lignite coal.

The conclusion touches upon how the Energiewende is reshaping Germany's identity, and ends with implications for the future. I argue that ordoliberalism catalyzed the physical growth of renewable energy, but limits the underlying socio-political power shift. The energy transition is an opportunity for a more equitable social order, which the divisive laws of competition do not promote. Ordoliberalism favors small private enterprises over monopoly control, but still gives priority to those with the money to invest in projects. A move to public ownership of energy is necessary for a true democratization of energy.

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Acknowledgments

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Chapter 1: The Path to a Power Shift

Within days of the March 2011 Fukushima Daiichi nuclear disaster in Japan, German Chancellor Angela Merkel stood before the Bundestag, or German Parliament, offering support to Japan and announcing the closure of eight aging nuclear power plants in Germany. Emphasizing the inexorable dangers of nuclear power, she said, "we cannot and must not simply go back to business as usual" (C-Span 2011: 8:30). They were shut down a week later, but anti-nuclear protests continued across the country. By May 2011 came the announcement that Germany would phase out all nuclear power plants by 2022, a full 14 years ahead of schedule (Dempsey & Ewing 2011: 1).

The exceptional move — Germany is Europe's largest economy and is highly dependent on reliable energy to fuel its industrial sector — was met with skepticism from Europe and even more suspicion from German industry leaders (Dempsey & Ewing 2011: 1). Indeed, Merkel herself was accused of realpolitik; her party's former stance on extending the life of nuclear power plants was extremely unpopular, and may have cost her control of the German state of Baden-Württemberg for the first time in 58 years (Dempsey & Ewing 2011: 1). The Fukushima disaster appears as if it incited a sudden reversal in Merkel's position on nuclear energy. But to most Germans, the decision was the culmination of a long, hard-won fight.

Phasing out nuclear is just one part of a great transition to renewable energy in Germany. This energy transition, called the Energiewende, did not begin in 2011. Its origins lie in the anti-nuclear movement of the 1970s, a movement started by the people that has since been embraced by the state. Along the way, key historical events and ordoliberal policies have accelerated movement towards a green economy powered by renewables, namely wind and solar. The country still has a long way to go. For example, it is highly reliant on its vast reserves of lignite

— the dirtiest form of coal. And so far, the transition has focused primarily on electricity production. But more than just a shift in power sources, the Energiewende represents something bigger. It is a shift in power distribution and structure that is as much a public movement as a technical one. This dual social and physical shift in power distinguishes the Energiewende from other energy transitions. The following section will briefly examine anti-nuclear movements in Europe, setting the stage for the resistance from which the Energiewende organically emerged.

Nuclear Resistance in Europe

Although Germany's sudden decision to phase out nuclear has garnered much attention from the international community, the country was by no means the first to make such a move (Morris & Junjohann 2016: 7). Prior to Fukushima, the 1979 Three Mile Island nuclear meltdown and the 1986 Chernobyl disaster also galvanized anti-nuclear sentiments, particularly in the Western world, leading many countries to stop new plant construction and phase out existing plants (Brunnengräber & Schreurs 2015: 49). Even earlier, in 1978, Austria held a referendum on nuclear power — as Austrians were partially emboldened by the successes of Germany's anti-nuclear movement — with 50.47 percent against nuclear power and 49.53 percent in favor (Koutrakou 2004, p. 423). As a result, the Austrian Nuclear Prohibition Law 1978 was passed, the text read of which reads:

> "Installations which use nuclear fission for the purpose of electricity generation for the supply of power may not be built in Austria. In so far as such installations already exist, they may not be commissioned" (Koutrakou 2004, p. 423).

Other European countries have since made the commitment to wean themselves off of nuclear power, in spite of often heavy reliance on the energy source. Seven nuclear reactors generate about half of electricity production in Belgium (World Nuclear Association, 2016). Yet

in 2003, the Belgian Senate approved a phase out plan that prohibited construction of new nuclear power plants, and mandated that existing plants would be shut down after an operational lifetime of 40 years (World Nuclear Association, 2016). The law was later revised to safeguard against blackouts and price surges, ruling that plants would only be shut down only if there were adequate energy supplies from alternative sources. Though the country has already extended the life of the first three reactors slated for shutdown, if the country meets its other targets, the phase out of all seven reactors will be completed by 2025 (World Nuclear Association, 2016).

In Switzerland, five nuclear reactors generate 40 percent of electricity. However, in June 2011, the country's parliament committed to phasing out nuclear power by 2034 (World Nuclear Association, 2016). The country resolved not to replace the existing reactors, and abandoned plans to build new ones. Like Germany, the timing of this move was in part a knee-jerk reaction to the Fukushima disaster. In a statement, the Cabinet said its decision came to protect its citizens and reduce risks "in the face of the severe damage that the earthquake and tsunami in Fukushima caused" (Kanter, 2011). Allowing the reactors to operate until the end of their lifespans gives Switzerland time to develop energy sources with which to replace nuclear energy.

Of the 28 European Union countries, fourteen (Denmark, Estonia, Ireland, Greece, Croatia, Italy, Cyprus, Latvia, Luxembourg, Malta, Poland, Portugal, and Lithuania) did not have operating nuclear power plants as of 2015 (European Commission Country Datasheets, 2017). Many never did, and some are strongly opposed to it as an energy source.

On the contrary, France — which lies just southwest of Germany — generates about 75% of its electricity from 58 nuclear reactors (World Nuclear Association, 2017). Globally, France produces the most nuclear power per capita (Sokolski, 2011). The government decided following the first oil chock in 1974 to increase its energy security by vastly expanding its nuclear capacity.

France lacked domestic natural resources but enjoyed engineering expertise (World Nuclear Association, 2017). Its cost of generation remains very low, and the country is the world's largest net exporter of electricity (World Nuclear Association, 2017). Yet even France may be inching towards a phase out — the 2012 election of President François Hollande after Fukushima incited a public debate on whether to reduce reliance on nuclear energy (World Nuclear Association, 2017). According to *Newsweek*, two thirds of the French supported nuclear power before Fukushima, compared with 62% favoring a phase out after the nuclear disaster (Sokolski, 2011). The Energy Transition for Green Growth bill of 2014 set a goal to reduce nuclear-powered electric to 50% by 2025 (World Nuclear Association, 2017).

Why Germany?

Within this European perspective, it is evident that Germany is not unique in its decision to phase out nuclear, nor is it remarkable in its portfolio of renewable energy. And yet the country is consistently highlighted by international media for its energy policies. Given Germany's position as an economic and global power, and its reliance on industry, perhaps this comes as no surprise. Its progress towards a renewable-powered electric sector is no small feat. But I am focusing on Germany's energy transition for different reasons.

Moreover, in tracing the Energiewende from its origins in the 1970s anti-nuclear movement to today, it becomes evident that the energy transition is unique in another oft-unnoticed way. Germany's Energiewende is inciting a social power shift, in which pressure from political activists and grassroots groups is gradually shifting power from the hands of a few large companies to those of the average citizens. Specifically, Germany's energy policy is enabling decentralized energy production. While past policies facilitated monopolization and a market

dominated by utilities with disproportionate economic and political power, new policies are encouraging competition while advancing deployment of renewable energy. Wind and solar technologies are inherently more conducive to decentralization, and through the transition such projects are becoming increasingly popular at the community level. Furthermore, the Energiewende's chronology reveals exciting stories of hard-won victories, even in the face of corporate and political resistance.

The social and physical power shifts coincide. Fossil fuels and nuclear are forms of centralized generation, in which large-scale electricity production occurs at huge facilities far from end-users and is transmitted through a high voltage grid (Momoh et al. 2012: 3). This type of generation allows power to be controlled by a select few — those with the means to accumulate fuel and capital, thereby locking end-users into a system of dependence to access a particular source of energy. Wind turbines and solar panels are better suited for decentralized generation, in which electricity is produced close to where it is consumed, typically at an individual or community level (Momoh et al. 2012: 2). This is also called distributed generation, but I will be referring to it as decentralized generation to highlight the spatial and organizational differences between these types of plants. By transitioning from large, centralized facilities with very limited ownership to small scale, decentralized production with many owners, the Energiewende is redefining power relationships in the energy sector.

This redistribution of power is at the crux of my research, and has been shaped significantly by the book: *Energy Democracy: Germany's Energiewende to Renewables*. Craig Morris and Arne Jungjohann, American and German writers, respectively, make the argument that the Energiewende is democratizing Germany's energy sector. In it, they posit, "Apart from Denmark and, more recently, Scotland, Germany is the only country in the world where the

switch to renewables is a switch to energy democracy" (Morris & Junjohann 2016: x). To outsiders, and the international community at large, the Energiewende may appear to be the product of a progressive federal government enacting bold policies for the good of the planet. While it is true that Merkel's administration has come to embrace the Energiewende, more credit must be given to the decades-long grassroots movement. As such, the authors explain that their "intent is to show international readers how German citizens got their government behind a policy that the public wanted" (Morris & Junjohann 2016: xi).

There is a relatively limited body of research in English — indeed, only a handful of resources — that focuses specifically on the democratization inherent in the Energiewende. *Energy Democracy* is unique in that it used primarily German sources in its development, making new information available to Anglophone audiences. My project will build upon this comprehensive account, while analyzing democracy in the context of the Energiewende. I refer to the transition as a "power shift" rather than "energy democracy" because I believe the transition is redistributing physical and social power, but lacks some of the fundamental elements of democracy.

For several grassroots stories, it relies on the book fully, because it appears other scholars have not documented them in English. Further, my project will examine the Energiewende through the lens of ordoliberalism, a theory of social liberalism developed in the twentieth century by German economists and legal scholars of the Freiburg School. Ordoliberalism differs from modern neoliberalism most notably in the belief that state intervention can be used to increase fair competition in the market and prevent monopoly control. Ordoliberal policies simultaneously produce greater market competition in the energy sector while allowing smaller players to get involved. While this is a laudable achievement, and much momentum has come

from the German public, the policies are not necessarily democratic. The subsequent chapter will break down ordoliberalism in greater detail, so it can be applied to address the central question of my research: does ordoliberalism aid or inhibit the power shift inherent in the Energiewende?

Energy Democracy: An Evolving Concept

First, it is useful to establish what is meant by "energy democracy." It is thought to have originated the in the German climate justice movement, and broadly can be thought of as aligning the transition to renewable energy with increased public participation and equality (Angel 2016: 10). However, specific definitions differ, and several have been offered as a means to help guide the movement. In 2012, groups of the Lausitz Climate Camp settled on the following definition:

> "Energy democracy means that everybody is ensured access to sufficient energy. Energy production must thereby neither pollute the environment nor harm people. More concretely, this means that fossil fuel resources must be left in the ground, the means of production need to be socialised and democratised, and that we must rethink our overall attitude towards energy consumption" (Angel 2016: 10).

This definition focuses more on sustainability and the right to clean energy, presumably decreased consumption, and social ownership of energy. The Trade Unions for Energy Democracy present a comparable definition:

> "A trade union approach to energy democracy can be built around three broad and strategic objectives, namely the need to resist the dominant agenda of the large energy corporations and their allies; the need to reclaim to the public sphere parts of the energy economy that have been privatized or marketized; and the need to restructure the global energy system in order to massively scale up renewable and low–carbon energy, aggressively implement energy conservation, ensure job–creation and local wealth creation, and assert community and democratic control over the energy sector" (Angel 2016: 10).

The emphasis here is stronger on the public sphere, with the implication that energy should not be privatized or for-profit. Finally, Craig Morris and Arne Jungjohann provide an expansive four-part definition of energy democracy before the preface of their book on the topic:

> "1) when citizens and communities can make their own energy, even when it hurts energy corporations financially; 2) something currently mainly pursued in Denmark and Germany but that can spread around the world during the current window of opportunity; 3) the most often overlooked benefit of distributed renewables in the fight against climate change; 4) something to fight for as the path to a better quality of life with stronger communities and better personal relationships" (Morris & Junjohann 2016: vii).

Certainly, there is no one correct definition, nor is any widely accepted by international or governmental bodies. Common to all three definitions is the idea that energy users should have a say in its management. I am most partial to the second definition for I feel it accentuates the need to return energy to the public sphere — and the notion that energy need not be a business, particularly when that business is damaging our common environment. A privatized energy sector, even one with many more owners, is locked into competition and, therefore, profit maximization, and can restrict access to only those with capital. A democratized energy sector allows the public to dictate terms of use, inform how decisions are made, and exercise agency through a voting apparatus. As director John Farrell of the Energy Democracy Initiative posited, "To call a system that decentralizes and disperses the control and economic benefits of the energy system democratic, but without racial and socioeconomic equity, is to cheapen the term democracy" (Farrell 2016). Energy democracy, in my opinion, should be founded on principles of public participation, equality, and accountability.

The next chapter will analyze the history and applications of ordoliberalism, which can be seen in the energy policies of the German state. I argue that ordoliberalism aids immensely in

the power shift that decentralizes of energy production and ownership, but emphasizes competition and privatization in ways that limit energy democracy.

Chapter 2: The Emergence of Ordoliberalism

Shifting Prefixes: From Neo- to Ordo-

Ordoliberal theory has guided my research due to its particular importance to the energy sector, and as such, it is necessary to deconstruct its origins and principles before proceeding. Many comparisons will be made with reference to contemporary neoliberalism, as both are forms of liberal economic theory, but also because of neoliberalism's hegemonic influence on the global market. It is my intent to present ordoliberalism as an alternative to neoliberalism to an audience largely unfamiliar with both theories. This is not to advocate for any particular economic or political theory. I personally contend that liberal theory is deeply flawed, and is liable for many of the structural problems facing our world today — particularly those concerning the environment, too often brushed aside in the pursuit of profit. In any case, as the dominant economic model today, it is appropriate to analyze how its applications have shaped the world around us. Both gaining traction in the twentieth century, the two brands of liberalism I will analyze differ most notably in their view of how competition is created; the neos tend to favor a totally free market, while the ordos believe regulation can be used as a tool to facilitate fair competition.

In February 1979, French philosopher Michel Foucault gave a series of lectures on German ordoliberalism at the Collège de France, which were subsequently documented and translated in *The Birth of Biopolitics*. Importantly, Foucault uses the prefixes neo- and ordo- somewhat interchangeably, and uses "anarcho-capitalism" to refer to the American brand of unfettered free-market capitalism that we today associate with neoliberalism. In other words, German neoliberalism has evolved to be called ordoliberalism — given that prefix in part due to the journal published by economist Walter Eucken, titled *ORDO* (1948). Today's neoliberalism

is therefore a variant of that which Eucken developed with the Freiburg School in twentieth century Germany. Their origins overlap, and this is why Eucken is sometimes associated with the origins of neoliberalism. But Eucken's own words illuminate his view on the state. He is quoted as saying, "The state is responsible for the result of economic activity" (Foucault 2004: 133). Notably, in his lectures, Foucault describes the birth of neoliberalism and the underlying interventionist role of the government:

> "In all the texts of the neo-liberals you find the theme that government is active, vigilant, and intervening in a liberal regime, and formulae that neither the classical liberalism of the nineteenth century nor the contemporary American anarcho-capitalism could accept" (Foucault 2004: 133).

What is critical about this account is that at neoliberalism's inception, the government was never meant to be absent. Compare this to the laissez-faire liberalization policies associated with it today: fiscal austerity, deregulation, and privatization (Harvey 2005). To be a neoliberal in the 1950s and 1960s meant a belief in the social market economy, rooted in capitalism and competition but regulated by the government. Private power and capital accumulation were still important tenants of this philosophy, but it was believed that government regulations were important to creating the conditions for fair market competition. When Foucault was lecturing in the 1970s, however, the freer-market version popular in America was outlandish enough to earn the name "anarcho-capitalism." This is not to diminish the emphasis that Eucken and his fellow scholars put on the principles of the market and competition, but rather to highlight an important divergence with the prevailing ideology today. Going forward I will refer to the German style of neoliberalism exclusively as ordoliberalism, to reflect its contemporary usage, and so that it can be more easily contrasted with modern free-market neoliberalism.

The Freiburg School

During the Third Reich, members of the Freiburg School of economic thought put much thought into West Germany's post-war economy, influencing the economic and social policy plans of the German resistance (Rieter & Schmolz 1993: 87). While socialist or Marxist economists were expelled from the country, those with liberal beliefs were permitted to stay in Germany and given some latitude to disseminate their ideas.

Walter Eucken, an opponent of Nazi dictatorship who began teaching economics at the University of Freiburg in 1927, is credited as the father of ordoliberalism. Later joined by jurists Franz Böhm and Hanz Grossmann-Doerth, the three were concerned with "private power in a free society" and published *The Ordo Manifesto of 1936* (Rieter & Schmolz 1993: 96). They believed the state had to maintain a competitive order by enacting legislation that prevented special interests from dominating society, specifically cartels and monopolies. The prefix "ordo" comes from the Latin word for "order," after all. In their vision of an ordered market, rules and regulations would make certain no single player had an unfair advantage. It was Eucken and his colleagues' conviction that the state had to play a large role in maintaining order in the market, creating a competitive framework rather than allowing monopolies to exert unfair influence. Given that electric grids fell subject to such monopolization by fossil fuel-burning utilities, ordoliberal principles provide the state with the means to help smaller players get involved.

They were also interested in promoting social wellbeing. As Eucken put it, "The real challenge in the political realm no less than in that of the economy is to establish a framework that induces ordinary self-interested people to pursue in their own interest what is in the common interest of all" (Glossner 2010: 39). Their ideology attracted a few dozen adherents, who collectively came to be known as the Freiburg Circle.

In 1942, Dietrich Bonhoeffer, a leading Protestant church member of the resistance, asked the Freiburg School to draft a program to serve as the basis of a post-war world conference of churches. It became known as the Freiburg Memorandum, and was eventually presented at the ecumenical conference, held in Amsterdam in 1948 (Rieter & Schmolz 1993: 98). Though the Freiburg Circle worked in secrecy, parts of the memorandum were obtained by the Gestapo in 1944 following the attempted assassination of Hitler (Rieter & Schmolz 1993: 98). The group was temporarily disintegrated as many key members were detained and interrogated.

When the war ended, economists and academics of the Freiburg School advocated for a new liberal economic order in Germany, sowing the seeds that would become the Social Market Economy. Indeed, West Germany was characterized by pervasive economic liberalization in the post-World War II era. Ordoliberalism was presented as a "third way" between *laissez-faire* and a centrally planned economy (Rieter & Schmolz 1993: 100). As academic Christian Glossner explains:

> "While the members of the Freiburg School placed themselves firmly in the tradition of classical liberalism, they distanced themselves from a *laissez-faire* liberalism that failed to appreciate the essential positive, or functional, role government has to play in creating and maintaining an appropriate framework of rules and institutions which allows market competition to work effectively. Equally, they rejected the Controlled or Command Economy as it limited the freedom of the individual" (Glossner 2010: 39).

The Freiburg School influenced Ludwig Erhard of the Christian Union, who served as German Economics Minister from 1949 to 1963. Eucken and Erhard both believed in a free market economy, regulated only to help the market reach its fullest potential. To accomplish this, they acknowledged a strong state was necessary. Thus ordoliberal ideas were incorporated into the official economic policy of Germany in the 1950s and the foundation of the Social Market Economy. For example, the Deutsche Mark replaced the Reichsmark in 1948 under pure neoliberal policies, but Erhard would add regulations wherever their absence led to undesirable

outcomes (Morris & Junjohann 2016: 166). Consequently, the period that followed World War II was called the Wirtschaftswunder, or "economic miracle," as ordoliberal policies led to rapid development of West Germany and Austria.

The (In)Visible Hand

Here we pause to compare two schools of thought — the Chicago School and the Freiburg School — in their interpretations of Adam Smith. The American brand of neoliberalism took off in the mid-twentieth century from the Chicago School of Economics, led by economists like Friedrich von Hayek and Milton Friedman, maintaining many of the same principles as ordoliberalism. Central to neoliberalism is the concept of the "invisible hand." Attributed to Adam Smith, an eighteenth century philosopher and pioneer of modern economics, it argues prices should be free from government interference and instead set by the market's "invisible hand." This notion of an "invisible hand" is ubiquitous in neoliberal economic theory, taught in classrooms to be Smith's most enduring contribution to economics. As critics have pointed out, the "invisible hand" is mentioned just three times in Smith's work (Rollert, 2012).

Morris and Junjohann take time to debunk incorrect interpretations of Adam Smith in their book, *Energy Democracy: Germany's Energiewende to Renewables.* They clarify that in his two most celebrated books, it is used as a passing metaphor, first as an "invisible hand" redistributing wealth, and second as the reason consumers prefer domestic goods even when there is free trade (Morris & Junjohann 2016: 164). Quoting Smith in *The Wealth of Nations*, "By pursuing his own interest he frequently promotes that of the society more effectually than when he really intends to promote it," the authors assert that Smith is not saying the market always produces the best outcome, though it frequently does (Morris & Junjohann 2016, p. 164).

However, different people certainly have different ideas as to what is the best outcome. The authors nevertheless contend that these excerpts have been taken out of context and used to promote an ideology that Smith himself would have renounced.

While both the Chicago School and Freiburg School believe in the free market, the latter also believes state intervention is sometimes necessary to prevent undesirable outcomes. Moreover, the Freiburg School holds that unbridled competition concentrates power in a limited number of firms, producing oligopolies and monopolies rather than more competition (Morris & Junjohann 2016, p. 165). To prevent monopolies and ensure fair competition, ordoliberals argue, certain regulations — such as antitrust laws — are often necessary.

Admittedly, energy has never been left to the devices of wholly free markets. In practice, neoliberal policies create corporate-friendly states and lead to the privatization of social goods — electricity is an example of this. In many states, including Germany and the U.S., electricity has been supplied by private monopolies under public regulations that demarcate the specific territories in which they can operate. Samuel Insull successfully implemented the monopoly model in early twentieth century Chicago, irrevocably changing the electric industry and normalizing the perception that the grid could only function as a "natural" monopoly (Bakke 2016: 82). Indeed, it now seems illogical and wasteful to have multiple sets of power lines and companies competing for customers. One can imagine the chaos and frequent blackouts that would ensue as companies drove each other out of business. Cultural anthropologist Gretchen Bakke explains:

> "By 1925 almost nobody in the electricity business could even imagine a system for making, transmitting, distributing, or managing electric power other than as a monopoly enterprise. This was an extraordinarily rapid transition from chaos and competition to a single service provider. Remarkably disparate interests, including advocates of municipal power networks, of public power projects, and even electricity cooperatives, were all convinced by the 1920s that the monopoly was the best way to manage the manufacture

> and sale of electric power. There were different visions of who might control such a monopoly—the people, the government, a corporation, a co-op — but the basic notion that electricity markets were to be consolidated and managed without competition was, by the 1920's universal." (Bakke 2016: 61).

So in these states, for-profit, investor-owned utilities are typically allotted large areas in which to operate and given vast customer bases that have little say in their electric generation (Bakke 2016: 78). But as regulated monopolies, utilities are permitted to set electric rates at prices that guarantee a return on their capital investments, and thus have no financial incentive to adopt more efficient production technologies. Local, decentralized generation is antithetical to this lucrative business model. Under the guise of government regulation, these private industries are unresponsive to public opinion and therefore stifle democracy. Since these utilities are given monopoly control over territories, they experience no competition other than between resources, inevitably favoring whichever less expensive. Since the most expensive elements of production — the power plants themselves — are already erected, it is logical for utilities to try to protect their existing assets. Without government intervention, it would be nearly impossible to diversify energy sources.

While Germany's ordoliberal philosophy helps elucidate how it has implemented some of the Energiewende's key policies, the power shift has not been easy. In *The Road from Mont Pèlerin,* Philip Mirowski and Dieter Plehwe explain that even ordoliberals have not been eager to let democracy interfere with markets. They say that most historical accounts of the school of thought "fail to critically examine the hostility of key ordoliberals to parliamentarian democracy and their entanglements in the Nazi regime" (Mirowski, Plehwe 2009: 100). This is an important observation, which is explained in greater detail later in the book. But the most important takeaway for purposes of my research is that ordoliberalism does not foster democracy; private

interests are still often at odds with democratic values. It is not ordoliberalism that led the Energiewende, but people.

With this theoretical foundation in mind, we will now shift to what is often considered the birth of Germany's Energiewende: the bottom-up anti-nuclear and renewable movements. Through hard-fought grassroots movements, the German citizenry was able to spur government intervention in the energy market, leading to policies that introduced smaller players into the market and enabled the Energiewende to develop into the force it is today.

Chapter 3: The People's Power

Popular Resistance in Wyhl

Wyhl, a municipality in southwestern Germany — in Baden-Württemberg, the same place Merkel lost power due to her stance on nuclear — is often cited as the first major success of the anti-nuclear movement. The tiny village in the winegrowing region on the French border was first identified in 1971 as a possible site for a nuclear station (Patterson 1986: 113). Farmers were initially concerned that steam clouds from the reactor's cooling towers would block sunlight from their vineyards, but resistance intensified as they learned of the potential health effects of low-level radioactivity (Hockenos 2012: 2). Local opposition grew in the years that followed, but their efforts had little effect on politicians or planners.

Construction began on February 17, 1975 after official permission was granted (Patterson 1986: 113). The next day, several hundred protesters occupied the site. Two days later they were forcibly removed by police, but their rough treatment galvanized wine-growers, clergymen, and others. Among the protesters was scientist Florentin Krause, author of the 1982 book *Energiewende: Growth and Prosperity Without Oil and Uranium*, where the movement now derives its name (Morris & Pehnt 2016: 58). Support came from the nearby university town of Freiburg, bringing 28,000 protesters to the construction site in Wyhl (Appunn 2015: 1). It soon "became a virtual settlement, with living quarters, supply lines and rotas [or fixed orders of rotation] of occupiers" (Patterson 1986: 113). The occupation continued for months. Plans to remove protesters were abandoned by the state government due to the large number of people involved, as well as the potential for more negative coverage of their hostile treatment. The utility giant was eventually forced to back down, and the nuclear plant in Wyhl was never built.

Press originally focused on police brutality against protesters, but through its coverage, nuclear power emerged as an important national issue. Notably, the Wyhl coalition was politically diverse and locally led (Hockenos 2012: 2). The success of the protest demonstrated the power of non-violent civil disobedience, inspiring similar anti-nuclear movements across Europe and North America. These movements led to the founding of green political parties in the 1970s and 1980s. The German Green Party achieved more than five percent of the vote in 1983, passing the threshold needed to enter Parliament, and was finally able to voice the people's nuclear opposition in the Bundestag (Morris & Pehnt 2016: 59).

Germany's anti-nuclear movement continued to gain traction, represented by the image of a smiling sun with the slogan "*Atomkraft, Nein Danke*!" (Nuclear Energy? No, Thank You!). Resistance efforts were concentrated at the very sites of reactors and waste processing plants, but the movement was supported by a developing infrastructure of NGOs, newspapers, training centers, and expertise (Hockenos 2012: 2). Its political diversity has been important to its success because "it made it impossible for politicians and the energy lobbies to label the protesters as crazy, leftwing agitators," according to a Berlin-based feminist who was at Wyhl (Hockenos 2012: 2, 3).

Opposition to nuclear was also fortified by experts and former nuclear scientists who defected from their companies. This was a key factor that distinguished Germany's movement from those of other countries. German nuclear engineer Klaus Traube, once a manager of nuclear installations in West Germany and the U.S., was able to inform the anti-nuclear movement with technological expertise. He grew weary of the dangers of nuclear power after witnessing an accident caused by human error in a German reactor, which turned to ardent opposition following the Three Mile Island accident in Harrisburg, Pennsylvania. German historian Erhard

Stölting explains, “Experts like Traube made the German movement evidence-based, not simply emotional appeals or moralistic preaching” (Hockenos 2012: 5).

The Chernobyl Nuclear Disaster

The nation turned to Traube for explanation when nuclear catastrophe struck Chernobyl, present-day Ukriane, in April 1986. The Soviet Union was slow to announce the meltdown, which is considered the worst nuclear power plant disaster in history. Radioactive rain fell on Germany. East German media downplayed the incident; the very next day, one East German newspaper headline read: "Experts say: No danger from Chernobyl in East Germany" (Jochum 2006: 1). Many would not learn the full extent of the risks until reunification in 1990. Meanwhile, West German media was inundated with warnings of various degrees, reporting closed playgrounds and advising pregnant women to stay indoors (Hockenos 2012: 6). Uncertainties of the health and food risks caused panic.

An excerpt from the May 26, 1986 issue of the West German magazine *Der Spiegel* and its cover are as follows:

> “But no one is touching the salad buffets in the country's steakhouses. Some scientists, including those at Hanover's Ecological Institute and at the University of Oldenburg, are warning against drinking milk again. The term "radiation-free" has become part of advertisements for fresh vegetables, like the one used by Dutch farmers. "Consumption is slowly rising," the newspaper *Hamburger*

> *Abendblatt* informed us last week, referring to the fruit and vegetable markets" (*Der Spiegel* Archives 2006: 1).

The credibility of scientists was questioned, as few could agree on the extent of the dangers. Quarrels with government officials made matters worse. The same magazine article reported that the number of dead to be expected after Chernobyl ranged from 4,000 to several hundreds of thousands (*Der Spiegel* Archives 2006: 2). Of course, irrespective of when food was deemed safe, it would be nearly impossible to link each additional cancer case to Chernobyl's radioactive fallout. In any case, public trust in nuclear energy received yet another blow.

Fukushima Incites Change

Decades later, following the Fukushima nuclear disaster, Chancellor Angela Merkel made the seemingly hasty decision to phase out all seventeen reactors in Germany, immediately shutting down eight of them — just a few months after extending their commissions by 8 to 14 years (Morris & Junjohann 2016: 338). It had been 25 years since Chernobyl, after all, and Merkel believed "an explosion or fire—like the one that happened in Chernobyl— [was] not possible" in Germany (Morris & Junjohann 2016: 338). It would appear that Fukushima, and the nuclear protests that followed it, changed her mind. But with a better understanding of Germans' longstanding aversion to nuclear power, her decision seems more like a tactical calculation than an impulsive reaction. Public opinion had further solidified against nuclear energy. Following Fukushima, a survey by GlobeScan showed 52% of Germans wanted nuclear plants to be shut down as quickly as possible in 2011, compared with only 25% in 2005 (World Nuclear Association, 2017). Opposition to new reactors increased to 90% in 2011 from 73% in 2005

(World Nuclear Association, 2017). Merkel devoted herself to the phaseout, and put together an ethics commission to help her do so smoothly. She asked the commission:

> "How can I prudently complete the phaseout so that the transition towards the age of renewable energy is practicable and reasonable, and how can I prevent, for instance, risks from the import of nuclear power to Germany, which may be greater than the risks in the production of nuclear power domestically?" (Morris & Junjohann 2016: 343).

It is important to note that fears Germany would experience blackouts as a result of the phaseout never came to fruition. In fact, growth in renewables made up for the drop in nuclear power production (Morris & Junjohann 2016: 343). But as an environmentalist, it can be difficult to grapple with the positions for and against nuclear energy — it is, after all, a low-carbon source of energy, though its safety hazards and potential for catastrophe cannot be overlooked (Mazur 2013: Part IV, 4). With nuclear infrastructure already in place, it is reasonable to criticize Germany for shutting down its plants prematurely. The utilities that owned the nuclear plants were justifiably angry. But Germany ultimately responded to the wishes and safety concerns of its people, and for that it deserves credit. This decision signified a major power shift at the national level, in which Merkel's response to Fukushima took power away from nuclear-owning utilities and granted it to the anti-nuclear majority in Germany.

It is also critical to remember that nuclear power is inherently incompatible with variable wind and solar power (Morris & Jungjohann 2016: 287). As wind speed and solar intensity fluctuate throughout the day and there is still no adequate or cheap means of battery storage for their excess energy, they demand flexible backup plants. Yet nuclear power (and fatefully, coal) are baseload power plants — nuclear being the least flexible of all (Morris & Jungjohann 2016: 288). These plants produce a constant rate of energy and are very difficult to turn on and off, and awfully uneconomical if not producing energy consistently. The expansion of wind and solar needs support from flexible backup plants. Many contend that natural gas is best suited for the

job, but in any case, conventional plants will need to be shut down before wind and solar can be further integrated into the energy mix. Like the nuclear phase out, this issue is generally more political than technical. The sudden decision to purge an entire country of a major energy source is bound to be met with fierce opposition. Their stranded assets make it difficult for conventional fuel sectors to accept, let alone spearhead, the transition to a low-carbon economy.

And in some ways, the ongoing issue of what to do with nuclear waste presents one of the central problems of the abuse of the environment. The short-term time horizons of capitalism, in which profit should be sought as quickly as possible for high turnover rate and reinvestment into the means of production (Jalee 1977), has favored open-loop systems in which waste is byproduct. For decades, Germany has been using nuclear energy and accumulating waste, yet it has not determined a final repository for the radioactive waste (Morris & Jungjohann 2016: 287). Many other countries with large nuclear sectors are in the same situation (Brunnengräber & Schreurs 2015: 48). The impact of waste from the conventional energy sector, whether nuclear or fossil fuels, cannot be absent from consideration. Through grassroots resistance, the German public confronted the risks and impacts of nuclear energy. In addition to being ardent nuclear opponents, many had long been advocating for alternative, greener forms of energy.

The Rise of Community-Led Projects

While the anti-nuclear movement gained momentum in Germany, another movement was happening simultaneously. German citizens, particularly those in rural areas, were becoming increasingly interested in their own electricity production (Morris & Jungjohann 2016: 95). Their intention wasn't always to preserve the environment. Stefan Bayerlein, head of a local

community energy project in rural Bavaria, said, “Saving the planet was not the main objective. Saving the community was” (Morris & Jungjohann 2016: 95).

Despite significant resistance from utilities and, occasionally, the government, this power shift was quite fruitful. In addition to solar panels on roofs and other individual undertakings, local energy cooperatives became increasingly prevalent. Notably, many more people were able to get involved — a meaningful change from centralized, undemocratic utilities. For a true shift of power, equal access to natural resources like wind and solar is essential, in contrast to fossil fuels that allow power to be controlled by a select few. Such infrastructure requires great collaboration, and it provides the foundation for a more equitable social order.

Though there is no specific definition for what constitutes a community project, in 2012, such projects were estimated to make up half of investments in renewable energy in Germany (Morris & Junjohann 2016: 104). This public involvement is critical to the Energiewende’s popularity. As Morris and Junjohann argue, people are more likely to support wind turbines they set up themselves than a wind farm erected by a utility, the latter of which they may complain comes with noise and bad aesthetics (Morris & Junjohann 2016: 104). Moreover, public involvement has the added benefit of eliminating the distance between electricity production and consumption. The dissociation of where power is made and where it is consumed can create apathetic consumers who are unaware of energy’s impacts. I believe reconnecting people and their power is critical to raising environmental consciousness, including endowing consumers with an appropriate sense of responsibility for the consequences of consumption. The following anecdotal stories of German communities demonstrate their belief in renewable technologies like wind and solar, and their underlying support for sustainability. The subsequent sections will explore the rise of community-led projects that have catalyzed the Energiewende.

The Wind Picks Up

Originally, many doubted the efficacy of wind power in Germany because it was believed the country's weather conditions were not suited for the technology. At the outset, some of the larger turbine designs deployed by the government were not very effective. But deployment led to technological advances and the realization that bigger is not always better, particular for decentralized energy production (Morris & Junjohann 2016: 52). Enthusiasm from communities turned wind power into a formidable force, along with support from engineers, investors, and government actors (Morris & Junjohann 2016: 67).

In 1975, Dietrich Koch hooked up the first citizen-owned wind turbine to the grid in Germany, in an act of resistance against monopolist utility RWE. Koch had moved to a small, remote home outside Mettingen with poor grid connection, but RWE told him that a modern grid connection to power his entire house would cost 50,000 marks — or "the price of five Volkswagen Golfs" (Morris & Junjohann 2016: 55). Unable to afford the obscene request, Koch set out to power his own home, inspired by citizen wind projects in Denmark. He bought a turbine from a young electrical engineer across the border in the Netherlands, and cleverly secured a permit to set it up in Germany by telling officials he was going to use it to power a nuclear bunker (Morris & Junjohann 2016: 57). Getting the turbine into the country proved difficult, because even in the 1970s, post-WWII European borders were strict. The windmill did not fit within border regulations, so Koch was stuck. He ended up calling a local TV station, whose live reporting on Koch's story led the border officials to sending Koch on his way (Morris & Junjohann 2016: 58). The tactic worked in more ways than one – the station followed the story

for the next few days, which also garnered recognition for the first citizen-owned wind turbine in Germany.

RWE doubted the turbine would generate any electricity, and reluctantly hooked it up to the grid. But since it had no interest in purchasing electricity from customers, it paid a meager 2 Pf for Koch's excess wind power, even though the utility was charging him 28 Pf at the time for the connection (Morris & Junjohann 2016: 58). In order to avoid the connection fee, Koch avoided selling electricity to RWE by using all of his excess power in inventive ways, such as by building a greenhouse. Koch's story is important because it features an average man who was motivated not just by a concern for the environment, but a desire to produce his own energy and gain independence from a corporate utility's abusive profit-making tactics. The media attention allowed Koch's success to inspire others, giving individually-owned wind power a valuable platform in its infancy.

In 1985, a wind energy group of a few dozen people run by Koch and Heinrich Bartelt outlined three criteria for community ownership of wind power: "minimized visual impact on landscapes, distributed supply, and integration in municipal energy supply concepts" (Morris & Junjohann 2016: 61). The permitting process for wind turbines proved incredibly challenging, as some states only allowed them on farm property, yet certain counties required them to be 200m from the nearest building — often off the farmer's land (Morris & Junjohann 2016: 61). Bartelt lamented, "Applying for a grid connection was about as complicated as trying to get out of communist East Germany back then (Morris & Junjohann 2016: 61).

The group was especially frustrated by the inability to sell wind energy to the grid at a profit, as well as disproportionately high fees demanded by utilities to hook up turbines to the grid. Did utilities have any obligation to hook up privately owned power generators to the grid?

In the 1980s, this was unclear. The Energy Management Act of 1935 essentially gave utilities monopoly power and outlined geographic areas in which to operate, with oversight from public regulatory bodies (Midttun 1997: 241). They were to supply electricity as safely and economically as possible. The law didn't directly confront the question of privately owned generators, but couldn't utilities refuse such arrangements on the grounds that they were not safe? What about economical? Greater legal clarity was obviously necessary. After taking the matter to court, a ruling "stipulated that wind turbines could be built as long as no other public concerns were detrimentally affected" (Morris & Junjohann 2016: 62). But since the court spoke only of turbines exporting "all" of their power to the grid, which few did, there was still legal uncertainty.

Nevertheless, community wind power was picking up in Germany. A 1984 survey revealed that by 1982, 450 to 500 small wind turbines had been built — mostly by experimenting individuals (Morris & Junjohann 2016: 62). Enercon, a wind turbine manufacturer founded in 1984 that popularized the "direct drive" turbine, received its first big order from a rural farming community in Lübke Koog. Even though the farmers didn't receive the cushy tax credits that were offered to corporate investors, they moved forward with the project despite the high cost of 16 million marks (Morris & Junjohann 2016: 67). Initially, they wanted to set up 22 turbines. In 1992, the first 14 were installed, and by 1999, 32 were up and running (Hentschel 2012: 20). Funding from the State of Schleswig-Holstein covered 25 percent of the purchase price for the first seven turbines, while the next seven were supported by the federal government's 250 MW program (Morris & Junjohann 2016: 67). An extension of the 100 MW program, it offered grants for the installation and operation of wind turbines at sites deemed appropriate (International Energy Agency, 2012).

These federal programs demonstrated government support of wind projects, and conveyed a shifting focus from funding research and development to deployment of wind power. A local cooperative bank offered a generous loan to cover some of the remaining costs. But a good chunk of the funding, about 2.3 million in total, came from the locals who had acquired capital by mortgaging their property (Morris & Junjohann 2016: 67). Essentially, they were willing to take out loans to raise money for the turbines.

The actions of these wind advocates embody the principles of ordoliberalism in several ways. Their story is one of private individuals taking power from the hands of monopoly RWE, with the intent to sell electricity to the grid at a profit. Koch, Bartelt, and others believed that they had a right to access the electricity market, and deserved a fair opportunity to profit from their investments in wind turbines. Surely, RWE's attempts to overcharge Koch for a grid connection and refusal to give him just compensation for his green electricity demonstrate abusive monopoly power that the ordoliberals sought to diminish. Community wind proponents envisioned a market landscape that groups or private individuals could easily enter and compete with generation from incumbent utilities — they wanted policies that would create a framework for fair completion. Eventually, this is precisely what they got. While the involvement of communities ensures more voices in decision-making and planning processes, it is still limited to those with the time and capital to invest in renewable energy projects. This is ordoliberalism at work.

It was grassroots movements like these that led to policies on wind power in the 1990s. Still, proponents of wind had a hard time getting utilities to embrace the wind power they generated, and an even harder time convincing utilities to let them sell their energy at a profit. One town of particularly ambitious Germans tried a different approach: instead of haggling with

utilities to sell their power at a profit, why not buy back the grid? The next section highlights the inspiring story of the residents Schönau, dubbed "the electricity rebels" by the press (Isenson 2005).

Energy Cooperatives and the Electricity Rebels of Schönau

Schönau is a small town with a population of 2500 in Germany's Black Forest (Barringer, 2011). Following the Chernobyl nuclear disaster in 1986, the radioactive fallout struck fear into its residents, who pleaded their children to not go out in the yard to play. Ursula Sladek was one such concerned parent. Debilitated by a broken leg from a skiing accident, Sladek had trouble convincing her children to heed her warnings, who could not understand what was suddenly dangerous about going outside. Feeling helpless, she formed a group called Parents for a Nuclear-Free Future with other Schönau residents, hoping to convince her neighbors to become less dependent on nuclear power (Isenson 2005). They were dubbed "the electricity rebels" by the press, or "the power rebels," as they are called in *Energy Democracy: Germany's Energiewende to Renewables* (Morris & Junjohann 2016: 77). Sladek explains of herself and her husband, "When we moved here in 1977, we weren't particularly political or ecological. We were just unbelievably naïve. After Chernobyl, we thought politicians would react, but the only thing that happened was that the levels of admissible radioactivity increased" (Morris & Junjohann 2016: 77).

One tactic they used was advocating for decreased electricity consumption and energy efficiency. The group tried to persuade the local electricity provider, Kraftübertragungswerke Rheinfelden (KWR), to reward consumers for frugal energy use. KWR rejected the idea, throwing the group out of the building. KWR incidentally motivated Sladek and her group to

launch an even bigger campaign that included hosting a competition for power conservation — the success of which inevitably hurt KWR's profits (Morris & Junjohann 2016: 78). But KWR's contract with the local municipality was set to expire in 1994, at which time the concession fee which set the percentage of the retail rate the utility paid to maintain control of the grid would have to be renegotiated.

In November 1990, the electricity rebels founded a company for distributed energy systems, Schönau Power Systems, and another to buy back the local grid. Fearing the latter company, KWR offered to increase its concession fee to 5 percent of the retail rate as soon as the new contract was signed, which would generate 32,000 additional marks for the town (Morris & Junjohann 2016: 79). But six weeks later, 282 people — more than 10 percent of the community's population — had promised to cover the full amount. Engineer Wolfgang Zander developed an extensive business plan for the takeover, but when it came to a vote by the city council, the electricity rebels lost. People were not confident that the inexperienced group could meet the town's energy needs.

The group launched nationwide fundraising campaign later that garnered widespread support and recognition, and after the second town referendum, Schönau became the first German community to buy back its electricity grid in 1995 (Morris & Junjohann 2016: 84). They succeeded in spite of an expensive counter-campaign run by KWR that intended to make the citizen initiative look amateur compared to the established utility. The electricity rebels formed an energy cooperative called Elektrizitätswerke Schönau (EWS), which went national after the German power market was liberalized and now markets its renewable power portfolio across the country (Isenson 2005). EWS had approximately 161,000 customers as of 2015 (Elektrizitätswerke Schönau – Who We Are, n.d.).

The little town's impressive feat has not gone unnoticed: Ursula Sladek won the coveted Goldman Environmental prize in 2011. On a television talk show in 2009, Sladek said that extending nuclear plant commissions would be "reinforcing monopolistic structures in the power market" (Morris & Junjohann 2016: 92). At the time Sladek appeared on television, a full 25 years after Chernobyl, the Black Forest's mushrooms were still considered unsafe due to radiation (Barringer, 2011). While the achievements of EWS are undoubtedly a move away from centralized generation towards citizen ownership of energy, it is worth asking whether the EWS energy cooperative-turned-national energy provider is necessarily democratic.

EWS offered citizens a stake in the cooperative for 5,000 marks per share, 2.4 million marks of which came from locals (Morris & Junjohann 2016: 85). Therefore, socio-economic status impacted individual's ability to invest in the project. The remaining 1.7 million marks came from shares sold across the country. An institutional investor had offered to fill the gap, but the Electricity Rebels rejected his money on principle. They maintained that the majority of the project could not be funded by a single person, particularly a non-local (Morris & Junjohann 2016: 85). According to its website, the Schönau cooperative had about 4,795 shareholders at the end of 2015 (Elektrizitätswerke Schönau – Who We Are, n.d.). This is nearly twice the amount of residents in Schönau when the project began. Needless to say, this distribution of power is far more democratic than that of a monopoly, which is owned and governed by a single board of directors. But not everyone can afford to invest and subsequently profit from the energy cooperative's success.

It is also important to deconstruct two different types of citizen energy cooperatives in Germany. First, there are the *Genossenschaften*, cooperatives in the legal sense, which have per-person voting rights regardless of their share (Morris & Junjohann 2016: 103). According to a

policy paper by U.S. Congressman Jim Cooper, “Electric co-ops are owned entirely by their customers who are called ‘members’ of the co-op due to their dual role as customer/owner” (Cooper 2008: 3). Customers can therefore shape policies and business decisions in a democratic way (Tune 2016). The main difference is that they are not able to profit off of electricity production in the same ways as investors. But whether through consumption or investment, money is still what gives citizens voice in the cooperative, not pure or fair public involvement. There is a second type of community energy project is set up like a limited liability company, in which individuals are given voting rights proportional to their investment (Morris & Junjohann 2016: 103). These are obviously much less democratic, and aside from having more shareholders and prioritizing renewable energy, these cooperatives appear to operate similarly to conventional utilities. Since there is no clear definition for community energy, it is difficult to keep track of who actually owns the Energiewende. A degree of elitism is still present, as those without the capital or time to participate in the movement are not included in decision-making processes. Private investors — though there are more of them — still seem to dominate the electricity sector.

EWS began as a grassroots movement, and developed into a business. Its design is classically ordoliberal, as it distributed ownership to thousands of private owners and consumers. The story of the electricity rebels also accentuates an important element of ordoliberal energy policy. The idea is to enable more smaller players to get involved and level the playing field, which EWS did successfully when it bought the grid back from local incumbent KWR. Thanks to this effort, cleaner energy is able to compete with dirtier fossil fuels. The nationalization of EWS exhibits expansive growth, which is positive in that it would give more Germans access to green electricity. But it also seems to signify a move away from localized production and

ownership. It is easy to imagine a future in which giant renewable energy utilities simply replace conventional fossil fuel utilities, without significantly changing the power structures that enabled them to manipulate the market. We must be prudent in ensuring that energy cooperatives are set up democratically. Furthermore, we must look beyond energy cooperatives to guarantee that citizens can engage in the democratic process irrespective of their socioeconomic status. The next section details a policy predecessor to the feed-in tariff, which allowed individuals to receive full-cost compensation for the electricity they produced.

Von Fabeck and the Solar Campaigners

A burgeoning solar activist, former military officer Wolf von Fabeck joined the environmental movement in the late 1980s due to his concerns about the effects of acid rain brought by coal-powered plants (Morris & Jungjohann 2016: 128). Working with his pastor, von Fabeck formed a group of solar campaigners and raised money for 12 solar panels. The price was astronomical. His small group, the Solar Energy Association (SFV) then went around to local farmers' markets demonstrating the power of solar to run common household appliances (Morris & Jungjohann 2016: 128). The demonstrations received much fanfare and even some televised coverage. However, supporters were dismayed to find that the cost of this technology was still too high.

Campaigning in von Fabeck's hometown of Aachen, SFV managed to prove that the local utility should pay two deutsche marks for a kilowatt-hour of power from photovoltaics, since it already paid that much or more to cover peak demand. Fabeck argued that the request was "something the utilities had all along: rates that covered the full cost of an investment with an additional reasonable profit added on" (Morris & Jungjohann 2016: 129). The City Council of

Aachen adopted a resolution requiring the local utility to provide full-cost compensation for solar power — an idea that has become known as the Aachen Model (Morris & Pehnt 2016: 61). But the local utility ignored the request, conceding only after city officials passed an additional four resolutions over two years (Morris & Jungjohann 2016: 129).

Through community ownership and localized electricity production, power dynamics were beginning to shift. By this time, around 40 out of 900 German municipalities had implemented similar measures for full-cost compensation of solar power (Morris & Jungjohann 2016: 129, 102). As professor David Schwartzman of Howard University stated, "solar is the energy source most compatible with decentralized, democratic management and control, relatively free of the dictates of the MIC [Military Industrial Complex] compared to fossil fuels and nuclear power" (Schwartzman 2013, p. 483). Aachen was certainly not the first to pioneer this policy, and von Fabeck did not come up with it himself, but his efforts had lasting impact and garnered substantial attention. It is considered an early form of the most important policy to Germany's energy transition, the feed-in tariff, which will be discussed in greater detail in the following chapter. Moreover, by allowing Germans to profit off of green electricity production, the full-cost compensation for solar incentivized individuals to invest in renewables. It is a capitalistic, market-based approach to mitigating climate change.

The community-led projects described in this chapter detailed the anti-nuclear movement, community wind innovators, electricity rebels, and solar advocates. These anecdotal stories are just a few examples of the decentralization of power happening all over Germany. In each case, private individuals or communities fought to regain power from a monopoly utility. Before the ordoliberal policy framework was established, competing with these utilities was no easy feat.

The next chapter analyzes several ways in which the German government used policy action to support small players like von Fabeck and allow renewables to compete in the marketplace.

Chapter 4: Policy Mechanisms

This chapter examines three policies — the feed-in tariff, emissions trading, and auctions — enacted by the German government, and in the case of emissions trading, by the European Union. Each is a unique liberal approach to increasing deployment of renewable energy or lowering carbon emissions. My intent here is to describe how ordoliberalism and neoliberalism influenced policy decisions, but also to address their shortcomings.

The feed-in tariff, alluded to in the previous chapter, is an ordoliberal policy designed to enable small producers of green electricity to compete in the market by providing them with full-cost compensation. With this policy, Dietrich Koch would have been able to profit off of his excess wind energy by selling it to RWE. Emissions trading is a policy mechanism that is based on the buying and selling of carbon permits, providing economic incentives to those who reduce their carbon emissions. Through this system, utility KWR would have been able to buy carbon permits from organizations or utilities that underused theirs. Finally, auctions are the policy instrument that replaced the feed-in tariff in January 2017, in which renewable energy projects will be awarded compensation on a competitive basis. Under this policy, the Solar Energy Association (SFV) may have had to compete with other solar energy projects for a contract to receive compensation for its energy.

The Feed-In Act of 1991

The most emblematic law of the Energiewende scarcely passed. The Feed-In Act, or *Stromeinspeisungsgetz* (StrEG), literally means the law on feeding electricity into the grid (Buchan 2012: 13). Christian Union politician Matthias Engelsberger was preparing for the last session of parliament of the season — his last session ever — to be held on October 5, 1990 (Morris & Jungjohann 2016: 123). After 21 years in the German Parliament, he had authored no

major legislation, so he drafted a succinct two-page bill that would enable citizens to sell electricity to the grid for a profit. Because many constituents in his region owned small hydropower plants and were offered meager compensation for electricity they created, his bill specified what percent of the retail rate that owners of hydropower and other renewable sources would be paid for their electricity.

But Chancellor Helmut Kohl's coalition partner, the libertarian FDP, believed the tariffs distorted the market, and advocated for the quota systems that were embraced by the EU (Morris & Jungjohann 2016: 124). The days before the session were dominated by heated debates over Chancellor Kohl's decision to accept the Oder-Neisse Line, which delineated the border between Germany and Poland. On October 5, the vote on Engelsberger's bill was held so late in the day that there was not even a quorum of parliamentarians present (Morris & Jungjohann 2016: 125). It passed without opposition. Since no one later challenged its passing on that basis, the law remained. Utilities, too, were distracted when this seemingly innocuous bill was passed because they were focused on expanding into the newly reunified East German energy sector. An English translation of the original feed-in law is below. It was retrieved from the website of prominent renewable energy and wind advocate and scholar, Paul Gipe (Wind-works, n.d.).

"**Act on Feeding Renewable Energies into the Grid of 7 December 1990**

Federal Law Gazette I p. 2663, last amended by article 3 of the Act of 24 April 1998 (Federal Law Gazette I p. 730, 734)

Section 1

Scope of application

This act shall regulate the purchase and price of electricity generated exclusively from hydropower, wind energy, solar energy, landfill gas, sewage gas or biomass in the area of validity of this act by public electricity utilities. It shall not cover electricity.

1. from hydro-power stations, landfill gas or sewage gas facilities or from facilities in which electricity is generated from biomass with an installed generator output of over 5 megawatts and Federal Republic of Germany, a Land, public electricity utilities or

companies affiliated to them as defined in section 15 of the Stock Corporation Act, unless electricity from these facilities cannot be fed into an area supplied by these companies.

Section 2

Duty to purchase the electricity

Electricity utilities which operate a system for the general supply are obliged to purchase the electricity generated from renewable energies in their supply area and to pay for the electricity fed into the system pursuant to section 3. For electricity from generation facilities not located in the area supplied by a system operator, this obligation shall apply to the utility which has the system suitable for receiving the electricity located closest to the site of the facility. Extra costs arising from sections 2 and 4 can be allocated in accounts to distribution or transmission and can be included in the setting of the price for third-party access.

Section 3

Level of the price

1. For electricity from hydro-power, landfill gas, sewage gas and biomass, the price shall amount to at least 80 per cent of the average revenue per kilowatt-hour from the delivery of electricity by electricity utilities to all final consumers. For a hydro-power station, a landfill gas or sewage gas facility with an output of more than 500 kilowatts, this hall apply only to that part of the electricity fed in in the relevant accounting year which corresponds to the ratio of 500 kilowatts to the capacity of the facility in kilowatts; the capacity shall be ascertained by the annual average of the maximum actual power measured in the individual months. The price for the remaining electricity shall amount to at least 65 per cent of the average revenue pursuant to sentence 1.
2. For electricity from solar energy and wind energy, the payment shall be at least 90 per cent of the average revenue mentioned in paragraph 1 sentence 1.
3. The average revenue applying to paragraphs 1 and 2 shall be the figure published in the official statistics of the Federation for the respective calendar year before last, excluding turn-over tax, in pfennigs per kilowatt-hour. When calculating the price pursuant to paragraphs 1 and 2, the amount shall be rounded to two places behind the decimal point.

Section 4

Hardship clause

1. To the extent that the kilowatt-hours to be paid for under this act exceed 5 per cent of the total kilowatt-hours sold by the electricity utility via its supply system in a calendar year, the upstream system operator shall be obliged to reimburse the extra costs arising from the kilowatt-hours exceeding this proportion to the electricity utility purchasing the electricity. In the case of upstream system operators, these extra costs shall include the burden of the right to reimbursement pursuant to sentence 1. If there is no upstream system operator, the electricity utility to which the preconditions listed in sentences 1 and 2 pertain shall be relieved of the obligation contained in section 2 sentence 1 from the beginning of the calendar year following the time when these preconditions take effect

for facilities which at that time were to a substantial extent not yet erected; for wind power facilities, this applies to the erection of the mast and the rotor.
2. The obligations pursuant to sections 2 and 3 shall not apply to the extent that adherence to them represents an unfair hardship even when the reimbursement rule pursuant to paragraph 1 has been applied. In this case, the obligations shall be transferred to the upstream system operator.
3. A case of unfair hardship shall particularly exist when the electricity utility would have to increase its electricity delivery prices tangibly above the prices of equivalent or upstream electricity utilities.
4. The Federal Ministry of Economics shall report to the German Bundestag at the latest in 1999, but in any case in sufficiently good time, about the impact of the hardship clause, so that before the consequences pursuant to paragraph 1 sentence 3 take effect, a different compensation rule can be made.

Section 4a

Voluntary commitment in favour of renewable energies and the production of combined heat and power

1. The Federal Government shall encourage the electricity utilities to enter into voluntary commitments for additional measures to increase the proportion of electricity generation from renewable energies and from the production of combined heat and power.
2. The Federal Government may, after hearing the groups involved, stipulate objectives to be achieved within an appropriate period. In each case, it will report to the German Bundestag after two years.

Section 5

Entry into force

This act shall enter into force on 1 January 1991."

The act's brevity is noteworthy, for it was accessible and comprehensible to policymakers and citizens alike. The feed-in tariff helps give green power priority over fossil fuels, guaranteeing that renewable producers receive compensation based on the electricity market rate. It applied to wind power, solar energy, biomass, and small hydropower generators. But the retail price was still subject to price fluctuations, which made banks and investors less interested in lending money to producers of renewable energy (Buchan 2012: 13).

In 2000, the government implemented a more rigid form of the feed-in tariff that was less tied to market variation. The *Erneuerbare Energien Gesetz* (EEG), or Renewable Energy Act, specified that the rates paid would be linked to the cost of investment, not to retail rate (Buchan 2012: 13). Fixed feed-in tariffs were introduced for each type of renewable energy, and the rates offered were to be guaranteed for 20 years starting in the year of installation, set to decrease on a precise timetable (Morris & Pehnt 2016: 62). The law has since been revised and expanded several times, notably in 2004, 2009, 2012, and 2014. The most recent revision, taking place in 2016, is making a big switch from feed-in tariffs to auctions in which the buyer receives bids from sellers.

The tariffs have been criticized both domestically and internationally as "subsidies" that distort the market. However, the European Commission ruled in 2002 and again in 2014 that the feed-in tariffs are not state aid, the EU term for subsidy (Morris & Junjohann 2016, p. 175). Besides, the reasonable profits guaranteed through feed-in tariffs are "something that utilities had all along" (Morris & Junjohann 2016, p. 128). This is to say, utilities have always been permitted to charge consumers at rates that would allow them to profit. It only made sense that renewables would be allowed to do the same. The feed-in tariffs were necessary to create the renewable energy market in Germany and abroad, and to allow smaller market players to compete with the utility status quo — centralized production based primarily on fossil fuels. The tariffs still leave much up to the market, rewarding the most successful renewable technologies with money. Moreover, the policy reduced two undesirable outcomes: monopoly control of the electricity sector and pollution from conventional fuels.

Certainly, the Energiewende would not have been possible without this ordoliberal policy. Those who focus too much on the price-fixing aspect of the feed-in tariff in their critiques

ignore the underlying principles of competition. Price-fixing is generally anathema to liberal ideology, because it usually is designed to maintain and control power in a market. But here, the intent is not to limit competition, but rather to expand it. In European antitrust policy, Article 101 of the Treaty on the Functioning of the European Union makes clear why the feed-in tariff is in line with ordoliberal policy. Article 101 prohibits agreements between firms that restrict competition, notably cartels that fix prices or engage in market sharing (Article 101, 2008). I have included a consolidated version of the Rules on Competition below, taken from the European Commission's website, and emboldened the parts that justify the competitive nature of the feed-in tariff:

> "Article 101
> (ex Article 81 TEC)
>
> 1. The following shall be prohibited as incompatible with the internal market: all agreements between undertakings, decisions by associations of undertakings and concerted practices which may affect trade between Member States and which have as their object or effect the prevention, restriction or distortion of competition within the internal market, and in particular those which:
> (a) directly or indirectly fix purchase or selling prices or any other trading conditions;
> (b) limit or control production, markets, technical development, or investment;
> (c) share markets or sources of supply;
> (d) apply dissimilar conditions to equivalent transactions with other trading parties, thereby placing them at a competitive disadvantage;
> (e) make the conclusion of contracts subject to acceptance by the other parties of supplementary obligations which, by their nature or according to commercial usage, have no connection with the subject of such contracts.
>
> 2. Any agreements or decisions prohibited pursuant to this Article shall be automatically void.
>
> 3. The provisions of paragraph 1 may, however, be declared inapplicable in the case of:
> - any agreement or category of agreements between undertakings,
> - any decision or category of decisions by associations of undertakings,
> - any concerted practice or category of concerted practices,

> **which contributes to improving the production or distribution of goods or to promoting technical or economic progress, while allowing consumers a fair share of the resulting benefit, and which does not:**
> (a) impose on the undertakings concerned restrictions which are not indispensable to the attainment of these objectives;
> **(b) afford such undertakings the possibility of eliminating competition in respect of a substantial part of the products in question**." (emphasis added)

According to paragraph 1 alone, the feed-in tariff raises legal concerns, for it fixes rates paid to producers of specific energy sources. However, the third point exempts the feed-in tariff from this blanket rule. Since energy is a necessary and fundamental component of the production and distribution of goods, doing so with fewer carbon emissions is undoubtedly an improvement. Consumers receive a fair share of the benefit, particularly when they are selling their own energy to the grid. Above all, the feed-in tariff does not "afford such undertakings the possibility of eliminating competition in respect of a substantial part of the products in question." The policy is a response to monopolization of the energy sector by conventional sources, and provides a framework for renewable energy to compete. The fixing provides stability and assurance to investors, and enables communities to get involved.

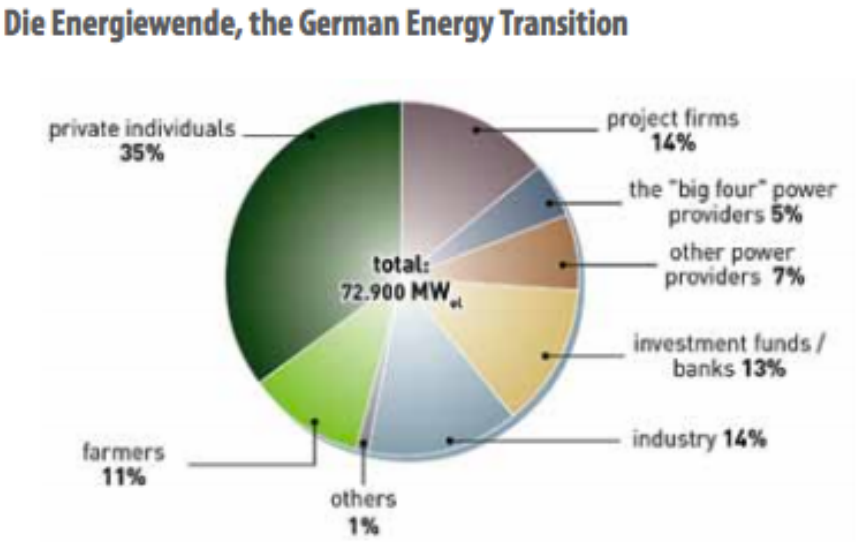
Fossil fuels reigned supreme for decades; renewables simply couldn't compete with their low prices and institutional power without the support ordoliberal theory provides. The incumbent utilities would never have catalyzed the transition, as they understandably wanted to protect their existing assets. And despite the momentum for renewables generated since the feed-in act, they have largely failed to embrace the change that is sweeping the nation. As many of the grassroots stories demonstrated, utilities fought against renewable energy, tried to charge exorbitant fees for grid connections, and offered unfairly low compensation for electricity sold to the grid.

But the feed-in tariff does more than just get renewable energy on the grid — it is redefining the relationship between energy producers and consumers. This decentralization of energy, or what David Buchan of the Oxford Institute for Energy Studies calls "power from the people," is one of the most important power shifts of the Energiewende (Buchan 2012: 13). He says, "the growing activism of municipal energy companies (*stadtwerke*) and citizens energy cooperatives (*energiegenossenschafen*) lend political and social dynamism to the country's energy transformation, particularly because their bottom-up actions are in tune with the federal government's goals" (Buchan 2012: 13). The community wind innovators, the electricity rebels, and the solar campaigners are just a few examples. However, electricity production is still dominated by four large utilities, which have been slow to adopt the principles of Energiewende. They are suffering from the premature closing of nuclear reactors, but see an opportunity in offshore wind. This vision conforms to ordoliberal theory in that power generation would be decentralized — produced by a number of small wind turbines rather than one central plant. Still, a physical shift to renewables is not enough, and will not rid the energy industry of short-sighted profit motives and monopoly control. The move to a low-carbon economy is an opportunity to redefine ownership of the energy, and giant utility-backed offshore wind farms do not work towards that goal.

But there are hundreds of municipal energy companies, both for electricity generation and distribution, that have also been slower to pick up renewables. Germany has about 900 municipal utilities, which can be staffed by as few as one person, and tend to buy electricity from big utilities to provide for their area (Morris & Jungjohann 2016: 102). They often do not have the resources to spearhead community renewable projects, so it is typically up to the communities they serve to take the lead (Morris & Jungjohann 2016: 102). Because of their

existing assets in conventional electricity generation, Morris and Jungjohann contend that they prefer to invest in renewables abroad (Morris & Jungjohann 2016: 103).

The heart of the movement is truly found in citizens, who are increasingly investing in renewable energy generation. By the end of 2010, private citizens owned nearly 40 percent of the country's installed renewable energy capacity, mostly through energy cooperatives. Incentivized by the rewards of feed-in tariffs, these cooperatives are mutually beneficial both for citizens and the environment (Buchan 2012: 10). Indeed, the Germans seem to feel strong moral inclinations to preserving the environment, which has added to the popularity of these cooperatives. In the 2013 World Values Survey, 47.7% of German respondents said, "Protecting the environment should be given priority, even if it causes slower economic growth and some loss of jobs" (World Values Survey, 2010-2014). Chancellor Merkel made this linkage when she said, "just as we must break even with our finances, so we must [break even] with nature" (Buchan 2012: 10). The figure breaks down ownership of renewable energy in 2012 (Vansintjan 2015: 47).



Renewables in the hands of the people. Ownership distribution of installed renewable energy capacity for power production 2012, Germany. (Renewable Energies Agency[1])

As many as 97 countries have since implemented policies similar to Germany's feed-in tariff with the intention of making renewable energy competitive (Dinkloh 2014). But a crucial element to Germany's success with the tariffs has been ease of access to the grid. Certainly, hooking up small-scale generation units to the grid is no easy feat, and connections in Germany are not perfect. It is worth noting that distributed or decentralized generation can strengthen the grid, making it more reliable in the event of storms and blackouts (Bakke 2016: 204).

From the perspective of the private citizen, the process of selling energy to the grid is made much simpler. In Germany, the standard contract for feed-in tariffs to sign with your utility is just two pages. The United States uses Power Purchase Agreements (PPAs) that are negotiated between seller and buyer, which can be 70 pages long and typically require a lawyer to draft. Most do not last the 20 years for which Germany's feed-in tariffs are guaranteed (Morris & Pehnt 2016: 38). Needless to say, not all compensation policies can be treated equally. It is evident that Germany's are designed with citizens in mind, while it would seem that the U.S. makes citizens jump through hoops in order to discourage private electricity generation.

It is clear that the feed-in tariff, and the ordoliberal philosophy guiding it, has had numerous benefits. But I argue that this does not go far enough. It is necessary to provide renewable energy with the means to compete in a liberal market economy, and the feed-in tariff is a viable market-based solution that encourages renewable growth. However, competition between renewables and fossil fuels is truly a competition over the future of our planet. The stakes are just too high given the reality of climate change. If German ordoliberals could truly capture the true costs of continued fossil fuel usage, they would depress their usage altogether and demand a much quicker shift towards a renewable-based country.

Emissions Trading in the EU: A Neoliberal Approach

The policy of emissions trading, typically called cap-and-trade in the U.S., began gaining traction at the tail end of the twentieth century. It is often associated with the largely failed Kyoto Protocol, which attempted to enforce emissions trading on a global level as one means to limit anthropogenic climate change. But the EU took its own crack at emissions trading through the European Union Emissions Trading Scheme (EU-ETS), the pilot phase of which began in 2005. As of 2017, the EU is in its third phase of the EU-ETS.

In theory, emissions trading could be an effective market-based solution to limit carbon emissions. But its real-life applications have fallen dismally short of its goals. Commonly seen as an alternative to a carbon tax, it works by setting a limit, or "cap," to carbon emissions and distributing allowances to emitters. If an emitter is going to exceed its allotted emissions allowances, it will either engage in trade by purchasing allowances from those with some to spare, or invest in technologies to reduce its own emissions — generally whichever option is cheaper. Emissions trading is therefore supposed to reduce emissions at the lowest cost possible, and is seen as a "cost-effective" approach to climate mitigation (Lohmann 2012: 91). Some have lauded the concept as an innovative means to control emissions, while critics argue it simply gives polluters permission to pollute (Mazur 2013: Part V, 4).

Emissions trading embodies the neoliberal approach to addressing climate change. The price of allowances is determined by supply and demand, so cap-and-trade is preferred by those who see the price fixing of feed-in tariffs as anti-market. However, the specific price of carbon is key here. As Europeans soon discovered, if the price of carbon was not high enough, emissions trading would be rendered wholly ineffective — or even backfire. Emitters could continue

emitting as much as they wanted, so long as they had enough allowances or the liquidity to purchase them.

In the first phase of the EU-ETS, which ran from 2005 to 2008, far too many allowances were given out. This flooded the market with a supply of allowances that made the price of carbon hopelessly low by the end of the pilot phase — a mere 14 euros (Morris & Jungjohann 2016: 260). The price would have needed to be at least 50 euros to incentivize a switch from European lignite to gas, and even higher for a switch to even less carbon-intensive technologies (Morris & Jungjohann 2016: 260). The second phase of the ETS tried to standardize allocation rules across member states, and also permitted them to offset emissions at home with investments abroad. Often, investing in carbon-reduction technologies in Africa or Asia was cheaper than reducing emissions at home. These projects may or may not have taken place without the ETS platform, but it is likely that, when coupled with emissions trading, they led to windfall profits for those who invested in them (Morris & Jungjohann 2016: 260).

Worst of all, the price of carbon continued to drop. Due to the 2008 recession following collapse of the subprime lending market in the US, European economies shrank and therefore had lower emissions. There was still a surplus of allowances, and utilities profited greatly from these free allowances, despite doing little to curb their emissions. The electricity sector in particular benefited from windfall profits during the first two phases of the EU ETS between 2005 and 2012 (Nicolaï, JP. & Zamorano, J. 2016: 1). The failure of the ETS incited fierce criticism, including from Pope Francis. In his encyclical "On Care for our Common Home," he said:

> "The strategy of buying and selling "carbon credits" can lead to a new form of speculation which would not help reduce the emission of polluting gases worldwide. This system seems to provide a quick and easy solution under the guise of a certain commitment to the environment, but in no way does it allow for the radical change which

> present circumstances require. Rather, it may simply become a ploy which permits maintaining the excessive consumption of some countries and sectors" (Francis 2015: Encyclical Letter Laudato Si).

Ultimately, the profits utilities collected from emissions trading allowed them to construct new fossil fuel-burning power plants. The WWF estimated that Germany's five biggest utilities earned at least 31 billion euros in windfall profits from emissions trading between 2005 and 2012 (Morris & Jungjohann 2016: 263). With skyrocketing profits and stock value, the utilities began investing in new facilities. Because of stricter regulations from the European Commission's Industrial Emissions Directive (IED), old polluting coal plants would have to be retired by 2016. Since utilities deeply underestimated the potential of renewables like wind and solar, consensus supported the construction of coal-fired plants, especially since nuclear was to be phased out eventually. Not just utilities pushed for new coal plants; politicians, too supported the coal projects. Chancellor Merkel and Environmental Minister Sigmar Gabriel advocated for the coal plants, even visiting the sites for which they were planned in 2008 and 2009, respectively (Morris & Jungjohann 2016: 267). Leading politicians seemed to agree that lignite would be necessary if nuclear was ever to be phased out. Despite their faith in coal, many of the proposed plants were blocked due to citizen protests. In fact, 15 of 23 major projects planned between 2005 and 2011 were blocked entirely (Morris & Jungjohann 2016: 267). All the while, renewables were booming and outperforming expectations.

The failure of the first two phases of the ETS highlight notable shortcomings of neoliberal theory. First, letting the market determine the price of carbon was ineffective in deterring precisely the kinds of investments and pollution that emissions trading intended to prevent. Industry representatives who contest a higher carbon price on the grounds that it would drive them out of the EU reveal the truth — that their concerns are primarily with their bottom

lines, not the welfare of the environment (Morris & Jungjohann 2016: 258). Second, by allowing member states to offset their emissions through foreign direct investments, they were rewarded for ignoring emissions at home. The carbon offsets market "encourages capitalists to try to achieve cost savings in 'reduction production' by moving their operations around the globe, switching from one technology to another, avoiding risky investments in low-carbon technologies by annexing cheap carbon-absorbing lands in the global South, and so forth" (Lohmann 2012: 93). The windfall profits that resulted from ETS support this claim, demonstrating how cap-and-trade commodified the right to pollute.

Given all the intricacy of emissions trading platforms, if the goal was truly to reduce carbon emissions, it seems obvious that a carbon tax would be a far more straightforward means of reaching that end. As Pope Francis explained, ETS and its cap-and-trade equivalents have essentially turned carbon emissions into a speculative market, providing opportunity for gaming and commodification. In "Financialization, Commodification, and Carbon: The Contradictions of Neoliberal Climate Policy," Larry Lohmann also tackles the problems inherent in cap-and-trade, particularly the lack of clarity and regulation in offset markets:

> "Through this state-sanctioned framework for market exchange, the surplus-generating use of fossil energy by the industrial North is prolonged, while further profits are realized through commerce in a new commodity. For example, routine efficiency improvements at exceptionally dirty, coal-intensive iron works in rural India can generate cheap offsets that help high-polluting electricity generators in Europe – often, as elsewhere, sited in poorer communities – continue business as usual at the lowest possible cost in the face of EU restrictions on emissions. Like some other ambitious forms of market environmentalism, carbon offset trading not only morphs existing environmental regulation toward ineffectiveness (for example, by punching holes in emissions 'caps' and letting in offset credits from outside, thus 'rolling back' part of the regulation that underpins cap and trade schemes). It also helps head off demand for other regulatory measures more capable of addressing the fossil fuel problem in all its political complexity." (Lohmann 2012: 95).

Lohmann's last sentence deserves special attention. Advocates of emissions trading have even argued that additional policy support for renewables is unnecessary so long as cap-and-trade is in place (Morris & Jungjohann 2016: 267). But emissions trading still promotes only the cheapest options, and therefore would only benefit the most developed renewable technology —onshore wind, which needs the least policy support. Certainly, other policy measures are necessary to encourage a diverse renewable portfolio, and can do so much more successfully than the ETS. The feed-in tariff is once again an appropriate case study. Because feed-in tariffs for solar were by far the most expensive, and also can cause boom and bust scenarios (e.g., Spain), many were calling for drastic cuts to feed-in tariffs for photovoltaics. In January 2010, the government announced a 15 percent reduction (Morris & Jungjohann 2016: 288). A compromise was negotiated setting different reduction percentages depending on where the solar systems were installed. This move highlights the ordoliberal emphasis on competition; solar was only given a larger handicap until it could compete with less help. If the government wanted to transition completely to renewables, it would not reduce its support for solar when it was exceeding all expectations. Reducing its feed-in tariff is a move that may level the playing field, so to speak, but also risks stunting expansion of solar.

From Feed-In Tariffs to Auctions: the 2014 EEG

The most recent revision of the EEG, or Renewable Energy Act, has made a drastic and controversial move away from the feed-in tariff. Though the feed-in tariff is the hallmark of Germany's Energiewende, beginning on January 1 2017, it is transitioning to a new system of auctions (Appunn 2016). The conservative Christian Democrats and center-left Social Democrats

initiated the shift in policy, which appeases the European Commission's wish for Germany to end price-fixing (Dinkloh 2014).

The auctions set "deployment corridors" for renewable energy, which Germany will stick to by auctioning off specific capacities for various renewable technologies. Instead of being fixed by the government through feed-in tariffs, payments for renewables are awarded in a competitive process that chooses whomever can provide electricity at the lowest rate (Appunn 2016). This is intended to cut costs of the energy transition, stabilize the grid by limiting how much renewable energy can be added to it yearly, and introduce more competition into the renewables market.

The share of renewables is set to increase to 40-45 percent by 2025, to 55-60 percent by 2035, and to at least 80 percent by 2050 (Appunn 2016). Three to four auctions will take place per year, and auctions will follow a pay-as-bid principle in which funding corresponds to the bid placed (Appunn 2016). Very small renewable projects of less than 750 kW capacity will still be compensated through feed-in tariffs, though they will have to take part in the auction process. This complex auction system was piloted only for photovoltaics in 2015.

This transition to auctions raises concerns for several reasons. First, the deployment corridors risk stifling renewable energy growth by setting predetermined limits and reduced access to permits. Renewables grew faster than anyone anticipated in the early 2000s, so it seems illogical to not let this natural expansion flourish if the government is truly committed to a green electricity sector. Second, though Germany has made some exceptions for citizen energy projects, the auction system is inherently more difficult for small players. The time and money that goes into the planning of energy cooperatives is already significant; if they compete for a project permit at an auction and lose, the losses will be expensive and discouraging — not to mention an additional hurdle to jump. Third, feed-in tariffs provided stability for investors, who

could determine how much profit to expect from a renewable energy project. Auctions introduce a new sense of uncertainty to the people involved in these projects. Fourth, like emissions trading, auctions are another overly complicated neoliberal attempt at using the market to encourage growth of renewables.

Auctions pick winners in terms of companies and projects to pursue, while feed-in tariffs pick winners only in terms of energy sources. Direct state intervention, like that of the feed-in tariff, is an ordoliberal approach that's more conducive to expansion. While feed-in tariffs promote competition that allows renewables to compete against traditional fossil fuels, auctions demand competition in which renewables are fighting with one another. This is not constructive to the expansion of renewable energy, and contradicts the power shift underlying the Energiewende. Morris and Jungjohann explain the perverse outcome of Germany's first experiment with auctions:

> "Worldwide, auctions tend to produce a large number of losers and a small number of winners. Eventually, small firms just barely able to take part in the first rounds of bidding (each of which can cost tens, if not hundreds, of thousands of dollars) can't afford to continue budding, so they stop. At the request of the European Commission, the German government began conducting pilot auctions for ground-mounted photovoltaics in 2015. Even though the Germans know about this pitfall, the pilot auction repeated this outcome. Only 25 contracts were awarded to the 170 bidders, so there were 145 losers. Not a single community project or individual was awarded a contract. Furthermore, the prices obtained were slightly higher than the feed-in tariffs applicable at the time" (Morris & Jungjohann 2016: 186-187).

Though the law claims to support diversity of market players, it seems inherently more favorable to big business. Perhaps the government wants conventional energy companies to catch up to citizen energy in terms of deployment of renewables, but this is not the best way to go about it. The Energiewende's impetus comes from people, and corporations have consistently neglected to participate. The German government needs to recognize and support the grassroots

momentum from its citizens and encourage community ownership. Transitioning to auctions is a dangerous step backward that risks stifling not only public involvement, but the Energiewende as a whole. It is only through collective action that the vision of a strong, clean grid can be realized.

In fact, I believe Germany should push for public ownership of electricity. This is the only way to ensure that the sector is governed democratically. Ballot initiatives could let people vote for whether they want public or private ownership of electricity, as was the case in Boulder, Colorado, where citizens voted for municipal/public ownership of its grid (Bakke 2016: 166). Though ordoliberal policies certainly catalyzed growth of renewable energy, they still force clean sources of energy to compete with fossil fuels. In addition, they favor small private enterprises over monopoly control, but still give priority to those with the money to invest in community projects. The power shift that is decentralizing ownership and production of electricity is threatened by auctions, and democratic accountability could prevent the power dynamic from regressing to big utilities.

In a privatized energy system, profit incentives are fundamental elements of competition. Indeed, all of the policies discussed in this chapter function by rewarding those who produce renewable energy with money. But shouldn't energy, arguably a necessity of modern life, be considered a public service rather than a business opportunity? And with increased deployment of wind and solar, perhaps this isn't a far-fetched idea. On October 4, 2010, "a surge in wind power production brought the price of electricity on the spot market down to -5 cents, meaning that power generators were paying buyers a tidy sum to take electricity off their hands" (Morris & Jungjohann 2016: 295). These negative prices were due in part to the inflexibility of German nuclear baseload plants, and had some adverse consequences. But with better grid management

and battery storage, it's possible that wind and solar could generate electricity with very little input costs once the infrastructure is in place.

Some media and scholars talk of the "utility death spiral" — the phenomenon in which large German energy providers are rapidly losing profits (Morris & Jungjohann 2016: 354). The phrase death spiral has a negative connotation, but the big four utilities produced only 5% of renewable energy in 2012 (Vansintjan 2015: 47). Moreover, a German study titled "The future of large energy providers" found that it was not the Energiewende that hurt the big utilities, but rather their failed international investments using the liquidity from emissions trading (Morris & Jungjohann 2016: 356). This is money that they could have put into domestic renewable energy. The CEO of utility giant RWE admitted in 2014 that the company started with renewables "late, maybe too late" (Morris & Jungjohann 2016: 359).

The big four's utilities profits may have shrunk, but one conventional fuel still dominates the electricity sector: coal. The subsequent section looks at the Energiewende's progress thus far, its goals for the future, and how coal fits into this equation. I argue that a phaseout of coal is necessary for Germany to lower its emissions and increase growth of renewable energy.

Goals and Progress: The Coal Problem

So how is Germany's Energiewende doing? In September 2010, Chancellor Merkel's government adopted the official goal to reduce emissions by 40 percent compared to 1990 levels by 2020, and a 80-95 percent cut by 2050 (Buchan 2012: 2). This is double the European Union's goal to cut emissions by 20 percent by 2020, and the EU has not set the latter target. Certainly when the country set these ambitious goals, it was not expecting to suddenly shut down so much of its nuclear capacity the following year.

Losing so much of this relatively carbon-friendly power source stunted Germany's ability to reduce carbon emissions, especially since its primary alternative has been coal power — the dirtiest of all fossil fuels. Germany's reliance on its immense reserves of lignite, "a soft brown coal that burns inefficiently, producing roughly one-fourth more carbon dioxide than hard coal and almost three times as much as natural gas," is especially troublesome (Schrader 2016: 430). Given Germany's position as the largest economy in Europe and an industrial powerhouse, its carbon emissions are still high compared to many European countries.

Germany has also committed to a one-third renewable share of electricity by 2020, a target that it will likely meet thanks to the feed-in tariff driving investment in renewables (Buchan 2012: 33). It is already nearing this goal, and wants to raise the share of renewables to at least 80% by 2050 (Schrader 2016: 430). However, cheap coal is still the nation's top source of electric power, producing 43 percent of Germany's electricity in 2015 (Schrader 2016: 430). That said, the renewable energy market creates far more jobs: in 2014, roughly 355,000 people worked in the renewables sector, while well under 50,000 worked jobs in coal mining and conventional fuels (Morris & Pehnt 2016: 6). Moreover, jobs in the renewables sector are expected to grow substantially in the coming decades.

If Germany is to meet its climate goals, it has no choice but to abandon coal. German think-tank Agora Energiewende laid out a comprehensive plan for Germany to phase out coal by 2040, including construction of cleaner natural gas generators as well as ramping up installment of renewable infrastructure (Schrader 2016: 431). Despite having some of the highest electricity prices in Europe, the country is overwhelmingly in favor of the Energiewende. An August 2015 survey found that 93 percent of the German public said further growth of renewables was important or very important to the country's development (Morris & Pehnt 2016: 100). It shows

that the people's priorities lie with the environment, and they are willing to sacrifice money for its benefit. This level of support is crucial to driving tough policies forward, and will help Germany shift power sources once and for all from fossil fuels to renewable energy.

Though Germany has stood by principles of competition as the best way forward, pitting renewables against fossil fuels is an insufficient approach to greening the grid. As was proven by Merkel's decision to phase out nuclear in 2011, it is not necessary to wait for the market to decide which energy sources should be pursued. With ordoliberal policies maintaining a competitive framework to level the energy playing field, such a phaseout would never occur naturally. As the vast majority of Germans favor renewable energy growth, public ownership of energy would ensure that the government responds to its citizens' desires. If Germany is serious about preserving the environment for future generations, it must forgo competition and phase out fossil fuels as quickly as possible.

Chapter 5: Conclusion

Reclaiming Germany's Identity

Does ordoliberalism aid or inhibit the power shift inherent in the Energiewende? The policies enacted by the German state catalyzed the physical shift in power, enabling massive growth in the renewable energy sector. The social power shift is limited under ordoliberal policies, as decentralization cannot be conflated with democracy. The involvement of so many new voices in Germany's energy sector, especially those of average citizens, seems inherently more democratic. But money is still the key to accessing this power — whether through buying back the electric grid or investing in an energy cooperative.

The success of the anti-nuclear and renewable energy movements evidence the enthusiasm for sustainability in German communities. What better way to harness this momentum than by returning energy to the public sphere? Recall that a democratized energy sector allows the public to dictate terms of use, inform how decisions are made, and exercise agency through a voting apparatus.

The German government has thus far supported the Energiewende in ordoliberal ways. Its policies support principles of competition between energy sources and uses profit incentives to expand clean energy. The feed-in tariff has helped individuals and communities profit from renewables, emissions trading uses state intervention to reduce carbon emissions, and auctions spur competition between renewable energy projects.

Still, each of these policies, and more so with emissions trading and auctions, favors the privatization of energy. The shift to auctions risks stifling community involvement in the Energiewende and rejuvenating large utilities. But the big four have done little to suggest that they are committed to sustainability; I do not trust the transition in their hands. These policy

actions seem to say that the government supports the market for renewables more than the underlying belief that climate change is an imminent threat to our planet. The result is a power shift, not the democratization of energy.

It is not my intent to undermine the progress that has been made in Germany, but rather to reframe the way in which we think about energy transitions. By changing the climate change narrative, the vision of public ownership and energy democracy won't sound so utopic — it will be a reality worth striving for. The transition is an opportunity for radical social change that does not discriminate based on socioeconomic status. It can strengthen communities and reconnect us with the earth. And finally, it can help Germany reclaim its identity.

The air raid bunker in Wilhemsburg was hastily built by forced laborers and prisoners of war in July 1943, made of windowless concrete with seven-foot-thick walls (Kunzig 2015: 1). At the end of World War II, as many as 30,000 people would squeeze into the bunker to take shelter from Allied bombs (Smee 2011: 1). After the war, the massive eyesore remained as a reminder of a shameful past — so strong that it withstood post-war attempts to blast it to the ground with dynamite (Smee 2011: 1). But like the rest of Germany, the Wilhemsburg bunker is undergoing a major transformation.

By 2013, the "energy bunker" was retrofitted with solar panels across its roof and south wall, supplying the grid with energy for a thousand homes (Kunzig 2015: 1). The central space of the bunker, where people once hid for their lives, now houses a 528,000-gallon hot water tank warmed by solar panels and cogenerated heat (Kunzig 2015: 1).To the north, 17 wind turbines dot the horizon. The bunker also offers a café for visitors to enjoy panoramic views of Hamburg as well as a detailed exhibition of the bunker's history and transformation. As a result, residents now enjoy clean and locally-produced power.

In taking responsibility for its dark past and using it to forge a brighter future, the *Energiewende* is far more than just an energy transition. As Germany's biggest post-war infrastructure project, it is producing substantial shifts in power (Morris & Pehnt 2016: 106). Some shifts are small-scale, like turning a WWII bunker into a renewable energy powerhouse, while others represent large-scale social participation and successes. A coal exit is the next logical step in the *Energiewende* conversation, as it will be fundamental to meeting the country's climate goals. Though Germany is not alone in the fight for a green future, it is proving that a major industrial nation can successfully transition to renewable energy. Most importantly, the *Energiewende* is showing the world that renewable energy can simultaneously provide economic, social, and environmental benefits. Power dynamics are shifting across the globe, and if others follow Germany's leadership, they will change for the better.

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