European Union Energy Diversification and European Neighborhood Political Stability

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Introduction

Energy security and diversification

At the heart of a state's economy, industrial complex, and its national security, lies the state's ability to feed the respective networks with energy and resources. This necessity is so large that states themselves have waned over time due to the inadequate maintenance of energy security (Smil, 2004). Although other factors surely make or break state survival, more and more international relations scholars deem energy security to be one of its key pillars (Youngs, 2007). In fact, while it was generally closely associated with liberalism due to its seeming economic nature, realist scholars as well are generally willing to argue that energy security plays a crucial role in the maintenance of national security and state survival (Česnakas, 2010, pp. 31-32). Therefore, it can be stated that energy security is deeply interwoven with national security and based on this logic, one can assume that states naturally seek to enhance their energy security in tandem with it. The most fundamental way to do this, as Furubayashi and Nakata point out, is to diversify energy partners and increase domestic production (2017, p. 5). This leads to a further self-reliance, as well as a lower dependency on other states. States and domestic actors do have different wishes regarding energy security, which can be separated in the following three anchors: (1) affordability, (2) sustainability and (3) availability where most states nowadays desire all three (Tekin & Williams, 2011). Put more concretely the International Energy Agency (IEA) its definition says the following:

> The IEA defines energy security as the uninterrupted availability of energy sources at an affordable price. Energy security has many aspects: long-term energy security mainly deals with timely investments to supply energy in line with economic developments and environmental needs. On the other hand, short-term energy security focuses on the ability of the energy system to react promptly to sudden changes in the supply-demand balance. (2020)

Furthermore, preferences and differing wishes from several actors can stem from things such as geographic factors, economic affluence to political ideas. Certain states, led by an environmentalist coalition for example, might desire sustainable energy, whereas states with no natural resources might prefer availability. Despite these actors' preferences, scholars of energy security consider a combination or triad of these factors to lead to the maximization of energy security as illustrated in Figure 1 (Furubayashi & Nakata, 2017).

Types and routes of energy

This energy diversification triad is essential to understand energy security and the state's behavior that follows from it, which is only possible in two ways. For one, states seek to diversify its reliance on certain energy-commodities. In other words, states may seek to focus on more affordable, available or sustainable energy-commodities to enhance its energy security (Tekin & Williams, 2011). The *type* of energy is the first method in which energy may be diversified and is enhanced via its own domestic production and alterations in the manner of consumption (Furubayashi & Nakata, 2017).

Admittedly, affordable, and available energy can be imported, and it can even have the luck of being sustainable. It is therefore not a surprise that energy markets are generally international and cut across borders to facilitate this process. This leads to the point that certain routes of energy commodities can result in being points of international contestation and conflict. In fact, according to both realist and liberal scholars, energy commodities serve as strategic resources and may shift power balances or be used as a matter to exacerbate the opponent's vulnerabilities (Goldthau, Kuzemko, & Keating, 2018, p. 26). As such, the second method to diversify energy and thusly enhance energy security, is to look at the *supply routes* it is carried out over. A state is wise to not rely on one partner, but instead rely on multiple ones.

EU's energy security and its backyard

The *sui generis* European Union (EU) and its member states are in a different, albeit interesting boat compared to most state actors. As Natorski and Surrallés elaborate exceptionally well, member states of the EU have had a myriad of difficulties in being able to guarantee the maximization of their energy security from their biggest supplier region: the European neighborhood (EN), and subsequently were quick to look at the EU as a guiding force since 2006 (2008, p. 71). In this year, the supply of affordable energy was so limited that EU member states made initial steps to further delegation to the EU, leading to an ever-growing mandate to solidify energy supplies to the EU, effectively all coming from the EN and Russia (Natorski & Surrallés, 2008, p. 72; Eurostat, 2020). While the EU is not quite a unitary energy market or actor, member states of the EU are expected to aspire a more unified energy market as long as it enhances their energy security (Natorski & Surrallés, 2008).

Research question

Coincidentally, this EU-steered external component of the EU energy market naturally gravitated to solidify the supply lines from the EN, serving as the EU largest region of imports of energy commodities (Eurostat, 2020). Partially due to this reason, it should not come as a surprise that the EU has a lot at stake in this region, and consequently has outlined a blueprint in how it desires to positively influence this region, as expressed in the European Neighborhood Policy (ENP). Here it is mentioned that the EU seeks to stabilize this region from a political, economic and security dimension (European Commission, 2020a). This strategy's goal is to be met mostly by financial measures amounting to a budget of €15,4 billion (European Commission, 2020a). However, as was mentioned earlier, states are expected to diversify their energy partners. Due to this, it can be expected that the reliance on individual EN states will be lowered, resulting in less investments in the region. Considering that the EU largely seeks to stabilize the region via the ENP by monetary means, one may anticipate the opposite effect as larger energy related investments are expected to stop flowing to this region. Furthermore, a continuation of domestic production of (sustainable) energy in the EU is probable and due to the fact that the EN produces negligible amounts of sustainable energy (Eurostat, 2020), one can further anticipate a lower reliance on the EN, leading to less investments in the region. This would be an affront to the EU's own logic on stabilization as expressed in the ENP and either has to be compensated for by more ENP-related investments or it might lead to further destabilization of the EN. As such, the following research question is asked: "To what extent has the European Union's pursuit of energy diversification affected political stability in the European Neighborhood?"

Energy diversification and EN stability

In order to avoid vagueness on how this research question will be tackled, the two essential variables of the research question will be dissected accordingly. Put briefly, I hypothesize an effect of EU energy diversification on the stability of the European Neighborhood. The former (independent) variable has been elaborated on, but in short it entails the domestic production of (sustainable) energy in the EU and the change in reliance of partners for their energy (Furubayashi & Nakata, 2017). As for the (dependent) variable on stability, the EU aspires it in the EN and seeks to gain it by pumping monetary funds into it, as the ENP outlines (European

Commission, 2020a). However, by diversifying its energy imports, it effectively leads to less financial investments and, also by EU and ENP logical standards, less stability. This stability can be measured by the World Governance Indicators (WGI) that encapsulate the economic and political turmoil in any given state, but also unlawful and violent aspirations for regime changes (WGI, 2019). The types of stability that the WGI measures, are the in the same realm as the EU seeks to promote: economic, political and security (European Commission, 2020a) and is therefore suitable to answer the research question.

Literature

Economic mechanisms

By looking at the actual reliance on imports from foreign markets, one can see why it may damage the EU's energy security. In fact, it has become a glaring truth that the EU imports vast amounts of its consumed energy from outside the EU; mostly from Russia as in 2018 alone the EU relied on this partner for 29,8% of its crude oil imports (Eurostat, 2020). The Russian-EU oil and gas pipelines pass through states between Russia and the EU, such as Ukraine and Belarus (Theodora, 2017). These two states happen to be part of the EN, and thusly in its legal and political sphere of influence (European Commission, 2020a). As mentioned earlier, the presence of these two states in this region has political and economic implications for their relationship with the EU as the latter has been consistent in its desires to stabilize it for almost two decades (Hill, Smith, & Vanhoonacker, 2017, pp. 50-53).

However, the pro-active role of the EU to diversify its energy needs is likely to change the energy relationship with the EN. Firstly, the EU may produce more energy domestically, considering the fact large amounts of energy from the EN are in natural gas and oil, both of which are increasingly considered unsustainable and therefore undesirable for energy security (Atlantic Council, 2020). To illustrate, in 2018, the EU produced 636.499 'Kilotons of oil equivalent' (KTOE) domestically, of which 217.298 KTOE (34%) was sustainable and it meanwhile imported 1.350.484 KTOE in energy, of which a meager 6 KTOE (0,004%) was sustainable (Eurostat, 2020). This shows that sustainable energy, while being on the radar of the European Commission (Commission), has barely been imported since and instead produced domestically. Secondly, the EU likely desires to diversify its pool of energy partners so that not all its eggs are in one basket, thusly being able to dampen international shocks (Sculecki, Fischer, Gullberg, &

Sartor, 2016, p. 549). The change in relationship might have grave implications on the economies of the states in the EN. For one, the sheer investment necessary for energy production and export might have created a so-called debt trap, in which a state has borrowed money or received investments to build its large infrastructure, with the assumption it would be paid back over time via yields with its energy partners (Nash, Stading, & Davis, 2019, p. 1).

Furthermore, the discovery of a resource could have meant that the states in question went all-in on the resource its industry. This then results in the crowding out of other manufacturing or service sectors and leads to a mono-economy; also known as the Dutch Disease (Nash, Stading, & Davis, 2019, p. 3). Weyland put the curse of resource-reliant economies very well: "Seemingly limitless rents stimulate a propensity towards risk-taking. As visitors of Las Vegas who initially win a large amount are willing to risk this unexpected gain and "gamble with the house money," so people use windfalls for risky bets […]" (2009, p. 151). This then might backfire if the buyer of the relationship, the EU in this case, changes the energy relationship and imports less energy. Thus, the economic mechanisms suggest that the EU aims to rely less on the EN's states by producing more energy domestically and relying more on new partners, which likely destabilizes mono-economic states. Due to the significant and sudden damage to the economies, the state cannot develop properly and become a full-fletched stable regime. As such, a sudden change in demand of the EN states their main export product, may lead to an inability to compensate for it, resulting in serious economic decline and eventually political instability (Feng, 1997; Weyland, 2009).

Two energy-political approaches

Considering the fact that energy security is central in answering the research question, it is necessary to rely on energy-political approaches for guidance and potential predictions. In addition to the beforementioned economic theory on the EN, the *geopolitical approach* can explain the EU its behavior vis-à-vis other states. Siddi has argued rather sophisticatedly that the EU has taken a steadfast stance against Russia in diversifying its energy imports in most recent years (2019). In doing so, the EU has behaved much like the geopolitical approach would have predicted. Inspired and relying on neorealism's assumptions, this approach assumes that energy and energy commodities are strategic resources that have to be secured by the state to enhance national security, inevitably resulting in interstate conflict (Wilson, 2019, pp. 115-116). Siddi

concludes that the EU has underestimated economic nuances and technical and infrastructural considerations in Turkey and Azerbaijan, while overestimating the security dimension, with the sole aim to bypass Russia (2019, p. 124). This active steering of international energy markets has resulted in many exporting states losing their stakes and seeking to counteract the EU plans. This approach fuels the idea that a change in reliance may lead to a change in stability, or at least interstate conflict. In fact, states that are bound by infrastructure which cross borders, are prone to conflict as the stakes become ever more increased for either state. This further strengthens the assumption outlined in the economy theory that infrastructure plays a large role in political stability as it may not only lead to debt traps, but also interstate conflict.

An approach where the market takes a leading role however, and solves itself, is the (neoliberal) *global energy governance approach*. Here the state is placed in the backseat role and is assumed to take a lenient posture towards the market and other states, believing in a definite win-win for all (Wilson, 2019, pp. 116-117). This approach manages to explain the EU behavior of the internal EU energy market but cannot explain the zero-sum logic of its external component. While this approach never denies the inevitability of conflict, it does argue that a non-conflictful outcome is possible, which is exactly why it is an important approach to build off of. Supposedly, domestic markets (and thusly their states) that do business with each other over a prolonged period of time, grow a dependency for one another. This dependency leads to a symbiotic relationship; implying that a (negative) change in dependency may still lead to interstate conflict or internal economic instability as the markets get disrupted. From this, one can concretely hypothesize that a negative reliance trend leads to disruption in interstate market mechanisms.

EU's externalization

In this light, the EU is a decisive actor that uses its economic tools to facilitate its member states' energy security, much like the Market Power Europe (MPE) approach would suggest (Damro, 2012). MPE offers essential assumptions that the geopolitical and global energy governance approach align with comfortably. Put briefly, both MPE and the two energy-approaches assume that the market is a rather loose entity, filled with interests from heterogeneous actors (Damro, 2012, p. 682). But, the state (or EU, in this case) may use that weight to steer and attempt to homogenize it, and as a result the external economic flows (Damro, 2012). Here, an export of social norms or identity is not required but instead there must be a financial incentive to do

business with the EU. The MPE is key for the research question and the implicit reasoning that the energy diversification strategy may render the stabilization strategy unsuccessful. This is because MPE assumes that an overlap of what is publicly stated in a strategy, must overlap with the factual outcomes (Damro, 2012, p. 696). This then means that the economic weight of the EU is indeed a powerful tool, but it may only be externalized into a proper policy if the receiving actor (EN state) genuinely sees the promised results.

To illustrate, the Project of Common Interest (PCI) is one tool that the EU employs to 'capture' or solidify its energy supply to the EU (Maltby, 2013). These EU-led projects are meant to streamline the internal component of the EU energy market, whereas other ones link the EU with certain EN states via large and essential infrastructural projects (European Commission, 2019). The economic weight of the EU becomes apparent as it can neatly pick out states that it desires to build energy relations with, and hopefully guarantee its energy supplies. The geopolitical approach, naturally, would argue that this is the working of a state that captures a strategic resource, whereas the global energy governance approach would see it as a building of good faith so that the two markets may continue to supply to one another. Regardless, MPE suggests that the EU uses its economic weight to steer foreign policy, and the PCI's reflect this exceptionally well, but it may only be externalized properly if the EN states genuinely see promise (stabilization) be matched with action (investment).

Taking the economic, energy-related and EU literature into account, the EU may unintentionally disrupt one strategy by chasing the other. It desires a stable and democratic EN but may accidentally disrupt its process of stabilization by also desiring more energy security. If the EN is destabilized, then it may lead to less credibility, rendering externalization impossible as an overlap of words and action must take place (Damro, 2012). This literary preposition may be tested by analyzing if a reduction in oil and gas imports lead to their respective infrastructure projects' deterioration and economic and political turmoil in the EN, and thusly to a limited increase in energy security overall (Siddi, 2019).

Hypotheses

To recap, the EU behavior in recent years has seen the EU act largely as the geopolitical approach would predict. Here, the state or rather EU, took a firm position against Russia to facilitate further energy security by actively delinking itself from the regionally powerful Russian

state. This arguably has led to a neglect in critical infrastructure in Ukraine (originating from Russia), which is part of the EN, resulting in high costs for Kyiv and its ability to maintain a steady economic and political course. More broadly, it can be stated that the EU has seen energy as a strategic resource over which no other state-like entity ought to have significant control over, just as the geopolitical approach would predict. This, then possibly results in accidental destabilization in the EN, as exemplified by the Ukrainian case (Siddi, 2019).

Secondly, considering the fact that the EU desires an energy commodity (sustainable energy) that is effectively absent in the EN, the demand of energy imports from the EN is likely to drop (Eurostat, 2020). These two factors lead me to believe that while the EU actively has attempted to increase its energy security, it has changed its energy relationship with the EN possibly leading to economic turmoil and debt traps in the EN's states. As a result, I suspect an effect on the economic and therefore political stability in those respective states. In other words, the research question can be answered by seeking to investigate the change in reliance on the EN for energy commodities and see to what extent it correlates with the change in political stability. This, with the logic in mind that sustainable energy is not imported from the EN (Eurostat, 2020) and that the EU has actively sought a lower reliance on its current partners (Siddi, 2019), resulting in an essential economic pillar falling in the EN states culminating in instability, the first hypothesis is as follows:

1 H_0: EU energy diversification does not lead to more political stability in the EN.

1 H_1: EU energy diversification does lead to more political stability in the EN.

Essentially, this first hypothesis is suitable in its ability to test the logic as set out by the economic and energy related theory and therefore is crucial to test as the research question itself revolves around this mechanic. As mentioned earlier, the essence of infrastructure relating to debt traps and the so-called Dutch Disease should not be downplayed, let alone the possibility for interstate conflict. Interestingly, this hypothesis allows room to explore recommendations based on infrastructure in the EN that (possibly) seeks to produce sustainable energy, opening up a corridor for diversification, continuous imports, and stability. Regardless, most infrastructure that is in place focuses itself on natural gas and oil, most notably in Algeria and Ukraine. If it is built with the expectation that earnings stemming from trade with the EU would pay for itself, a halt in imports would be detrimental. As such, the following hypothesis is stated:

2 H_0: EN states with energy-infrastructure are not stabilized by EU's energy diversification.
2 H_1: EN states with energy-infrastructure are stabilized by EU's energy diversification

Despite having been mentioned earlier, PCI's deserve further elaboration and consideration. PCI's are a tool used to increase energy security by further coupling energy markets inside, and outside the EU where possible (European Commission, 2020b). In doing so, the streamlining process has an internal and external component relating to infrastructure projects. This is an interesting point as it may refute the implicit assumption made in the second hypothesis that non-EU states may enter debt traps by having to finance its own infrastructure on its own soil. However, for this research, the PCI's will prove largely unable to answer the research question for two reasons. On one hand, the projects themselves deal with quite different energy commodities ranging from electricity gained from concentrated solar power plants to so-called CO_2 transport networks.
On the other hand, the PCI's are seldom connected with non-EU states. As such, even though the Commission has future desires to involve these states, at this moment it largely lacks this external component, with the exception of a handful of cases. Regardless, it may be interesting to incorporate this PCI dynamic in the analysis to see if the few EN states that are somewhat connected with this tool, are destabilized or not. Because PCI's are rarely connected externally and due to their heterogeneous nature; a separate hypothesis would carry no weight. However, I do suspect, nonetheless, that the PCI's together with regime type as a variable will play an essential role in explaining stability in the states that were linked, but do not deserve their separate hypothesis due to either a lack of data or because it runs at the risk of conceptually stretching the concepts laid out in the energy approaches.

Concepts, variables, and indicators

In order to promote replicability of this research and avoid disruptive vagueness, the concepts, variables, and the respective indicators will be listed in the order of the hypotheses. Also, provided in the appendix are tables detailing the concepts, variables, indicators, and thresholds, all with a brief annotation. The case selection itself will be elaborated under the heading 'Methodology', but it should be stated that due to the case selection amounting to N = 15, the method of Qualitative Comparative Analysis (QCA) will be chosen. This method is sound in its

ability to answer the research question by finding necessary conditions under which the dependent variable (political stability) will take place in the EN due to the independent variable (EU energy diversification). It should be stated that while it may seem wise to incorporate more variables that possibly can explain a relationship between energy diversification and EN political stability, it will inevitably lead to more vagueness and lower internal validity (Halperin & Heath, 2017). The main reason being that, if more conditions are met, more outcome groups will arise. So, surely economic recession, war, terrorism, sophistication of economy (etc.) all may account for instability or economic downfall, but by incorporating them the QCA model will not find one or two clear conditions, but instead five or six.

Crucially, Halperin and Heath warn that data, whether nominal, ordinal or scale, must be coded into binary form: 0 or 1. But, it does allow for 'fuzzy sets' (coding on a spectrum from 0,00 to 1,00) or 'crisp sets' (simply '0' or '1'). However, considering the fact that energy diversification (key independent variable) either happens or not, the crisp set will be chosen. In addition, fuzzy sets would require multiple categories per variable, which is lacking when looking at raw energy imports, or the presence of infrastructure.

As for the first concept: (EU) 'energy diversification'. As mentioned earlier, a state desires to increase its energy security by diversifying its reliance on partners and the reliance on those partners' energy commodities (Furubayashi & Nakata, 2017). Then, this can be dissected in the following two quantifiable variables: reliance on partners (path) and reliance on energy commodity (type). The former will be measured by how much the EU has relied on all its energy imports from that one EN state in the first year and compare it with the reliance in the final year of the time period. If, for example, the reliance in 2006 was 10.000KTOE and in 2018 7.000KTOE, then we can speak of a downward trend, resulting in the variable being coded as a '0' based on the notion that the reliance is in a negative trend. If, however, the reliance on that one state has increased, then there is a positive trend and the variable is 'turned on' or 'true', and as such coded as a '1'. The general limitation in this approach lies in the fact that very minor changes may flip the trend quite bluntly in a negative or positive trend. Fortunately, exploratory data may give nuance to this story, as it will show the trends in comparison to each other. Although natural gas and oil are economically and chemically vastly different and distinct, they can be converted into the same unit (KTOE), allowing for comparison, and bundling together in overall reliance. This dependency rate is very similar to the EU its own definition as it inherently

implies the degree to which imports are necessary to fuel the domestic market (Eurostat, 2020). This (independent) variable aptly measures the dependency trend, while shedding light on its commodity diversification as well, rendering it perfect but also essential to serve as an indicator in testing the hypotheses and research question. The threshold and all the other thresholds are shown in Table 6.

Secondly, there is the concept of 'political stability'. As this paper will rely on data from WGI, their accompanied methodology and definition will be used as well. Put briefly, WGI its definitions admit that governance as a concept knows little to no consensus and must be subdivided in several pillars, one of them being political stability and the absence of violence (Kaufmann, Kraay, & Mastruzzi, 2010, pp. 3-4). Here a focus lies on turmoil inside the state leading to social unrest measured by seven other indicators (such as internal conflict and unconstitutional regime change) leading to one coefficient (WGI, 2019). This coefficient falls on a range from -2,5 to 2,5 where positive values will be coded as a '1', implying it has been stable and a negative value as '0', implying longitudinal instability. Despite there being a time-dimension with this variable as well, 2018 will be used as a point of reference, but a further elaboration on this timeframe will follow on the next page. On one hand, the political stability is already measured in a coefficient and thusly accounts for change over time and if one subtracts the 2018 value by the 2006 value, then it will lead to a faulty outcome as both are coefficients.

Thirdly, 'regime type' may provide a huge amount of explanatory power to the research question and act as a moderator variable. Although not used to explicitly test the hypotheses themselves, it may be a condition that has to be met to lead to (in)stability. Relying on Freedom House their data, democracies will be coded as 'free' and states that fall outside of this (the majority of states in the EN) will be coded as 'partly free' or 'unfree'. The justification for this threshold lies in the fact that democracies, as the (neoliberal) global energy governance approach governance suggests, are unlikelier to fight each other over strategic resources and are more willing to hand over a degree of dependency.

Fourthly, there is the fairly simple matter of 'energy infrastructure'. While there may be hundreds upon hundreds of deviations of what constructs could be a piece of infrastructure, this paper will look at gas and oil pipelines, as well as LNG terminals as the primary conveyors of energy commodities. The threshold relies on the methodology of the Global Gas & Oil Network including only pieces of infrastructure with a capacity larger than 6.000 barrels per day (oil) or a

hundred million M^3 per year (2020), which avoids oversimplified binary logic. So, with this outlook, no energy infrastructure and lower than the beforementioned capacity is coded as '0', whereas the opposite is '1'.

Finally, PCI's are incorporated as well in the research model. Most of the EN states are not linked by PCI's, but the ones that are may yield interesting results that increase internal validity. While it is true that the EU its policies around the PCI's may generally fly under the radar, they do carry large interests if one looks at the sheer costs of the projects (European Commission, 2020b). They inherently have the intention to streamline the internal energy market and connect it with non-EU partners. Generally, PCI's are carried over gas or oil pipelines, and while no beforementioned theory discusses them adequately, it will prove key to test whether or not the geopolitical approach is correct in assuming that steering of the energy market leads to conflict and more energy security. The states that are linked with PCI's may see a positive trend in energy reliance and therefore may give credibility to the idea that a sign of good faith is necessary since the costs will be shared, signaling dedication on the EU's side. Infrastructure that is linked will be coded as a '1', and the lack thereof leads to a codification of '0'.

Methodology

Timeframe

Naturally, a crystal-clear timeframe will mean less ambiguity and is therefore worth discussing. While surely 2006 was not the first moment EU states' representatives had the desire to seek further EU energy integration, it can be argued that it dictates a key turning point (Natorski & Surrallés, 2008). As mentioned earlier, most energy-related literature discusses the key fundaments of energy security: affordability, availability, and sustainability. The first two were not met in 2006. This, therefore, led to grave energy insecurity and jeopardized national security. This year, as a result, saw the pooling of sovereignty by member states and marked the starting moment in which the Commission started to steer the internal- and external energy market of the EU (Maltby, 2013).

In fact, this increasing delegation, as Maltby outlines, is because of four anticipated factors and geopolitical paradigm shifts that the Commission itself stated: (1) an increasing dependency on energy imports, (2) an increase in energy commodities' prices, (3) further friction due to EU enlargement towards Russia and, finally, (4) gas supply instability for the upcoming five decades

(2013, p. 435). This cocktail of factors led therefore (especially since 2006) to the slow, but steady pooling of sovereignty by EU member states to the Commission (Maltby, 2013).
In this light, it is unsurprising that the EU's high-standing officials have made firm commitments in the recent past to further bolster its energy security. This has crystallized into a fifth element that leads to the Commission finding itself in a more comfortable driving seat as states pool more sovereignty, specifically by focusing on sustainability. In fact, Von der Leyen desires much more than just that, as she stated: "I want the European Green Deal to become Europe's hallmark. At the heart of it is our commitment to becoming the world's first climate-neutral Continent […]" (Tamma, Oroschakoff, & Schaart, 2019). Importantly, it should be noted that these environmental concerns serve as the third pillar in energy security (Furubayashi & Nakata, 2017). Due to this, if member states, too, consider environmental issues a concern which ought to be mitigated via sustainable venues, then a fifth anticipated factor is added: (5) environmental concerns. Recent trends surrounding environmental concerns should not prove a problem to this timeframe, but instead enhance internal validity as the EU truly takes note of this third pillar of energy security. Thus, this paper will have a timeframe with a starting point in 2006 (or the most recent year thereafter if data is lacking), ending in 2018. This year is chosen as the end of the timeframe since data on 2019 is not yet available, let alone from 2020. Due to this 2018 serves as the latest measurable moment in regard to energy imports, but this will not prove as a problem as the Commission its position has been stable since 2006 and the third element of energy security has only been added recently. The timeframe leading up to 2018 is fairly coherent in encapsulating the EU's behavior, as a result.

Case selection

Importantly, both the economic theory on debt traps and the Dutch Disease, as well as the energy-related approaches assume that their respective mechanics interplay within a state context, requiring an appropriate unit of analysis. As such, the EN level of analysis as case selection will be broken up into all its respective states, or, in other words N = 15. Normally the total amount of states in the EN would contain sixteen states as these include all the states mentioned in the ENP (European Commission, 2020a). Palestine is (statistically) considered a state in the EN, but data is lacking on this state, leading to its exclusion. Sadly, this unfortunate number (15) implies that the case selection does not allow for a small-N method or large-N method. One may opt for

singling out one or two cases and study them in-depth, but it would disregard the EU's interests in the region as a whole, which it bases much of its ENP on.

As mentioned earlier, due to the medium-N sample size, a QCA will be chosen, which allows for the discovery of causal mechanisms in different subgroups, under specific conditions (Halperin & Heath, 2017, p. 227). This method excels at finding conditions at which the dependent variable is reached, due to the independent variable being 'on' or 'off', depending on the case. From this, certain outcome groups will roll out of the model, resulting in the deeper group-by-group analysis as to why these conditions lead to the outcome.

Furthermore, it should be noted that in this research, two industries will be analyzed: natural gas and oil commodities. The reasoning is twofold. For one, as was stated earlier, the EN does not export much, if any sustainable energy to the EU, let alone produce it with that goal in mind. Due to this, sustainable forms of energy, mostly making up energy from solar energy, will be excluded. Secondly, while oil and natural gas do differ from each other, these two fossil fuels their subtypes are highly homogeneous and comparable from an economic and chemical point of view (Webster, 2013). Considering the fact oil and gas companies usually diversify their own reliance on the respective resource, they are used to comparing quantities in one given value. This value, as earlier mentioned, is listed as KTOE, but runs at the risk of overly emphasizing natural gas as it is generally higher in KTOE (OECD, 2006).

Expectations

By elaborating on my expectations on the outcome groups, I hope to increase replicability by shedding light on my applied logic and made assumptions. I do not expect to significantly reject any null hypothesis, nor confirm any in the same manner. The primary reason for this is that the QCA method never intends nor is able to do this. Instead, it excels at looking for necessary conditions under which the dependent variable may take place (be 'on' or 'off').

Put briefly, I foresee three types of outcome groups: the first one (1) being non-exporting regimes that (de-)stabilize, regardless of what the EU does, such as Lebanon. Here the independent variable of EU energy diversification thusly has no effect on political stability. The second group (2), however, will likely destabilize due to the states' mono-economic reliance and (expensive) presence of infrastructure. Here, a negative trend in exports will likely be a factor in its destabilization due to debt traps or crowded-out non-energy sectors. In particular states such as

Algeria, Azerbaijan, or Ukraine that rely enormously on their energy exports, are vulnerable to this. The third group (3) may have a more positive story. Possibly low in internal validity, these regimes may be stabilized, regardless of a negative trend in exports, which likely is only due to their democratic nature. Coincidentally however, the only free states in the EN (Israel and Tunisia) are linked with PCI's. If these two states are indeed stabilized, it will prove essential for this paper as it would imply that the EU only initiates PCI's with democracies and, therefore, the two variables may have a self-reinforcing effect. This then leads to a possible overlap in the two major strategies of the EU this paper focuses on: EN stability and EU energy diversification.

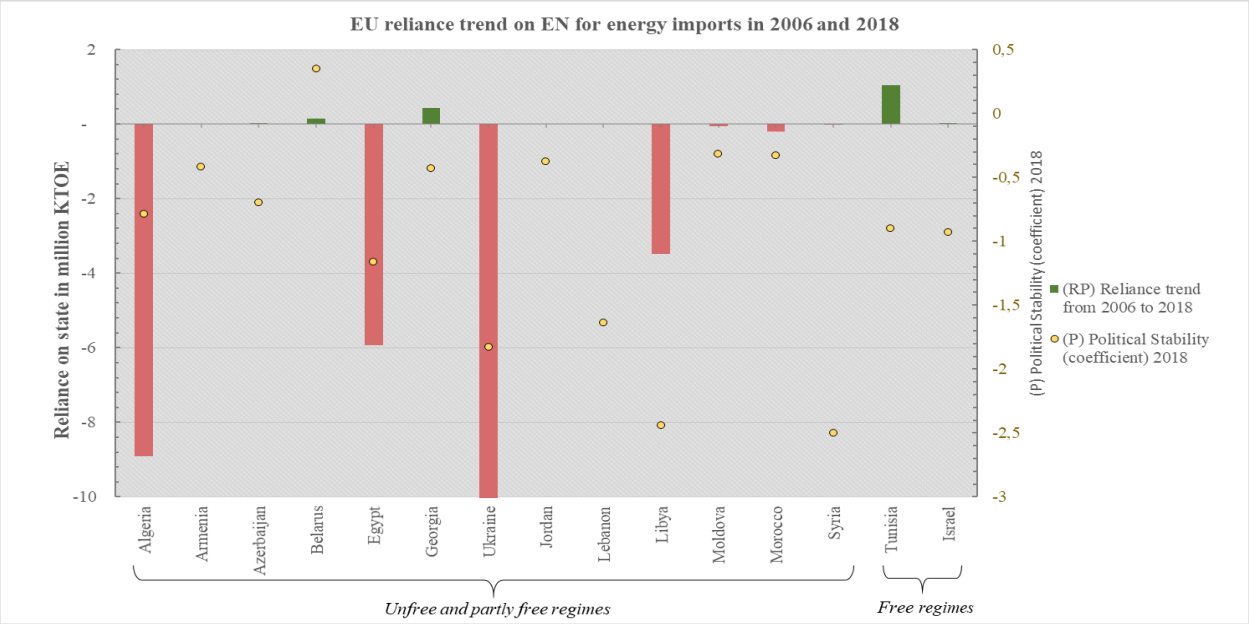
Results and analysis

First and foremost, before one jumps to the analysis of the outcome groups, it would prove key to discuss the results. The QCA has been carried out in the software 'Tosmana' (Tosmana, 2019), which yields a truth table with the variables being coded '1' or '0' for each case descriptor (country), as shown in Table 1. No countries are excluded from the pool of fifteen states and, quite interestingly, each proved to exist in a very distinct context.

In order to get an idea on the situation of each state, which shall prove key to discuss the outcome groups and their respective states, Graph 1 is offered with exploratory data. Here, one can see that there were only two free states (Israel and Tunisia) and most states had a negative trend in energy exports: in total ten out of fifteen states had negative or constant trends. It appears therefore that the EU has been relying significantly less on those ten states but has been unable to significantly accommodate these losses as its upward trends remain insufficient. This means that the EU has successfully diversified its energy supplier pool as it relies less intensely on a handful of states but has to compensate the raw quantities in KTOE with domestic production. However, while there does not appear to be a significant relationship in political stability and energy imports, a meager one might still exist but work in the opposite direction. Judging off of Graph 1., one can see that states that had enormous political instability (being lower than -2,0) saw corresponding drops in energy imports. This instability, found in the cases of Syria and Libya no doubt has to do with the ongoing civil wars, and while they are possibly fueled by struggles over energy resources, EU's energy diversification cannot have had a significant role in this. As for the lower instability between 0,0 and -2,0, it is unlikely that the EU has had a significant role as states with positive energy trends were also destabilized (with the exception of Belarus). In regard to the

regime type; it appears this concept has little explanatory power, but it does seem that the EU is keen on importing energy from the two free states, especially if one takes into consideration that the EU currently invests in a PCI with Israel, capable of conveying 44.186KTOE in gas annually (Gas Infrastructure Europe, 2019).

Graph 1. EU reliance on the EN



Naturally, exploratory data merely serves to get an idea and overview of the cases and their situations. Here, QCA does not yet sort the cases into distinct outcome groups to find necessary ingredients for political stability. For this, the two tables below will serve as the core of the analysis. First of all, Table 1. shows, in line with the exploratory data, that there is no evidence to support the hypothesis that energy diversification inevitably leads to political instability. In fact, the evidence is particularly low in external validity, as Belarus appears to have stabilized.
This may be highly case-dependent as the infrastructure in this state is fairly well-established and thusly aged well, implying its permanent costs are low or non-existent; resulting in no debt traps (Gas Infrastructure Europe, 2019). Furthermore, what is special in this case is that it likely replaced Ukraine as the main gas-hub to Europe. This, in turn, shows PCI's are not a necessity, but infrastructure is, as long as it is well established. Interestingly, PCI's facilitate this process of well-establishment also, just like Soviet Belarusian engineers facilitated their respective network's establishment. If one turns to look at the explanatory power of PCI's, one sees that the regimes were not stabilized, but did see the reliance trend turn positive. The states that were not

linked with PCI's, saw their energy exports diminish enormously. These states were ravaged by wars, but it also included states with limited conflict such as Algeria and Egypt.

The main reason why PCI's may have led to further energy imports and limited political instability, is the avoidance of any debt traps as the theory would suggest (Nash, Stading, & Davis, 2019). This gives a lot of credibility to the assumptions outlined in the geopolitical approach as the conquest for energy may be facilitated by the state and not just the market. Furthermore, PCI's may have served as a sign of good faith where it is not up to the exporter to establish a stable supply line. The (neorealist) geopolitical approach perfectly outlines this in the logic that no state would want to help increase the relative gains of another state by improving its energy security. Here, a quid-pro-quo is necessary and the (neoliberal) global energy governance approach cannot explain that the market alone would simply sort itself out, supposedly resulting in a diversified palette of energy. Moreover, while Algeria and Egypt are devoid of (explosively violent) inter- and intrastate conflicts, they are destabilized more than the other states. This may be explained as both states coincidentally had planned very large infrastructural projects around 2010, all of which now cannot export their desired amounts (Gas Infrastructure Europe, 2019). Here the EU's steadfast behavior to find new partners, may have led to the diminishment of other ex-partners' respective economies or turmoil from within.

Lastly, the cases of Israel and Tunisia as free regimes yield limited results. Although it is true that both these states export large amounts (Israel is expected to export 44.186KTOE with its PCI), they are not stabilized. This may be due to the fact that the coefficient is measured over a period of twelve years, during which Tunisia has seen phases of great turmoil, something Israel as well is not a stranger to even as a democracy. In this light, the indicator itself may have been defective in what it set out to do. If, however, one assumes the indicator to have worked properly, one can conclude that regime type does lead to a more comfortable position of the importer, possibly as free regimes may be considered more reliable partners. In the case this is true, then the ENP may have been unable to create stability in the EN but is right in what it sets out to do: aspiring the region to be democratic and stable. The cases show however that the type of regime and its respective dominant norms are a factor in its increase in energy exports, but the Belarusian infrastructure and PCI's are as well. As such, there are two sets of cases as illustrated in Table 2. Crucially, these two groups do not differ in the fact that they both have been destabilized. This leads to the idea that the EN overall is a highly unstable region, and that the EU has been

ineffective in dealing with this. However, important for this paper, the two groups are differing in their linkage by PCI's and corresponding energy trend. Overall, the trend was only positive if PCI's were linked, and it was negative when there was no PCI present whatsoever. Here the EU has successfully diversified its energy security, as it may opt to resort to old partners where necessary as their infrastructure remains. However, if one assumes that reputational norms matter in an anarchic system, which the geopolitical approach does not, then this unreliable behavior is unlikely to be fruitful in the long-term. Therefore, by linking the second outcome group with PCI's, the EU signals its dedication to those states rendering long-term reliance possible and it may even resort to the first group its energy imports, when necessary.

Table 1. Truth table

Countries	(RP) Reliance trend from 2006 to 2018	(RT) Regime type	(I) Infrastructure	(PCI) Projects of Common Interest	(P) Political Stability
Armenia, Lebanon, Moldova, Morocco	0	0	0	0	0
Algeria, Egypt, Ukraine, Jordan, Libya, Syria	0	0	1	0	0
Belarus	1	0	1	0	1
Azerbaijan, Georgia	1	0	1	1	0
Tunisia, Israel	1	1	1	1	0

Table 2. Outcome groups

Outcome group	Results
1. Algeria, Egypt, Ukraine, Jordan, Libya, Syria, Armenia, Lebanon, Moldova, Morocco	(RP) Reliance trend from 2006 to 2018{0} * (RT) Regime type {0} * (PCI) Projects of Common Interest{0}
2. Azerbaijan, Georgia, Tunisia, Israel	(RP) Reliance trend from 2006 to 2018{1} * (I) Infrastructure{1} * (PCI) Projects of Common Interest{1}

Conclusion

In order to answer the research question: "To what extent has the European Union's pursuit of energy diversification affected political stability in the European Neighborhood?", this paper proposed the two corresponding hypotheses. The first null hypothesis: "EU energy diversification does not lead to more political stability in the EN" may not be rejected as there has not been a significant amount of cases that would suggest a relationship between EU energy diversification and a change in stability in the EN. There is but one exception as the Belarusian case was associated with stabilization, regardless of the energy reliance trend being positive or negative. The second null hypothesis: "EN states with energy-infrastructure are not stabilized by EU's energy diversification" offers mixed results after having been tested. It will be rejected on the notion that effectively all states that did have infrastructure planned, in place or under construction were significantly destabilized. The case of Belarus once again, however, offers different results since it can be considered an extreme and interesting outlier case. This Belarusian example shows that stabilization may be possible because of energy diversification, but it is far likelier it stabilized due to its specific context, serving as a replacement for the war-torn Ukraine. As such, the evidence suggests that only the second hypothesis may be rejected and that energy diversification is either unlinked or distantly related to political stability, unlike what economic and the neoliberal global energy governance approach would suggest.

In addition, as the MPE predicted, the EU still seems to desire to play a decisive role and use its economic weight in seeking to diversify its energy security, instead of letting the market take control. This is something Siddi has argued against, specifically for the reason that it may see the energy partner actively trying to counteract the EU if it feels wronged (2019). Currently, both the geopolitical and global energy governance approach seem to align with this logic by putting emphasis on the fact that good faith may be necessary so that the EN energy partner is convinced that the EU will remain dedicated, resulting in successful externalization of its policy. In other words, while the geopolitical approach advises steering the market actively, it (the EU) should only do so in a manner where the energy supplier feels confident the EU will remain dedicated. This is likely for the reason that the energy supply routes are carried out over monumentally costly projects, which any state invests greatly in and is therefore an opening to its vulnerabilities. In this way, it is a matter of completion and whether the energy supplier has to fully fund the infrastructural project individually. Infrastructural projects may then serve as a boon for the

Belarusians, but as a curse for the Egyptians as the former finished theirs, but the latter did not (Gas Infrastructure Europe, 2019).

All in all, this paper finds evidence for the fact that infrastructural projects are a key ingredient in explaining political stability and its relationship to energy reliance. It cannot, however, find significant evidence that is high in external validity, which would suggest that a change in energy reliance by itself would inevitably lead to more instability. As such the answer to the research question inherently is that EU energy diversification does not necessarily lead to political instability in the EN, but it appears to do so if infrastructural projects are involved as exemplified by the first outcome group from the QCA analysis. This group shows that infrastructural projects are not to be overlooked due to the sheer amount of resources necessary to complete them. If completed, they may perfectly facilitate economic gains and an increase in stability for the state that has them. If incomplete, however, they are likely to lead to uneasiness, but also debt traps on the side of the smaller supplier state, confirming the theoretical claims on debt traps. One way to overcome both these problems by the EU, is to show that is willing to remain dependent on the supplier state for an indefinite time. The manner in which this may be facilitated is by investing more in PCI's: being linked to the EN as most members of outcome group 2 were. PCI's show to the EN state that the EU is willing to rely on its energy as it has stakes in the project. But it also pays for a good part of the costs for the EN state, which means that debt traps are unlikely to take place.

In this light, this paper has found proof that PCI's are able to both facilitate an increase in energy security, but possibly also an increase in stability over time due to signs of good faith. With this project in mind, no matter if one prefers absolute or relative gains, both will be enlarged as the consumer (EU) remains the enabler of the energy relationship, thusly no energy-approach would have any issue with PCI's.

Recommendations

While collecting data and reading more literature on the EN states and political stability, I have come to the realization that even though the economy of any state is a massive indicator for its political stability, it is only one of the many indicators. For example, it seems unconvincing to say that Ukraine has been destabilized only due to a drop in energy exports. However, I do think that due to the dynamic of energy infrastructure, it allows for destabilization with a lagged effect

as they are planned and paid for over a period of decades. In this light, we may indeed see destabilization with an economic cause, but not merely in twelve years as this paper suggested. Due to this, the used timeframe in this paper might have been too brief and it may prove fruitful for future scholars to enlarge it.

Furthermore, this paper has disregarded private actors completely, which may significantly have dampened and mitigated the potential economic damage. In this light, actors such as the Russian Gazprom and Algerian Sonatrach may be so influential and powerful that they either have fused with or become an economic tool of the state. Here, scholars may find interesting results to see as to what extent the energy market plays an independent role, both as a potential facilitator of energy security and its possible role as a device of the state.

Lastly, it should be stated that this research has been too ambitious in setting out to investigate such an elaborate relationship, and as such was bound to have low internal validity. However, since this paper aimed to find a clash in EU strategies and has done so successfully, it has found fairly interesting and generalizable results in the EN overall. Although data was missing in some cases, it appears that PCI's may play a major role in the upcoming decades and field of energy security. It has proven to be an active tool of the state or EU in this case, that has set out to both stabilize the EN and diversify energy imports. While largely having failed in the former, it shows that a hybrid version of these two strategies may be necessary. Not because energy diversification leads to destabilization, but because PCI's may be a sign of EU's dedication in the new energy relationship leading to an intensification in bilateral ties and successful externalization. Thusly, PCI's may serve as an energy-platform that bolsters energy security and further links the EU with the EN, potentially leading to its stabilization over a long period of time.

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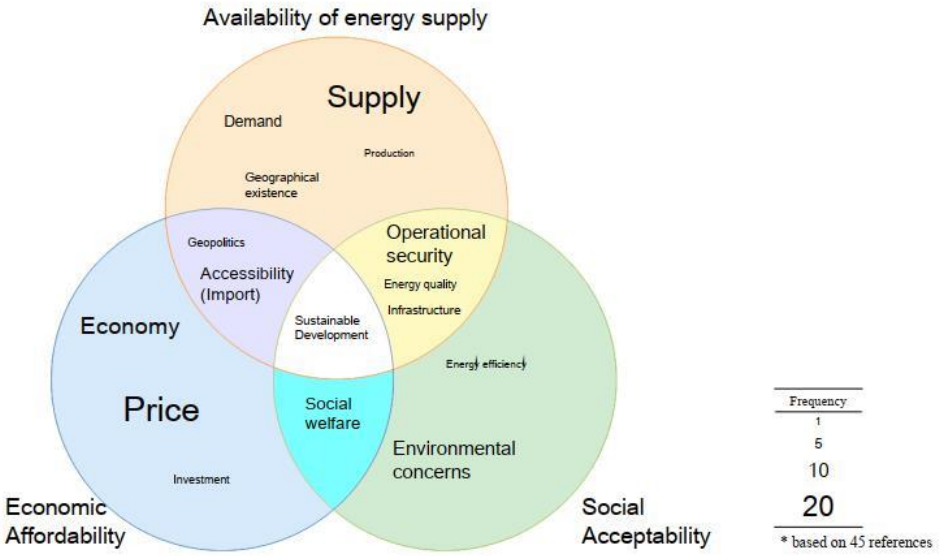
Appendix

Figure 1. Energy security



Conceptualization of energy security where affordability (blue), availability (orange) and sustainability (green) meet at the maximization of energy security (white) (Furubayashi & Nakata, 2017, p. 5).

Table 3. Hypothesis overview table

	Concept	Variable	Indicator	Motivation
Hypothesis 1: EU energy diversification and EN stability	(1) Energy diversification	Reliance on partner for imports (*path*) Reliance on energy commodity for imports (*type*)	(RP) Reliance in KTOE Reliance in KTOE (%) in natural gas (R-NG) and oil (R-O)	Meant to increase energy security by relying on different partners (*paths*) and different *types* of commodities *(Tekin & Williams, 2011)*. If one focuses on different partners, it will decrease the initial reliance. Same goes for a more varied menu of energy commodities), but that will rely on consumption. As such, the *type* diversification is interesting but will not be run inside the QCA model.
	(2) Political stability	Worldwide Governance Indicators (WGI, 2019)	(P) Political stability (-2,5 to 2,5)	The decrease of financial flows to the EN state, if a mono-economy, may lead to a significant damage on the economy and political landscape, resulting in instability *(Feng, 1997)*.
	(3) Regime type	Regime Type	(RT) Free (1), partly free (0) or unfree (-1)	Regime type *(Freedom House, 2018)* may affect willingness of EU to maintain energy relationship or invest in PCI projects.
Hypothesis 2: Reliance on infrastructure and stability	(4) Infrastructure	Infrastructure	Binary presence of (I) infrastructure in the form of LNG terminals, oil, or gas-pipelines (Theodora, 2016)	Economic theory suggests that most energy-infrastructure such as LNG terminals, oil or gas-pipelines carry heavy costs and often loans. Debt traps may be introduced if energy relationship is cut-off, whereas Dutch Disease may be introduced if other sectors are crowded-out *(Nash, Stading, & Davis, 2019)*.

(5) Projects of Common Interest	Infrastructural connection under PCI banner	(PCI) Infrastructure financed, maintained, or constructed by PCI approval	If EN state is or will be connected by PCI's, may affect energy relationship. Neorealist energy-approach (geopolitical) predicts that EU would never venture in such soft-power direction, neoliberal predicts it will but only with likeminded regimes *(Wilson, 2019)*. PCI's would refute economic theory on Dutch Disease, as well as debt traps as the EU shows a sign of good faith. Furthermore, PCI's may be expected to facilitate EN Policy strategy more.
(2) Political stability	Worldwide Governance Indicators (WGI, 2019)	(P) Political stability (-2,5 to 2,5)	The decrease of money-flows to the EN state, if a mono-economy, may lead to a significant damage on the economy and political landscape, resulting in instability *(Feng, 1997)*.

Table 4. Threshold Table

	Indicator	Threshold value	Threshold motivation
Hypothesis 1: EU energy diversification and EN stability	(RP) Reliance in KTOE	RP = 1,00	This threshold aptly would indicate for positive trends, excluding constant (non-existing) or negative trends. However, Graph 1. will include constant or non-existing trends. In this way, anything lower than 1,00 is considered not positive.
	(P) Political stability (-2,5 to 2,5)	P = 0,00	This threshold separates positive values from negative ones, changing this to lower (negative) values may be interesting for future research, as most cases are likely to be mildly negative due to the EN's nature.
	(RT) Regime Type: Free (1), partly free (0) or unfree (-1)	RT = Free	This threshold distinguishes between free and 'other' regimes; those that are partly free or unfree altogether.
Hypothesis 2: Reliance on infrastructure and stability	(I) Presence of infrastructure in the form of LNG terminals, oil, or gas-pipelines.	I ≥ 6000 barrels per day (oil) or I ≥ hundred million M^3 per year (natural gas).	A binary presence of infrastructure would harshly discriminate non-functioning infrastructure, or heavily decentralized ones. By looking at capacity, one looks for the potentiality of that infrastructure and therefore is able to capture its magnitude and corresponding costs.
	(PCI) Infrastructure financed, maintained, or constructed by PCI approval	PCI = Yes	Here a PCI is planned, constructed or in process. As such, a binary logic does apply, especially if one considers the fact that the economic dimension is dampened (no risk of debt-traps), if financed by the EU.

(P) Political stability (-2,5 to 2,5)	P = 0,00	This threshold separates positive values from negative ones, changing this to lower (negative) values may be interesting for future research, as most cases are likely to be mildly negative due to the EN's nature.

Table 5. Raw data

Countries	(RP) Reliance (RP) Reliance in KTOE 20	(RP) Reliance trend from 2006 to 20	(R-NG) 2006 Reliance of imports natural g	(R-O) 2006 Reliance of imports	(R-NG) 2018 Reliance of imports natural g	(R-O) 2018 Reliance of imports	(RT) Regime type	(I) Infrastructur	(PCI) Projects of Common Inter	(P) Political Stability (coefficient) 2018
Algeria	46.048.876	37.142.011	**-8.906.865**	46.036.352	12.525	37.132.754	9.257	Unfree	Yes	No	**-0,79**
Armenia	-	-	-	-	-	-	-	Partly free	No	No	**-0,42**
Azerbaijan	12.660	23.332	**10.672**	-	12.660	-	23.332	Unfree	Yes	Yes	**-0,7**
Belarus	3.177.023	3.329.857	**152.834**	3.176.902	121	3.329.782	75	Unfree	Yes	No	**0,35**
Egypt	6.074.448	139.661	**-5.934.787**	6.070.135	4.313	135.990	3.671	Unfree	Yes	No	**-1,16**
Georgia	1.689.671	2.119.300	**429.629**	1.689.634	37	2.119.201	99	Partly free	Yes	Yes	**-0,43**
Ukraine	44.380.467	12.111.150	**-32.269.317**	44.380.298	169	12.111.109	41	Partly free	Yes	No	**-1,83**
Jordan	-	-	-	-	-	-	-	Partly free	Yes	No	**-0,38**
Lebanon	62	62	-	-	62	-	62	Partly free	No	No	**-1,64**
Libya	7.463.808	3.978.130	**-3.485.678**	7.413.359	50.449	3.946.948	31.182	Unfree	Yes	No	**-2,44**
Moldova	1.049.836	998.316	**-51.520**	1.049.836	-	998.316	-	Partly free	No	No	**-0,32**
Morocco	788.260	581.475	**-206.786**	788.260	-	581.475	-	Partly free	No	No	**-0,33**
Palestine (omitte	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	Unfree	N.A.	N.A.	**N.A.**
Syria	7.162	4.813	**-2.348**	-	7.162	-	4.813	Unfree	Yes	No	**-2,5**
Tunisia	809.816	1.860.948	**1.051.131**	808.586	1.231	1.858.421	2.527	Free	Yes	Yes	**-0,9**
Israel	-	3.000	**3.000**	-	-	-	3.000	Free	Yes	Yes	**-0,93**
Source:							Eurostat (2002)	reedom House (2018)	Theodora (2016)	European Commission (2020)	WGI (200)	

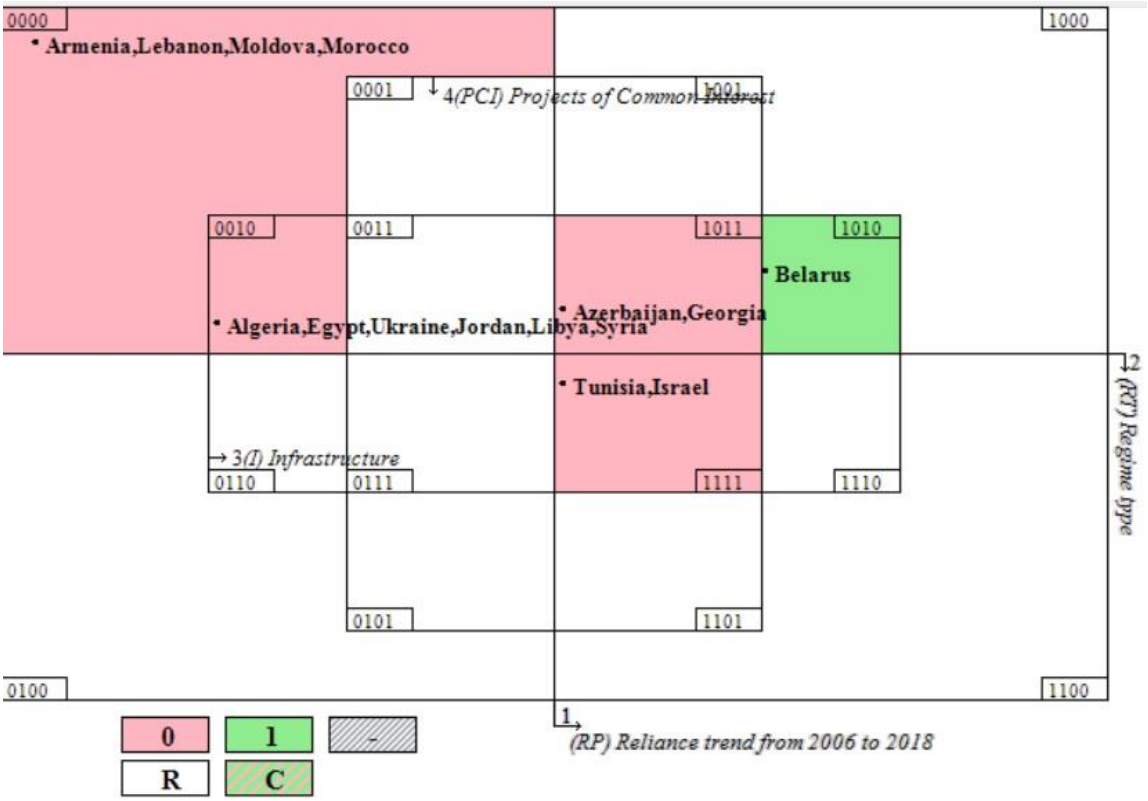
Note: the values that are coded with a '-'are considered to be of the value 0.

Table 6. Data: thresholds in place

Countries	(RP) Reliance in KTOE 2006	(RP) Reliance in KTOE 2018	(RP) Reliance trend from 2006 to 2018	(R-NG) 2006 Reliance of imports natural gas	(R-O) 2006 Reliance of imports oil	(R-NG) 2018 Reliance of imports natural gas	(R-O) 2018 Reliance of imports oil	(RT) Regime type	(I) Infrastructure	(PCI) Projects of Common Interest	(P) Political Stability (coefficient) 2018
Algeria			**0**					0	1	0	**0**
Armenia			**0**					0	0	0	**0**
Azerbaijan			**1**					0	1	1	**0**
Belarus			**1**					0	1	0	**1**
Egypt			**0**					0	1	0	**0**
Georgia			**1**					0	1	1	**0**
Ukraine			**0**					0	1	0	**0**
Jordan			**0**					0	1	0	**0**
Lebanon			**0**					0	0	0	**0**
Libya			**0**					0	1	0	**0**
Moldova			**0**					0	0	0	**0**
Morocco			**0**					0	0	0	**0**
Palestine (omitted)											
Syria			**0**					0	1	0	**0**
Tunisia			**1**					1	1	1	**0**
Israel			**1**					1	1	1	**0**
Threshold:			**1**					Free	Yes	Yes	**0**

Note: Thresholds for the 2nd, 3rd, 5th, 6th, and 7th column do not make sense as they together constitute the 4th column. Here (P) and (RP) are the independent and dependent variable, respectively.

Figure 2. Venn diagram of outcome groups



Note: This figure shows the solution of the QCA. Here, only Belarus appears to have been stabilized, while at the same time was able to export more energy to the EU.

Output 1. QCA results

Tosmana Report

Algorithm: Quine

File: C:\Users\Joost Klooster\Desktop\Tosmana13-5_v4.xml

Settings:
Minimizing: 0
including: 1

Truth-Table:

Countries	(RP) Reliance trend from 2006 to 2018	(RT) Regime type	(I) Infrastructure	(PCI) Projects of Common Interest	(P) Political Stability (coefficient) 2018
Armenia, Lebanon, Moldova, Morocco	0	0	0	0	0
Algeria, Egypt, Ukraine, Jordan, Libya, Syria	0	0	1	0	0
Belarus	1	0	1	0	1
Azerbaijan, Georgia	1	0	1	1	0
Tunisia, Israel	1	1	1	1	0

Result(s):

(RP) Reliance trend from 2006 to 2018{0} * (RT) Regime type {0} * (PCI) Projects of Common Interest{0} + (RP) Reliance trend from 2006 to 2018{1} * (I) Infrastructure{1} * (PCI) Projects of Common Interest{1}
(Algeria,Egypt,Ukraine,Jordan,Libya,Syria+Armenia,Lebanon,Moldova,Morocco) (Azerbaijan,Georgia+Tunisia,Israel)

Created with Tosmana Version 1.61