THE INTERRELATION BETWEEN A NATION'S ENERGY SECURITY AND THE SHIFTS IN BALANCE OF POWER

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Introduction:

Major Research Question:

This research studies critical aspects of the global energy security equation regarding shifts in the balance of power over the last half-century. It attempts to utilize quantitative analysis and comparative case studies to find a relationship between countries' changing power dynamics (through a changing global energy economy) and the energy security of nations affected by this change. It also discusses the implications of such a relationship to the overall global security and stability of nations.

Significance of the Research Question:

From transportation, lighting, the cooling and heating of homes, and the manufacturing of goods to the distribution and production of food, energy dominates every aspect of life in human society. As stated by E.F. Schumacher, energy is "not just another commodity, but the precondition of all commodities, a basic factor equal with air, water, and earth."[1] Thus, the security of this energy, colloquially known as energy security, has long been considered a paramount interest of nations in the larger scope of national and human security.

Nonetheless, in the last half-century, the changing political geography of the global energy supply and demand has spurned both scholarly and political debate over the consequences of international energy conflict. The global energy economy has shifted, with demand and trade adjusted from the Atlantic Basin to the Pacific. This shift's implications has created power imbalances; for instance, the current oil price is greatly influenced by China trends. Gas prices have been driven by the pattern of demand in Southeast Asia and Japan[2]. Economies in China, India and Russia have become increasingly dependent on imports, and as a result, the topic of energy security has become more prevalent in Asian governments.

Energy and the continuing, insistent demand for it have become the instrument and driver of global warfare for some countries, and global diplomacy for others. It has the potential to spurn corruption, create extreme fluctuations in economic well-being, and further the gap in the uneven distribution of wealth. Despite the general decline in wars fought around the world, oil-producing countries make up most of the Earth's conflicts, and this number of conflicts associated with oil-producing countries is likely to increase with the rise of oil prices[3]. Finally, diversification and shifts in energy demand have led to the increased potential and potency for energy weapons.

Nonetheless, while there is research on global energy economies and statistics regarding energy security indexes, there remains a disconnect on interpreting this shift in the global energy

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[1] Adam Mayer, E. Keith Smith, “”Exploring the link between energy security and subjective well-being”, 15 August 2019, Accessed September 24, 2020, https://energsustainsoc.biomedcentral.com/articles/10.1186/s13705-019-0216-1

[2] Nick Butler, “The changing balance of power in global energy security”, 15 August 2017, Accessed October 4, 2020, https://www.ft.com/content/f871500e-7867-11e7-a3e8-60495fe6ca71

[3] Michael L Ross, “Blood Barrels, Why Oil Wealth Fuels Conflict”, May 2008, Accessed November 6, 2020, https://www.foreignaffairs.com/articles/2008-05-03/blood-barrels

economy as a shift in the balance of power between nations. Can the balance of power principle, utilized by historians since the Ancient Romans but used more frequently to describe the European Balance of Power in the First World War, be applied to current economic, political and social structures between nations? Moreover, if so, how does this principle relate to a nation's energy security level?

A further significance of the research question relates to the impact of energy security on the overall security and stability. Does energy security have any overarching impact on a country's national security? Should it, as a metric or index, be utilized more or less in calculating the overall security and stability of a country?

Literature Review:

Energy Security:

There is a considerable body of literature that has been published regarding energy security. Considering the size and scope of the topic at hand, however, it is interesting to note that there is still no collective, unified understanding of energy security. For instance, scholars who have attempted to define energy security, such as Daniel Yergin, encapsulate energy security as "the availability of sufficient supplies at reasonable prices."[4] Henryk Faas notes that energy security has often been misunderstood with the security and supply of primary energy sources such as oil and natural gas[5].

Authors who have published literature on energy security agree that the interpretation of the phrase varies from country to country. For instance, Yergin's definition of energy security is commonly shared by developed nations with a high capacity for consuming such energy. Alternatively, energy-exporting countries, such as Ukraine and Saudi Arabia, view energy as the security of demand, and the ability to ensure consistent, long-term contracts and sales in the future. On the other hand, countries such as China and India view energy security as a need to shift away from market dependence, while Russia prioritizes controlling energy infrastructure[6].

Nataliya Esakova details the temporal nature of energy security. She notes that while it was a particularly "dead issue" in the 1990s, the topic of energy security has gathered more attention since then[7]. She also notes the rise of the "new energy security paradigm," where changing energy security concerns has led to a more economic than political challenge.
Energy security literature relates energy security to specific indicators such as efficiency or affordability; nonetheless, it rarely discusses energy security implications to broader international relations theory.

International Relations Theory:

In assessing the implications of the energy security of various nations, and its effect from shifts in the balance of power, research must turn to international relations theory and its predictions on energy security. One of the ways scholars attempt to explain energy security is through the **realist** approach. The realist approach assumes that states are acting accordingly to their structural power within international relations[8]. The Waltzian system reflects a struggle for sur-

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4 Daniel Yergin, "Ensuring Energy Security", March 2006, Accessed November 15, 2020, https://www.foreignaffairs.com/articles/2006-03-01/ensuring-energy-security

5 Henryk Faas, Francesco Gracceva, Gianlucca Fulli, and Marcelo Masera, "European Security – A European Perspective", February 1, 2019, Accessed November 17, 2020, https://link.springer.com/chapter/10.1007%2F978-94-007-0719-1_2

6 Faas, "European Security - A European Perspective"

7 Nataliya Esakova, "*European Energy Security: Analysing the EU-Russia Energy Security Regime in Terms of Interdependence Theory",* (Wiesbaden: Springer VS, 2012), pp. 35-36

8 Andrei V. Belyi, *"Energy security in International Relations (IR) theories",* n.d, Accessed September 30, 2020, https://www.hse.ru/data/339/636/1233/ReaderforLecturesOnEnergySecurity.doc

vival, in a global system that is absent of any authority. This rise of power creates interstate relations that also allows access to resources. Realist theory also suggests that defensive realism (which constitutes engaging a threat) differs significantly from offensive realism (centered around the optimization of profits with other actors in the international system).

Mohapatra notes how realism and Neo-realism have gained prominence within scholars studying the epistemology of energy security. Specifically, the author argues that the realism and neorealism perspectives can also be correlated with classical geopolitics to underline that 'accumulation of resources' and controlling 'strategic landmasses' are some of the primary drivers of global politics[9]. Mohapatra also claims that energy has shaped inter-state relations and has influenced the generation of norms, that further shapes and molds the practices of international relations[10]. Mohapatra's paper utilizes the context of the Global South, through regions such as Central America and South-East Asia, to deconstruct the traditional notion of energy security and study them in the 'disciplinary perspectives' of International Relations theory, such as realism[11].

Scholars have also used **Institutionalism** in regards to defining energy security through IR theory. Institutionalism focuses on the principle that institutions (that stem from regular norms and practices) are the backbone for improved economic relations and stability. As institutionalist scholars point out, respect of law leads to better security, and through this juridicial ideology, information-based institutions shape the energy markets of the 21st century[12]. These institutions seek to provide increased transparency and data availability behind policies. For instance, institutions such as the International Energy Agency dictated the oil, gas and electricity sectors after the first energy shocks of 1973[13]. An institutionalist framework replaces the offensive (or defensive strategies) by Waltz with the power and authority of institutions.

The final approach to analyze energy security, the "international political economy," or IPE view, imposes a large importance on **economic values**, which draws upon the "new economics of energy," and argues the traditional approach to energy politics has been disrupted by a new age of international energy interdependency[14]. The IPE view contends that finance, security, production and knowledge are the pillars towards a source for the structural power of international actors[15]. Those that agree with the IPE view believe energy has a significant role in

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9 Nalin Kumar Mohapatra, "Energy security paradigm, structure of geopolitics and international relations theory", August 2017, Accessed September 30, 2020, https://www.researchgate.net/publication/299345421_Energy_security_paradigm_structure_of_geopolitics_and_international_relations_theory_from_global_south_perspectives

10 Mohapatra, "Energy Security paradigms"

11 ibid.

12 ibid.

13 ibid.

14 Belyi, "Energy Security in IR Theories"

15 ibid.

production, knowledge, finance and security[16]. The IPE view contradicts realist arguments, instead adding to institutionalist theory by suggesting that that the struggles around a nation's energy security are caused less by power imbalances between states, and more with the economic frameworks that energy policies take place in.

[16] ibid.

Theory and Hypothesis:

The author hypothesizes that shifts in the balance of power incentivizes more powerful states to decrease another country's energy security by deteriorating the country's energy infrastructure and threatening both the availability and affordability of its energy. This paper also contends that due to some states having greater access to financial resources, these states can deploy an additional tool of statecraft during times of scarcity. Finally, this paper argues that shifts in the balance of power, which lead states to increase their power, also directly (or indirectly) reduce their own energy security risk.

In the aggregate, the author believes that the decisions made by those with a greater level of energy security directly and indirectly contribute to the decrease in national security in regards to countries through a realist lens. The independent variable, shifts in the balance of power, reflects a continuing, self-preservation of national interest, causing countries to keep implementing and executing foreign policies that prevent any other country from becoming strong enough to enforce its will upon others. This effect decreases (or deteriorates) the dependent variable, the energy security of other countries. This paper predicts that the country's energy security in question becomes more stable as its power increases via shifts in the overall balance of power.

This paper employs the realist argument that it is in nation states' best interests to create initiatives that maintain or improve their energy independence and leverage over other countries. In essence, this reflects the balance of power concept that international relations theorists have proposed.

It is imperative to define both the independent and dependent variables to support the measurement of said variables in the research design. For this paper, a nation's power is defined as its ability to exert influence over other actors within the context of the international system. This influence can be applied through economic pressure, diplomacy, direct threats or the use of force.

As mentioned in the literature review, energy security is a complex and highly contested term. For this paper, energy security is measured and defined according to a country's natural resource endowment and the nations' vulnerability to energy supply disruptions through the interference and influence of another nation.

Research Design:

Research Methods:

This paper utilizes a mix of quantitative data analysis and comparative case studies in various developing and developed regions to prove or disprove the paper's hypothesis. The combination of both methods improves the validity and thoroughness of the research process.

The first research method utilizes comparative case studies between developing, developed, "powerful," and less powerful states to determine whether a relationship exists between the balance of power and changing energy markets. These case studies consist of existing accounts and controversies of energy projects and disputes between nation-states that threaten their military and energy security. These case studies comply with a comparable-case research design; specifically, a "most different systems" design, that identifies cases that are different on a wide range of explanatory variables but similar on the dependent variable, the energy security of the countries examined (utilizing energy security risk scores that are referenced later in the research design). These case studies identify covariation patterns and eliminate independent variables that do not covary with the dependent variable[17].

The first case study presides over the construction and implementation of the North European Gas Pipeline (or Nord Stream), a system of offshore natural gas pipelines from Russia to Germany, identified as a potential security policy problem for Sweden Minister for Defense, Michael Odenburg. Sweden's position on the pipeline highlights a significant concern for Russian interference, specifically Russian navy presence in Swedish economic zones[18]. The case study involved examines the issue from multiple sources and perspectives to gain a holistic and objective understanding of the issue at hand.

The second case study builds upon the implementation of the first Nord Stream. It focusses on the construction and controversy surrounding Nord Stream 2, an expansion of the original project that involves countries such as Germany, Ukraine, Poland and Slovakia—choosing this case study, in particular, varied from the implementation of the first Nord Stream, as the new pipeline only focusses on two extensions of the original project. It was much easier to control for other variables, such as the influence or interference from countries outside of the countries that were examined. This case study was also included due to its current timeframe, taking place as recently as 2018 and continuing to the present day. In varying the case studies' temporal nature, a more concrete relationship can be found between energy security and shifts in the balance of power.

The third case study involves the US government's decisions surrounding the 1970s oil embargo in the context of the Iranian revolution. Drawing heavily from the book "The Oil Kings," the case study examines the relationships between Iran, Saudi Arabia and the United

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[17] Jack S. Levy, “Case Studies: Types, Designs and Logics of Inference”, March 2008, Accessed December 3, 2020, https://www.jstor.org/stable/pdf/26275102.pdf?refreqid=excelsior%3A1da4613caf5493669ef52f2e3d17dda3

[18] Alex Bakst, “Baltic Sea Pipeline: Sweden Afraid of Russian Spooks”, November 15, 2006, Accessed December 4, 2020, https://www.spiegel.de/international/baltic-sea-pipeline-sweden-afraid-of-russian-spooks-a-448652.html

States amongst the backdrop of the mid-20th century energy industry[19]. Utilizing this spatial and temporal framework differs significantly from the European and more modern dimensions of the first two case studies. This case study also varies in that the shifts in the balance of power are more explicit; for instance, it is clear that through the back-channel politics that controlled the flow of oil, Iran suffered from a loss of control in the oil industry due to the United States and Saudi Arabia's newfound partnership[20].

The fourth and final case study involves the changing power dynamics and energy security in the Caspian Basin and specifically involves the controversy and energy security concerns brought about by implementing the Baku-Tbilisi-Ceyhan Pipeline. Involving multiple nations that share varying degrees of energy dependency for the pipeline, including Kazakhstan, Azerbaijan and Uzbekistan, this case study is included in the paper as an example of an energy project where the shifts in the balance of power are seen through Russia and China's interference and control over the pipeline.

All case studies included tables documenting the relative energy security risk indexes for the countries involved in each case study, with a further analysis of the quantitative metrics. The inclusion of this quantitative component supported the analysis of the case study itself.

As the paper involves examining the political realities of the "balance of power" concept in the 20th and 21st century, it is paramount to compare and contrast the changing levels of power varying nation-states yield regarding one another. For this reason, comparative case studies are a highly appropriate method for testing the hypothesis and answering the research question[21].

The advantages of comparative case studies are multi-faceted. For instance, by utilizing qualitative and quantitative methods, comparative case studies are particularly useful for understanding and explaining how the context of a situation influences an intervention's success. Comparative case studies also better relate the intervention to a specific context to answer the research question.

Secondly, to prove the casual mechanism in how shifts in energy markets lead to shifts in the balance of power, affecting energy security, the paper draws upon a research methodology of process tracing. The hypothesis contends that through a realist lens, states with more financial resources from greater energy independence can deploy an additional statecraft tool during times of scarcity, which gives them leverage over states with comparatively fewer resources. Therefore, establishing causation behind this reasoning depends on the hypothesized causal mechanisms within the confines of the case studies examined[22]. In analyzing the case studies, the cases selected identify whether the casual mechanism identified applies to other states beyond the con-

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[19] Andrew Scott Cooper, “The Oil Kings: How the U.S., Iran, and Saudi Arabia Changed the Balance of Power in the Middle East”, (Simon & Schuster: August 9, 2011), Accessed December 5, 2020, pp. 10-11

[20] Cooper, “The Oil Kings”, pp. 22-23

[21] Delwyn Goodrick, “Comparative Case Studies: Methodological Briefs - Impact Evaluation No. 9”, 2014, Accessed November 29 2020, https://ideas.repec.org/p/ucf/metbri/innpub754.html

[22] Derek Beach, Rasmus Brun Pedersesn, “Selecting Appropriate Cases When Tracing Causal Mechanisms”, January 13, 2016, Accessed November 26, 2020, https://journals.sagepub.com/doi/10.1177/0049124115622510

text of the case studies examined (such as rivals of the more "powerful" states) or simply the nations of the case studies themselves.

Measuring Power (Influence):

Though the theory and hypothesis section defined power as the influence of a nation over other actors in the international system in principle, influence is difficult to measure from a quantitative perspective. As such, in the regression analysis, the paper measures power by tallying each country's wealth and military assets by utilizing the "power as resources" approach as a working definition. Michael Beckley describes how this approach explains how wealth can enable a country to purchase influence through "aid, loans, investment and bribes."[23] In doing so, soft power is cultivated. On the other end of the spectrum, military sources can enable a country to directly interfere with enemies' energy projects and by issuing either offers of protection or threats of violence[24].

Utilizing Beckley's definition of power in quantitative analysis, it would be possible to calculate the net "power" levels of countries examined from year to year, to analyze the shift of power balance between nation-states. GDP per capita thus provides a rough but reliable measure of economic and military efficacy. This metric is effective, as population size is the primary indicator behind levels of security costs, welfare and production. The larger the country's population, the more that country must protect and provide for.

Measuring Shifts in the Balance of Power:

Measuring shifts in the balance of power is more difficult. However, several scholars have again attempted to provide a working research design on how to do so. The paper assumes that the following statements hold in order to continue with the measurement process:

1. The balance of power theory assumes that all states are determined to protect their rights and interest by all means necessary, including war[25];
2. The vital interests of states do come under threat from various projects and interferences from other nations;
3. A state's power position can be explicitly measured with a degree of accuracy;

As shifts in the balance of power are, by its phrasing, a temporal course of action, measuring shifts in the balance of power can be done by comparing changes in states' relative powers for different time frames. To do so, a table was constructed tabulating the GDP/capita for the top 75 energy-consuming countries in 2010. An analysis was then conducted for the GDP/capita concerning energy security indexes in different time frames (1995, 2000, 2005, 2010, and 2015).

In addition, measuring shifts in the balance of power was conducted through various case studies, where a country with a stronger infrastructure successfully extended its influence with

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[23] Michael Beckley, "The Power of Nations: Measuring What Matters", November 7, 2018, Accessed December 13, 2020, https://doi.org/10.1162/isec_a_00328, pp. 44-50

[24] Beckely, "The Power of Nations", pp. 44-50

[25] "Hans J. Morgenthau, "Balance of Power: Meaning, Nature, Methods and Relevance", n.d, Accessed September 22, 2020, https://www.yourarticlelibrary.com/international-politics/balance-of-power-meaning-nature-methods-and-relevance/48482

other countries. It is important to note that while the paper contains two different definitions of power (one of power by resources and the other of power by influence), they are utilized in tandem to answer the research question.

Measuring Energy Security.

As discussed in the literature review, energy security is a multi-faceted concept that shares social, political and economic dimensions. Nonetheless, this paper measures energy security according to the so-called four As of energy security[26]:

1. Availability, measured by security of supply, equal to **total production energy/total consumed energy**, self-sufficiency, equal to **imported energy/total consumed energy**;[27]
2. Affordability, measured by price stability, equal to the deviations of price about a global mean value; dependency, equal to **total imported energy/population;[28]**
3. Accessibility, measured by trade, military power, and safety/reliability, all qualitative metrics;[29]
4. Acceptability, measured by a collective set of metrics measured individually; international and national governance, investment, social satisfaction and employment [30]

The first two indicators of energy security are utilized to answer the research question, and are measured according to the energy security risk scores retrieved from the Global Energy Institute - International Energy Security Risk Index. The justification for these indicators is supported by past research of scholars. For instance, B.W Ang, a professor of Industrial Systems Engineering at the National University of Singapore, argued that the most important dimension of energy security is availability, and this component is taken into account in 99% of related studies[31].

Level of analysis of data:

The level of analysis for the research paper consists of data taken from approximately 1970 to the present day, with an emphasis on information retrieved after the 1970s energy crisis – caused by a peak of oil production in various industrial nations (e.g. Germany, United States, Canada) and embargoes from other producers. Comparative case studies focus on energy projects between two or more states, and these states must have had a physical, bordering element.

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[26] J. A Paravantis, "Energy Security and Renewable Energy: A Geopolitical Perspective", September 30, 2020, Accessed October 6, 2020, http://dx.doi.org/10.5772/intechopen.91848

[27] Paravantis, "Energy Security and Renewable Energy"

[28] ibid.

[29] ibid.

[30] ibid.

[31] B.W Ang, W.L. Choong, T.S. Ng, "Energy security: Definitions, dimensions and indexes", February 2015, Accessed December 6, 2020, https://www.sciencedirect.com/science/article/abs/pii/S1364032114008892?via%3Dihub

Archives, interviews, and other qualitative data-collection procedures formed the bulk of the process-tracing research method.

To measure and contextualize energy security related to the balance of power requires quantitative data analysis, specifically, data scrapping from websites that have already examined and ranked countries according to the indexes mentioned above. This paper heavily drew upon existing data collected and analyzed by the Global Energy Institute (specifically, the International Index of Energy Security Risk to find energy security risk indexes) and UN Stats and the World Bank in order (to find GDP/Capita). A regression analysis was then conducted that compared GDP/capita to each nation's energy security risk index. The energy security risk index serves as an annual energy risk indicator published by the Global Energy Institute that uses "quantifiable data, historical trend information, and government projections"[32] to identify policies and other information that positively or negatively contribute to a country's energy security.

Limitations of Research Methods:

There exist several limitations of the research methods selected. For comparative case studies, when many cases are analyzed, there must be a trade-off that needs to be made in terms of quality and quantity. For this paper, an effective trade-off must be ensured, allowing sufficient data/evidence to answer the research question. In addition, to fully examine comparative case studies, a deep understanding of each case is needed requiring a high level of data collection and analysis, which may not be fulfilled given the thesis timeline's time constraints[33].

Additionally, energy supply is assumed to be non-fungible, and controlling for energy supply aids the analysis of the case studies by limiting the variety of other factors beyond the independent and dependent variables. However, by not measuring energy supply and adjusting it for each case study, there may be major discrepancies in the results, which could be incorrectly justified.

There are also various limitations of process tracing, which apply to both the paper's qualitative and quantitative analysis portions. For instance, process-tracing is first and foremost a within-case methodology. As it is mostly used to study single cases, it does not tell us whether the found (or not found) causal mechanism is present in other cases[34]. Therefore, reaching common conclusions for each study and relating those multiple case studies to answer the research question collectively may be invalidated in theory. There are also limitations of the research methods due to the underlying assumptions in the paper, any one of which, if found inaccurate, could significantly dispute the quality of the paper:

1) The last 20 years have brought about changing energy markets;
2) The balance of power theory is valid and alive in the 20th and 21st century;
3) These changing energy demands/markets has brought about a shift in the balance of power;

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[32] Global Energy Institute - US Chamber of Commerce, December 15, 2020, Accessed December 15, 2020, https://www.globalenergyinstitute.org/international-index-energy-security-risk-2020-edition

[33] Delwyn Goodrick, "Comparitive Case Studies", September 2014, Accessed November 3, 2020, https://reliefweb.int/sites/reliefweb.int/files/resources/Comparative_Case_Studies_ENG.pdf

[34] Yf Reykers, Derek Beach, "Process-Tracing as a Tool to Analyse Discretion", October 18, 2017, Accessed December 4, 2020, https://link.springer.com/chapter/10.1007/978-3-319-55137-1_11

Results/Analysis:

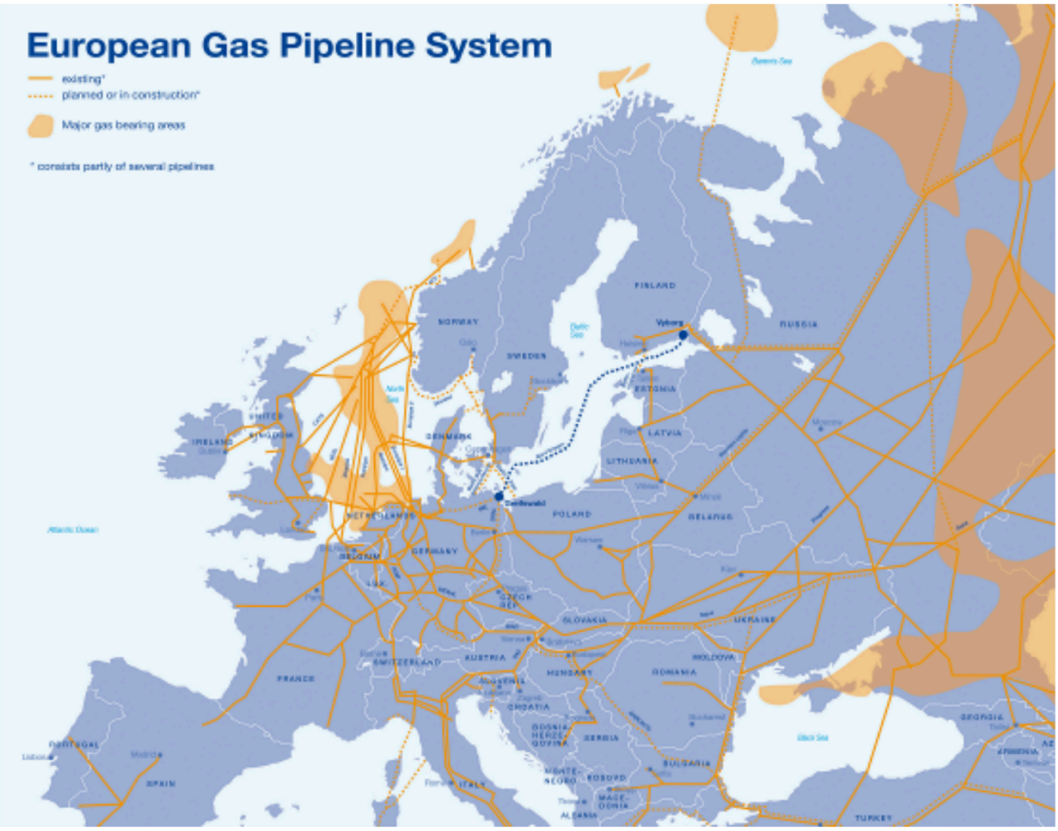
Comparative Case Studies:

North European Gas Pipeline (Nord Stream):

Background/History:

In 2003, President Putin and German Chancellor Gerhard Schroeder agreed to construct the north Transgas (Nord Stream Pipeline) to supply Germany with Russian natural gas. In by-passing Belarus, Poland and Ukraine, the pipeline totalled $16 billion and crossed the Baltic Sea from Vyborg's Russian port to the German port of Greifswald. The project was expected to be completed and operational by 2010. The pipeline would tie European energy security to the Russian gas deliveries and further Gazprom's (Russia's stakeholding company in the project) influence in Europe[35].

Figure 1: European Gas Pipeline System (Nord Stream) Piepelines[36]



[35] Ariel Cohen, "The North European Gas Pipeline Threatens Europe's Energy Security", October 26, 2006, Accessed November 13, 2020, https://www.heritage.org/europe/report/the-north-european-gas-pipeline-threatens-europes-energy-security

[36] Robert L. Larsson, "European Gas Pipeline System", June 2006, Accessed December 8, 2020, https://inis.iaea.org/collection/NCLCollectionStore/_Public/38/013/38013648.pdf

Analysis:

Support of the Nord Stream is derived from two components. Firstly, supporters argue that increased energy security for Germany and the EU will occur due to an additional transit route spanning thousands of kilometres of existing gas pipelines. They also argue that the Nord Stream is likely to decrease the potential dangers of tanker collisions in the Baltic Sea, a crowded and heavily used body of water that shares shipping lanes with other industries[37].

However, opposition to the pipeline was expressed among both the Central and northern European states of Estonia, Sweden and Finland, citing an increased energy dependence on Russia. Though the concerns initially surrounded the pipeline's environmental safety, political concerns were raised by the Baltic states and Poland. In particular, Sweden raised security concerns and strongly opposed the construction of a compressor station near its Gotland Island, resulting in statements by both politicians and military experts. In late 2010, Robert Larsson, a security analyst at the Swedish Defense Research Agency, claimed that "The project will only cause trouble."[38]

Furthermore, the 30 by 30-meter service platform built off the coast of Gotland, a Swedish island in the Baltic Sea, also raised concerns that Russia would be able to maintain a "surreptitious" view of all military/civilian traffic in the area[39]. Swedish intelligence maintains the belief that the Russians would utilize the platform for military intelligence, if necessary[40].

Beyond a military concern, Ukraine, Belarus and Poland all shared negative experiences of Russian energy policy deemed "coercive," going so far as to include them in their national security concepts and other strategic documents[41]. The Baltic Sea region's energy concerns come from Russia's control of the gas supply, without risking further exports to Europe as a result of its power over the gas tap to the states as mentioned earlier. Nonetheless, these states (by serving as transit states for the majority of gas transport to European territories) have also been able to exert counter-leverage on Russia by controlling gas output to other end customers[42].

Overall, the vulnerability of Russia's neighbours is more than that of Russia itself. Due to staged cut-offs and misbehaviour towards EU and NATO members, the reliability of Russia is questioned even with an uninterrupted flow of energy from the pipeline. Regardless of any technical interruptions, Russia's power over European energy imports will be further strengthened through this pipeline.

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[37] Fraser Cameron, "The Nord Stream Gas Pipeline Project and its Strategic Implications", 2007, Accessed December 9, 2020, https://www.europarl.europa.eu/RegData/etudes/note/join/2007/393274/IPOL-PETI_NT(2007)393274_EN.pdf

[38] Alex Bakst, "Baltic Sea Pipeline: Sweden Afraid of Russian Spooks", November 15, 2006, Accessed December 4, 2020, https://www.spiegel.de/international/baltic-sea-pipeline-sweden-afraid-of-russian-spooks-a-448652.html

[39] Cameron, "The Nord Stream Gas Pipeline Project"

[40] ibid.

[41] Larsson, "European Gas Pipeline System"

[42] ibid.

Table 1: Energy Security Risk scores during the Nord Stream implementation timeline[43]

Country	Year					
	2007	2008	2009	2010	2011	Average
Russia	834	815	867	873	851	848
Sweden	1,003	1,040	1,031	1,095	1,140	1,061.8
Poland	929	952	958	1,029	1,061	985.8
Ukraine	1,717	1,564	1,476	1,544	1,569	1,574
Belarus	1,871	1,753	1,809	1,786	1,885	1,820.8

From the results shown, collected from the Energy Security Risk Scores from the Global Energy Institute, it is evident that out of the five countries involved in the establishment and implementation of the Nord Stream, Russia maintained the lowest energy security index. On the other hand, the nations of Ukraine and Belarus maintained the highest energy security indexes, implying that their energy security was threatened due to the implementation of the Nord Stream pipeline. These results also support the case study, in which multiple countries, out of fears of national and energy security, voiced their concern of the Russian Federation being a significant, negative influence over the pipeline project.

Another interesting observation is that Sweden, being part of the Nordic countries that were implied to have one of the most secure energy security indexes in the world, in reality, produced energy security indexes that were lower than that of Russia and Poland. The unusually high energy security risk score perhaps supported the sentiments of several military experts and politicians who warned that the Nord Stream would cause a majority security policy problem for Sweden and an energy security problem for Sweden.

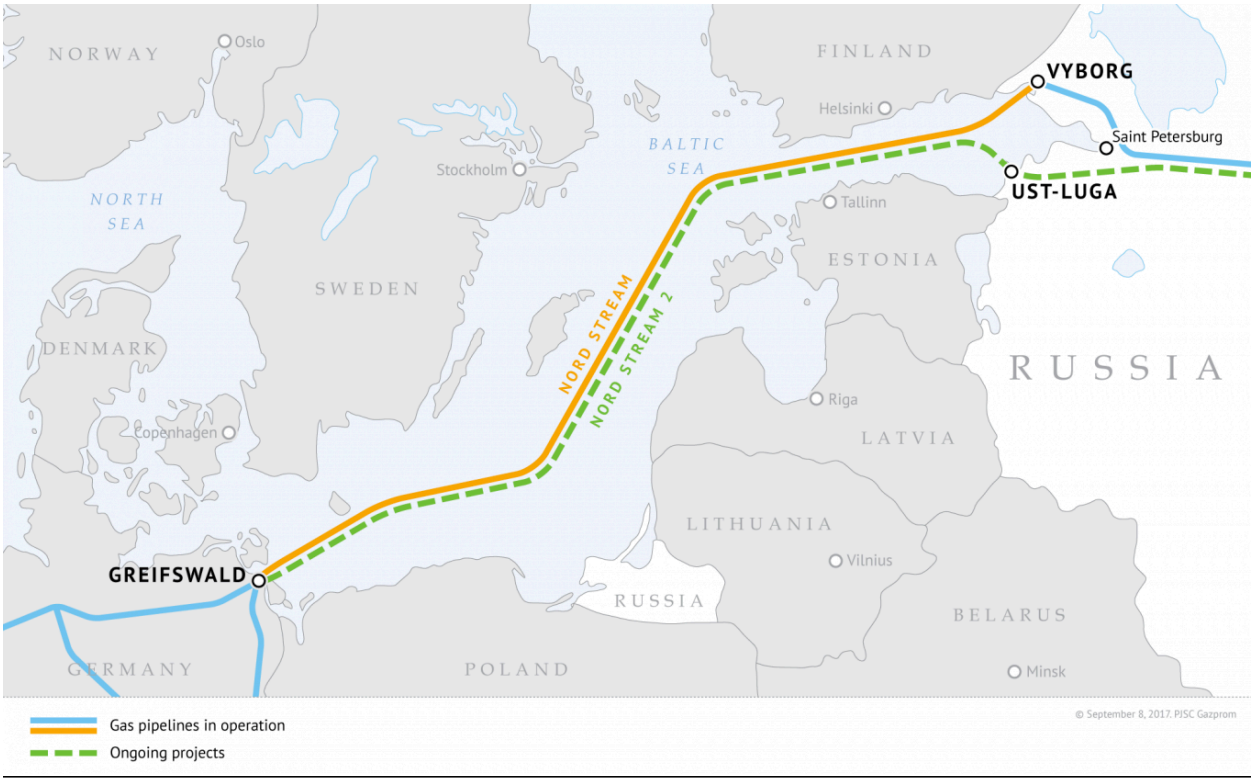
[43] Global Energy Institute - US Chamber of Commerce, December 15, 2020, Accessed December 15, 2020, https://www.globalenergyinstitute.org/international-index-energy-security-risk-2020-edition

Nord Stream 2:

Background/History:

Furthermore, we can examine the relationship between the energy security of less developed countries and the influence by more developed countries through the proposal of "Norm Stream 2", an expansion project consisting of two additional lines to increase the pipeline's overall annual capacity to 110 billion m3. The added pipeline doubles the gas transported through the Baltic region and will become operational in early 2020, providing Russia with increased access to the European gas market[44].

Figure 2: Nord Stream 2 Pipelines[45]



[44] Jordan Stevens, "Nord Stream 2 explained: What it is and why it's proving controversial", May 21 2019, Accessed December 4, 2020, https://www.cnbc.com/2019/05/21/nord-stream-2-explained-what-it-is-and-why-its-proving-controversial.html

[45] AFP, "Gazprom Restarts Construction on Controversial Nord Stream 2 Pipeline", December 11, 2020, Accessed December 15, 2020, https://www.themoscowtimes.com/2020/12/11/gazprom-restarts-construction-on-controversial-nord-stream-2-pipeline-a72336

Analysis:

Inconsistent with EU policy, and with increasing concerns over security and geopolitics, ten European Union nations submitted a letter to the European Commission shortly after the announcement of Nord Stream 2's formation, calling the project "contrary to EU interests."[46]

Energy dependence remains a significant source of concern among nations involved in the pipeline, and Nord Stream 2 is expected to decrease overall energy security in Eastern Europe. For instance, with over 98% of its oil and 92% of its gas supply being imported, Germany's core concern surrounds the susceptibility of Russian exploitation and vulnerability of interference. Nonetheless, German Defense Minister Ursula von der Leyen published a statement, indicating that the country "is not too concerned" over security risks, claiming an increased focus to sufficiently diversify their imports[47].

For Ukraine, Russia's gatekeeper to the European gas market, the "middle-man" statute affairs Ukraine substantial geopolitical leverage. As a result, many in Ukraine fear that Nord Stream 2 is Russia's attempt to weaken the country for its strategic initiatives[48]. From an economic perspective, abolishing gas transit could reduce Ukraine's GDP (gross domestic product) by up to 3%[49]. The full capacity of 110 billion meters cubed of gas from the resulting Nord Stream pipeline would be able to completely displace Ukrainian transit gas, resulting in a potential loss of royalties up to 2 billion euros and thus damaging Ukraine's energy security even more[50].

Along with Ukraine, Eastern European states' response has been overwhelmingly negative, with EU members such as Slovakia and Poland claiming that the project contradicts EU energy law. As transit states for Russian natural gas (Poland hosting the Yamal Pipeline, and Slovakia the Bratstvo pipeline), both are also poised to incur significant economic damages if Russia diverts gas supplies to Nord Stream[51]. With a prior history of price-discrimination and other mo-

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46 Stevens, “Nord Stream 2 Explained”

47 ibid.

48 ibid.

49 ibid.

50 ibid.

51 Clingendael International Energy Programme, “Russian Gas Imports to Europe and Security of Supply,”, March 19, 2016, Accessed December 1, 2020, http://www.clingendaelenergy.com/ files.cfm?event=files.download&ui=9C1DEEC1-5254-00CF-FD03186604989704.

nopolistic practices, it is feared that Russia will further isolate the Baltic Sea region and capitalize on high levels of manipulation and dependence[52].

Table 2: Energy Security Risk scores for countries during implementation of Nord Stream 2[53]

Country	Year - 2018
Germany	1,085
Russia	875
Ukraine	1,463
Poland	967
Slovakia	1,178

Similar to the energy security risk scores from the initial implementation of the Nord Stream, Nord Stream 2 also maintains Russia as having the most secure energy security index out of all involved countries. Though the results could not be retrieved for the years 2019 and 2020, it is clear that Ukraine and Slovakia, two states that both had concerns over their energy security from the pipeline, suffered from a worse energy security index than Russia, Poland or Germany.

[52] Baran Zeyno, "EU energy security: time to end Russian leverage", September, 2007, Accessed December 3, 2020, https://muse.jhu.edu/journals/wq/summary/v030/30.4baran.html, pp. 20-21

53 Global Energy Institute - US Chamber of Commerce, December 15, 2020, Accessed December 15, 2020, https://www.globalenergyinstitute.org/international-index-energy-security-risk-2020-edition

The 1973 Oil Crisis/Embargo:

Another case study utilizes the backdrop of the Iranian Revolution and the history of trilateral oil diplomacy to demonstrate that through the United States' interference in the Middle East, a shift of balance of power occurred, leading the United States to become more energy independent, powerful, and subsequently decreasing the overall energy security of most territories in the region. Through the book "The Oil Kings," scholar Andrew Scott Cooper details the sudden shift from producer dominance to import dependency of the United States, the transition of allies from Iran to Saudi Arabia in the Persian Gulf[54].

History/Background:

Despite a close relationship, during the 1973 oil embargo, Iran's insistence on high oil prices lead the United States to ally with Saudi Arabia. The outcome of this effect was a significant deterioration in Iran's economy after Saudi Arabia modified its production to cause a drop in the price of oil[55].

Analysis:

To finance his overspending on military armaments and pharaonic development projects, the Shah ordered an extreme price hike of the OPEC that not only crippled the world economy but led the United States to enter rapprochements with Saudi Arabia. In turn, Saudi Arabia flooded the global energy market with cheap oil, resulting in the Shah's downfall and complete demolition of Iran's energy availability and economy. Although the US-Saudi oil coup was intended against the Shah's leadership of the OPEC, it was not intended to topple his leadership[56].

Nonetheless, as Cooper details, the coup brought a severe psychological blow to his stature as the OPEC leader and helped create a perception of political instability both abroad and at home[57]. In addition to severely undermining the nation's economy, Iran's energy security,

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[54] Andrew Scott Cooper, “The Oil Kings: How the U.S., Iran, and Saudi Arabia Changed the Balance of Power in the Middle East”, (Simon & Schuster: August 9, 2011), Accessed December 5, 2020, pp. 10-11

[55] Cooper, “The Oil Kings”, pp. 11-25

[56] ibid.

[57] ibid.

specifically regarding the ability to effectively and efficiently allocate resources towards the withdrawal of oil, also faltered[58]. The combined effects of the drop in oil prices, combined with the Shah's failing health and instability of the region, would later set the stage for the Iranian Revolution and the emergence of Ayatollah Khomeini, the next Supreme Leader of Iran[59].

Table 2: Energy Security Risk scores for countries after the 1976 Oil Embargo[60]

Country	Year - 1980
United States	1071
Saudi Arabia	927
Iran	879

Due to the Global Energy institute's data only starting from 1980, the energy security risk scores could not be found for the United States, Iran or Saudi Arabia. However, from the scores from 1980, we can infer some conclusions regarding each country's energy security. For the United States, which concluded with an energy security risk score of 1071, compared to Saudi Arabia with a risk score of 927 and Iran with a risk score of 879, contradicts the results inferred from the third comparative case study, and the findings from Cooper's work in "The Oil Kings." The results from these scores indicate that, on the contrary, the United States suffered a greater energy dependence, and thus lower energy security from its interference in the Middle Eastern oil crisis in the 1970s. Subsequently, Saudi Arabia and Iran, which were expected to have higher energy security risk indexes, turned out to have lower indexes than the United States. This can be explained, in part, by the aftereffects of the U.S.-Saudi collusion to exert greater Saudi control of the OPEC, which resulted in a much higher energy dependency for the United States than expected.

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58 ibid.

59 ibid.

60 Global Energy Institute - US Chamber of Commerce, December 15, 2020, Accessed December 15, 2020, https://www.globalenergyinstitute.org/international-index-energy-security-risk-2020-edition

Energy Security in the Caspian Basin and the Baku-Tbilisi-Ceyhan Pipeline:

History/Background:

Following the collapse of the Soviet Union in 1991, the Caspian Basin became an important energy source (particularly gas and oil) as instability in the Middle East highlighted the importance of energy supply diversification to nation-states and energy security[61]. The region's relatively stable, strategic geographic location has made it an attractive option for both companies and consumers from the West, while countries to the east (such as China and Russia) have also made increasing investment opportunities. By offering a multitude of overload transit options, the Caspian Basin is a region that allows countries to avoid external shipping costs that are frequently required to obtain hydrocarbon resources[62]. For instance, as the European Union imports ~40% of its gas imports from Russia and ~45% of its oil imports from the Middle East, the energy-rich Caspian Basin is considered a key component of their future energy security[63].

Figure 3: Oil Pipelines and Infrastructure of the Caspian Region[64]

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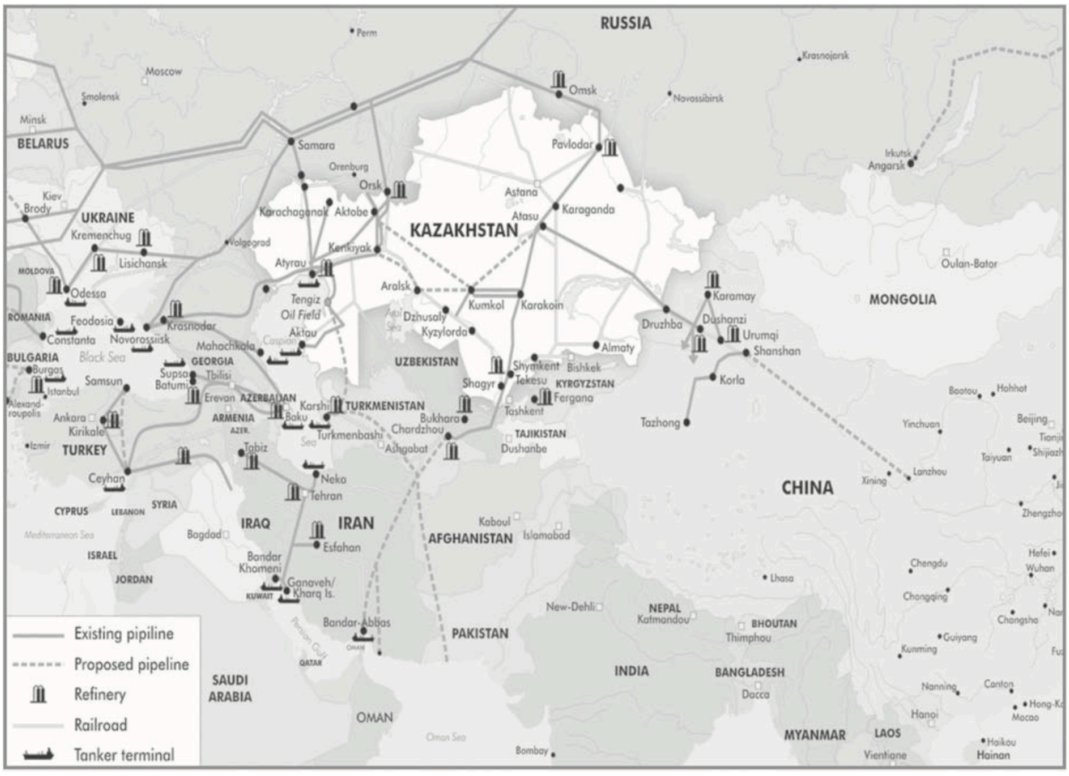
61 Gawdat Bahgat, "Central Asia and Energy Security,", March 2006, Accessed November 29, 2020, http://www.informaworld.com/smpp/content~db=all?content=10.1080/030 68370500456819, pp. 1–16

62 Ariel Cohen, "Energy Security in the Caspian Basin", 2009, Accessed December 5, 2020, http://phavi.umcs.pl/at/attachments/2015/1103/124625-j-gal-luft-anne-korin-energy-security-challenges-for-the-21st-century-a-reference-handbook-2009-2-.pdf, pp. 109-128

63 Geopolitics of EU energy supply, September 24, 2007, Accessed September 29, 2020, http://www.euractiv.com/en/ industry/geopolitics-eu-energy-supply/article-142665

64 Cohen, "Energy Security in the Caspian Basin"



Analysis:

The Baku-Tbilisi-Ceyhan (BTC) Pipeline is just one of many projects that have sought to promote regional growth, stability and development in an area dominated by international competition. As shown in Figure 3, several Central Asian states have shown an interest in constructing pipelines such as the BTC, which would cross Central Asia, continue under the Caspian Sea, and complete its transportation process in Europe[65]. Cooperation on this project has been supported by bilateral agreements and state visits, especially Turkmenistan.

In summary, the pipeline was the main source of weakening Russia's control of energy resources, led by Azerbaijan (primary supplier to the BTC pipeline) and neighbouring Georgia and Turkmenistan. By establishing a non-Russian controlled export route for Caspian gas and oil, these states aimed to create greater regional independence from Russia[66].

Nonetheless, competing geopolitical objectives have continued to undermine further international cooperation and regional policies in the area. For instance, Russia's attack on Georgia in August 2008 shed a concerning light on the balance of power in the Caspian Basin and cast further doubts about Georgia's ability to continue to serve as a reliable transit state. Furthermore, strong Russian opposition was raised when the European Union pushed for a pipeline connecting Turkmenistan to Azerbaijan, with Russia inciting Turkmen gas exports, going through the Black Sea to Bulgaria, then via Romania to Hungary and Austria[67].

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65 ibid.

66 ibid.

67 ibid.

Table 4: Energy Security Risk scores for countries during implementation of the Baku-Tbilisi-Ceyhan Pipeline[68]

Country	Year					
	2006	2007	2008	2009	2010	Average
Russia	925	834	815	867	873	862.8
China	1,076	1,012	971	964	982	1001
Azerbaijan	1,659	1,265	1,140	1,081	1,031	1,235.2
Kazakhstan	950	902	875	840	834	880.2
Uzbekistan	2,908	2,578	2,123	1,886	1,642	2,227.4
Turkmin-istan	2,227	2,165	1,813	1,667	1,822	1,938.8

The results from Table 3, showing energy security risk scores for countries that were involved in the Baku-Tbilisi-Ceyhan Pipeline, similar to Tables 1 and 2, show Russia as having the most secure energy security indexes for the entire duration of the implementation of the pipeline. In contrast, less economically developed, energy-dependent countries such as Uzbekistan and Turkmenistan maintain a significantly higher energy security index score than the more developed countries of Russia and China.

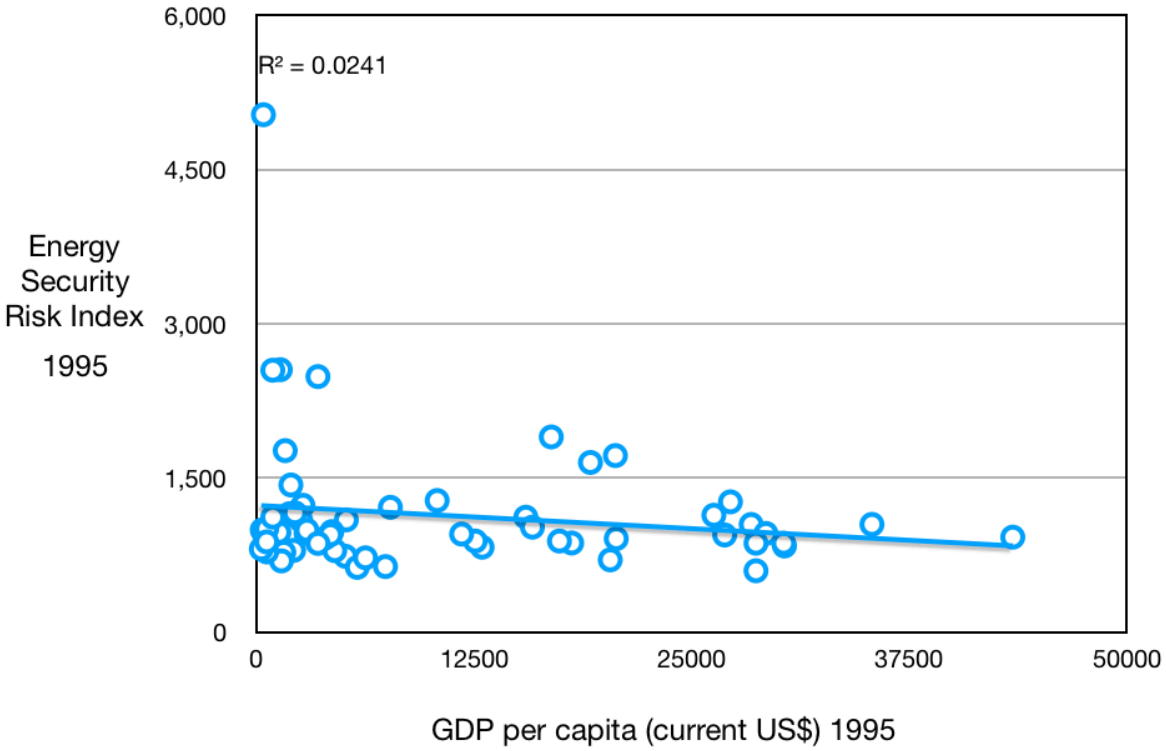
68 Global Energy Institute - US Chamber of Commerce, December 15, 2020, Accessed December 15, 2020, https://www.globalenergyinstitute.org/international-index-energy-security-risk-2020-edition

Quantitative Analysis

Power (GDP/Capita) against Energy Security risk indexes

Firstly, five linear regressions were created graphing GDP/capita[69] (or power, as defined in my theory and hypothesis section) against the energy security risk indexes, retrieved from the Global Energy Institute[70] website for the years 1995, 2000, 2005, 2010 and 2015). The reason for five linear regressions with five-year gaps was two-fold. Firstly, I wanted to show a temporal progression of the relationship between "power" and energy security over the selected time frame specified in the research design. Secondly, due to the majority of the top 75 producing countries not having energy security risk scores before 1990, I was forced to start the regression from 1990 until 2015, as there was no data for 2020 on either GDP/Capita or Energy security risk indexes. As shown in Appendix 1, the top 75 energy-consuming countries in the year 2010 were selected that would be graphed against the GDP/capita, which was the paper's definition of a particular country's power/influence.

Graph 1: GDP/Capita Against Energy Security Risk Indexes (1995)

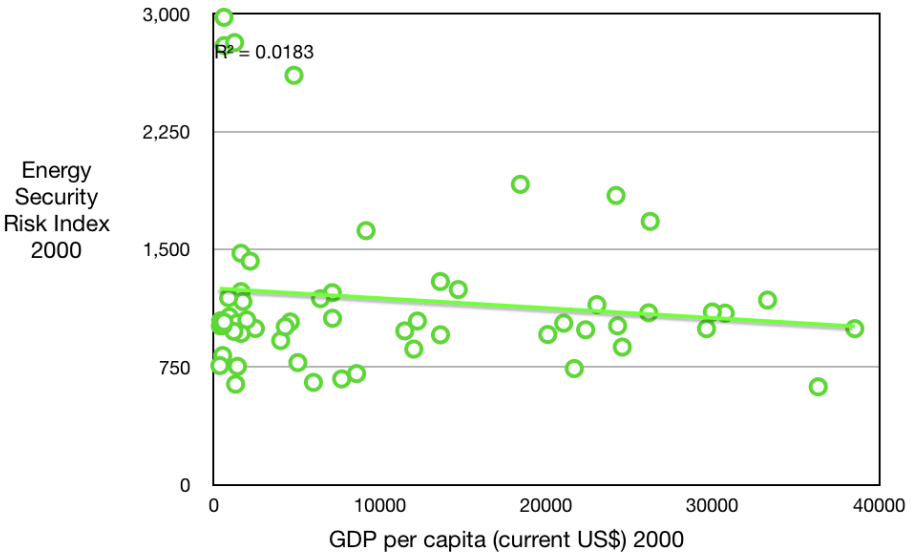


Slope: -0.009764465 Intercept: 1258.448277 P-value: 4.49328E-09
Error on Slope: 0.008045967 Error on Intercept: 124.3418027

[69] The World Bank. "GDP Per Capita (Current US$)". December 15, 2020, Accessed December 15, 2020 https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?end=2019&start=1970

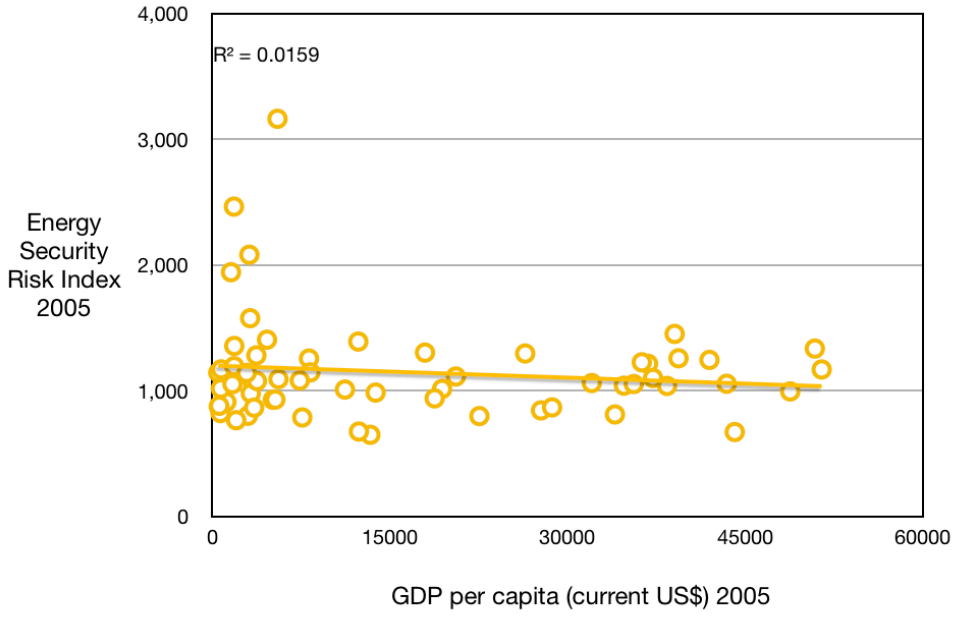
[70] Global Energy Institute - US Chamber of Commerce, December 15, 2020, Accessed December 15, 2020, https://www.globalenergyinstitute.org/international-index-energy-security-risk-2020-edition

Graph 2: GDP/Capita Against Energy Security Risk Indexes (2000)



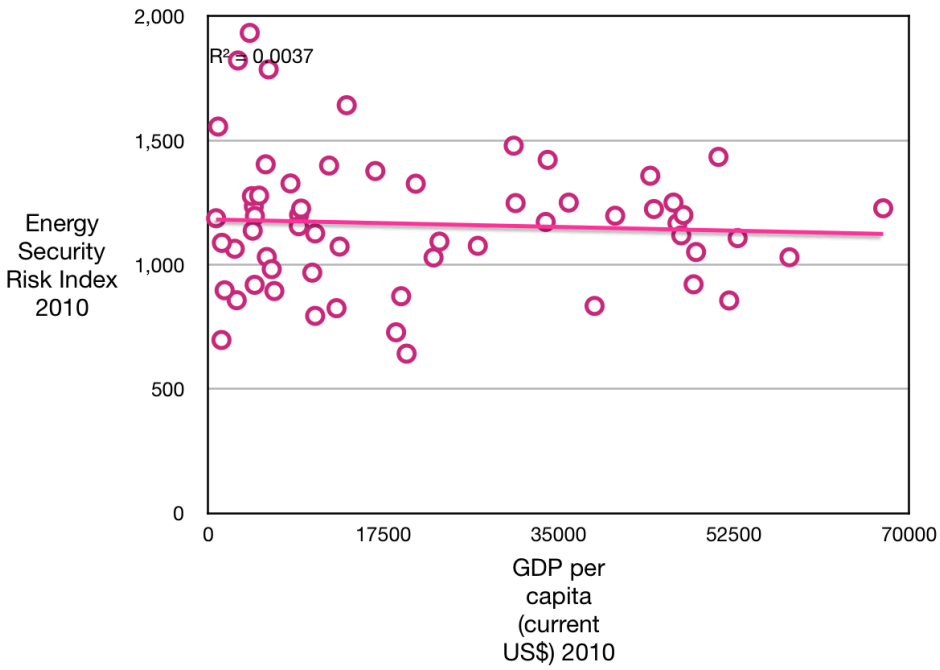
Slope: -0.006281855 Intercept: 1251.896762 P-value: 1.26508E-09
Error on Slope: 0.006207525 Error on Intercept: 97.39490533

Graph 3: GDP/Capita Against Energy Security Risk Indexes (2005)



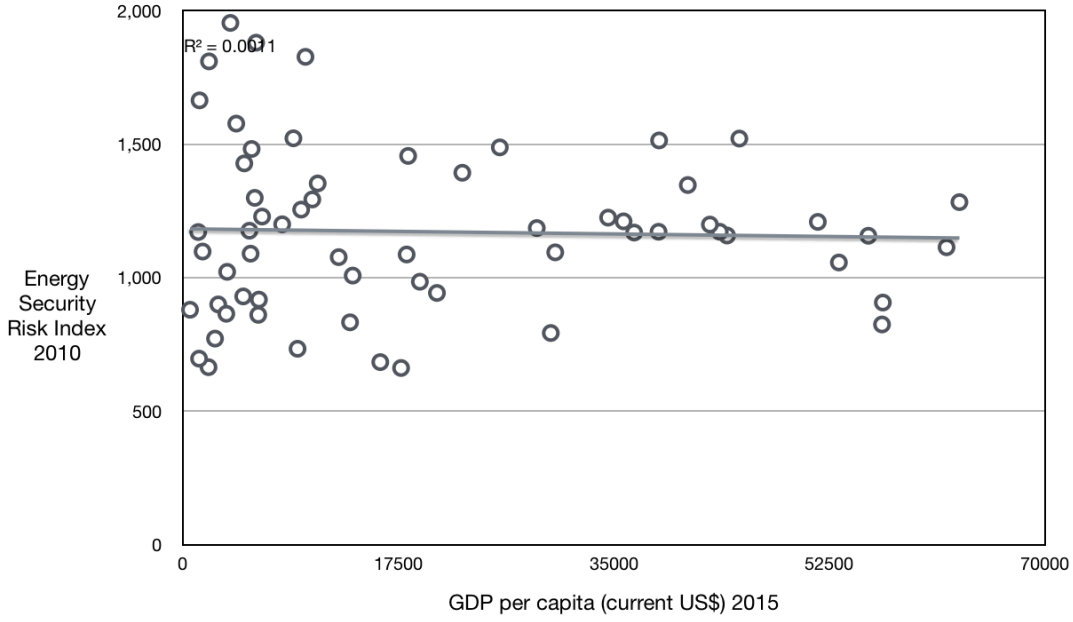
Slope: -0.003607108 Intercept: 1221.775247 P-value: 8.10879E-11
Error on Slope: 0.003367103 Error on Intercept: 78.12191262

Graph 4: GDP/Capita Against Energy Security Risk Indexes (2010)



Slope: -0.000867199 Intercept: 1182.372297 P-value: 2.12728E-13
Error on Slope: 0.001879781 Error on Intercept: 53.26244852

Graph 5: GDP/Capita Against Energy Security Risk Indexes (2015)



Slope: -0.001622675 Intercept: 1224.944175 P-value: 4.73184E-13
Error on Slope: 0.002149264 Error on Intercept: 60.85016489

Regression Analysis:

The five graphs show power as a measure of GDP/capita of a country against that country's energy security risk indexes, all indicating a negative relationship between the two variables. As the GDP per capita of a country increases, the value for the energy security risk index of a country decreases.

However, given the context towards the energy security risk index, the regressions support the hypothesis of the research paper. As the value for an energy security risk score decreases, the country has a more secure energy security infrastructure. As such, across all five graphs for the years 1995, 2000, 2005, 2010 and 2015, the hypothesis continues to be successfully proven.

It is important to note that the research paper focuses on shifts in the increase of power of a nation towards both its energy security and other countries' energy security.

Therefore, the hypothesis stated that as shifts in the balance of power occur, which was explained as having certain countries gaining more power, that other countries' energy security would worsen (in the context of this regression, the energy security risk value would increase). The regression analysis cannot determine this effect, but it can prove that its power increases and its own energy security risk is reduced.

There are discrepancies across the regressions that must be examined. For instance, the slope values for all five graphs differ from year to year, with Graph 1, showing GDP/Capita against Energy Security Risk Indexes for 1995 having a slope of -0.0097, the lowest coefficient among the regressions created. As the years progress, the coefficient gradually increases from -.0097 in 1995, to -0.0063 in 2000, and -.0036, indicating a stronger relationship between GDP/Capita and Energy Security Risk Indexes. For Graph 5, the last regression in 2015 correlating the dependent and independent variables, the calculations demonstrate the most significant relationship between GDP/Capita and Energy Security Risk with a slope of -.001.

The linear trendiness across the graphs also supports the hypothesis that shifts in the balance of power (caused by increases in power) also tend to better its energy security. All five graphs demonstrate a downward sloping line of best fit, indicating that its energy security risk reduces as a country's power increases.

It is also interesting to note that for Graph 4 and Graph 5, the plot points for Energy Security Risk vs GDP per capita are significantly more scattered than Graph 3 and Graph 1. The reasoning behind this trend is unclear; perhaps, there is an omitted variable bias from other factors at play that influence Energy Security Risk more so than GDP/capita.

Regarding statistical significance, all graphs are deemed statistically significant, as the p-value for all five graphs is less than 0.05. A t-test with two tails was utilized to find the p-value of Graphs 1-5, as it was initially unclear whether the estimated value would be greater or less than a certain range of values. In addition, the T-test was conducted with two-sample (heteroscedastic) unequal variance as it was also unclear that the variances of the two types of values would be equal.

Conclusion:

As the literature review, theory and hypothesis, and results and analysis, demonstrate, energy security is a complex matter. Therefore, it is only more complex to find a relationship between energy security and the shifts in the balance of power.

From the comparative case studies examined, all four examples presented different results regarding the relationship between energy security and shifts in the balance of power. For the North European Gas Pipeline, despite support from Germany and the European Union that the project would economically benefit the region as a whole, the analysis also demonstrated strong opposition to the Nord Stream from Central and Northern European states increased energy dependence on Russia. The analysis concluded that Russia's neighbours' vulnerability is higher than that of Russia itself, and the seemingly increasing energy dependence from Russia's neighbours indicates a decreased level of energy security from the aforementioned Northern and Central European states (such as Ukraine, Belarus and Poland). The first case study concludes that the balance of power favouring the Russian Federation has increased its influence in the Nord Stream, directly resulting in a worsening of its neighbours' energy security levels. Furthermore, the quantitative results, measuring the varying energy security risk levels, also support the case study. Out of fears of national and energy security, multiple countries voiced their concern of the Russian Federation being a significant, negative influence over the pipeline project. With Russia maintaining the lowest energy security risk score during the Nord Stream implementation timeline, and the aforementioned nations of Poland, Ukraine and Belarus each receiving the highest, second highest and fourth-highest average energy security score, it is clear that Russia's influence over the Nord Stream only served to threaten the energy security of the other countries involved.

In addition to the implementation of the initial Nord Stream case study supporting the hypothesis, the proposal and installation of Nord Stream 2 also demonstrated the effect of one nation's influence on other nations' energy security. As the case study explained, energy dependence remains a common source of concern among nations involved in the pipeline. Nonetheless, certain nations such as Germany have downplayed the energy security risks from Russia's potential interference, suggesting that this expansion project would potentially increase their level of energy security. Furthermore, as the pipeline is still in its implementation stage, most of the concerns and fears have not been realized yet. In essence, without quantifiable effects from Russia' interference and overarching influence into Nord Stream 2, it is difficult to determine a relationship between the dependent and independent variable solely on this case study. Therefore, the second case study's effectiveness in either proving or disproving the hypothesis is not as strong as the initial case study, which took place from 2007 to 2011.

The third case study, which describes and analyzes the US-Saudi oil coup that precipitated the events of the Iranian Revolution and the emergence of Ayatollah Khomeini, the supreme leader of Iran, also does not strongly support the hypothesis that shifts in the balance of power would affect a nation's energy security. For instance, the data retrieved from the Global Energy Institute Index for Energy Security risk scores do not show the United States or Saudi Arabia has a more stable sense of energy security. On the contrary, despite the coup, data from 1980 shows that Iran had the lowest energy security risk score out of the three countries. Nonetheless, An-

drew Cooper's description and entailing of the 1973 oil crisis and embargo highlight a detonation in both Iran's economy and political leadership. As such, one could also argue that energy security, as a key component of a nation's national security, would also suffer. However, given the juxtaposition of the qualitative analysis's assumptions and the contradicting quantitative results, the third case study does not provide enough evidence to support the hypothesis.

The fourth and final case study examining energy security in the Caspian Basin, focusing on the Baku-Tbilisi-Ceyhan (BTC) Pipeline, demonstrates the increased level of cooperation from nations as Azerbaijan, Georgia and Turkmenistan to promote regional growth and stability. Despite strong opposition from Russia, the pipeline was aimed at weakening Russia's control of energy resources and has thus far shown that despite Russia's attempts to interfere and influence the BTC, these nations' energy security levels have not been as impacted as the first and second case study. In analyzing Table 4, it is clear that despite Russia's opposition, the energy security risk scores for Azerbaijan, Kazakhstan, Uzbekistan and Turkmenistan all decreased from 2006, the year the BTC pipeline began, until 2010.

From the regression analysis, the results were able to prove the hypothesis partially. All five graphs demonstrated that as the "power" of a nation increased, its energy security risk score would decrease as a result. Furthermore, the results were statistically significant.

In conclusion, from both the comparative case studies and the regression analysis, it is clear that there is a relationship between shifts in the balance of power and the effect of that power (or influence) on a nation's energy security. From the first comparative case study, it is clear that the shifts in the balance of power that led Russia to possess more influence/interference over the Nord Stream directly led to a decrease in other countries' energy security. This case study reflects the realist argument developed by Kenneth Waltz, that in the pursuit of the preservation of its self-interests, nation-states (in this example, Russia) continues towards the accumulation of resources and the controlling of strategic landmasses to prevent any other nations from realistically challenging their status on the international level.

Likewise, from the regression analysis, shifts in the balance of power that leads countries to have more power (i.e. a greater GDP/capita) have also proven to *increase* their energy security level (via reducing the energy security risk score). This relationship reflects the "international political economy" viewpoint in International relations theory that imposes large importance accorded to economic values. Utilizing GDP/capita as a measure of a country's "power" through the "power-as-resources" approach allows the final result of the regression analysis to infer that, though nations do act in self-interest, it can be argued that their energy security is also determined by the total of their country's financial resources.

Finally, the research question aimed to ask if energy security had any overarching impact on a country's national security. From this paper's research and scope, I believe that countries with high energy security levels also maintain a strong sense of national security. Moreover, given the increasing damage done to the environment and our quickly dwindling natural resources, energy security should be one of the forefront indicators in calculating the overall security and stability.

Limitations of the Paper/Potential Improvements

Nonetheless, there is also evidence and holes in the results/analysis that contradicts the conclusions made by the author. For instance, although the first case study does support the hypothesis, the temporal limitations of the second case study, contradictions between the qualitative information and quantitative data for the third case study, as well as the increased cooperation of the less developed states in the fourth case study towards the BTC pipeline cannot support the statement that shifts in the balance of power for some nations *definitively* lead to decreases in the energy security levels for other nations.

The quantitative analysis, although partially answering the research question, does not attempt to examine how the impacts of more developed countries with more power impact the energy security risk scores of, perhaps, less developed countries.

As a result, some improvements could be made that would significantly improve the research's quality and breadth. For instance, in examining shifts in the balance of power, the paper could utilize a variance formula to conclude which countries faced the largest variability in "power" to determine changes in the balance of power. The paper could then regress countries with the largest variability in GDP/capita (as a measure of power) against physically bordering territories over a defined timeframe to determine if their power increase would necessarily indicate a higher/lower energy security risk score. The paper could also benefit from a more diverse set of case studies from different regions beyond Europe and the Middle East in attempting to answer the research question.

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Appendix:

Appendix A:
Linear Regression Table for Graph 1:

			Slope	Intercept
			Error on slope	Error on intercept
	1995 GDP/capita	1995 Energy Security risk score		
United Arab Emirates	27222.03586	1,269	-0.009764465	1258.448277
Argentina	7408.708238	640	0.008045967	124.3418027
Australia	20319.63063	705		
Austria	30325.84958	840	4.49328E-09	p value
Azerbaijan	397.1981161	5,033		
Belgium	28413.82644	1,049		
Bangladesh	329.4240846	997		
Bahrain	10376.9717	1,282		
Belarus	1370.676559	2,554		
Brazil	20613.78788	1,719		
Canada	5107.276802	740		
Chile	609.6566792	786		
China	2539.912877	1,090		
Colombia	5788.150737	632		
Czech Republic	35351.36546	1,050		
Denmark	2132.906969	797		
Ecuador	965.11073	818		
Egypt, Arab Rep.	15471.96272	1,120		
Spain	26271.59981	1,139		
Finland	26890.21988	947		
France	12959.32432	828		
United Kingdom	4494.707624	795		
Greece	373.76648	985		
Hungary	19181.40045	1,652		
India	1569.255294	778		
Ireland	18103.66252	869		
Iran, Islamic Rep.	20664.55227	911		
Iraq	43440.36787	926		
Israel	1288.239052	972		
Italy	12564.77813	888		
Japan	16932.1483	1,900		
Kazakhstan	5161.683342	1,094		
Korea, Rep.	1432.310151	695		
Kuwait	3928.223926	916		
Libya	4329.707364	980		
Morocco	29258.13435	962		
Mexico	17400.42018	888		
Malaysia	6261.736061	725		
Netherlands	489.881814	864		