

AN ANALYSIS OF EUROPEAN SHALE GAS POLICIES:
WHY EU MEMBER STATES ARE PURUSING DIVERGENT 'FRACKING' STRATEGIES

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ABSTRACT

Ben Thorne: An Analysis of European Shale Gas Policies:
Why EU Member States are Pursuing Divergent 'Fracking' Strategies
(Under the direction of advisor Don Searing)

The recent progression in hydraulic fracturing or 'fracking' has enabled energy companies to extract once-considered, inaccessible hydrocarbons. The United States has been at the forefront of this controversial industry, revolutionizing the energy market by becoming the world's largest oil and natural gas producer as a result of its vast shale deposits. Shale oil and gas deposits are not unique to North America, however. EU member states are faced with the dilemma of whether to permit fracking domestically or suspend operations. The United Kingdom and Romania have issued concessions for exploring their reserves, while France and Bulgaria have halted all drilling efforts, citing environmental concerns. This paper evaluates why these four European countries pursued divergent fracking policies, arguing that energy security and Russian-relations are more relevant and powerful explanatory factors than a country's commitment to protecting the environment.

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LIST OF ABBREVIATIONS

BSP	Bulgarian Socialist Party
EIA	Energy Information Agency
EU	European Union
EUR/100 KWh	Euro per 100 Kilowatt Hours
EUR/GJ	Euro per Gigajoule
GAL	Green/Alternative/Libertarian
GDP	Gross Domestic Product
GERB	Citizens for European Development of Bulgaria
GWh	Gigawatt Hours
kWh	Kilowatt Hours
PPP	Purchasing Power Parity
PSD	Romanian Social Democratic Party
SD	Standard Deviation
TAN	Traditionalism/Authority/Nationalist

1. Introduction

Energy security has become a major point of concern for political elites in Brussels and national capitals throughout Europe. Fossil fuel reserves have peaked on the continent, necessitating industrial and government circles to find innovative solutions to diminish the growing reliance on foreign imports and reduce energy costs. The European Union (EU) member states already import over half of their energy supply from outside the twenty-eight country area and this total is expected to rise to nearly seventy percent by 2030 (European Commission 2006: 3). Just as troubling as the dependency rates for the member states are the supplying and transit countries the EU relies upon for receiving its energy. This concern came to fruition in the late 2000s, when the Russian natural gas supplier – Gazprom – cut-off supply to Ukraine, consequently leaving pockets of Europe without electricity and heating. At the time of writing, the EU is unable to aggressively confront Russia for its hostile annexation of the Crimea region in Ukraine because of its dependency on Russian natural gas.

Not only does the regional energy market look bleak for the EU, a resource race is escalating as global energy demand is estimated to soar fifty-six percent over the next thirty years with fossil fuels expected to supply eighty percent of the world's consumption (U.S. EIA 2013: 9). If current fossil fuel consumption rates go unabated, the earth's temperature will surpass the two-degrees Celsius threshold, which is expected to cause irreversible, harmful effects to the planet and human society.

The EU is deeply invested in producing clean, domestic energy through renewable sources, hoping energy harnessed from the sun, wind, and ocean will produce over half of the

EU's energy needs by 2050 (European Commission 2011: 7). The member states are at the forefront of developing environmentally progressive policies that will help lead to a less carbon-intensive global economy. Nevertheless, fossil fuels such as oil, natural gas, and coal, will remain crucial energy sources for a competitive Europe as clean technology develops and matures. One fossil fuel that is becoming more and more prominent in the member states' energy mixes is natural gas. Natural gas is the cleanest of the fossil fuels and provides a more consistent and reliable energy source than solar and wind power. The global energy market is experiencing a tremendous boom in natural gas production as progression in technology has recently allowed for unconventional sources of natural gas to be explored and exploited. This drilling technology called hydraulic fracturing or "fracking" has enabled the United States to tap into its vast shale gas deposits to become the leading gas producer in the world.

These hydrocarbon deposits, once thought to be inaccessible, are not unique to North America. Private and public estimates of shale gas deposits throughout the European continent have led many to believe several member states can reap modest benefits that fracking has brought to North America. The shale gas debate does not come without determined opponents who argue fracking has dangerous implications on the environment and cannot contribute to the transition to a low-carbon economy for which the EU is championing. Fracking has become one of the most salient and polarizing issues across political circles and civil societies in Europe. By and large, the issue has largely been framed as industry promotion and energy competitiveness versus ecological protection. Some countries in the EU are optimistic about incorporating shale gas into its domestic energy mix, while others have already suspended the controversial drilling technique. The EU member states that have either placed a moratorium or a ban on fracking have cited environmental concerns as the principal reason for doing so.

In this paper, I ask why environmental concerns were more prominent in some member states than others and if policy-makers were truly acting in the best interest of the environment when formulating fracking policy? I analyze what factors account for the variation in EU member states fracking policies that led some to pursue shale gas exploration, while others have restricted the drilling practice due to environmental concerns. Does environmental protection tell the whole story or are there more telling variables that shaped fracking policy-making in EU member states? Environmental concerns are certainly prominent in anti-fracking policies; however, I hypothesize countries are more flexible to incorporate ecologically protective policies if they have a more favorable energy security position.

This paper evaluates the fracking policies of the United Kingdom, France, Romania, and Bulgaria. The United Kingdom and Romania have issued concessions for the exploration of their shale gas reserves and both current governments support the exploration and exploitation of hydrocarbons by fracking. France and Bulgaria, conversely, have halted all fracking operations as Paris banned the use of fracking and Sofia placed a moratorium against the drilling technique. Both France and Bulgaria have cited environmental concerns as the justifying principle as to why policy-makers pursued an anti-fracking agenda.

These four countries were chosen as case studies for several reasons. All four countries have implemented nation-wide policies and have significant shale gas reserves that have attracted interest from multinational energy corporations. Most importantly, all countries have experienced significant domestic opposition to fracking, primarily from environmental groups and local residents. France and the United Kingdom represent the old member states that have established and active energy extraction sectors. Both have incorporated controversial energies

such as nuclear into their domestic energy mixes. France and the United Kingdom have stable democracies that would, in theory, represent the public's opinion towards shale gas.

Bulgaria and Romania both joined the EU in 2007 and are catching up to EU environmental standards, growing an environmentally conscious civil society, and do not currently have green parties represented in parliament. Sofia and Bucharest are generally criticized for high levels of corruption and backsliding on EU mandated reforms. The two former Communist states also host the lowest levels of economic development in the EU.

This paper follows accordingly. Section two provides an overview of the general debate behind why fracking has become such a controversial topic. Section three discusses how the fracking industry is regulated and governed in the EU. The EU overview is followed by a brief background of the member states' current fracking policies in section four. Section five provides a literature review of energy policy and security of supply, and how different policy-makers are either constrained or directed to certain policy options. Section six describes the independent variables being used in this paper and evaluates the findings from the data. Section seven uses two comparative analyses, interpreting the data between the United Kingdom and France and the statistics of Bulgaria and Romania to determine why environmental protection was more a point of contention in France and Bulgaria, but not the United Kingdom or Romania. Lastly, section eight offers general conclusions and avenues for future research.

2. The Shale Gas Debate

The U.S. Energy Information Agency (EIA) estimated Europe has approximately 470 trillion cubic feet of technically recoverable shale gas reserves lying underneath the old continent (U.S. EIA 2013: 6). The United States, in comparison, has an estimated 665 trillion cubic feet of

technically recoverable shale gas reserves, producing about 4.88 trillion cubic feet of shale gas per year or twenty-five percent of its natural gas production (Economist 2011; U.S. EIA 2013: 6). European policy-makers, scientists, environmentalists, scholars, industry leaders, and other concerned citizens have all entered the shale gas debate over whether to explore and possibly utilize these shale gas deposits. The debate is generally geared towards unproven technology and whether fracking can be conducted without damaging effects to the environment and surrounding populations. The position of the United States towards fracking has been relatively unconstrained because of its long history of drilling and powerful industry influence in Washington. Local and state opposition have, however, increasingly challenged fracking operations throughout the country. Europe generally has taken a much more cautious and gradual approach.

To understand the rationale behind why policy-makers of the member states are adopting the strategies they are taking, it is worth evaluating both sides of the debate. Advocates of fracking believe European shale gas extraction can negate the growing dependency on foreign suppliers and limit vulnerability to Russian political leveraging in the energy market. Twelve EU member states receive more than half of their total natural gas consumption from Russia (Ratner 2013). Gazprom has desperately sought to infiltrate the European energy market by purchasing natural gas distribution networks throughout the EU. Taking advantage of the absence of a common European external energy policy, Moscow has strategically played EU member states against one another with its 'divide and rule' political strategy (Umbach 2008: 18). Gazprom seeks to 'bilateralize' natural gas contracts with European national energy companies in order to diminish trans-European blocs and weaken the bargaining power of the EU (Baran 2006: 133; Umbach 2009: 18). Pipeline politics with Russia remains one of the most divisive issues in the EU because member states have repeatedly sought to secure national energy interests with

Russia at the expense of EU solidarity. Irrespective of the EU evolving from an energy organization in the 1950s, European energy policy is arguably the least integrated sector in the EU because of the sensitivity of energy security. The 2014 Russia-Ukraine crisis will undoubtedly serve as a critical juncture for energy policy in the EU, either leading to more of a collective energy approach or more national division.

Natural gas is also desired because it is the cleanest of the fossil fuels and will be critical for the transformation to a low-carbon economy the EU is working towards (European Commission 2011: 11). The European Commission outlined its ambitious “Energy Roadmap 2050”, which calls for the EU to reduce carbon emissions by eighty-five percent by 2050 (European Commission 2011: 3). Substituting gas fired plants for coal plants will be necessary to achieve this in the interim. The future of nuclear energy as an electricity source is in limbo in the EU because of the uncertain costs of new reactors and the radiation leaks that transpired in wake of the Fukushima disaster in 2011. Because of long lead times for renewable energy and its inconsistent deliveries when on the grid, natural gas will remain a stable energy source in fuel mixes. Other proponents argue fracking could have the potential to attract foreign investment, create jobs, increase Europe’s competitiveness, and provide substantial tax revenues to the austerity ridden and indebted economies (Shale Gas Europe 2013a).

The anti-fracking community has challenged the validity of many of these arguments. Although Europe has comparable levels of estimated shale gas deposits to the United States, technically recoverable shale gas reserves differ from economically recoverable reserves. The price of European shale gas will be much more expensive than American produced gas. The United States has a well-developed drilling and pipeline infrastructure that allows this newly fracked gas to be sent into the market in a less costly manner. In 2008, at the height of the gas

boom in the United States, 1,600 drilling rigs were in operation, whereas Europe only hosted about 100 rigs (Economist 2011). European reserves tend to be deeper underground and harder to extract, leading to higher costs. A substantial difference between the United States and Europe is the right of ownership of minerals. In the United States, mineral rights belong to the landowner, enticing homeowners to allow drilling in their backyard because they can reap financial rewards (Economist 2011). In Europe, the minerals are state-owned and citizens only see unattractive drilling rigs without the direct payoff. Washington and its state governments have more robust regulations to adapt to unconventional drilling, thus minimalizing legal delays. Furthermore, shale gas opponents believe political and economic capital should not be diverted away from renewable energy production for more carbon-intensive projects.

Shale gas opponents can argue that fracking does not improve the security of energy supply based on its commercial merits alone, but the greatest criticism of fracking is the harmful impact fracking can have on the environment. Environmentalists and other concerned actors are actively committed to a green energy sector and have mobilized protests against the industry. Fracking involves injecting millions of gallons of water mixed with chemicals, acids, and detergents into layers of shale rock to create fractures that release the desired gas from below (Brantley and Meyendorff 2013). If this fracking liquid were to infiltrate a drinking supply, severe health risks would emerge. This injection of millions of gallons of water into the earth and the subsequent drilling to store the wastes have triggered small to medium-size earthquakes in North America and the United Kingdom. Now the worry over the method of methane tracking is becoming a central focus of debate. Fracking implies releasing methane gas, which companies are legally obliged to capture. According to the International Panel on Climate Change, if leaked, methane is eighty-six times more damaging than carbon dioxide (Evans-Pritchard 2013). Other

concerns related to the industry are the unsustainable use of water and sand, noise pollution, traffic congestion, and the common environmental critiques of conventional hydrocarbon drilling. Additionally, there are scientific disputes over whether the complete life cycle of shale gas is cleaner than coal. In sum, anti-fracking campaigners are opposed to investing in another fossil fuel industry that is experimenting with the earth.

3. EU Fracking Governance

Fracking regulation in the EU involves a myriad of actors and regimes, orchestrating at multiple levels, creating a fluid and complicated regulatory structure. EU institutions, national governments, and subnational localities are implementing fragmented and overlapping regulations of the industry (EU law supersedes all others). Meanwhile, transnational industry leaders, non-government organizations, and other interest groups are scaling vertically and horizontally at these levels to lobby their interests.

The European Parliament in 2012 passed a resolution with 492 Members of European Parliament in favor, 129 against and 13 abstentions to allow EU member states to determine the fate of fracking domestically (Vote Watch Europe 2012). All hydrocarbon projects, including those using fracking, are expected to conform to EU laws. This includes the protection of health and the safety of humans and the environment through responsible maintenance of waste and chemicals, and safeguarding the surface and groundwater among others (European Commission 2012b). The Commission has played an active role as regulator and overseer of the industry to ensure environmental and social responsibility by the energy companies. This implies introducing new laws or reinterpreting non-fracking energy extraction legislation to “ensure that EU environmental rules are adequate for this relatively new activity of ‘fracking’ (European

Commission 2012b: 1).” Fracking policy falls under the guidance of the Directorate General of the Environment in the Commission, and not Energy or Industry, which reflects the EU’s commitment to have “a robust regulatory regime” unparalleled in the world (Kanter 2013). EU fracking policy is constantly in flux. At this point in time, member states maintain sovereignty over fracking policy, while Brussels introduces best practices through regulations as a result of the European Parliament resolution.

4. Policy by Country

4.1 United Kingdom

The United Kingdom and the Conservative government of Prime Minister David Cameron have become one of the greatest supporters of fracking in the EU. In an op-ed addressed to his home country, David Cameron wrote, “Fracking has become a national debate – and it’s one that I’m determined to win (Cameron 2013).” Citing lower energy bills, a catalyst for job creation, and the influx of money that would reach local neighborhoods, Cameron did not ask his people to keep an open mind to fracking. Instead, he made his position unequivocally clear that the United Kingdom cannot afford to miss out on this untapped energy source.

The UK Department of Energy and Climate Change released a report that estimated Northern England has nearly 1,300 trillion cubic feet of shale gas, double which was previously estimated (Shale Gas Europe 2013c). The amount of technically recoverable shale gas is still unknown, but the U.S. EIA conservatively estimated this number to be twenty-six trillion cubic feet. A government commissioned report recently stated as many as 2,800 wells could be fracked in the country, spanning across almost half of Britain (Gosden 2013). Some of the areas that will be offered to companies to explore for shale gas and oil on the United Kingdom include national

parks and sites designated to conserve wildlife and Britain's natural beauty (Gosden 2013). Additionally, the report stated there could be between 14 and 36 trucks a day traversing through nearby communities for roughly three months during the exploration phase and upwards to fifty-one a day during the 145 week production period thereafter.

4.2 France

In 2011, France and its center-right Union for a Popular Movement (UMP) government, led by President Nicolas Sarkozy, became the first country in the world to place a nationwide ban on fracking hydrocarbons. The succeeding Socialist government and current President Francois Hollande upheld the ban, promising to continue this course throughout his presidency. Both the left and center-right governments have claimed environmental protection as the foremost reason why shale gas is not being explored.

Analysts estimate France possesses the second greatest amount of shale gas in Europe, mostly concentrated in the south. Business groups have relentlessly lobbied Paris to overturn the ban, claiming fracking would help reverse France's industrial decline, improve competitiveness with cheaper energy prices, and lower unemployment (Energy Market Price 2013). Despite this, environmental protection of the French countryside and farmland has triumphed corporate interests thus far.

4.3 Romania

Romania has been an oil and natural gas producer since the 19th century, and diverse natural resources have made it one of the more energy independent countries in Europe. A recent U.S. EIA study concluded that Romania could possess the third-largest shale gas deposits in Europe behind France and Poland, enough to meet domestic needs for one-hundred years (U.S.

EIA 2013: 6). In 2011, when in opposition, the current Prime Minister Viktor Ponta and his Social Democratic Party (PSD), proposed a draft law demanding a complete ban against the fracking industry (Besliu 2013). Along with vocal citizen disapproval of the industry, the PSD pressured the Civic Force government to implement a fracking moratorium, which was implemented in May 2012. Once the PSD assumed control of government in December 2012, Ponta and the PSD lifted the temporary moratorium against fracking and rejected their own draft law (Shale Gas Europe 2013b). Since this policy reversal, domestic opposition and protests have been widespread throughout Romania, culminating in the U.S. energy firm Chevron suspending its exploration drilling in the village of Pungesti (Reuters 2013). Local villagers squatted the privately owned drilling site to deter Chevron from resuming operations. Romanian police eventually removed the occupiers and Chevron proceeded to commence drilling in the area (Reuters 2013).

4.4 Bulgaria

Fracking policy in Bulgaria has also been a contentious issue. A fracking moratorium was issued in Bulgaria in January 2012 in response to domestic protests spearheaded by local residents and environmental groups. Prior to the proposal, thousands of demonstrators protested on the streets of Sofia and the region of Dobrudzha where Chevron was set to drill (Agence France-Presse 2012). The originally pro-fracking, conservative Citizens for European Development of Bulgaria (GERB) government controlled the National Assembly at the time of voting. Surprising to many analysts, Bulgarian lawmakers reversed course, revoking Chevron's drilling permit and overwhelmingly voted 166-6 to impose a fracking moratorium in the Balkan country (Konstantinova and Carroll 2012). The current Coalition for Bulgaria government, led by the Bulgarian Socialist Party (BSP), has supported the fracking moratorium.

5. Literature Review

The purpose of this section is to contextualize the various dimensions of energy security and provide understanding on why certain energy strategies are pursued in political circles. Energy security is a multidimensional concept that involves the interaction of technical, geopolitical, economic, environmental, and social factors. The prevailing definition of energy security that is generally accepted, but interpreted differently by all, is “the availability of sufficient supplies at affordable prices (Yergin 2006: 70-71).” The European Commission’s interpretation of energy security closely mirrors this definition stating:

The European Union’s long-term strategy for energy supply security must be geared to ensuring, for the well-being of its citizens and the proper function of the economy, the uninterrupted physical availability of energy products on the market, at a price which is affordable for all consumers, while respecting environmental concerns and looking towards sustainable development.

(European Commission 2000:2)

Factors that affect energy security, and therefore energy policy, typically fall into the elements of availability (geological), accessibility (geopolitical), affordability (economical), and acceptability (environmental and societal) (APEREC 2007; Kruyt, van Vuuren, de Vries, and Groenenburg 2009: 2167). The interplay between these four elements provides tremendous explanation into why certain energy policies are pursued by member states. These dimensions will provide the basis for the alternative explanatory variables that are tested later on in the paper.

5.1 Availability

The availability of supply, the geological or natural elements of energy, is the most basic element of energy security. A finite amount of fossil fuel reserves exist in the world and not all

deposits can be exploited. As noted before, there is a difference between shale gas reserves, technically recoverable reserves, and economically recoverable reserves. No two shale gas basins are identical and only a fraction of rock beds have been explored, leaving the quantity of economically recoverable reserves unknown. Countries with abundant energy resources will certainly have different energy policies than countries with limited fossil fuels or environments hospitable to renewable energy. In terms of shale gas, all countries in the study have an attractive amount of reserves in the ground. While variation does exist between the size and geology of the four countries' reserves, this variable will be held constant.

5.2 Accessibility

Accessibility refers to the geopolitics of energy supply. The EU relies on neighboring and Middle Eastern countries to supply over half of its energy supply because the continent's conventional reserves are depreciating. Securing energy supply for a country differs, depending on its system of supply corridors (all actors involved in the extraction, refinement, handling, and delivery); its domestic demands and energy dependence on foreign suppliers; and the geopolitical relationship with producing and transit countries (Escribano and Garcia-Verdugo 2012: 29). Daniel Yergin takes this one step farther, claiming states must consider the physical security of these corridors whether the threat comes from natural disasters, terrorist attacks, cyber sabotage, or inter or inner-state warfare (Yergin 2011: 266-267). Moreover, countries have dissimilar abilities to develop and acquire energy because of commercial limitations and foreign policy relations with supplying and transiting states.

Two strategies a nation-state can use to decrease vulnerability and dependence is through diversification and energy independence. The EU can become less vulnerable to energy crises if

it diversifies the number of supply corridors. Given that Russia holds 17.6 percent of proven gas reserves and Middle Eastern countries hold 48.1 percent of proven oil reserves, diversification proves to be one of the greatest challenges for the EU (BP 2013: 20). EU member states cannot change geology or geography, but they can invest in infrastructure to open new channels of supply and diversify the number of suppliers and transit areas they are importing energy from.

Diversification can decrease vulnerability, but this strategy does not improve dependency. Europeans do not live on a treasure trove of fossil fuels, so most EU members states will remain importers of natural gas, coal, and oil for the foreseeable future. Countries can reduce dependence on foreign suppliers in a few ways. EU member states can produce more domestic energy through investment in renewables, nuclear energy, and now fracking. Governments can change consumer behavior through taxation and other measures and improve energy efficiency (Umbach 2008: 15). Lastly, the EU can enhance its common energy market and invest in an integrated infrastructure to make better use of the available energy resources.

5.3 Affordability

Affordability is another element politicians have to consider when determining energy policy. This component generates the most attention and scrutiny from voters and businesses alike. The price of energy, in most cases, acts as the greatest indicator for government and industrial elites in determining energy sources. Energy is a substantial portion of household and companies' expenses. With high energy prices, families spend less on other consumer products and businesses lose competitiveness. Opting for the cheapest energy is not always plausible in a developed country because these energy sources are often dirty fossil fuels and concentrated in one energy carrier. While keeping in mind the other components of energy security, government

must do everything in its power to lower energy bills in order to keep households satisfied and businesses competitive.

5.4 Acceptability

The EU's inclusion of environmental responsibility and sustainable development into the standard definition of energy security emphasizes the evolving nature of energy security.

Democratic countries can no longer separate environmental policy and energy policy. The EU is at the forefront of promoting sustainable energy policies as all member states agreed to reach the most ambitious climate and energy targets to date known as the 20-20-20 plan. The key objectives of this plan are to reduce EU greenhouse emissions by twenty percent from 1990 levels; to raise the share of EU energy consumption produced from renewable sources to twenty percent; and improve the energy efficiency in the EU by twenty percent - all by 2020.

Party competition and the political landscape of countries greatly affect energy policy-making. Dismissed by many neo-realists and theorists of energy security, policy is going to vary as a result of a party's ideological creed or national outlook. Governments are comprised of politicians and parties that are representative of the domestic populace and seeking re-election. Each EU member state has a unique political space and party cleavages.

Many scholars argue European parties compete along a two-dimensional space with one dimension reflecting the traditional left versus right socioeconomic dimension and the vertical dimension consisting of non-economic factors (Marks et al. 2006). On the left versus right spectrum, the left prioritizes economic equality and the right prioritizes individual economic freedom. The second, non-economic dimension has gained credence since the 1970s as the left versus right dimension did not capture the totality of party competition (Marks et al. 2006). The

non-economic social dimension encompasses ecological, lifestyle, and communal ideologies and this dimension varies across countries and especially between the West and the East (Marks et al. 2006). The poles of this dimension are green/alternative/libertarian (GAL) and traditionalism/authority/nationalism (TAN). The GAL-TAN construction was partially a result of the emergence of the green party in the 1980s. Environmental initiatives did not fit along the left versus right dimension, which led to green issues constructing a new source of partisan polarization and a potential new dimension (Dalton 2008: 10). Once green parties across Europe gained an electoral base, party leadership shifted their economic position and are now more consistent with existing party alignments along the GAL-TAN dimension (Dalton 2008: 10).

Greens have been able to join governing coalitions as a minority partner in both regional states and countries, and have become well represented in the European Parliament. Green parties have certainly realigned the political space and created more salience around environmental issues in countries in which they have a presence. Protecting and conserving the planet is one of the foundational values of the party and they have become vocal campaigners against fracking in Europe.

These four interconnected and multidimensional elements are paramount in shaping fracking policy as countries strive to produce cheap, domestic energy to reduce dependency and vulnerability and please its electorates. A well-balanced energy mix that reduces price and supply risk and improves competitiveness remains the central aim of policy-makers. As we will see, each country has its own constraints and conditions to secure energy supply, which will affect fracking policy.

6. Data and Findings

This section will test several alternative explanatory variables to determine what causes the variation found in EU member states fracking policy. EU member states have not followed a universal strategy on whether or not to exploit shale gas reserves. Countries differ greatly in their size of shale gas deposits, and even more so in having the capability to make the reserves commercially accessible. The four countries in this study, nevertheless, have all attracted interest because multinational energy corporations determined that profits could be reaped if fracking were permissible. Moreover, protests against fracking have been widespread in all four countries. The politicians of Bulgaria and France have decided not to explore their respective reserves because of the environmental risks that fracking implies; meanwhile, the United Kingdom and Romania have issued concessions for exploratory drilling. Even though this country list is short, testing several independent variables will provide clarity to why countries pursue different strategies.

6.1 Energy Prices

Energy prices are only one expense that households and businesses have to plan for, yet gas and electricity bills receive a disproportionate amount of attention. Consumers often demand rash policy changes that will alleviate energy bills and depreciate costs. Whether these policies are price subsidies, tax cuts, or by increasing supply, citizens will pressure politicians to find short-term solutions to alleviate the bills or turn to the ballot box to find someone who will. Energy prices fall under the affordability component of energy security and often this element supersedes the other aspects of energy security.

Hypothesis 1a: Member states with high electricity prices will be more likely to permit fracking than member states with low electricity prices.

Table 1: Electricity Prices

Country	Electricity Price in Households Real Prices Excluding Taxes (EUR/100 KWh)	Electricity Price in Industry Prices Excluding All Recoverable Taxes (EUR/100 KWh)
EU Average	15.7	11.1
UK	15.8	10.4
France	12.2	7.2
Bulgaria	8.7	6.7
Romania	10.9	8.0
European Commission (2012a): 88. *2011 Second Semester Data		

Results 1a: The European Commission data indicates the United Kingdom has significantly higher household and industry electricity prices than the other three countries, which suggests a positive relationship with the hypothesis. French industry prices are highly competitive, supporting the hypothesis as well. Romania has lower electricity prices than France, undermining the hypothesis. When comparing the two poor, southeastern member states, however, Bulgaria's extremely low prices may explain why Sofia opted not to allow fracking and Bucharest did.

Hypothesis 1b: Member states with high natural gas prices will be more likely to permit fracking than member states with low natural gas prices.

Table 1b: Natural Gas Prices

Country	Natural Gas Price in Households Real Prices Excluding Taxes (EUR/GJ)	Natural Gas Price in Industry Prices Excluding All Recoverable Taxes (EUR/GJ)
EU Average	16.6	7.7
UK	14.5	10.4
France	17.5	10.5
Bulgaria	13.1	8.8
Romania	5.5	6.9

European Commission (2012a): 90.
*2011 Second Semester Data

Results 1b: Of the four countries, the French Republic hosts the highest household and industry gas prices, while prices in Romania are substantially lower than the others. The data shows that a complete reversal occurred to what the paper had hypothesized.

6.2 Dependency Ratios

Countries that rely heavily upon foreign suppliers are in theory more vulnerable to energy supply cut-offs. This resonates more with natural gas because the source is not yet a global commodity where supply can easily meet demand if there are disruptions. All countries unrealistically strive to become energy independent; nevertheless, some European countries see fracking as a means to achieve this in the short to medium term.

Hypothesis 2a: Member states with high natural gas import ratios will be more likely to permit fracking than member states with low energy import ratios.

Hypothesis 2b: Member states with high electricity import ratios will be more likely to permit fracking than member states with low energy import ratios.

Table 2: Dependency Ratios

Country	Natural Gas Dependency (%)	Net Imports of Electricity GWh
EU Average	62.4	3,455
UK	37.7	2,663
France	93.0	-30,749
Bulgaria	95.1	-8,446
Romania	16.8	-2,274
European Commission (2012a): 34, 48. *2011 Second Semester Data		

Results 2a: The fracking countries of the United Kingdom and Romania have among the lowest natural gas dependency ratios in the EU. Therefore, there is no relationship between high gas dependency rates and fracking policy.

Results 2b: There appears to be a relationship between fracking policy and imports of electricity. France and Bulgaria possess a tremendous amount of surplus electricity, which would reduce the need for another source. Weakening the relationship is Romania as Bucharest is a net exporter of electricity. The United Kingdom, meanwhile, is a net importer.

6.3 Import Diversification

Member states can decrease vulnerability to energy crises if they diversify the number of supply corridors. Given that Russia holds 17.6 percent of proven gas reserves in the world and is geographically neighboring the EU, diversification proves to be one of the greatest challenges for member states (BP 2013: 20). Russia proves to be an unreliable energy partner as Moscow has disrupted natural gas supply to Europe several times and has engaged in military conflicts with Ukraine and Georgia. While analysts debate if the EU-Russian energy relationship is a one-sided dependence or a mutual interdependence, Russia maintains tremendous short-term leverage in the Eurasian energy market as the dominant supplier. Dependency rates within the EU are tremendously asymmetrical. Twelve EU member states receive more than half of their total

natural gas consumption from Russia, while nine members are completely independent from Gazprom (Ratner 2013: 13). Moreover, the 2011 Arab Spring uprisings confirmed the inherited risk that importing from North Africa entails. Member states ideally would import natural gas outside of North Africa and Russia, but this is difficult to achieve because of the limited number of suppliers in the region that can deliver affordable supply.

Hypothesis 3: Member states highly dependent on Russian or North African natural gas supply will be more likely to permit fracking than member states less dependent on Russian or North African gas supply.

Table 3: Import Gas Vulnerability

Country	% of Natural Gas Consumption originating from Russia*	% of Natural Gas Imports Originating from Russia*	% of Natural Gas Imports from North Africa**
EU Average	43.8	NA	NA
UK	0.0	0.0	2.8
France	17.2	13.6	20.9
Bulgaria	100	100	0.0
Romania	24.2	100	0.0

(IEA 2012: IV179, IV397) (Ratner 2013: 10)
 *2012 Data
 ** 2011 Data

Results 3: Hypothesis three is falsified as the United Kingdom only imports 2.8 percent of its energy from the turbulent regions of Russia and North Africa. Additionally, the anti-fracking member state of Bulgaria imports one-hundred percent of its domestic natural gas consumption from Russia. All of Romania’s imports originate from Russia, but Romania produces more than three-fourths percent of its own need.

6.4 Green Party Representation

Green parties have mixed electoral success across Europe depending on a variety of factors. Countries with plurality voting systems and single member districts generally have fewer parties represented in government compared to parliamentary representative democracies. Green parties in Western Europe have more established roots than in the former Communist states. The transnational European Green Party has clearly outlined its fracking position, stating, “(Fracking) is a harmful way to extract fossil fuels. We’ll continue to fight against it, and try to ban it across the EU (European Green Party 2014).”

Hypothesis 4: Member states with green party representation in legislature will be more likely to restrict fracking than countries without green party representation.

Table 4: Green Party Representation

Country	Election Year before Constructing Fracking Policy	Green Party in National Government at time of Fracking Policy Formulation	Green Party Representation in National Parliament
United Kingdom*	2010	No	1/655 MP
France**	2007	No	4/577 MP
Bulgaria	2009	No	0/240
Romania	2012	No	0/588
			(UK Parliament 2014)* (Election Resources 2014)**

Results 4: There is no relationship between green party representation and fracking policy. None of the countries had a green party in the national government at the time of policy formation and the number of parliamentarians in the United Kingdom and France was miniscule.

6.5 Free Market Ideology and Social Ideology

A plausible explanatory variable for why some member states might support fracking more than others is a country’s ideological positioning on the two-dimensional economic and

social spectrums. The *Political Parties: Chapel Hill Expert Survey* measures positioning of parties on the traditional left versus right economic dimension and the social GAL-TAN vertical dimension (Bakker et al. 2012: 10). The parties are given a score between zero and ten by political experts in the country. The end values are the aggregate scores of all parties from the respective countries. States with a more economically right-leaning political position may opt to promote industry at the expense of risking environmental destruction. Moreover, countries closer to the GAL pole of the GAL-TAN vertical dimension tend to be more environmentally friendly and postmaterialist and might be more likely to restrict fracking.

Hypothesis 5a: Member states with high levels of free market ideology will be more likely to permit fracking than member states with low levels of free market ideology.

Hypothesis 5b: Member states that align closer to the TAN pole are more likely to permit fracking than member states closer to the GAL ideology.

Table 5: National Party Ideology

Country	Economic Left/Right Placement (SD)	GAL-TAN Placement (SD)
UK	4.84 (1.24)	4.81 (1.31)
France	4.24 (1.56)	4.98 (1.59)
Bulgaria	5.09 (1.77)	6.48 (1.74)
Romania	4.94 (1.44)	5.93 (1.68)
2010 Data (Bakker et al. 2012: 10) SD=Standard Deviation		

Results 5a: When evaluating the data for economic left/right party positioning, there appears to be no correlation between economic ideology and fracking policy. France favors government

intervention more than the United Kingdom, which would support the hypothesis, but Bulgaria scores higher on free market ideology than the other three countries.

Results 5b: The GAL-TAN hypothesis does not indicate any relationship to the dependent variable. It is noteworthy that Bulgarian parties are perceived as the most authoritarian leaning in the entire EU and are substantially distanced from the green, postmaterialist pole.

6.6 Public Opinion

Public opinion should be a strong independent variable because these states are all democracies. Public opinion statistics can be misleading for a variety of reasons. Respondents from cities who are far removed from the environmental repercussions of fracking would be more likely to support fracking than a rural farmer near the drilling rigs for instance. There are also questions related to cueing and when the poll was taken. Did the polling occur before or after policy implementation? Was there sound statistical methodology being performed in the polls? Cross-country public opinion polls were difficult to come by. A University of Nottingham survey polled British citizens, asking them the question, “Should shale gas exploration be allowed in the UK?” Fifty-four percent of respondents said ‘yes’ (O’Hara 2014). In France, a 2013 Harris poll asked if shale gas should be incorporated into France’s energy transition. Proving to be more averse than the Brits, only thirty percent of French citizens and twenty-three percent of French business leaders consider fracking to be “compatible” with issues related to the transformation of the energy system (Werth 2013). In Romania, three towns in Dobrogea were given an unofficial referendum to determine whether fracking should be permissible in the region. Only one village, Costinești, met the designated voter threshold, resulting in 94.4 percent of the villagers opposing fracking (Ionescu 2013). The other two villages that did not meet the

required number of participants had similar results. No polls related to fracking were found in Bulgaria.

A Eurabarameter poll in 2012, asked, “If a shale gas project were to be located in your neighborhood, do you think you would be”: “very concerned”, “fairly concerned”, “not very concerned”, “not at all concerned”, and “don’t know”. This question has its limitations because it does not specifically address a person’s overall view towards fracking. Most respondents would be opposed to conventional drilling operations in their neighborhoods. Nevertheless, the data may provide plausible explanations for why the countries pursued dissimilar shale gas policies.

Hypothesis 6: Member states with high levels of public opinion against fracking will be less likely to permit fracking than member states whose public opinion are relatively supportive to fracking.

Table 6: Public Opinion

Country	Very Concerned	Fairly Concerned	Not Very Concerned	Not at all Concerned	Don’t Know
UK	42	35	13	7	3
France	54	35	6	3	2
Bulgaria	50	28	10	8	4
Romania	42	31	14	7	6

(European Commission 2013: 106)

Results 6: The results highlight the two anti-fracking countries, France and Bulgaria, have higher “very concerned” scores than the two fracking countries, suggesting a strong relationship between public opinion and fracking policy. When aggregating the percentages of “very concerned” and “fairly concerned”, France is clearly the most opposed to fracking at 89 percent and Romania is the lowest at 73 percent. The United Kingdom and Bulgaria have similar responses at 77 and 78 percent, respectively.

6.7 Environmental Protection Expenditure and Taxes

Countries that prioritize environmental expenditure and tax objects that are harmful to the environment might indicate a country's commitment to the environment and green policies. The environmental protection expenditure variable is the amount of money, as a percentage of GDP, allocated to activities directly targeting the prevention, reduction, and elimination of pollution or any other degradation to the environment (European Commission 2012a: 227). "Environmental taxes are taxes whose tax base is a physical unit of something that has a proven, specific negative impact on the environment (European Commission 2012a: 228)."

Hypothesis 7a: Member states with high levels of public expenditure and investment towards environmental projects will be less likely to permit fracking than countries with low levels of public expenditure and investment towards environmental projects.

Hypothesis 7b: Member states with higher environmental taxes will be less likely to permit fracking than countries with lower environmental taxes.

Table 7: Environmental Protection Expenditure and Taxes

Country	Environmental Protection Expenditure % of GDP*	Environmental Taxes (% of GDP)**
EU Average (2009)	2.25	2.37
UK (2008)	.29	2.62
France (2009)	2.16	1.86
Bulgaria (2009)	1.74	2.92
Romania (2009)	2.67	2.05
		(European Commission 2012a: 214)*
		(European Commission 2012a: 202)**

Results 7a: Comparing the United Kingdom and France, Paris spends drastically more on environmental protection than London, which would imply a strong relationship. However,

Romania stymies this hypothesis by having the highest environmental protection expenditure relative to GDP in the country list.

Results 7b: There is no relationship between environmental taxes as a percentage of GDP and fracking policy. Bulgaria has the highest percentage of environmental taxes, while France taxes the lowest on such objects, the opposite of what the hypothesis prescribed.

6.8 Diversity of Energy Mixes

The energy mix of a member state reflects the interaction of the four elements of energy security. While political leadership is striving to attain a continuous energy supply at affordable prices, several constraints and conditions alter this strategy as the paper has described. Countries cannot alter which resources are abundant and exploitable, but they can create a business climate that attracts investment and pursues policies that improve the security of supply. For the diversity of energy mix, Winston Churchill's decree on energy security, "variety, and variety alone," still stands as a central strategy for governments in reducing vulnerability to supply disruptions (Yergin 2011: 716).

Diversity of energy mix is a leading indicator of energy security, and there are many scenarios that can steer policies in a particular direction. Countries dependent upon coal and lignite, for instance, may be pressured to pursue more renewable energy options in order to meet the EU's 20-20-20 goals. Moreover, countries with favorable wind and solar conditions may be more willing to phase out natural gas and nuclear energy because of the potential in renewable energy. Labeling a country's energy mix as secure or insecure is highly subjective, unless one source of energy is providing an overwhelmingly amount of energy, thus no hypothesis will be included. This variable will provide insight into further analysis later on.

Table 8: Gross Inland Consumption by Fuel

Share of Each Fuel to Total Consumption (%) 2010						
Country	Oil	Natural Gas	Coal	Nuclear	Renewables	Lignite
UK	45	40	14	8	3	0
France	31	16	4	41	8	0
Bulgaria	23	13	11	22	8	28
Romania	26	30	3	8	16	16
European Commission (2012a): 40. *2011 Second Semester Data						

Results 8: When evaluating the energy mixes of the four member states, all countries have a decently diversified portfolio. There are a few statistics that convey changes will eventually need to be made with the current and future policies. In the United Kingdom, there is tremendous civic pressure to reduce the British carbon footprint. The United Kingdom has a national target of fifteen percent of energy coming from renewable resources by 2020, which appears distant at this point with Britain producing just 3.8 percent (European Commission 2014: 10). London is increasing nuclear energy supply; the implication being coal consumption will reduce. France, conversely, is looking to diversify away from nuclear energy, so new electricity sources will need to fill this void. Paris has a 2020 national renewable energy target of twenty-three percent of gross inland consumption (European Commission 2014: 10). Bulgaria will be looking to phase out the dirty fuels of coal and lignite, which produce thirty-nine percent of the country's energy need. This will need to be achieved by importing more natural gas from the South Stream pipeline from Russia (if constructed); producing domestic gas by conventional or unconventional drilling; or building more nuclear reactors. Lastly, Romania has a well-balanced energy portfolio, but will need to eventually reduce energy consumption away from lignite.

7. Analysis

The qualitative statistical analyses of the independent variables suggest several interesting explanations as to why the four member states pursued the fracking policies that they did. A few facts were known before testing. Three center-right parties were in control of the legislature in France, the United Kingdom, and Bulgaria. Paris and the UMP party banned fracking. The United Kingdom and the Conservative party became vocal supporters of the drilling technique, and the GERB party of Bulgaria switched its original, pro-fracking position and introduced a moratorium against fracking. When the Socialist Party in France came into power, President Hollande followed Sarkozy's course and kept the fracking ban. On the other hand, the once, anti-fracking Social Democrats in Romania are now pro-fracking. Green party representation in all four countries was negligible.

After evaluating the data, France and the United Kingdom, unsurprisingly, tend to have similar data points with one another, while Romania and Bulgaria's data group together as well. Comparing France and the United Kingdom, there are three interesting independent variables that provide clarity into why the countries pursued the policies that they did. Public opinion and price of electricity indicate the French are more opposed to fracking than the Brits, and France has much lower electricity prices than the United Kingdom. France also exports an extraordinary amount of electricity while Britain is a net importer.

A second interesting aspect of the results is that almost all energy security indicators suggest Bulgaria would permit exploration of its shale gas reserves when comparing the country to Romania. Bucharest is highly dependent upon Russian natural gas reserves and suffers from high natural gas prices. Half of Bulgarians are "very concerned" about fracking, so it is possible

democracy is running its course in Bulgaria's environmental policy. A third standout observation is Romania no longer has a mainstream party opposing shale gas, even though there are widespread grassroots movements against fracking. Romania has a long established history of extracting hydrocarbons and the variables suggest this path will go unaltered. All of these observations will need to be evaluated more thoroughly. Comparing the data of the United Kingdom to France, and Romania to Bulgaria, will be useful to help discern why the countries pursued the fracking policies that they did.

7.1 Comparative Analysis of the United Kingdom and France

The center-right governments of the United Kingdom and France chose divergent strategies towards securing long-term energy supply vis-à-vis shale gas. The question is, why did France decide to halt fracking operations to safeguard the environment and the United Kingdom did not? Both countries had negligible green party opposition who could hold legislation hostage in return for a fracking suspension. The collective ideology of French political parties on economic issues slightly favored more government intervention than the United Kingdom's. The UK's political parties, however, aligned closer to the GAL pole on the social dimension, suggesting the Brits might subscribe to more of an environmental ideology. The results show the United Kingdom taxes more on objects that negatively impact the environment than France, but there is substantial variation in public expenditure in environmental protection projects as the United Kingdom spends the smallest amount in the EU in relation to GDP.

The energy security indicators suggest both countries could benefit from an increase in natural gas supply. Britain holds a very favorable dependency ratio, producing nearly seventy-five percent of its own energy, leaving the country less vulnerable to foreign supply cut-offs

from North Africa and Russia (European Commission 2011b: 24). Unfortunately, for Britain, conventional domestic resources are depleting rapidly. Natural gas output in the United Kingdom is at its lowest since 1985 and oil reserves have peaked in the North Sea. British oil production fell under one million barrels per day for the first time in 2013 (Richards et al. 2013: 2).

Paris, too, could benefit from shale gas production. France imports 97.7 percent of oil consumption, 91.7 percent of coal consumption, and 100.9 percent of natural gas consumption (European Commission 2011b: 24-30). The country maintains a favorable overall dependency ratio because of its extensive nuclear industry, producing almost half of its own energy requirements. This feature is expected to change. In September 2012, to diversify the domestic electricity mix, President Hollande announced France would decrease nuclear production from seventy-five percent of its electricity mix to fifty percent by 2025 (Boselli 2013). With absolute dependence on foreign gas reserves and a nascent, renewable energy industry, many are skeptical about what sources of energy will fill this void if it is not domestic shale gas.

The primary reasons why France became the first country in the world to ban fracking, and the United Kingdom ramped up its drilling activity, are because of the discrepancies in public opinion and electricity prices. According to a 2013 Harris public opinion poll in France, less than a third of respondents believed shale gas should be incorporated into the country's energy transition (Werth 2013). In comparison, a University of Nottingham poll revealed fifty-four percent of British respondents say they would support fracking (O'Hara 2014). It should be noted that the Cameron government has lobbied and pleaded for this support, while the French elites have cued the populace that fracking is not suitable to the country's interests. The same University of Nottingham poll shows the more Brits learn about fracking, the more opposed they are to the drilling technique. Furthermore, in the Eurobarometer poll, when EU citizens were

asked, “If a shale gas project were to be located in your neighborhood, do you think that you would be,” French respondents were the most averse to this question with 89 percent responding “very concerned” or “fairly concerned” compared to the Brits’ 77 percent (European Commission 2013: 106).

The French government can more adequately respond to public opinion and claim environmental protection, as opposed to the United Kingdom, because of low, stable electricity prices. Electricity prices are substantially higher in the United Kingdom than in France. In second semester data of 2011, industry electricity prices (EUR/100 kWh,) excluding all recoverable taxes, were 10.4 cents in the United Kingdom and 7.2 cents in France, the second lowest in the EU (European Commission 2012b: 88). Relative to purchasing power, average electricity prices in euros/kWh (2011 PPP) for the United Kingdom was 15 cents compared to 12 cents in France (Wilson 2013). Moreover, household energy bills have increased seventy percent from 2004 levels in the United Kingdom and British energy leaders have warned that household energy bills could rise by fifty percent over the next six years (Macalister 2013).

Reports conflict on whether fracking will actually reduce energy prices in the United Kingdom, but Prime Minister David Cameron has stated, “fracking has real potential to drive energy bills down....even if we only see a fraction of the impact shale gas has had in America, we can expect to see lower energy prices in this country (Cameron 2013).” Price shocks have been less frequent in France because of its stable supply of electricity coming from nuclear energy. Over fifty French nuclear reactors enable the country to export 30,449 gigawatt hours of electricity, allowing Paris to be among the top electricity exporters in the world (European Commission 2012: 48). The tremendous excess in electricity supply does not necessitate France to look for additional electricity sources. France does have higher natural gas prices than the

United Kingdom, but the amount of gas in the energy mix in France is substantially less than its English Channel counterparts. Rising energy prices have become more of a contested topic in the British political debate than in France, consequentially leading to the Conservative Party in the United Kingdom framing fracking as a way to cut the electricity bill. France has had the flexibility to become an environmental steward against fracking and respond to public opinion because of stable, cheap electricity prices produced by nuclear energy.

7.2 Comparative Analysis of Romania and Bulgaria

Civil protests against the fracking of shale gas have been widespread in both Romania and Bulgaria. Demonstrators have organized sit-ins at Chevron's drilling areas in the two member states, hoping to cease fracking in the region's fertile farmlands. The Bulgarian elites responded to public opinion and reversed its fracking course, suspending all operations, or at least this is what is portrayed by the government and media. This explanation might be credible, but when comparing the situation with Romania and the energy security position of Bulgaria, it appears much more is transpiring behind the scenes.

Romania, on the other hand, continued with its shale gas exploration plans after a temporary moratorium against fracking was lifted in May 2013. Since Prime Minister Victor Ponta announced this reversal, citizens have been quite active in voicing their concerns (Besliu 2013). Chevron was forced to suspend its operations momentarily in December of 2013 as a result of a local demonstration in the small town of Pungesti. Romanians, once again, voiced their concern to Bucharest when 94.4 percent of the villagers from Costinești voted against fracking in a local referendum (Ionescu 2013). Additionally, over 8,000 Romanians publically protested against fracking throughout 2012 and 2013, calling for increased transparency of

operations and for a moratorium until more information was available (Besliu 2013). Less worrisome than the French and Bulgarians, Romanians are still relatively concerned about shale gas projects as seventy-two percent of respondents of the Eurobarometer survey said they would be “very concerned” or “fairly concerned” if fracking were to take place in their neighborhood.

Evaluating the economic and energy security position of Romania, it appears the country could benefit from shale gas exploitation. The country has significantly higher household electricity prices compared to Bulgaria and other Eastern European countries. Romania does enjoy low natural gas prices because of its robust natural gas industry, but increasing production is necessary to keep prices level, given that Russia provides almost a quarter of Romania’s natural gas consumption. The two major parties of Romania are now fully supportive of the industry because of the economic benefits fracking can bring, even though the population is largely skeptical. This leaves minimal democratic channels open for citizens opposed to fracking. It is not surprising to see a former Communist and underdeveloped country, with questionable democratic legitimacy and extensive corruption, prioritize economics over the environment. What is surprising is Bulgaria’s two major parties are now supporting anti-fracking legislation.

Tapping into Bulgaria’s shale gas deposits could provide substantial benefits for the country in terms of job creation, reducing dependence on Russia, stabilizing energy supplies, contributing much needed revenue funds to support a range of government initiatives, and supporting economic growth. Natural gas currently comprises only eleven percent of the energy mix for Bulgaria, but Sofia relies upon Russia for nearly the entirety of it (European Commission 2011: 36, Ratner 2013: 10). Bulgaria’s vulnerability to Russian muscling was exposed after the 2009 Ukrainian gas crisis necessitated Sofia to find alternative gas suppliers in the dead of winter.

Bulgarian elites face difficult choices on how best to pursue energy security strategy in the years ahead. Bulgaria could benefit from increased market competition through domestic production and gain autonomy in the energy sector in the long-term by undermining Russia's dominant position in the market. The country, however, hosts the lowest household electricity prices in the EU because of its privileged relationship with Russia (Eurostat 2013: 2).

Considering this dichotomy, did Bulgarian parliamentarians vote almost unanimously to suspend fracking operations because of the citizens' desire for ecological protection? Half of Bulgarians polled in the Eurobarometer survey claimed they would be "very concerned" if fracking was to take place in their neighborhood. Bulgaria has higher tax rates on physical units that have a negative impact on the environment than the average rate in the EU. Conversely, Bulgaria allocates almost a full percentage point of GDP less to environmental protection projects than Romania. Both Romania and Bulgaria have a higher than average free market ideology and lean more to the TAN pole than the GAL pole compared to other member states. Evaluating the statistics aggregately, it appears Bulgaria and Romania do have a modest ecologically conscious society, but this does not adequately explain why the originally pro-GERB government in Bulgaria voted for a moratorium against fracking and the originally anti-fracking SDP government in Romania now supports the drilling technique.

Gazprom and the Russian lobby are significant players in shale gas policy at the EU and member state level (Buisset, Øye, and Selleslaghs 2012: 9). Ivan Sotirov, member of the Bulgarian National Council and former Senior Advisor to the Bulgarian Minister of Foreign Affairs, insisted Gazprom manipulated the government into placing a moratorium on shale gas rather than the claimed notion of democratic legitimacy. His proclamation for why the once pro-fracking center-right government flip-flopped was because,

The ostensibly rightist majority at the National Assembly has capitulated, without any serious arguments, to this pseudo-civic pressure, and has adopted a moratorium on prospecting and extracting shale gas in Bulgaria... The most shameful fact is the realization that after 22 years of democracy Bulgaria's policy continues to be dictated by oligarchic pro-Russian circles, which, hiding behind nationalistic and ecological rhetoric have not allowed a single serious strategic Western investor to set a foot in Bulgaria.

(Daly 2012)

The main opposition party at the time of voting and current leader of the present governing coalition - the BSP - is perceived as pro-Russian. This is not surprising since the party evolved from the Bulgarian Communist Party after 1990. Moscow has been quite outspoken against Bulgarian fracking operations as Russia's revenue from its energy sector would be significantly hindered. President Putin has relentlessly pursued regional hegemony in Russia's near-abroad throughout his tenure. Gazprom, at the time of voting in Sofia, was negotiating several gas contracts and pipelines with Bulgaria, namely the South Stream pipeline, which was competing against the non-Russian Nabucco Pipeline. Fracking Bulgarian shale gas deposits would challenge Russian power, especially since a U.S. company had the concession rights to some of the promising shale gas prospects in question. Further alleging Russian-Bulgarian corruption, Sotirov claimed the three parliamentarians who led the anti-fracking campaign in the National Assembly were from the BSP and held the closest ties to Gazprom (Duhme 2012).

While Sotirov is just one outspoken National Assemblymen, U.S. Ambassador James Pardew supports Sotirov's accusation, when he wrote in a leaked U.S. cable detailing the ramifications if the BSP won the 2005 elections, "The one area where Russia's influence is likely to grow if the BSP takes power is in the economy. Most Bulgarian companies with Russian business ties are aligned with the BSP, especially in the energy sector (Pardew 2005)." The BSP is not the lone social group in Bulgaria to be perceived to have less than democratic ideals in the energy sector. Transparency International revealed the public sector of Bulgaria was

perceived to be the second most corrupt country in the EU, behind countries like Jordan and Bosnia and Herzegovina (Transparency International 2013). Another leaked U.S. diplomatic cable from 2006 revealed:

Accounting for a significant share of the country's wealth, Bulgaria's energy field is a closed-off, clubby branch of the economy, dominated by a handful of players who have a stranglehold over public procurement contracts and disproportionate influence over government decision-makers and the country's energy policy.

(Karagiannis 2006)

The reasons behind Bulgaria's intentions to place a moratorium on fracking are nebulous. Environmental groups have predictably been most vocal in their rejection of shale gas exploitation, but underlying political motivations probably play an important role. Russia's influence on Sofia policy-makers is difficult to discern because of the opaque nature of corruption and the rampant private-public interconnectedness that former Communist countries tend to exhibit. There are certainly particular social groups, such as the BSP and energy cronies, that would benefit from maintaining dependency on Russian gas. It appears pro-Russian politicians had a lot to gain, considering Russia provides over ninety percent of gas to Bulgaria; Gazprom purchased a fifty percent stake in South Stream Bulgaria AD Pipeline in 2010; and that the natural gas contract between Bulgaria and Gazprom expired at the end of 2012 (Daly 2012).

Perhaps the National Assemblymen were acting with the best of intentions to protect the Bulgarian environment. Environmental consciousness certainly played an important role in the policy reversal change, but Bulgaria has never been the hallmark of democratic legitimacy or environmental protection. More realistically, the pervasive presence of Russia in Bulgaria's energy sector is a prominent factor in determining why Sofia decided to adopt anti-fracking legislation.

8. Conclusion

This paper has sought to explain the variation in EU member states' fracking policies. Why have certain EU member states opted to implement anti-fracking legislation in response to environmental concerns, while other member states have proceeded with the controversial drilling technique? After evaluating the policies of the United Kingdom, France, Bulgaria, and Romania and testing numerous independent variables, several conclusions are possible. The research shows that all countries have unique domestic conditions and no one independent variable explains all four countries' fracking policies. A combination of the variables do, however, provide clarity to the research question and offer insight into each country's reason for pursuing the policies that it did.

After comparing the results of the United Kingdom and France, three independent variables suggest why the United Kingdom has been so persistent in exploring its shale gas reserves and why France became the first country in the world to ban fracking. Civil society in France is much more opposed to fracking than in the United Kingdom. The French are the most averse to exploiting shale gas in the EU, but public support in Britain is fading rapidly. Public opinion is certainly a significant explanatory variable in explaining the variation in fracking policy. The research suggests, however, that the French political elite have much more flexibility in dismissing fracking because France has considerably cheaper household and industrial electricity prices compared to the United Kingdom and the EU. The United Kingdom's domestic reserves have peaked and electricity prices are skyrocketing, while France is a major exporter of electricity. Prime Minister Cameron has framed fracking primarily as a means to cut energy bills for families and businesses in the United Kingdom. It has not been necessary for President Sarkozy and President Sarkozy to do so.

Since public and private agencies estimated Romania and Bulgaria have substantial shale gas reserves, thousands of Romanians and Bulgarians have mobilized against the fracking industry. Protests have been widespread in both EU countries, calling for the governments to halt all fracking operations and provide more transparency of the industry. Both member states appeared to respond to the public opposition as Bulgaria and Romania issued a moratorium against fracking in January and May of 2012, respectively. However, the once anti-fracking PSD party in Romania won the December 2012 elections and eventually lifted the moratorium shortly after. Meanwhile in Bulgaria, both the center-left and center-right parties have supported the fracking ban. After comparing the two countries' energy security indicators and political landscape, it appears Romania and Bulgaria could benefit from fracking, but the independent variables could not explain why the two similar countries pursued different shale gas policies.

The analysis shows both major parties of the Romanian political scene have prioritized economic benefits over public concern for the environment. Romanian anti-fracking advocates will have difficulty reversing the major parties' positioning on the issue because of the revenue the industry brings in. It is no surprise a country with meager economic and democratic credentials prioritized money and economic growth over its citizens' environmental concerns. Bulgaria's policy to continue the moratorium against fracking, however, was bewildering to many analysts. Safeguarding the environment appears to be a very plausible reason why nearly all National Assemblymen in Bulgaria decided to implement the moratorium against fracking. However, there also appears to be other underlying motives. Russia's influence in Bulgaria's energy sector is quite extensive. Ranging from a small, right-leaning group of energy cronies to the former Communist PSD party, several factions in Bulgaria's political elite appear to be vulnerable to Moscow's muscling. Bulgarian representatives may be doing what Romanian law

makers are not by responding to the citizens' concerns as to what fracking can do to the environment. This would be an optimistic analysis, however, and one that does not reflect the corruption levels in Bulgaria's government.

There are several dimensions of this thesis that necessitate further research in order to develop a greater understanding as to what determines a member state's shale gas policies. Of course, incorporating other member states into the analysis would provide a more comprehensive study. Countries such as Poland and Lithuania have stated interest in exploring their shale gas reserves, while numerous member states have suspended all fracking operations. Exploring the lobby and interests groups at the EU and member state level in more depth could also provide alternative explanations as to why different fracking policies are pursued. Perhaps competing industries, such as the nuclear industry in France, have a powerful influence on fracking regulations in Paris. In other instances, non-government organizations may be more effective in penetrating some capitals than others. More research is needed in this area. There is also a tremendous shortage of data on member states' public opinions towards fracking that can be compared cross-nationally. This will be needed to gain a greater understanding on environmental politics and issue prioritization. Lastly, the Russian annexation of Crimea will hopefully generate transparency behind government motives for determining fracking policy. The aftermath of this geopolitical crisis will be interesting to monitor because it will likely affect all European energy issues as the EU looks to diminish its dependence on Russian energy supply.

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