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# Changes in the Energy Dynasty: Transitioning Away from King Coal.

## A case study of energy transitions in Germany and Poland

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### Abstract

This paper examines the “3-i” framework and to understand energy transitions in the European Union (EU). The EU has prioritized environmental sustainability and declared that EU countries will transition away from coal towards renewable energy. The capacity and priority of transitioning away from coal varies across the EU. Germany and Poland were chosen as case studies to analyze the variables that affect energy transition speed. These two countries were chosen because they have the largest coal reserves in the EU but are drastically different in how they are transitioning their energy sectors. To understand the differences, institutions, interests and ideas are analyzed through the variables of Green party representation, the number of jobs in the coal sector and the cultural significance of coal; three hypotheses were created from these variables. This paper draws upon previous literature to examine these hypotheses. Based on previous research as well as a discussion of recent trends in Germany and Poland’s energy sector, Green party representation is the strongest variable that explains energy transition speeds. Jobs in the energy sector has a moderately strong argument while cultural significance has a weak argument. This paper considers all three variables and reflects on the future implications of the energy sector in Germany and Poland.

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## Introduction

The European Union (EU) has acknowledged the need for an energy transition and has made great promises to shift towards renewable energies. Under President von der Leyen's Commission, she prioritizes the Green New Deal and aspires to have an 80% to 95% reduction in greenhouse gases by 2050 while obtaining climate neutrality by 2050<sup>1</sup> (European Commission 2020). EU member states are required to develop national strategies in order to achieve this goal. Some countries have taken major strides in transitioning their energy sectors. For example, Germany, once a coal powerhouse, is now one of the EU's leaders in renewable energy and low-carbon energy transition. Renewable energy now makes up about 40% of Germany's energy source while coal only makes up about 28% (Appun, Haas and Wettengel 2019). This is a huge shift as Germany closed all coal plants in 2018 and plans to completely phase out coal plants by 2038 (Appun, Haas and Wettengel 2019). By contrast, some EU countries refuse to shift away from coal. Poland is heavily reliant on coal; over 80% of its energy is from coal and its leading political party advocates for coal (Mahajan 2018). Poland is not set to phase out coal or achieve the EU targets as the government has not created an energy transition plan.

Different countries within the EU are transitioning their energy sectors at different speeds. This leads to the question *What factors contribute towards EU countries transition towards renewable energy?* This paper will attempt to answer this question by analyzing two EU countries, Germany and Poland. Previous research has individually examined Germany and Poland's relationship with coal and their energy transitions. No previous work has directly compared them to understand the variables that explain why the two countries have different energy transition speeds. I will use the "three i" framework to compare the differences in Germany and Poland's institutions, interests and ideas. This will be represented through the variables Green party representation, jobs in the coal sector and the cultural significance of coal. The following hypotheses can be created based on these variables:

**H1:** If the country's party system does not have any representation from the Green Party, then the government is unlikely it will transition away from coal.

**H2:** If the coal sector is creating and occupying a significant portion of jobs in the country's economy, then the government is less likely to transition away from coal.

**H3:** If coal has a strong cultural significance in a country, then the government is unlikely to transition away from coal.

The paper will be structured as follows: First, I will begin by briefly explaining why I have chosen Germany and Poland as case studies. I will then follow with a literature review on the variables that influence energy transitions and identify gaps in the literature review. The contributions section will follow. There I will examine the significance of these variables and use previous literature, current events and my own insight to analyze the three hypotheses. Next, I will present my personal contributions based on the analysis and explain which hypothesis has the strongest argument. Lastly, I will conclude with a summarization of my claims and consider the prospects for the future energy sectors in Germany and Poland.

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<sup>1</sup> Climate neutral means having net-zero greenhouse gas emissions; this means eliminating coal.

## Case Selection

Germany and Poland were both coal power houses and still have the largest coal reserves in the EU (See Appendix A, Figure One) (Euracoal 2020). Their economy and energy sectors were heavily reliant on coal. During the 1980's, both countries experienced environmental movements as citizens protested the use of coal, fossil fuels and nuclear energy. Germany's national government listened to its citizens and started to transition away from coal while Poland continues to mine for coal. This is significant as Germany decreased its absolute reduction on fossil fuel by 36% while Poland has only decreased it by 6% (see Appendix A, Figure Two) (European Environment Agency 2018).

### *Germany*

Germany was formally Europe's center for coal. After World War II, Germany focused on rebuilding its industrial power through coal and steel. In 1951, it formed the European Coal and Steel Community, which directly linked the mining of coal to the potential for economic expansion in Germany and Europe (Oei, Brauers and Herpich 2018). As the EU's largest energy consumer, Germany turned to coal as a viable and cheap option. Coal was the norm and was projected to continue as such until the 1980s when scientists at West Germany's Eco-Institute proposed an *Energiewende* (energy transition) after scientists revealed the unsustainability and dangers of both fossil fuels and nuclear energy (Hager 2018). The proposed *Energiewende* quickly gained public support as environmental movements grew in both East Germany and West Germany. *Energiewende* was supported by the national government and they created action plans to transition towards renewable energy. The EU quickly followed suite and further approved of EU energy transitions. Now Germany is the largest industrial country that has committed itself to transitioning from fossil fuels and nuclear energy to renewable energy (Hager 2018). Germany has made major adjustments to its research and development sector. It is committed to renewable energy; it creates new jobs in this sector while overall lowering the price of renewable energy.

### *Poland*

Similar to Germany, Poland's history is rooted in coal. Poland has the largest coal reserves in the EU; its economy and energy sector is still dependent on it (Euracoal 2020). New coal mines are still being opened in Poland; most recently, one was opened in September of 2019 (Kosc 2019). The Polish economy is locked on coal and is unlikely to transition away from it. Coal mining is a sense of national pride and identity in Poland. Despite Poland's pride in mining, many of its citizens face the negative externalities that arise from mining. During the 1980s, Poland experienced rapid industrialization. This had severe environmental consequences, such as acid rain, smog and runoff. Additionally, many citizens who live near coal mines suffer serious health consequences (Santos Moura 2018). Environmental movements during the 1980s were created to slow down mining and promote safe and sustainable energy options. Polish citizens advocated for stricter environmental standards and cleaner solutions (Ault 2019). However, their

messages fell on deaf ears. The Polish government did little to support the needs of its citizens, and continues to mine for coal, arguing that the economic benefits outweighed the costs.

### **Literature Review**

The “3-i” framework, originally discussed by researcher Peter Hall in 1997, is widely used to understand why changes are made in policy. This framework holds that policy developments are influenced by the institutions, interests and ideas (Gauvin 2014). Institutions can be defined as the rules, organizations and structures that shapes political behaviors. For the purpose of this paper, the variable that depicts institutions is the representation of Green parties in Germany and Poland. Interests can be defined as the agenda of various government and societal stakeholders. This concept is represented by the number of jobs in the coal industry. Lastly, ideas can be defined as the beliefs and values that exist in society. The cultural significance of coal is used for this variable. These variables will be further analyzed based on previous research.

### ***Institutions***

The institutional political environment is a crucial factor in energy transition. National leaders and policy makers assist energy providers in transitioning. These political leaders also set the precedent for energy standards in their country. If the government in charge does not support renewable energy, then it is difficult for those companies to flourish in the country. Political support stems from party ideology. The main European party that is a supporter of renewable energy and green energy transitions is the Green party. The Green party’s platform supports environmental sustainability and strongly criticizes the use of fossil fuels and nuclear energy. While the Green parties representation in national governments is fairly low across Europe, their impact is still significant. Green party representatives work in coalitions with left-winged and center-right party leaders to pass legislation that is targeted at environmental sustainability and renewable energy (Dumont and Bäck 2006). European Green parties started as protest movements against nuclear energy in the 1970s and were able to mobilize into political parties by the 1980s (Gahrton 2015). Environmental protests and Green party movements were seen in both Germany and Poland. However, Germany’s Green parties were able to create a political impact while Poland’s fizzled. European Green parties impact on the energy sector is evident today. The Green party has held EU conferences about transitioning away from coal, has created working papers on energy transitions and created a Fair Transition Campaign (European Greens 2018).

#### *Germany*

Per Gahrton (2015) described Germany’s Green party, Die Grünen, as the most influential European Green party because it was the first Green party to gain political influence. Germany’s Green party led the nation to dismantle nuclear energy and continues to push for further energy transitions. When German citizens started to raise public concern over the effect of fossil fuels and nuclear energy on the environment, the government listened. Germany’s

environmental movements were prominent in both East Germany and West Germany; when the two merged in 1989, they were able to successfully build off each other's environmental movements (Gahrton 2015 and Ault 2019). Germany dedicated itself to renewable energy and made commitments to uphold higher sustainability standards. The government created successful energy audit programs and performance maintenance checklists, measurement systems and progress reports for companies to ensure that they were complying with the new sustainability standards. These audits helped small and medium enterprises enhance their competencies and assisted them to increase energy efficiency (Valentine, Brown and Sovacool 2019). The German government further incorporated legislation such as the Renewable Energy Sources Act in 2000 that initiated a feed-in tariff which guarantees renewable energy the payment of fixed prices (Gallagher 2013). Die Grünen is currently in an alliance with Bündnis 90. This coalition has 9% of the seats in Germany's national legislature, the Bundestag, comprising of a total of 67 seats (Politico 2020a). While Die Grünen is not in a coalition with the leading center-right Christian-Democrat party, this party has prioritized environmental sustainability and energy transitions. The Christian-Democrat Party has pledged to reduce greenhouse gas emissions by 55% by 2030 and pledged to increase Germany's overall share in renewable energy to 65% by the end of 2020 in order to meet the EU's 2050 climate neutral plan (Wettengel 2019). Additionally, Germany has committed itself to eliminating coal by 2038 (Wood 2020). This shows that the leading party has similar goals as Die Grünen, and the two parties can work together to officially transition Germany away from coal. While the Christian-Democrat party is getting the spotlight for this energy transition, Hager (2018) attributes Germany's progressive environmental stance to the Green party as they are the ones who first advocated for energy transitions on a national stage. It is also important to note that 21% of Germany's European Parliament seats are designated for the Green party (Politico 2020a). In this election, one in five Germans supported the Green party (Schwägerl 2019). This further shows that Germany's Green party has a strong international presence and pushes for environmental changes at both the national and supranational level.

### *Poland*

Poland also had environmental movements during the 1970s and 1980s and was actually the hub of environmental activism in Eastern Europe (Ault 2019). While Germany's early protests focused on nuclear energy, Poland's focused on pollution from the steel and coal factories. The Polish government attempted to address the citizens' concerns, but environmental progress was unsuccessful. Since Poland was under a communist regime during the beginning of environmental movements, the citizens concerns failed to be successfully mobilized. Furthermore, other concerns such as the ongoing economic crisis, lack of consumer goods and religious struggles took priority over the environment (Ault 2019). Thus, once communism was defeated in Poland, environmental movements had a weak foundation to build off of. The Green party struggled to mobilize but eventually became an official party in 2004. Since then it has gained little recognition in the Polish national government as right-winged and far-right parties led. These parties do not prioritize renewable energy or environmental sustainability. Currently, there are three Green party representatives in Poland's national legislature, the Sejm, making up

0.6% of all of the seats (European Greens 2019 and Politico 2020b). Poland's leading party, the Law and Justice Party (PiS) has made no intention on working with the Green party representatives. PiS is actively trying to open new coal mines. Schwartzkopff and Schulz explain that the PiS party encourages coal as it tries to earn coal workers votes, thereby catering its platform to coal. Polish Green party members have openly spoken against the PiS party's coal-friendly platform (Tracz and Kossakowski 2020). In October of 2019, the PiS party drafted legislation that would allow for the national government to override local governments in opening coal mines (Kosc 2019). Furthermore, Poland is the only EU member state that secured an opt-out from the EU's climate neutrality goal (Rankin 2019). Poland is not a strong supporter of the EU's environmental initiatives because there are no Polish representatives that directly advocate for the environment at the supranational level. There are no Polish Green party Members of the European Parliament (MEPs). Instead, 43 of Poland's MEPs are right-winged, with the overwhelming majority of those members being from the PiS party; only eight MEPS are left-winged (Politico 2020b). This is significant because it shows that Poland does not have a strong voice on environmental matters as Poland's right-winged MEPs do not prioritize the environment or renewable energy.

### *Interests*

Interests are the agendas set by politicians, societal groups, researchers and policy entrepreneurs (Pomey et al 2010). The interests can be economic, political or professional. In assessing which interests to pursue, the actors must determine the gains and losses from the options (Stone 2001). Concerning energy policy, the national government dictates which interests are pursued. Policy makers must determine what is the best interest of the citizens, and whether environmental health or economic security takes priority. Clean energy transition can face huge economic barriers, making it exceedingly costly to transition away from fossil fuels. Governments have historically supported fossil fuels, funding billions of euros into this industry with subsidized investments as a way to boost the economy by securing employment (Valentine, Brown and Sovacool 2019). Jobs are deeply tied to these sectors, further making it difficult to break this economic connection and fund new renewable technology. In order to overcome these economic barriers and successfully transition towards renewable energy, governments need to weigh the costs and put the environmental benefits above the economic costs. This requires a clear plan to ensure a transition of jobs while still attracting investors to the energy market. However, if policy makers do not deem this to be a worthy adjustment, then the energy sector will remain relatively static. Thus, the number of jobs represented in the coal sector is indicative of the interests of the national government.

#### *Germany*

The energy transition in Germany started relatively early, giving the German government significant time to develop an economically advantageous plan to phase out coal. Gallagher (2013) explains that renewable energies have become attractive in Germany and have stimulated further investment into this sector. Now, renewable energy technologies are one

Germany's fastest growing exports (Gallagher 2013). Germany is also providing a compensation fund to assist the closure of mines and help reskill workers, so they are able to find better jobs (Wood 2020). Germany ended its coal subsidies and instead used that money to retrain coal workers (Stognief, Walk, Schöttker and Oei 2019). Additionally, when Germany pledged to transition from coal, it protected the workers and owners of coal mine companies and coal mine regions. Structural assistance was provided for mine closures and reductions in mine employment from 1969-1999 (Stognief, Walk, Schöttker and Oei 2019). Germany's government enhanced its research and development to innovate and fund new renewable energy. It currently spends approximately 3% of its gross domestic product on research and development. This shows that Germany supports innovation and is committed to funding new technologies (Trading Economics 2020). As a result, it has a booming renewable energy sector. Currently, Germany employs approximately 33,000 citizens in the coal sector and approximately 249,000 in the renewable energy sector (Rueter 2020).

### *Poland*

With 112,000 jobs in the coal industry, Poland has the largest number of jobs in the EU coal sector (Heilmann, Popp and Ámon 2020). Poland's economy is inherently tied to coal as the major coal companies are either partially or fully state-owned (Schwartzkopff and Schulz 2017). Poland is not predicted to transition to renewable energy as its national government continues to fund coal subsidies and have stated that they are committed to coal (Kuchler and Bridge 2018). The national government has yet to develop a plan to economically transition away from coal. Without a transition plan, cutting off coal in Poland would result in a decline in fiscal income, decline in national gross production, slow economic growth, and it would increase public spending as unemployment rates would increase (Manowska, Tobór Osadnik and Wyganowska 2017). Coal is also cheap to extract, thereby making it more difficult for Poland to justify transitioning away from it. Poland currently spends approximately 1% of its gross domestic product on research and development (Organization for Economic Co-Operation and Development 2020). It has failed to reach its 2020 target of spending 1.7% of its gross domestic product on research and development (European Commission 2016). Thus, this limits its innovation in creating renewable energy jobs. As a result, there is low employment in this sector as there are approximately 44,000 renewable energy jobs in Poland (Wasiuta 2018).

### *Ideas*

Ideas represent the values and opinions of society; it is the backbone of culture and unites citizens with a unique national identity. Since politicians are elected by citizens, they try to adhere to their demands and base their platform off the majority values of society. Hall (1993) explains that the state is inherently linked to the concept of ideas. Government officials and policy experts operate concerning the relevant terms of political discourse that arise from societal pressures, giving legitimacy to social interests and thereby delegitimizing other interests. Thus, the ideas of the citizens shape politics. Some countries gain a sense of pride through various sectors if there are strong historical connections. If countries identify and support one sector, then it is difficult for the national government to support a transition from it. Since coal mining

has strong roots in both Germany and Poland, it is interesting to analyze the citizens opinions and cultural ties to this sector.

### *Germany*

Coal was once a sense of national identity in Germany. But as Germany advanced, coal lost its significance. Focus was placed on other sources of pride in Germany, such as the automobile industry and the banking industry. When the national government decided to transition away from coal, it provided the workers with jobs so there was no need to fight for the coal industry. Societal roots in coal were easily transitioned. Additionally, Germans are very passionate about environmental sustainability and acknowledged that the coal industry is harmful (Oei, Brauers and Herpich 2019). Approximately 88% of the German public approves of the *Energiewende* but only 8% fully agree that Germany has progressed well with the *Energiewende*. This shows that Germans are highly critical of their government and hold them accountable in improving its energy sector and making it as efficient and sustainable as possible (Wehrmann and Wettengel 2019).

### *Poland*

Coal still holds significant value among Polish citizens. In many cities around Poland, coal is a way of life. Miners are seen as disciplined and honest workers (Darby 2018). Tours to the mines are common and there are coal museums. Religion is also heavily connected to this industry as there is even a patron Saint, Saint Barbara, of Polish coal miners and the coal industry (Santos Moura 2018). Poland has dedicated a day to celebrate Saint Barbara and the coal industry. On December 4<sup>th</sup>, Polish mine workers celebrate Barborka Miner's Day (Saint Barbara's Day) with an orchestra and a parade (Scislowska 2018). The Prime Minister of Poland has even spoken at these celebrations, furthering demonstrating the national governments support for this industry (Kuchler and Bridge 2018). This shows that the mining industry has its own unique culture that has a deep sense of pride in Poland. Coal miners are proud of their jobs and still fight for this industry. Polish miners recently held public protests demanding that the government protect their industry and they want them to stop importing coal (Associated Press 2020). However, these ideas conflict with Polish attitudes on environmental sustainability. Polish citizens are passionate about the effects of climate change and are active in climate protests. A poll conducted by United Surveys highlighted that “[m]ore than 90% of Poles think the climate is changing and almost 64% believe Poland should stop using coal in power generation to reduce emissions” (Barteczko 2020). However, the Polish government does not respond to these opinions, which is further aggravating citizens and are causing them to take additional action. The Krakow Smog Alarm group was created in 2012 due to frustrations caused by a lack of data available on environmental information (Szulecka and Szulecki 2019). Quickly, other regional Smog Alarm groups were developed and started to meet with key government officials to discuss the future of Poland’s environmental policy. Still, the Polish government is reluctant to act and belittles the environmental problems that are caused by fossil fuels. Ignoring this issue and

ignoring societal groups shows that the Polish government is not willing to listen to the public and is not willing to change its policies.

### ***Gaps in Literature***

This literature review grazes the “3-i” framework. There are a plethora of other variables that can be chosen aside from the three that were discussed. For example, the concept of brain drain in these two countries would be interesting to analyze as there could be a connection between attracting young innovators and the development of renewable energy. Energy security is another variable that could be looked into further as there may be a link between the dependency of energy trade and energy transition. Lastly, the strength of energy labor unions would be interesting to analyze. Some labor unions yield significant influence over politics. Thus, the strength of the energy labor unions could provide insight into the why some countries are able to transfer their energy sector more easily. Future researchers could contribute to this study by analyzing these variables further.

Despite these gaps, previous researchers have individually analyzed separate factors that have discussed energy transfers in Germany and Poland. However, these researchers failed to connect the different variables to explain why Germany’s energy transition has prospered and why Poland is struggling to transfer from their coal sector. The following section will build off the literature review and will explain which variables provide the strongest explanation in why Germany has shifted from coal and why Poland is still steadfast on it.

### **Contributions**

This section uses the research discussed in the literature review to further analyze the three hypotheses that were created to explain the prospect of energy transfers. Each hypothesis will be critiqued based on previous research, current events and the authors insight. The section will conclude with an analysis on which hypothesis yields the strongest support for explaining the difference in energy transitions.

**H1:** *If the country’s party system does not have any representation from the Green party, then it is unlikely that the government will transition away from coal.*

Previous literature highlighted the importance of the role that the Green party played in environmental movements. The Green party is the leading political organization that advocates for energy sustainability. Their platform supports renewable energy and criticizes fossil fuels and nuclear energy. Without their voice and representation, there is little political motivation to initiate energy transfers. The energy sector takes their lead from the national government because the national government creates initiatives and can fund research and development projects that stimulates the energy sector. As Gahrton (2015) explains, Germany’s Green party was a European leader because it was able to successfully mobilize into a political party and gain national representation. Hager (2018) further contributes Germany’s success in energy transition

to the Green party as these representatives were the ones who nationally advocated for energy transitions. This success is still seen today as Germany's Green party is represented in national and supranational arenas. Germany's Green party was successful in advocating for energy legislation and contributed in creating the *Energiewende* that is still used today. Poland has not been successful in energy transitions and there is no research that explains the influence of the Green party in Poland. The lack of research on Poland's Green party is mostly attributed to the lack of representation that the Green party has in the national government. Poland's Green party was slow to mobilize and did not gain representation until 2004. Even after it gained representation it has few (only three) members in the national legislature and no representatives at the supranational level. There is little effort to collaborate with this party because they do not have significant power to influence any legislation. As a consequence, there is little political motivation to transfer Poland's energy sector. The Green party is not mobilized enough to argue against the leading PiS party in transferring away from coal. Thus, the PiS party will continue to cater their platform to coal miners with little opposition.

Based on the past research, this hypothesis is supported. Green parties are crucial factors in forming national legislation and advocating for energy transfers. They are the leading political force as its representatives are able to influence legislation. Germany has a fairly successful Green party and that is why it is able to pass legislation that helps the energy sector successfully shift away from coal to renewable energy. Poland does not have strong representation from the Green party. Thus, there is little mobilization at the national level that is able to successfully advocate for energy transfers.

**H2:** *If the coal sector is creating and occupying a significant portion of jobs in the country's economy, then the government is less likely to transition away from coal.*

The number of jobs in the coal sector varies drastically between Germany and Poland. Poland has over 100,000 jobs in the coal sector; Germany's coal sector has less than half of that. Instead, Germany has a higher number of renewable energy jobs; it actually has more renewable energy jobs than Poland has jobs in the coal sector. Stognief, Walk, Schöttker and Oei (2019) explain that Germany was able to successfully retrain coal workers. Thus, it was able to transfer jobs from the coal sector to other sectors without harming the workers or increasing the unemployment rate. Poland is not able to transfer jobs from the coal sector and has stayed committed to opening new coal mines in Poland (Kosc 2019). The government is strongly connected to the coal industry and has not created an effective transfer plan. Manowska, Tobór Osadnik and Wyganowska (2017) explain that if Poland's coal sector was to close, then there would be a spike in the unemployment rate, a drop in fiscal income, national gross production would decline, the economy would slow down and national public spending would increase. The reason that Poland still has a high number of jobs in the coal sector is not because the coal sector is a reliable industry, it is because the government has not put forward a transition plan. The government has not prioritized transitioning its energy sector; thus it is still creating jobs in the

coal sector. The number of jobs in the coal sector does not necessarily show the country's ability to transfer away from coal. Rather, the jobs available is a consequence of national planning.

Based on this analysis, the H2 hypothesis is loosely supported. The number of jobs available in the coal sector is not dependent on the country's ability to transfer away from this industry. Rather, this research points to an underlying cause that explains the number of jobs available in the coal sector compared to the renewable energy sector: government planning. Germany was able to transfer the number of jobs available in the coal sector because of government retraining programs. This provided a pathway from the coal sector to other jobs without a spike in unemployment. Poland's government has not released a plan to transfer jobs. Thus, the coal sector still provides many Polish workers with jobs. If the Polish government was able to create a retraining program for the coal sector, then it would be able to transfer jobs. Without a transition plan, coal workers will remain working in the coal sector. However, the number of jobs in the coal sector is evident of the government's priorities. Since Poland has a high number of jobs in the coal sector (and the number is increasing due to new mines opening), this shows that the government is supporting this sector. Thus, making it more difficult to transition as they do not value the renewable energy sector as strongly. While Germany's government is decreasing the number of jobs in the coal sector and increasing the number of jobs in the renewable energy sector.

**H3:** *If coal has a strong cultural significance in a country, then the government is unlikely to transition away from coal.*

Even though Poland and Germany border each other, they have two distinctive cultures and national identities. Germany is a European economic powerhouse and prides itself on innovation. It is constantly progressing and is able to successfully adapt to the changing environment. Poland has not progressed as much as Germany and still lags in innovation; it prides itself on traditions. One important tradition in Poland is the coal sector. Coal mining has an important role in Poland's history and coal mining is seen as an honest and respectable career. Kuchler and Bridge (2018) emphasize the importance of coal in Poland by explaining the significance of Barborka Miner's Day, a holiday that celebrates coal. This holiday is even approved by the national government as many officials have spoken at these celebrations. Conversely, Germany is not strongly attached to the coal sector, and many national representatives in Germany have actively spoken up about the negative effects of coal. A poll conducted by Wehrmann and Wettengel (2019) showed that German citizens are vocal about the need for energy transfers and are passionate about sustainability. Interestingly, a poll conducted by United Surveys in Poland also showed that Polish citizens support environmental sustainability and disapprove of the coal sector (Barteczko 2020). These attitudes conflict with the portion of Poland that value coal mining and celebrate Saint Barborka's Day.

This hypothesis has weak support. Based on previous research, it is evident that the coal sector is much more significant in Poland than it is in Germany. However, recent surveys show that both Polish and German citizens have acknowledged the harm of the fossil fuel industry and

support measures that promote environmental sustainability. Thus, it can be inferred that while the coal industry has strong, traditional roots in Poland, Polish citizens may be adjusting their views and opinions about the industry. Overall, this can lead to a loss in support for the coal industry as more Polish citizens acknowledge the environmental harm of coal mining. However, further research and additional polls must be conducted before a conclusion about this hypothesis can be concretely reached.

### ***Strongest Argument***

H1 is the only hypothesis that has strong support based on previous research. The second strongest hypothesis is H2. While the number of jobs in the coal sector does not represent the ability of a nation to transfer jobs, it does represent the national governments priorities and shows which energy sectors have strong support. Lastly, H3 is the weakest hypothesis. Support for this hypothesis is only based on the cultural pride of the coal sector and not of the environmental consequences of coal mining. It should be noted that additional research on public attitudes towards the environment and coal sector could nullify this hypothesis.

Hypotheses	H1	H2	H3
Support	High	Moderate	Low

Green party representatives in the national government have significant influence over transitioning energy systems; they are the catalyst for further energy support. Green party representatives have influence over the research and development budget funds, which stimulates the energy sector and leads to renewable energy development. Green party representatives also can push for an energy transition plan. If Germany's Green party was not elected into the national legislature, then the coal transition plan might not have been created. It is the Green party that pushes for energy legislature; these representatives act as a force of change in the government.

While this paper specifically focused on national energy transitions, H1 may have implications for support at the supranational level as well. Over 20% of Germany's MEPs are Green party members. Germany has been a strong supporter of renewable energy and environmental sustainability, and it is a supporter of these topics in the EU. Germany's Green MEPs are vocal about the necessity of energy transitions. Germany has pledged to uphold the EU's initiative towards becoming climate neutral by 2050. Conversely, Poland has zero Green MEPs and it is the only country that opted out of this initiative. The majority of Poland's MEPs are from the PiS party. They refused to endorse the climate neutrality initiative because they want to continue mining for coal. Since Poland does not have any Green MEPs, there was no one to stand up against the PiS party and support this initiative. The European Council's President,

Charles Michel, believes that Poland will join the initiative in June of 2020, however this is doubtful as the PiS party is unlikely to change its stance on coal (Rankin 2019).

Overall, the H1 hypothesis, *if the country's party system does not have any representation from the Green party, then it is unlikely the government will transition away from coal*, has the strongest support. This hypothesis is supported by previous research and it can be extended to both the national and supranational level. The case studies of Germany and Poland upheld this hypothesis as Germany has Green party support and has experienced a fairly successful energy transition through its *Energiewende*. Poland has not experienced such success. Poland's energy sector is still highly dependent on coal and has made little initiatives to transition away from this sector.

## Conclusion

Environmental sustainability is the leading topic in the EU. President Ursula von der Leyen has prioritized this topic and has set high environmental standards that she expects EU member states to follow. Some countries have rapidly transitioned their energy sector to reduce their transmissions and strive to be climate neutral. Other countries have struggled to transition their energy sectors and still continue to rely on fossil fuels. This paper looked into two cases to explore the factors that affect the speed of energy transitions.

Poland and Germany were chosen as the case studies because they were both heavily reliant on coal and still have the largest coal reserves in the EU. However, their two energy sectors diverged. During the 1980s, Germany started its transition away from coal while Poland continued to be a large producer of coal. Germany has made great strides in its transition and has created successful and growing renewable energy sector. Poland is slower in its transition and has the majority of its energy sector jobs in the coal industry.

The "three i" (institutions, interests and ideas) framework was used to understand the differences in Germany's and Poland's energy sector. Three hypotheses were created based on the following variables: Green party representation, jobs in the coal sector and the cultural significance of coal. Out of these three variables, the Green party representation had the strongest support in explaining the differences in the two countries energy sectors. This variable had the strongest support because Germany's Green party representatives were the leaders in pushing energy reform and the energy transition. Poland has a weak Green party and thus there is little national support for energy reforms. The cultural significance variable had weak support. The coal industry in Poland has a deeper connection and significance than Germany. This is evident through Saint Barbara, the Polish coal miners saint, and coal celebrations and museums. While Poland has coal celebrations, the majority of its citizens acknowledge that coal is harmful to the environment. Similar attitudes are evident in Germany. Thus, there is conflicting evidence of the significance of coal in Poland. The variable that had moderate support was the number of jobs in the coal sector. Poland has a higher number of jobs in the coal sector than Germany. However, this is because Germany's government created a transition plan for the coal sector. Germany provided job training for coal workers so they were able to transition away from this sector. Poland has not created a transition plan and continues to subsidize coal mines. Thus, this shows

that the government does not prioritize renewable energy and is still a strong supporter of the coal industry.

### ***Prospects for the future***

Germany has the necessary government support to achieve the EU's targets. It will continue to transition its energy sector and is on track to eliminate the usage of coal in Germany by 2038 (Wood 2020). There is still hope for Poland to transition its energy sector. Poland is not completely cut off from renewable energy. Its renewable energy sector is weak, but it shows the potential for growth. However, Poland's government is not willing to transform this sector on its own. President von der Leyen has promised to support coal-dependent countries. She has proposed a \$130 billion euro investment plan that that will fund new technologies and new jobs (Petrequin and Casert 2019). However, a five billion euro energy transition fund was proposed in 2018 and did not pass the European Parliament (Dumas 2019). Thus, it is uncertain if this investment plan will be approved. Since Poland's national government is not prioritizing energy transitions, it needs additional assistance and guidance from the EU and other member states in order to successfully transition away from coal.

## **Appendix A**

Figure One: Coal reserves across Europe  
(Euracoal 2020)

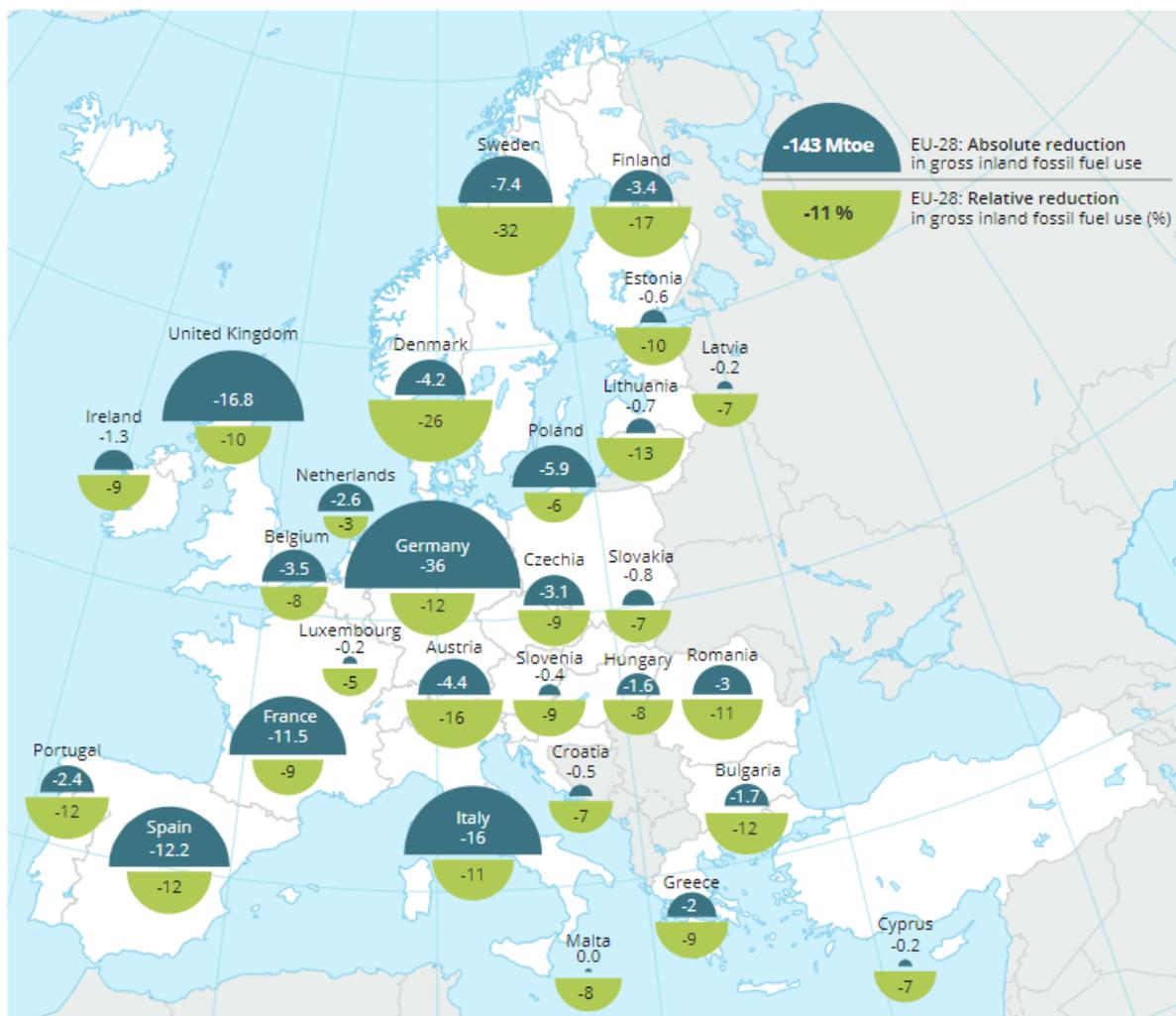


Appendix A

Figure Two: Reduction in fossil fuel usage in the EU

(European Environment Agency 2018)

Figure 3.2 Total and relative reduction in gross inland fossil fuel use (per year, in 2016)



**Notes:** The absolute reduction in gross inland fossil fuel use in 2016, expressed in million tonnes of oil equivalent (Mtoe), is proportional with the increase of renewable energy consumption achieved between 2005 and 2016. It represents the annual estimate for 2016; the cumulative value over the period 2005-2016 is much larger. The relative reduction in gross inland fossil fuel use is expressed as the absolute reduction over a country's total gross inland consumption of fossil fuels.

**Source:** EEA.

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