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**Cooperation in the energy security sector: a case study of the prospective EU-  
Azerbaijan natural gas trade**

MA thesis

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I have written this Master's thesis independently. All viewpoints of other authors, literary sources and data from elsewhere used for writing this paper have been referenced.

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## **Abstract**

European Union's growing natural gas import dependence, high dependency on Russia's gas and depletion of own intra-EU gas reserves has made EU look towards diversification of suppliers like Azerbaijan. Considering that nowadays energy ground involves various topics, neoliberalism with the help of international political economy liberal approach is used to explain EU energy security. For the analyse, considering the fuzziness of energy security concept, three energy security components reliability, affordability and sustainability are used, with applied indicators, to evaluate Azerbaijan's fit. This thesis tries to analyse potential fit to EU energy ground, at the same time considering, that there is no gas trade between Azerbaijan and Baku. The thesis finds, that Azerbaijan fits good enough to EU energy security framework, but other factors are involved. The reliability of supply dimension gives Azerbaijan a positive outlook for being a supplier, yet while gas trade will improve cooperation and mutual benefit, the potential risk on transit is high due to Russia's influence and interests in the region. Affordability dimension finds, that Azerbaijan's gas is affordable for the EU market and has been less volatile in price fluctuation, but is still highly dependent on oil prices. But the prices are expected to rise and will rise Azerbaijan's motivation towards EU market. Sustainability dimension finds that EU will benefit from Caspian import and by 2040 EU gas production has fallen almost three times, whereas Azerbaijan's production has increased by almost three times. Due to potential increase in future gas flows, it serves EU's aims to increase environmentally friendlier gas share in energy mix, which is seen as a bridge towards renewable energies. The thesis finds that through Azerbaijan's gas export, EU's energy security ground will benefit from supplies and diversification, while opening up new markets in the Caspian region and Middle East through Southern Gas Corridor.

**Key words:** natural gas, European Union, diversification, cooperation, Azerbaijan, energy security, Neoliberalism, International Political Economy, reliability, affordability, sustainability, Southern Gas Corridor

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## **Introduction**

European Union as a major energy consumer faces numerous challenges to overcome in terms of maintaining energy supply and security in future. The main aim of Energy Security Strategy, adopted in 2014 by the European Commission, is to achieve stable, environmentally sustainable and abundant supply of energy to cope with the future demands of European Union (EU)(European Commission 2014(a)). One potential pathway to that specific goal would be diversifying external supplies of natural gas, because due to its lower impact on environment compared with coal and oil. Gas is seen as a bridge towards renewables, which helps to step by step achieve EU aims to reduce greenhouse gas emissions by 2050. Besides diversifying suppliers, one of the aims is to reduce dependence on Russia's gas import, which is more than a third of total gas imports. One of the options for EU is to import Azerbaijan's gas from Caspian region through Southern Gas Corridor via Georgia and Turkey. Azerbaijan, who has a long history of energy resource production, being the first state that started industrial oil production at the end of 19<sup>th</sup> century, is now increasing their gas production due to decreasing oil resources and market demand. This on the other hand can mean more potential gas resources for the EU market and connecting further Caspian region states to a supply chain with potential Middle-East states in future. Therefore, it is important to evaluate potential energy relationship between EU and Azerbaijan, to see if it fits to the EU energy security framework and what factors can affect the future supply.

The majority of the energy security studies are based on analysing energy interdependence between states, which assumes physical trade and mutual effect analysis. This thesis tries to look at a long term perspective in the case of EU, because as of 2019, there is no physical gas trade between Azerbaijan and EU.

The main objective of this thesis is to set Azerbaijan to the EU energy security framework as a potential future gas supplier and answer a research question through three energy dimensions while applying energy security indicators. The research question of this thesis is "How would Azerbaijan fit to long-term EU energy security framework?". Hence, this thesis is based on current situation and applies forecasts to see, how Azerbaijan's role can potentially change over time. The overall aim is to give an assessment to a hypothesis "Through pursuing energy cooperation with Azerbaijan, European Union will benefit from long-term energy security."

This thesis is structured as five different sections. The aim of the energy security framework part of the thesis is to understand the current EU energy policy pursued by European Commission and member states which leads to energy triangle topics. The triangle gives an overview of main threats and goals, which EU pursues. First triangle objective is the security of supply issues, which shows the need of diversification. Secondly, the competitiveness of a free market, which firstly is concerned with natural gas affordability and liberalization of the energy market. And the third is sustainability, which reflects the environmental issues, but in the case of EU, it is strongly related to the increasing use of natural gas to fight climate change.

Additionally, oil and gas difference needs to be emphasized. It is due to different approaches towards the resource, where natural gas in energy security has more complex issues due to pipeline security and the difficult process of transporting gas. Oil on the other hand is easily transportable and is not as sensitive to interruptions. Therefore it serves the logic to understand the potential of Azerbaijan's supply through Southern Gas Corridor.

The theoretical background of the thesis is based on the neoliberal approach in international relations, which is explained through liberal approach in international political economy approach on energy. The neoliberal approach assumes, that for actors to benefit, they must have positive relations with each other on international arena. In the case of energy trade, both consumer and supplier will benefit, which helps to reduce the risk of conflict and is overall beneficial to all, based on liberal approach in International Political Economy. Due to neoliberal assumptions and growing globalization, actors are more interdependent because world's energy and economy are getting more and more integrated. Neoliberalism, with the help of International Political Economy liberal approach, helps to take into account free market, sustainability issues on climate change, that can also affect security. These matters can also be seen in the EU energy security goals and strategies.

The conceptualization section is based on the fuzzy concept of energy security and shows that there is no common approach to the issue. Energy security is strongly context dependent and it is used to justify or explain different policies taken by actors. Though various authors describe energy security through different dimensions, the main components remain the same - security, affordability and environmental issues. The

section concludes with Brenda Shaffer's three dimensions of energy security, which are reliability, affordability and environmental sustainability. They conform to the EU energy triangle and International Energy Agency goals. Each dimension is described and put in to the EU's framework.

The analysis section of the thesis focuses on three dimensions and their elaboration. Firstly, the reliability dimension which includes three components. The first is the diversification section that gives an overview of potential diversification possibilities and aims to show why Azerbaijan seems to be the most promising and logical supplier. Secondly, the transit section that describes Azerbaijan, Georgia and Turkey as a supply chain and the factors that can affect supply transportation. Additionally, the parts of Southern Gas Corridor will be looked at and their attributes, the role of Russia's influence in the region and finally the legal status of Caspian Sea and complexity of the littoral states situation. Finally, Azerbaijan's physical supply and properties in case of supply will be analysed as one of the main components for a reliable supply of gas.

Secondly, the dimension of affordability tries to give an overview of the price trends of natural gas in European Union. Hence, it must be considered, that oil prices have a strong effect on gas prices and therefore oil and gas price volatility is looked at with the consumption patterns of EU. The aim here is to find out if prices and consumption are related and if it has an effect on gas consumption. Finally, Azerbaijan's export prices are analysed to see volatility, price range and how it would estimatedly fit to EU energy prices together with future gas price forecast by World Bank.

The final dimension, environmental sustainability, firstly looks at the EU energy mix and the share of gas and renewables. Secondly at the greenhouse gas emission as CO<sup>2</sup> per capita is analysed and how the current progress reflects on long term climate goals. And thirdly, the EU long term forecast for natural gas, provided by International Energy Agency, tries to predict future trends, which indicate a drastic decrease of EU's production of gas and a growing import dependence up to 90% of total consumption. Azerbaijan will here be looked at as their potential gas output growth and how big hypothetical share it would have on the EU energy mix. Sustainability in EU means moving towards renewables, decreasing oil and coal through gas and therefore, a supply from Azerbaijan can be seen as a component to achieve these goals.

The single exploratory case study is used for conducting the analysis. The main reason is the fuzziness of the energy security approaches and that Azerbaijan is strongly context dependent. This approach seems to best describe the current overall issues regarding Azerbaijan-EU energy security and energy cooperation by author's point of view. This thesis applies simple energy indicators instead of complex, because of the lack of available data. Simple indicators are taken from Sovacool's and Mukherjee's (2011) research. They conducted a synthesized approach and created their five dimensions based on interviews with people related to energy security. They found 320 simple indicators and 52 complex indicators, that can be used in energy analysis.

This thesis strongly relies on Brenda Shaffer's "Energy Politics" (2009) to set up three dimensions and for providing an overview of natural gas as a commodity. She is one of the most know contemporary researchers, who mostly looks at natural gas issues related to energy security. In case of diversification, the geopolitical overview in relation with energy is mostly based on Ratner et. al (2013).

The data taken from the analysis of indicators is strongly based on British Petroleum Statistics, especially consumption, production and its ratio, prices and CO2 emission. Also, British Petroleum releases annual energy outlooks and is a trusted source of information and it has a long history of producing on Caspian Basin. Eurostat and European Environmental Agency service data will be used as providers of information on the EU level besides British Petroleum Statistics. Info about Azerbaijan's gas export and prices were derived from The States Statistical Committee of the Republic of Azerbaijan's statistics. Forecasts are based on World Bank predictions and International Energy Agency predictions based on 2018 outlook. World Bank's, as a finance organization's predictions on natural gas prices up to 2030 are based on the current situation and on their models. International Energy Agency collects its information from various sources and every year they give an overlook of the previous year. They create sustainable development scenario and every year they compare it with new policy scenarios based on current trends in energy sector and their information is widely used as a primary source.

# **1. A conceptual and theoretical overview**

## **1.1. EU energy security framework**

The following chapter gives an overview of European Union's main issues on energy policy emphasizing on current energy security approaches mainly presented by European Commission as a supranational institution trying to coordinate common goals in terms of energy. Additionally, the aim is to give an overview of what are the main components of energy security policy pursued by the EU.

### **Changing energy policy in European Union**

The importance of energy in European Union has been one of the main elements in creating more integrated union. In the case of EU as the treaty-based was created by Treaty of Paris in 1951, where European Coal and Steel Community was created, followed by the Treaty of Rome in 1957, where European Atomic Energy Community (EURATOM) was created (Shaffer 2009:128). Despite that, according to Shaffer, energy was one of the first spheres of common action for the EU and driver for Europe's integration and there was no common EU energy policy along member states. Until 2007, common EU energy policy was discussed only within the framework of environmental policies, but gas disputes between Russia and Post-Soviet States, such as Ukraine, Belarus, Georgia gave a signal, that EU needs comprehensive energy policy. Increasing dependency on Russia's gas raised questions on energy security and reliable suppliers (Shaffer 2009:128-129).

Despite the gas disputes, there are more aspects that are changing EU energy situation in the 21st century. Considering the geographical distribution of the EU, some states are more dependent on energy imports and primary energy resources are depleting. Due to the high demand of energy in case of economic growth and sustainability, achieving EU's energy security goals must be taken into consideration. EU imports more than 50% of its total energy consumption, where crude oil is almost 90% of it, natural gas about 2/3 of consumption, according to European Commission. The dependence on a single supplier is seen as a threat to those who have only one external operator, for example the Baltic

states (European Commission 2014(a):2). The EU external policy is seen as a crucial element to complete internal energy market. The fundamental importance and a core goal of EU security policy is to have secure, sustainable and competitive energy (European Commission 2011:2).

Overall, based on Umbach (2009), world is not facing an overall shortage of resources in terms of producing energy, but EU is facing a depletion of its own natural resources. This raises a question of emerging economies like China and India, that affect global gas prices. This also leads to “high energy politics” where oil and gas markets are affected, with challenges related to climate changes, by state players (Umbach 2009:1230).

Considering the internal and external challenges that EU faces, in 2014 European Commission published the European Energy Security strategy, which was strongly affected by the Ukraine Crisis that started in 2013 and also had great effect on the EU gas supply considerations because Ukraine is a major Russian gas transit state. These events showed how vulnerable the EU gas market is and how dependent it is on Russia. A common energy-related security strategy to set down clear principles and key areas what to follow and achieve is therefore needed.

### **EU Energy Security Strategy**

The aim of the EU Energy Security Strategy is to “...set out areas where decisions need to be taken or concrete actions implemented in the short, medium and longer term to respond to energy security concerns” through eight key pillars. These pillars were “1. Immediate actions aimed at increasing the EU's capacity to overcome a major disruption during the winter 2014/2015; 2. Strengthening emergency/solidarity mechanisms including coordination of risk assessments and contingency plans; and protecting strategic infrastructure; 3. Moderating energy demand; 4. Building a well-functioning and fully integrated internal market; 5. Increasing energy production in the European Union; 6. Further developing energy technologies; 7. Diversifying external supplies and related infrastructure; 8. Improving coordination of national energy policies and speaking with one voice in external energy policy (European Commission 2014(a):3).”

This thesis aims to explore Azerbaijan’s role and importance for EU, as the seventh pillar is related to diversifying external supplies and the importance of Southern Gas Corridor was mentioned by getting at least 10 bcm/y (billion cubic meters/ year) to European

market and opening future possibilities for natural gas in Caspian region and Middle East by 2020 (European Commission 2014(a):16).

Though, all pillars describe the situation in 2014 and had key actions set for long term security purposes based on that time circumstances. Additionally, long term energy security goals laid down in key were related to Energy Strategy 2020 expect pillars 1 and 8 (European Commission 2014(a)).

### **Long term energy security goals**

“Energy 2020: A strategy for competitive, sustainable and secure energy” presented in 2010 brought out five priorities: 1) achieving an energy efficient Europe; 2) building a truly pan-European integrated energy market; 3) empowering consumers and achieving the highest level of safety and security; 4) extending Europe’s leadership in energy technology and innovation and finally 5) strengthening the external dimension of the EU energy market (European Commission 2010:5-6). The first four priorities are aimed for the integration of EU states and efficiency on producing energy while aiming to cut down emission gases and to lower the impact on climate. The fifth one focuses on foreign policy goals and four actions were presented: integrating energy markets and regulatory frameworks with our neighbors; establishing privileged partnerships with key partners; promoting the global role of the EU for a future of low-carbon energy and fourthly promoting legally binding nuclear-safety, security and non-proliferation standards worldwide (European Commission 2010:18-19). As follows, EU took a clear promoter’s position on energy efficiency and low-carbon energy production which also aims for partner states to have bilateral relations with EU.

The energy roadmaps for 2020 (European Commission 2010), 2020-2030 (European Commission 2014(b)) and 2050 (European Commission 2012) are linked, starting from achieving 2020 goals and improving the situation by 2030 and ideally by 2050 these all should be met. The framework is laid down and EU pursues towards these goals step by step implementing changes to its common energy security with member states in different spheres of energy security.

## **EU Energy Triangle**

The overall EU energy objectives can be divided into three dimensions, which are security of supply, sustainability and competitiveness (referred also as internal market), which according to Szulecki et al. (2016) remain unaltered and the emphasis given to each objective goal is still open (Szulecki et al. 2016:549). These objectives are emphasized by policy makers and are mentioned in different EU documents. For example, an EC document "The EU Energy Policy: Engaging with Partners beyond Our Borders" as a fundamental importance (European Commission 2011:2).

There is no common energy security definition by the EU, yet one of the most used definition origins from Green Paper presented by the European Commission in 2000. There the definition on energy security is as follows "*uninterrupted physical availability of energy products on the market, at a price which is affordable for all consumers (private and industrial), while respecting environmental concerns and looking towards sustainable development*" (European Commission 2000). This definition is related to the triangle objectives as security of supply stands for uninterrupted physical availability of energy products; competitiveness through the affordability and sustainability in the case of respecting environment.

Related to the security of supply dimensions, the importance of natural gas will grow in EU energy mix and is needed as a backup fuel for various electricity generation (European Commission 2010:10). Shaffer brings out that the security of supply policy, in the case of natural gas, is ensured when there is diversity in energy, the country of origin and also in transit. In the case of creating a linkage through infrastructure, the security of supply policy will encompass independent gas pipelines from Caspian region and it would not go through Russia (Shaffer 2009:132). The Energy Security Strategy also brings out that creating a relationship with a new supplier through critical infrastructure to Caspian region is preparing ground for future resources from there and beyond (European Commission 2014(a):16). Therefore security of supply in the case of natural gas is achieved through long-term external suppliers in EU's perspective.

Competitiveness refers to a single market. In the case of natural gas, the opportunity to diversify suppliers depends on whether import capacities are made available and when gas will be sold with affordable prices (European Commission 2014(a):16). In the case of making energy market work and adding external natural gas suppliers to the single

market, it reflects Commission's measures in fully liberal way, but Goldthau, Sitter also stresses on the threat, that gas markets are far from textbook examples of a free gas market due to pipeline connection and regionality of trade (Goldthau; Sitter 2014: 1465).

Sustainability, as mentioned above, relates to environmental issues. European Commission has a long-term plan until 2050 to cut down emission by 80-95% and it strongly relies on decarbonization and energy efficiency in the case of environmental goals, which means increasing renewables share in energy mix. Also, it means that EU has to agree on tools and policies, which would make the shift and continuing on a sustainable path possible (European Commission 2010:2-3). States in EU are called up to influence their fuel mix towards new directions, which means importing more environmentally friendly energy, such as natural gas and nuclear energy and renewable sources, but this has an effect on dependency that must be considered (Chalvatzis; Hooper 2009:2704).

While the EU common energy policy has three dimensions, it is still important to fit natural gas inside the framework and explain its special properties related to energy security. The following chapter tries to address the main issues.

## **1.2. Gas role in energy security**

Brenda Shaffer (2009) discusses the relationship between energy and international politics in the 21st century and finds that energy and politics are inseparable. Where international politics are interconnected, energy security is the key for improving national security by ensuring primary commodities. Furthermore, energy creates interdependence in the international system, and market conditions lead to increased internationalization of political developments in the energy sector. Shaffer stresses that natural gas in the current era is the center of energy security policies due to the fact that it is more vulnerable and has high political influence, meaning that there is more opportunities for politics to affect energy relations between states, including transit states. In the case of transit states, she follows, they tend to use energy as a weapon. On the other hand, supplier states and consumer states use it infrequently to achieve their economic and political goals (Shaffer 2009:3-5)

Hence, Shaffer brings out the nexus relationship between energy and politics, where the best suitable for gas are (Shaffer 2009:3-5):

- *“Energy and politics are inseparable. Energy trends and international politics are innately interconnected and energy security is an integral part of the foreign and national security policies of states.”*
- *“Energy creates an additional link between the domestic and foreign policies of states. The impact of hydrocarbon use on climate change, energy prices, and concerns about energy supply availability have made a state’s domestic energy consumption habits and policies a matter of international political interest and concern.”*
- *“In the current era, natural gas is at the center of energy security policies due to its extreme vulnerability to political influence. In fact, the gas trade is much more vulnerable to political influence than the oil trade. With a rise in the global use of natural gas and surging cross-border natural gas trade, there is more opportunity for politics to affect energy supply relations.”*
- *“The major energy-consuming markets are privatizing and unbundling energy production, transport, and supply, while energy production is becoming more and more concentrated in the hands of states. This has created an uneven playing field between consumers and producers, which provides the opportunity for state-held producers like Russia’s Gazprom to gain control of a significant chunk of infrastructure.”*

### **Main key differences between oil and natural gas**

Shaffer (2009) brings out that by its nature, natural gas is more susceptible to political considerations than oil and the 21st century is also called as “the era of gas”. The main difference is that oil has little connections between supplier and consumer, while natural gas, on the other hand, demands pipelines for creating linkages. The long-term relations, according to Shaffer, come from the high price of natural gas, because it requires transport infrastructure - LNG or pipelines. All these carry high costs, especially building the pipelines, which are long term projects in need of long-term relationship between actors. This also requires actors to put effort into ensuring positive political and security relations and cooperation before undertaking a major project. Therefore, it shows, that oil has some benefits, because it is easier to deliver and has vast logistical infrastructure in place

already, but gas is doing the same transition as oil did in the 20th century (Shaffer 2009:35-37).

Shaffer in her article “Natural gas supply stability and foreign policy” (2013) continues that the gas consumption in the world is going to grow due to its relatively low environmental impact and her focus is on gas trading states and their relations. The main principle proposed by Shaffer is that gas disruption cannot be only initiated by the supplier, but the transit states and consumer states are also capable of doing that. Furthermore, she identifies three types of gas supply relations: a) where neither side is dependent on gas trade; b) where one side is dependent on trade; c) interdependency of gas trade from both sides (Shaffer 2013:114-115). She also predicts that natural gas consumption will increase not only in volumes but also in international trade level (Shaffer 2013:124).

In the context of European Union’s natural gas, concerns mostly indicate diversification and that gas supplies are hard to replace. The expectable growth of natural gas in the European energy mix is explained as a means of diversification from unreliable oil supplies and as a bridge towards renewables, where the aim is a transition from fossil fuels towards friendlier fuels aiming post-carbon era (Proedrou 2016:68).

### **1.3. Conceptual framework**

Over time, the meaning of energy security has shifted from being a matter of physical power and military strength, from a traditional realism vision, to economic aspects and environmental issues as strong affecting factors of energy security matters. Since the beginning of the 20th century energy security was mostly related with supplying necessary fuels for the military (Cherp; Jewell 2011:202). The first time the energy security was included in national energy calculations was when Winston Churchill decided to change the power source of the Royal Navy from coal to oil in 1912 and it has become as one preconditions for conduction modern warfare (Shaffer 2009:66). The modern approach and debate on energy security emerged in 1973-4 when the world was struck by the first oil crises and liberal approach found more attention (Van de Graaf et al. 2016:10). This is when it was understood that energy security is not only about military power, but extends to various problems in the world, for example economic effects (Biresselioglu 2011:10).

The traditional understanding of energy security has changed: militarism and securing resources abroad remained still in scope, but the approach to energy security took a wider meaning and obtained new dimensions. Maxwell D. Tylor wrote on the energy crisis in 1973/4 that “*One could hardly hope to find a better example of the seriousness of nonmilitary threats to national security than the present energy crisis*” (Taylor 1974:592).

### **1.3.1. Neoliberalism**

As the name neoliberalism suggests, *neo* means a revised and wider approach to liberalism. In 20th century, with the emergence of neoliberal thought surfaced the notion that IR agenda has expanded into the non-military, economics and environmental arenas, which now act as explanatory factors in the system change theories (Evans, Newnham 1998:29).

Robert O. Keohane and Joseph S. Nye have influenced the neoliberal school of thought, which emerged as a response to challenge neorealism. They are considered as founders of the neoliberal school of thought as they try to explain world and power issues through interdependence (mutual dependence), where they respond to the realist assumption of world politics. After they established differences between realism and complex interdependence, they argued that “*complex interdependence comes closer to reality than does it realism*” (Keohane; Nye 2001:20).

Through the interdependence approach, the scholars opened a new chapter in neoliberal way of thinking in international relations, where neoliberalism claims that there is no hierarchy between “high politics” and “low politics” (Bösz 2017:205). The absence of hierarchy among the issues based on Nye and Keohane means that military and security policy does not consistently dominate the agenda of international politics, but various issues, like economic goals etc., can have their place. (Keohane; Nye 2001:21). This also reflects the liberal assumption that economic incentives tend to be as important as concerns for security for maintaining their position in the international system (Keohane: Nye 2001:269).

As mentioned, the debates of neoliberalism and neorealism have showed the key differences between these two schools of thought. Proedrou overall brings out the main difference that “*neoliberalism thus makes it explicit that world politics is not a continuous struggle for power, as neo-realists claim, but a field where one can encounter both*

*cooperation and conflict*” (Proedrou 2007:331). The idea of cooperation in neoliberalist sense contradicts realism’s anarchy and uncertainty assumptions, where “*neoliberalism maintains that cooperation is possible, when the perceived benefits are high and perceived costs low; therefore, it is the calculation of costs and benefits and not anarchy that will determine whether cooperation will be achieved*” (Proedrou 2007:330-331).

From a broader neoliberal perspective, Keohane’s idea of cooperation holds that governments pursue self-interests through different deals, which can be beneficial for both sides. Cooperation will only take place, where states’ policies are actually or potentially in conflict. Ideally, without conflict or risk there is no need to cooperate. Furthermore, Keohane stresses that “*attainment of the gains from pursuing complementary policies depend on cooperation*” (Keohane 1984:53-54).

### **1.3.2. International Political Economy: Liberalism**

To understand neoliberalism’s relation to energy, international political economy’s tradition of liberal approach will be described. The aim is to show main applications of energy in their view of thought, which relates to the main ideas of neoliberalism.

The oil crisis and other economic changes in the beginning of 1970s led to the emergence of international political economy (IPE) as a subfield to international relations theories due to real-world changes. One of the reasons for IPE’s emergence was that realism could not take account changes taking place across the world, since it described the world as anarchic arena where states struggle over power and energy resources without taking into consideration economic concerns derived from integration of global energy markets (Van de Graaf et al. 2016:10). Main traditions of IPE trichotomy as mercantilism/realism, liberalism, marxism have their own assumptions and applications to energy (Van de Graaf et al. 2016:13). New approaches through other theories have come to debate on hence IPE still cannot be understood as coherent and unified intellectual theory in IR, but it tries to combine economics, politics and other details to explain the changing processes in world. Energy in IPE is one of the main topics of debates and research agendas which attempt to integrate politics, geopolitics and other issues in the framework of nowadays world (Van de Graaf et al. 2016:14-18).

According to Van de Graaf et al. (2016), the main assumption in the liberal approach in IPE is that politics and economics exist in separate spheres with emphasis on free market,

which ideally is efficient and morally desirable in allocating resources. Liberalists claim that consumers, companies and international organizations are equivalent to states in their importance. The role of a state is to ensure smooth and optimal, relatively unfettered functioning of the markets. Hence, liberalists, in the realm of economics, reject the view of a state as central actor, since the private sector should be more involved. Energy is mainly seen as a commodity, which involves numerous actors, and in their point of view energy market should be left for the “invisible hand” so it can be beneficial for everybody. Liberalization of energy and gas markets is seen desirable, because energy is understood as a commodity like any other in their view. In liberalist view, interdependence through energy trade centers on international level, a condition which ideally should lower the risk of conflict, and this again refers to the “beneficial to all” idea. In case of liberalist application to energy, they see that international organizations can help with negotiations to avoid dangerous climate change, bringing in the idea of sustainability (Van de Graaf et al. 2016:13-15).

### **1.3.3. Application of Neoliberalism to EU energy security**

Proedrou mentions, that energy is a hard case to capture for neoliberals, mostly due to its complicated role in development, welfare and survival of states and their economies, yet he maintains that it is better at explaining energy in the EU compared to the realist approach (Proedrou 2007:330). Considering neoliberal thought of school and IPE liberal approach to energy, the EU energy security framework with triangle can be related to a theory, where cooperation and economics play important role in energy security for EU in achieving its goals without military means.

Goldthau and Sitter, dealing specifically with the dynamics surrounding the EU, suggest that the challenges related to market governance are increasingly intertwined with including energy into the EU’s regulatory efforts (Goldthau; Sitter 2015:18). Hence, EU energy security and politics is designed and promoted by European Commission, where it is tried to predict and maintain proper functioning of the single market in the EU and to decrease potential vulnerability through energy integration and cooperation. Considering EU’s liberal entity, cooperation plays a key role on external level which is mentioned also in the EU Energy Security Strategy:

*“...energy security issues are addressed only at a national level without taking fully into account the interdependence of Member States. The key to improved energy security lies first in a more collective approach through a functioning internal market and greater cooperation at regional and European levels, in particular for coordinating network developments and opening up markets, and second, in a more coherent external action (emphasis added, EC 2014(a):3).”*

According to Youngs', energy cooperation within the unique nature of European Union as an intra-European international body devises an extra-European international policy, where external policy extends the nature of internal cooperation developed between member states (Youngs 2007:4). The cooperation towards Caspian littoral states can be seen since 2004 in the case of energy, when Baku Initiative was launched with an aim to develop regional energy markets through network interconnections. The aim of the reform in the region relies on EU regulations for having energy on internal energy market, on the other hand EU supports and aids their development through funding (Youngs:2007:3).

Overall, theoretical assumption for this thesis is based on neoliberalism and that European Union does not have a hierarchy in their agendas. Economic issues on energy market are important and decreasing vulnerability by increasing diversity of suppliers through cooperation promoted in their external policy. A specific case of securing the supply of Azerbaijan's gas relies strongly on cooperation tools and on free market rules. The theory assumes that through pursuing energy cooperation with Azerbaijan, European Union will benefit its own energy security and Azerbaijan will benefit from selling its gas to the EU market. The hypothesis is set down as follows “Through pursuing energy cooperation with Azerbaijan, European Union will benefit on long-term energy security”.

#### **1.4. Conceptualization of energy security**

In order to understand energy security approaches while considering its fuzzy concept, various different concepts will be presented and main core elements identified. Due to European energy security approach various aspects and ways of interpretation of energy security must be considered to set an approach to security framework.

### **A fuzzy concept of energy security**

The first definitions of energy security in 1970s and '80s were mostly market-centric, when ongoing processes of globalization, integration of energy markets and different new aspects like environmental issues etc. had caused a versatility of energy security definitions (Chester 2010:887-889). Felix Ciută mentions difficulties of energy entity in his article "Conceptual Notes on Energy Security: Total or Banal Security?". He states that "energy security clearly means many different things to different authors and actors, and even at times to the same author or actor" (Ciută 2010:124).

Coupled with the multitude of definitions on energy security, Benjamin Sovacool presents 45 definitions from different authors and institutions, while stressing that the concept has become diffuse and often incoherent. He follows that "multitude of definitions serve some strategic value which enables people to advance very different notions of energy security so that they can then justify actions and policies on energy security ground" (Sovacool 2010:3). With this in mind, Christian Winzer also mentions that energy security has become an umbrella term for different policy goals due to the absence of clear definition (Winzer 2012:36).

### **Different definitions in energy security studies**

In 2007, one of the debated approaches, Asia Pacific Research Centre (APERC) researchers introduced four A-s and defined energy security as the "ability of an economy to guarantee the availability of energy resource supply in a sustainable and timely manner with the energy price being at a level that will not adversely affect the economic performance of the economy", clearly referring to the four A-s. The four A-s are: availability, accessibility, acceptability and affordability and they align with their presented elements of energy security. APERC report also bind elements related to four A-s affecting energy security (Intharak et al. 2007:6):

- 1) the availability of fuel reserves, both domestically and by external suppliers;*
- 2) the ability of an economy to acquire supply to meet projected energy demand;*
- 3) the level of an economy's energy resource diversification and energy supplier diversification;*

*4) accessibility to fuel resources, in terms of the availability of related energy infrastructure and energy transportation infrastructure;*

*5) geopolitical concerns surrounding resource acquisition.*

The four A-s caused a wide debate over energy security and interpretation, but still found a place in energy analyses. Acceptability and affordability were relatively new in energy studies, they are more complex and do not have as straightforward analysis on a similar scale as the one that availability and accessibility have obtained through decades. Furthermore, Cherp and Jewell argue that the definition and four A-s derived from APERC were lacking in logical reasoning regarding to their application, since the existing reasoning for the four A-s did not rely on or referred to relevant academic literature. In their view they questioned whether the report, as whole, constitutes as a generic concept or essential characteristics of energy security. Furthermore, they claimed that the four A-s approach does not address the security issues and in their definition energy security is a low vulnerability of vital energy systems. In their opinion analysing energy security concept should at first try to address Baldwin's three question about security (Cherp; Jewell 2014:416-417):

1. Security for whom?
2. Security of what values?
3. From what threats?

Despite the criticism towards four A-s as new idea of analyzing energy security, Bert Kruyt et al. adhered the four A-s in their approach: availability or elements relating to geological existence; accessibility or geopolitical elements; affordability or economical elements and acceptability or environmental and societal elements (Kruyt et al. 2009:2167). As a framework for energy security they claim that it is based on the notion that an uninterrupted supply of energy is critical for a functioning economy. As gas is considered a long-term energy security perspective, they mention that short and long-time scales are connected and under-investment and efforts on energy security field can increase the risk of disruptions in general (Kruyt et al. 2009:2167-2168). Overall, they apply a lot of indicators what should be considered on national energy security to APERC four A-s, explaining that those indicators are context-dependent and also their

elaboration. For example, an indicator of political stability is dependent on paradigm and is used qualitatively in policy making (Kruyt et al. 2009:2169-2172).

Jonathan Elkind has an approach to elements of energy security that is similar to four A-s, but he names the elements availability, reliability, affordability and sustainability. He claims that the concept of energy security incorporates the four elements but countries never evaluate their priorities and vulnerabilities identically. He adds that one country may favor affordability and availability but it can still face challenges in reliability and sustainability of energy security (Elkind; Pascual 2010:130).

Sovacool together with Marilyn Brown defines energy security through interconnected factors of availability, affordability, efficiency and environmental stewardship which are key elements in analysing energy issues and their impact. With availability they stress the importance of diversification and safety of supply. Affordability is based on the quality and price on producing energy without putting the environment in danger. Efficiency is based on innovation and technology needed to evaluate energy security. Finally, economic stewardship aims to cope with climate change and in their opinion, this is one of the most important elements of energy security nowadays (Sovacool; Brown 2010:80-85).

Considering all the above mentioned, one of the modern definitions was provided by International Energy Agency. They define it as “the uninterrupted availability of energy sources at an affordable price” (IEA 2014:13). This mainstream definition is now used by IEA and it involves two traditional elements - availability and affordability, which are still important dimensions when analysing the energy security. Besides that, Shaffer brings out that IEA has also set its goals towards promoting basic needs of energy security through reliable, affordable and also clean energy (Shaffer 2009:95). These three components of energy security emphasized by contemporary energy expert Shaffer, with the attention on natural gas, the notions of concepts are emerging in academic literature and also in primary documents, such as IEA outlooks and analyses (Shaffer 2009:93)(IEA 2018). Therefore this thesis relies on her three components.

Shaffer says that “*energy security includes three components: reliability, affordability, environmental friendliness*<sup>1</sup>.” Considering the fuzziness and multitude of definitions,

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<sup>1</sup> Shaffer uses also environmental sustainability in her works

Brenda Shaffer presents and stands for the three main components of energy security in her book “Energy Politics”. Shaffer states that some countries use one component more than others. For example, USA puts more attention on reliability of supplies, while EU rather on affordability and friendliness to the environment. Shaffer stresses, that natural gas needs a completely separate approach compared to oil. The main components might remain same, but gas presents a greater challenge to energy security than oil (Shaffer 2009:91-94). Additionally, her three components go with the EU energy triangle dimensions and seem more straightforward and relevant in terms of analysing natural gas issues related to EU and Azerbaijan.

As various definitions show, energy security is fuzzy, but it all serves the purpose of analysing energy. These concepts shown above, the topics from geopolitics to energy efficiency, serve strategic value in research and all seem to indicate vulnerabilities that arise or questions that must be addressed to justify actions or concerns on energy ground.

## 2. Methods and data

This thesis conducts an exploratory single case study in case of the dependent variable “The fit of Azerbaijan as a supplier to EU” through the three components presented by Brenda Shaffer (reliability, affordability and environmental sustainability) which can be related to the EU energy triangle framework. Descriptive exploratory case study on Azerbaijan was chosen assess and analyse how Azerbaijan’s natural gas, as a commodity, would fit to the EU energy security framework through three main components of energy security. The aim of this thesis is to answer a research question “How would Azerbaijan’s natural gas fit in to the EU long-term energy security framework?” and to assess it as it “fits perfectly”, “fits partially”, “does not fit” or “fits good enough but other factors might be involved” to EU energy security framework. Furthermore, the aim is to also assess the theoretical hypothesis that “through pursuing energy cooperation with Azerbaijan, European Union will benefit on long-term energy security”.

The exploratory case study is chosen due to multiple reasons. The posed research question in this thesis is a “how” question which refers to an exploratory case design and is asked about contemporary set of events, over which the investigator has little or no control (Yin 2003:8-9). Based on Streb, the exploratory case studies, by definition, can be applied in a research context which is not clearly specified. Furthermore, considering the fuzzy concept of energy security and lack of detailed preliminary research analysing Shaffer’s three components of energy security by certain energy indicators, the exploratory case study helps to accomplish proposed goals of the thesis. With the high degree of flexibility, data collection and independence on research design serves the goal of this thesis when data is reliable and valid (Streb 2010:374). The complexity of analysing energy security can put as follows: “*energy security is like a Rorschach inkblot test, you can see whatever you want to see in it*” (Sovacool; Mukherjee 2011:5346).

Neoliberal theory and IPE liberal application on energy, where international energy trade of commodities, natural gas in this case, creates interdependence and is beneficial for all, at the same time reducing risk of conflict (Van de Graaf et al. 2016:15). Neoliberal interdependence’s analytical concept has been used widely in analysing international transactions between states, flow of goods etc., through two dimensions, vulnerability and sensitivity (Keohane, Nye 2001:7-10). Yet this thesis cannot apply interdependence theory between EU and Azerbaijan, because at the moment there is no flow of goods in

case of natural gas and it predicts future possibilities of Azerbaijan as a supplier through the prism of energy security. Yet turning back to liberalist approach to reduce risk of conflict, it indicates vulnerability. Therefore fitting Azerbaijan to EU energy framework must first include analysing EU issues related to natural gas and then how Azerbaijan will fit to this framework of energy security emphasizing on the three dimensions presented by Brenda Shaffer.

## **2.1. Reliability**

Brenda Shaffer defines reliability of supply “*that a state has regular, non-interrupted access to energy in the quantity and forms it requires*”. In case of reliability, the stress is on a regular access to supply, that is non-interrupted and can deliver commodity from supplier to customer (Shaffer 2009:93)”. Her definition leaves a lot of room for interpretation but the main elements that arise are availability of supply and accessibility in case of non-interrupted access related to Azerbaijan.

Elkind’s definition of reliability connotes to Shaffer’s definition, as it involves the extent to which energy services are protected from interruptions (Elkind; Pascual 2010:124). The aim to analyse reliability in terms on non-interrupted supply of gas, then according to Shaffer the transit states tend to use energy as a weapon, what is strongly related to non-interrupted supply of energy (Shaffer 2009:4). According to Shaffer “*transit states are more likely to be tempted to use their role to elicit economic, security, and other gains* (Shaffer 2009:40).” Hence, on all sides, both supplier and consumer, transit states energy is seen as a tool to promote foreign policy and security goals (Shaffer 2009:29). In terms of EU, natural gas from landlocked Azerbaijan will be retrieved by pipeline through transit states Georgia and Turkey which can affect reliability.

EU Energy Security Strategy relates to reliability with stating that “*accessing more diversified natural gas resources is a priority whilst maintaining significant import volumes from reliable suppliers*” (European Commission 2014(a):15). Bert Kruyt et.al. state that availability of energy resources is often used as a direct indicator for energy security and security of supply (Kruyt et al. 2009:2168).

Overall, this thesis divides the analysis of reliability dimension to three categories which seems most relevant when analysing Azerbaijan’s fit to the framework. Firstly, diversification is used to find out EU’s alternatives for gas and give reason why

Azerbaijan is emphasized. Secondly, transit dimension as a supply chain is used to evaluate possible concerns of transporting supplies from Azerbaijan to EU border. And thirdly, the natural gas as a physical availability of Azerbaijan and its prospects. The transit states and politics in the region can be considered as intervening variables, which can minimize or maximize the possibility of forming solid cooperation between the Azerbaijan and EU.

## **2.2. Affordability**

Affordability refers to the cost of product consumed. EU Energy strategy brings out that gas supply will be safe “...if import infrastructure capacities are made available and if gas volumes are on sale at an affordable price... (European Commission 2014(a):16)”. Shaffer’s definition of affordability is “*hat it has access to energy supplies at a price that can be sustained economically and promotes economic growth*”. Affordability promotes economic growth which indicates, that prices should be reasonable and should not hinder the economy. (Shaffer 2009:93). Elkind explains affordability in a quite simple manner saying that “*energy that is not affordable in absolute terms is energy that cannot be used*”. Some of the main components, according to Elkind, are low price volatility and realistic expectations for future prices (Elkind; Pascual 2010:126).

Shaffer states that natural gas supplies make it more susceptible to political considerations as compared to oil. One reason is that natural gas has stronger connections between supplier and consumer due to long-term linkage and contracts which indicates to long term cooperation and relationship (Shaffer 2009:36). Long-term relations reflect in investments by investors, because nowadays it takes at least 15-20 years before the investments can be recouped. This also makes participating states and companies to put effort into having positive political and security relations, which then indicates cooperation (Shaffer 2009:38). Natural gas price on market depends on various aspects, for example, is the price linked to global oil price. And also many contracts are drafted with primary exporters on a “take or pay” basis, where consumers must buy a certain amount of gas whether it is actually consumed or not (Shaffer 2009:13). In case of commercial considerations, gas can be considered as a weapon which EU tries to avoid and therefore looks for diversification of the market. (Shaffer 2009:42-45).

This thesis divides analysis of affordability into two sections: current gas prices in EU and long-term projections of natural gas prices and the possible price of Azerbaijan gas. As there is no import from Azerbaijan, the suitability of prices can be evaluated.

### **2.3. Environmental Sustainability**

Energy Strategy 2020 (goals emphasized also in EU Energy Security Strategy) mentions that “*the central goals for energy policy (security of supply, competitiveness, and sustainability) are now laid down in the Lisbon Treaty*” (European Commission 2010:2). Environmental sustainability is important for meeting EU norms and values towards lowering the impact to the environment and in Article 194<sup>2</sup> “(c) promote energy efficiency and energy saving and the development of new and renewable forms of energy” gave clear signal for member states for the goals.

Shaffer’s definition on environmental sustainability states that “*prevailing form of energy provides for environmental sustainability and does not incur high health costs for residents.*” She also states that “*policies that lead to the reduced release of climate-altering gases* (Shaffer 2009:93).” In case of EU she refers to EU Green Paper 2000, where three main core goals mentioned are sustainable development, competitiveness and security of supply. There sustainable, efficient and diverse energy mix along with measures to address challenges of global warming is one of the key aspects (Shaffer 131-132). EU member states that rely on natural gas achieve their environmental goals and reduce greenhouse gas emissions (Ratner et al. 2013:5).

EU aims to decrease pollution levels, change its fuel mix towards environmental goals, promote gas to oil in case of energy efficiency and hereby Azerbaijan with its natural gas can ideally help to achieve EU’s goals in the long term. Therefore this thesis will divide sustainability to following sections to analyse: firstly EU energy mix and the role of natural gas, secondly CO<sup>2</sup> trends, and finally IEA predictions of consumption of EU and Azerbaijan’s potential trends in gas exports to look how could it affect EU’s need for natural gas.

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<sup>2</sup> Article 194 of the Treaty on the functioning of the European Union (TFUE).

## **2.4. Operationalization of three dimensions**

This thesis will use simple indicators and metrics, instead of complex indicators, that presented and collected by Sovacool and Mukherjee in their article “Conceptualizing and Measuring Energy Security: A Synthesized Approach” (Sovacool; Mukherjee 2011: 5347-5352). Their research concluded that there are 320 simple energy indicators and 52 complex indicators that scholars, researchers and policymakers can use in analysing energy security. Also, they divided these indicators into five dimensions and that proves how complex a nature energy security analysis can be (Sovacool; Mukherjee 2011:5342). As there is no universal approach to measure/assess energy security and it depends on authors’ interests and subjects related to the concept, the selection of indicators to be implemented depends on the dimension and needs of this particular thesis. One of the underlying reasons is that there is a lack of available data to back certain indicators and there is no gas trade between EU and Azerbaijan at the moment.

### **Reliability**

To assess the dependent variable “The fit of Azerbaijan as a potential supplier”, first gas must be analysed with its potential as a physical supply. Therefore it is important to evaluate diversification in natural gas supply for the EU since diversification is the EU’s main tool. Additionally, derived from Shaffer, transit states must be analysed in context to avoid interruptions and assessing Azerbaijan's suitability as a potential supplier, while also taking into account other diversification options available for the EU with regards to their potential reserves of natural gas.

The domestic consumption of gas will be looked at on a par with the assessment of the overall situation, which is generally more relevant to gas trade. Sovacool et al. bring out main supplies indicators: total natural gas reserves and reserve-to-production ratio for natural gas and self-sufficiency, which takes into account domestic consumption (Sovacool; Mukherjee 2011:5347)-5348). Self-sufficiency data with proven reserves indicate the latest situation, resource to production ratio (R/P ratio). The data is derived from British Petroleum Statistics, which is annually presented to public (British Petroleum 2018). Since British Petroleum is operating actively in Azerbaijan, it has to provide reliable and updated information every year for investors. The statistical package was issued in June 2018 giving an overview of 2017.

### **Affordability**

In the case of EU and gas prices, the volatility and market prices must be considered as well as Azerbaijan's average export price to predict the potential price in the future. Sovacool et al. offered indicators for affordability dimension and the following will be used in this thesis: market prices for natural gas (also forecast added) and fuel price volatility (Sovacool; Mukherjee 2011:5348-5349). Additionally, oil price fluctuation in EU will be also looked at, because gas price in Azerbaijan is linked to oil price. The data is derived from British Petroleum, World Bank and Eurostat. With regards to Azerbaijan's gas price, Azerbaijan's Statistical Committee database information on average export price is used to evaluate the gas price to EU.

### **Sustainability**

Sustainability is stated as the most difficult aspect in analysing energy security. Sovacool et al. bring out some of the indicators, for example, share of zero-carbon fuels in energy mix (renewables share) and total greenhouse gas emissions and CO<sub>2</sub> emission (Sovacool; Mukherjee 2011:5351). Therefore, analysing EU energy mix together with CO<sub>2</sub> emission trends will give an overview of ongoing trends and show the role of natural gas. Data is collected from Eurostat datasets.

Also, in order to fit Azerbaijan into the sustainability dimension for the purpose of further analysis, IEA forecasts on energy issues of EU must be considered as well as any identification of possible trends over the next decades in consumption, trade and production of natural gas across the EU. Azerbaijan's potential will be analysed with the focus on the respective production and potential sustainability of gas supplies, while taking into account the future forecasts for the EU energy mix changes. The data is derived from Eurostat, IEA and British Petroleum.

The data is reliable and valid. The following statistics stand as primary sources: IEA, British Petroleum and Eurostat with European Environmental Agency are being used in policy and energy analysis and are dependent. Azerbaijan's State Statistic on natural gas based on SOCAR's information, which is reliable primarily due to the goal of attracting investors by providing them with the right data.

Different data surfaces from different organizations on natural gas proven reserves due their methods (Oral; Esen 2016:101). Nevertheless, this thesis relies only on British Petroleum data on proven reserves and statistics on natural resources physical availability. This is because BP is one of the world's biggest operators and producers of oil and gas and the issued statistics is trusted by investors and researchers worldwide.

### **3. Three components of energy security**

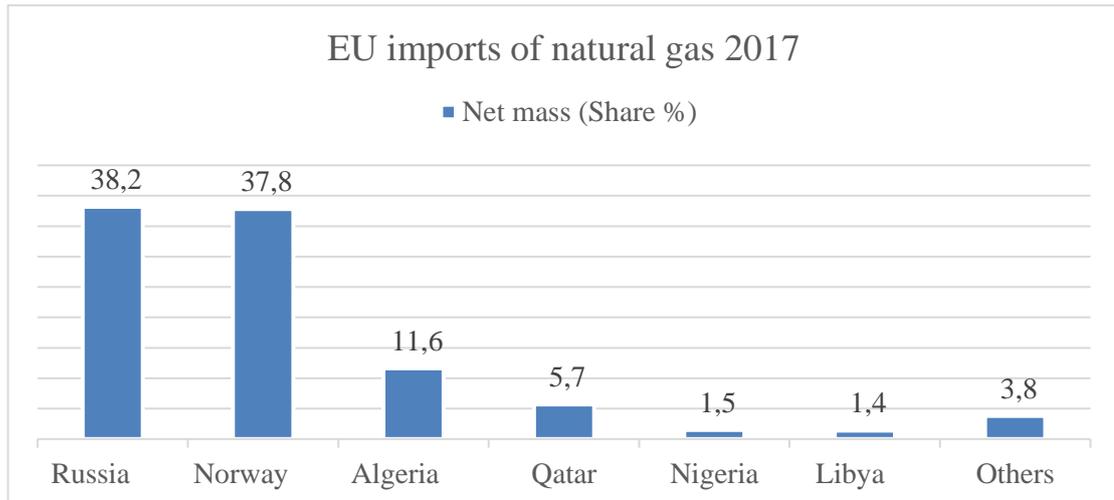
#### **3.1. Reliability dimension**

The first dimension of the three, reliability, aims to analyse three main components: diversification options for EU, the natural gas supply chain from Azerbaijan to EU and potential hindering aspects as Russia's influence in the region and Legal Status of Caspian Sea. Finally, Azerbaijan's outlook for diversification, role as a supplier and natural gas profile will be analysed.

##### **3.1.1. Diversification options for European Union**

Diversification in the case of EU means that there is a great need for import gas. As European Union imports gas in big volumes then it fits to the importer's perspective where avoiding shortages in energy needs have the main aim of energy security according to Proedrou. On the other hand, for exporters energy security equates with security of demand which guarantee significant profits, which in this case helps to understand Azerbaijan's role as a supplier for mutual benefit (Proedrou 2012:3). Considering EU external approach to diversify their gas dependence from Russia and Energy Security Strategy aims, then variety of matters will have a strong share in their external communication. Hence, all new relationships, for EU having gas in future rely on cooperation and implementing necessary policies in field of energy security.

The main logic on diversification remains. The increase of natural gas suppliers, combined with the increased importance of the commodity in the world, then it suggests increase in overall energy security for the states (Cohen et al. 2011:4868). The rise in demand for natural gas can see in the rising production levels, where for example in the last decades up to 2017, the production is risen from 2940bcm (billion cubic meters) to 3680bcm (British Petroleum(BP) 2018:28).



**Figure 1. Extra-EU imports of natural gas, shares (%) of main trading partners in 2017. Eurostat<sup>3</sup>**

External suppliers level is rather narrow for the EU. The market is mainly supplied by two states natural gas, Russia and Norway, which is almost 4/5 of total import outside the EU. Hence the main problem relies on Russia's import, towards which mainly the whole external diversification process is aimed to. Norway on the other hand is well integrated to EU market, yet not as a part of EU, Norway shares the same values and contributes to the Union and from them the risk of disruption from gas flow to the union seems quite low. This thesis will focus on potential pipeline natural gas supplies, therefore Qatar, Nigeria is left out, because they focus on LNG due to their geographical situation and are main LNG importers to EU based on British Petroleum. To add, Algeria also has LNG capability, but it relies strongly on pipeline movements (BP 2018:34).

Overall, Ratner et.al in their article about alternatives for EU gas bring out the main possible suppliers in future. They mention main regions as Caspian and Central Asia region (STAN states), North Africa and more distant opportunities in case of Eastern Mediterranean region and Arctic (Ratner et al. 2012:18-28).

In case of other opportunities, Ratner et al. bring an example of another potential source, that is in the North. Arctic region has great gas reserves and North Sea holds majority of

<sup>3</sup> Eurostat. (2018 October) .EU imports of energy products - recent developments. Retrieved 31.12.2018 [https://ec.europa.eu/eurostat/statistics-explained/index.php/EU\\_imports\\_of\\_energy\\_products\\_-\\_recent\\_developments#Main\\_suppliers\\_of\\_natural\\_gas\\_and\\_petroleum\\_oils\\_to\\_the\\_EU](https://ec.europa.eu/eurostat/statistics-explained/index.php/EU_imports_of_energy_products_-_recent_developments#Main_suppliers_of_natural_gas_and_petroleum_oils_to_the_EU)

Norway's natural gas reserves, but also Russia's. Authors mention that Arctic region can hold up to 25% of undiscovered gas reserves. Still it is in far future exploring these reserves it is one of the possible ways for EU natural gas diversification (Ratner et al. 2012:27-28). Yet, their offered other distant opportunities in case of Cyprus and Israel have come true (Ratner et al 2012:27). The new East Mediterranean pipeline agreed with capacity of 20bcm/y to supply EU (Staff 2018). Hence, these states are not considered in this thesis due to clear progress have been already made towards EU market. Finally, Northern area is under exploration and probably would include LNG transportation, yet this thesis rely on pipelines and natural gas.

### **STAN Countries**

Kazakhstan became a net natural gas exporter in 2009 and natural gas is second to oil in case of production based on Ratner et al. The further developing of gas fields can have alternative export destinations in future. Now their production is mainly aimed towards Russia and China. It can be possible in future, that they diversify their partners, but it requires huge foreign investments. Still the big dependence on Russia as a partner, domestic taxes and political situation rather discourage Western investors to invest in the state, but authors claim that there is some potential for future (Ratner et al. 2012:21).

The main issue for EU is the geographical location. For having long distance supply means high transactions costs with long duration of shipping and one concern for EU is their unpredictable tariffs, which makes investors to hesitate (Mantel 2015:67). Despite the challenges and Russia's influence, EU continues energy aimed cooperation with Kazakhstan, which is the most developed sphere of cooperation between EU and Astana (Mantel 2015:63).

Turkmenistan holds the largest gas reserves in Central Asia and they hold significant potential for gas export according to Ratner et al. As Turkmenistan has been searching for alternatives from exporting to Russia, it is rather aiming towards east in case of China. One of the obstacles is currently still situation of Caspian Sea and standing still Trans-Caspian Pipeline project, but it gives an motivation towards extra supply and reason to develop more Southern Corridor. Still it remains a big question mark relating to Turkmenistan real EU orientation (Ratner et al. 2012:22).

Considering the vast potential of its gas reserves, then Turkmenistan needs substantial investments to increase its production and is becoming more important for Eurasian importers (Oral; Esen 2016:105). The main struggle for EU is that Turkmenistan is a closed state, is greatly influenced by Russia and market is aimed towards China. Still Trans-Caspian Pipeline is possible, but emerging One Belt, One Road initiative from China through investments is a real challenge for EU. Other problem is that Turkmen gas is less competitive in EU market, because due to the long distance and yet-to-be constructed pipeline through Caspian, the transport prices are assumed to be high (Pirani 2018:14).

Uzbekistan, what authors refer as a “Sleeping Gaz Giant”, which has huge potential for exporting based on Ratner et al. Now they consume mostly their gas production domestically and are dependent on Soviet era pipeline systems. Even so Uzbekistan can be a potential supplier for EU if its natural gas infrastructure development begins to look westward. Ratner et.al say that main Russian origin gas firms as Gazprom and Lukoil are largest investors in Uzbekistan, but still their policies rather aim to keep Uzbek gas away from competing with Russia’s natural gas to EU (Ratner et al. 2012:22-23).

Hence, Uzbekistan is a possibility, but from now it seems rather excluded in case of diversifying EU gas market. Lack of infrastructure, geographical situation and Russia’s influence makes it an option for far future.

### **Middle East and North Africa (MENA)**

In case of North Africa, Algeria is one of the suppliers for EU but according to Ratner et.al then for further gas from the country security issues are main concerns also with business climate. As an example, a terrorist attack occurred which ensued hostage crisis at a natural gas facility in Algeria in January 2013 (Ratner et al. 2012:2). This situation highlighted security concerns that could present a key obstacle to further development in natural gas sector. Another factor they bring out is that the domestic consumption may outstrip exports within the next decade which have effect on EU (Ratner et al. 2012:24). As a third partner for EU in natural gas imports, Algerian role will have important share in total imports. Especially considering Southern Europe in future.

Egypt on the other hand is in the need of reorganization of their gas sector according to Ratner et.al. Their natural gas demand has grown annually and due to effects of Arab

Spring and resignation of Hosni Mubarak in 2011 the natural gas infrastructure has been attacked by terrorist groupings. One of the main issues is and was, that gas fields are underdeveloped and pose high price because of the hardly accessible locations which has negative impact on investors interests (Ratner et al. 2012:25-26). In 2011 Egypt became a natural gas net importer, at the same time gas demand is growing fast in the country, but 2020 it plans to become a net exporter of gas due to new discoveries of gas (Ruble 2017:345). In case of exporting it to EU, first they need to meet their own growing domestic demand which was 3.5% growth per year from 2006 to 2016 (BP 2018:29).

Libya has great gas potential, but due to Arab Spring and security issues it is complicated to have gas from the region. In 2011 gas production fell almost 90% in Libya (Ratner et al. 2012:25-26). Since then the political situation has been difficult and EU rather looks for alternatives, because Arab Spring showed how Southern EU member states energy security can be affected. Especially Italy, which domestic consumption depended also on Libya's gas through Greenstream pipeline, which was closed when war in Libya intensified (Silva 2017:53). At the current moment 4.4 BCM comes to Italy from Libya (BP 2018:34).

Considering EU pursues toward Iran, then in energy contexts Iran is also considerable potential in the region. Iran due its geographical position reaches from Caspian Sea to the Persian Gulf and is very rich on energy resources and is ranking in the world's top list. Due to Iran's energy resources it can be a valuable partner for EU increasing its diversification. Still due to Iran's policy and confrontation with the U.S it hinders the outlooks. Thus, Russia and Iran have the same point of view that they are not interested increasing U.S presence in the region and same goes on EU.

Based on Koolae et.al then U.S relations with Azerbaijan is one of the main concerns for Iran. Azerbaijan's close ties with U.S in economic and military cooperation is seen by Iran as a possibility for U.S to attack Iran. Nevertheless, Iran's relations with Azerbaijan has become weaker due to Azerbaijan's growing relations with Turkey and U.S. Iran role as a mediator in Nagorno-Karabakh conflict has dissatisfied Azerbaijan due Iran's relations with Armenia. One of the remaining issues regarding Iran's position in the region is the legal status of Caspian Sea (Koolae; Hafezian 2010:391). Considering that, for EU having gas from Caspian region and Iran, then due to Iran's position on USA, in

terms of gas as a potential weapon of influence, then firstly political situation plays role and will be first factor, when potential gas import idea may rise for EU.

### **3.1.2. Supply chain towards EU and concerns**

South Caucasus region has gain more attention after the collapse of Soviet Union and has become a strategic frontier for major actors in case of trade links, unresolved conflicts and most of all energy resources and security. Black Sea region is a sensitive area due to natural resources and geopolitical rivalries (Demiroglu 2015:26).

Due to the importance of transit states of making it possible for Azerbaijan's gas to reach EU border, then the current situation must be described with potential hindering factors as Russia and Legal Status of Caspian Sea. This chapter is divided firstly in describing and analysing supply chain in case of Georgia and Turkey; then following Russia's position in the region and finally Legal Status of Caspian Sea.

### **Southern Gas Corridor**

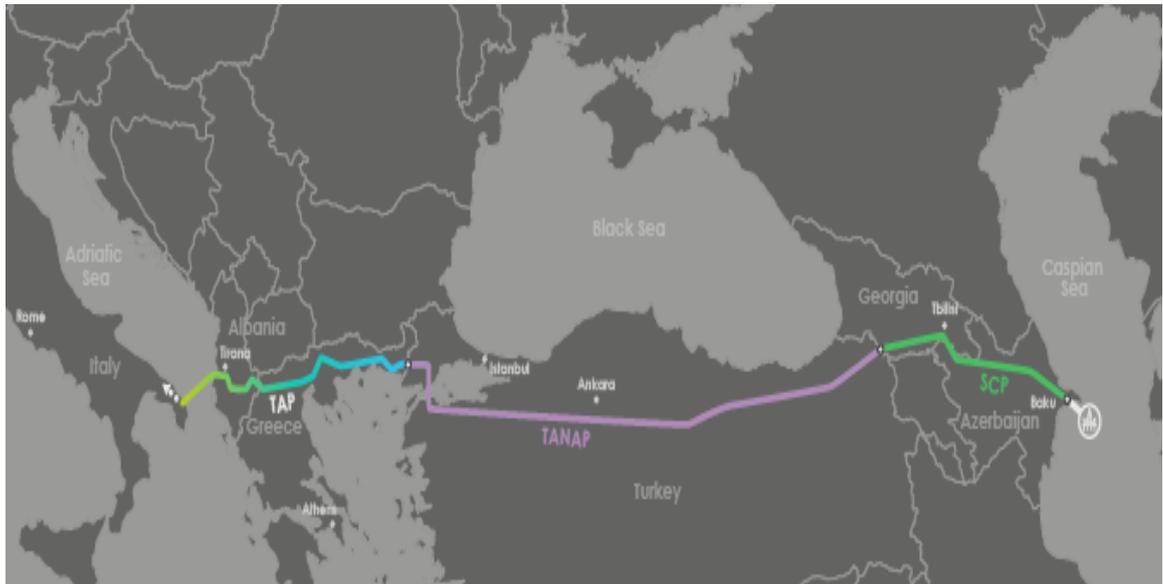
In 2009, by European Commission initiation and backed Southern Gas Corridor project which aimed to diversify Central and South-East European states gas dependence. The potential supplies from the Caspian Region, the Middle East and the East Mediterranean can be valuable sources for energy diversification. Additionally, EU aims to increase Southern Gas Corridor pipelines capacity to 80-100bcm of gas per year in the future. The main aims are to negotiate with possible supplier states as Azerbaijan, Iraq and Turkmenistan and main transit states as Turkey, Azerbaijan and Georgia (European Commission).

The Southern Gas Corridor involves four projects 1) Shah Deniz field in Caspian Sea, 2) South Caucasus Pipeline (SCP) and its extension SCPX from Azerbaijan to Georgia to Turkey, 3) Trans Anatolian Pipeline (TANAP) through Turkey to Greece and 4) Trans Adriatic Pipeline (TAP) through Greece, Albania, Adriatic Sea to Southern Italy. The total cost is estimated to be under 40 billion dollars (Elliot; O'Byrne 2018).

Shah Deniz project involves two phases and are supply source for natural gas. The Shah Deniz first phase is capable to produce 10.9bcm/y and 50mbd (thousand barrels per day) gas condensate, which is used due to its properties to dilute heavier oils. Shah Deniz phase two is aimed to EU market and it is capable producing additionally to Shad Deniz extra

16bcm/y natural gas and condensate 105mbd. Shareholders are: BP 28.83% (British Petroleum), TPAO 19% (Türkiye Petrolleri Anonim Ortaklığı), Petronas 15.50% (Malaysian oil and gas company), SOCAR 10% (State Oil Company of Azerbaijan Republic), Lukoil: 10% (Russian oil and gas company), NICO 10% (a Swiss-based subsidiary of the National Iranian Oil Company), SGC 6.67% (“Southern Gas Corridor” Closed Joint-Stock Company owned by Azerbaijan state 51% and 49% SOCAR) (Southern Gas Corridor website).

Second project is South Caucasus Pipeline and its extension via Azerbaijan and Georgia to Turkish border. The annual transportation capacity is for South Caucasus Pipeline 7.41bcm and extension with gives it total 23.4bcm/y, which can be expanded to 31bcm/y if there is a need. The total length is for South Caucasus pipeline 642km and extension adds 489km. The main shareholders are same as Shah Deniz project: BP 28.83%; TPAO 19%; Petronas 15.50%; SOCAR 10%; Lukoil 10%; NICO 10%; SGC: 6.67% (Southern Gas Corridor website).



**Figure 2. Southern Gas Corridor. Trans-Adriatic Pipeline homepage<sup>4</sup>**

<sup>4</sup> Map picture from Trans Adriatic Pipeline project homepage. Southern Gas Corridor. Retrieved on 09.05.2018 <https://www.tap-ag.com/the-pipeline/the-big-picture/southern-gas-corridor>

The third project is TANAP as Trans Anatolian Pipeline with a total of length 1345 km to reach Turkey-Greece border from Georgian border. The transportation capacity will be 16.2bcm/y but can be extended to 30.7bcm/y. The main shareholders are: SGC 51%; BOTAS 30% (Turkish national oil and gas Corporation); BP 12%; STEAS 7% (SOCAR Turkey Enerji AS) (Southern Gas Corridor website). TANAP as the longest pipeline link in Southern Gas Corridor project is owned mostly by Azerbaijan and SOCAR, total 58%. TAP as Trans Adriatic pipeline transportation capacity will be firstly 10bcm/y and can be expanded to 20bcm/y. Total length from Greece to Italy via Albania and through Adriatic Sea is 878 km. The main shareholders are: BP 20%; SGC 20%; SNAM 20% (Italian natural gas company); FLUXYS 19% (Belgium based gas company); ENAGAS 16% (Spanish energy company); AXPO 5% (Swiss based energy company) (Southern Gas Corridor website).

As seen from shareholders amount, Southern Gas Corridor is a global project backed up by international and state-owned energy firms. When we consider state ownership, then main control is owned by Azerbaijan government through SOCAR shares and SGC (Azerbaijan Government with SOCAR) shares. At the same time, they are taking a huge responsibility for selling their gas to EU market, yet unknowing the uncertainty of future gas prices in EU. Additionally, Turkey's government through BOTAS has supported the pipeline project TANAP, yet still SGP hold majority there with STEAS 58% which gives majority in decision process. These two states interest are reflected the most, because they are main benefit gainers in the project. Turkey becoming a gas hub and serving its domestic need, while Azerbaijan wants to escape free from landlocked state status in terms of natural gas.

European companies are presented and mainly by British Petroleum in all stages, who has been operating in Azerbaijan for decades. As major EU companies interest is to serve profit and earn back their investment. Since energy companies contribute by billions with Southern Gas Corridor project, then also home states of the firms are interested due to potential profit driving their economies. This also can have effect on diversification and cooperation by EU side. Yet firstly Azerbaijan's natural gas reserves will mostly affect Southern-Eastern European states energy market due to the location and gas pipeline systems connectivity.

## **Georgia**

Georgia is making progress towards EU, which is its largest trading partner based on European Union External Service. In 2016 EU-Georgia Association Agreement entered into force and Georgia has also entered in Deep and Comprehensive Free Trade Area (DCFTA). Even so, Georgia has some issues regarding their ambitions to join EU and NATO. One of the main reasons are breakaway regions of Abkhazia and South Ossetia. EU remains firmly committed to its policy of supporting Georgia's territorial integrity (European External Action Service (a)). On the other hand, despite the cooperation, Georgia's territorial integrity is complicated due to disputed areas and relations between Russia and Georgia, which turned to short term war in 2008 august. One of the factors of the attacks in 2008 was Georgia's attempts to sell natural gas to European markets through providing transit and it lead Russia to support South Ossetian breakaway region (Shaffer 2009:42). Since Russia's influence strongly relies on natural gas, then all kind of progress towards EU and pro-Western relations from the previous Soviet Union member states can weaken Moscow's political goals and through influence it tries to balance the situation and maintain the position.

Based on Demiroglu, Georgia's foreign policy follows pro-Western and aims to enter Western institutions. Additionally, they present clear interest towards NATO and EU. In 2006, when explosion on Mozdok-Tbilisi gas pipeline in Russia's North Caucasus region occurred, showed to Georgia, how dependent it is on Russia's energy. In case of transporting gas to EU, Georgia has become a transit state when Azerbaijan tries to re-route gas from Russia to EU market. South Caucasus pipeline gives a substantial asset to their economy which helps them to decrease dependence from Russia (Demiroglu 2015:28).

One of the solutions from decreasing dependence from Russia has been cooperation with Azerbaijan, especially on natural resources like gas and oil. Based on Shaffer, then transit states can have benefit for their self-interests. Georgia and Azerbaijan are taking part in NATO's Partnership for Peace program and they have been developing further transit frameworks through cooperation to increase each other's stability and prosperity. The one case is that to reach EU and Turkey's market, Azerbaijan sells natural gas for Georgian market with extremely low rates. This on the other hand increases their mutual

dependence from each other and cooperation is necessary element for having Azerbaijan's gas (Shaffer 2009:41).

Georgia will remain important figure as a transit state both for Azerbaijan and European Union. The potential expanding of gas supply from Caspian Sea makes firstly Azerbaijan to continue friendly relationship with Georgia and secondly EU needs to continue cooperation and peace promotion to avoid escalation in Georgia over disputed areas under Russia's influence to avoid potential escalations and disruptions on gas.

## **Turkey**

Turkey has important strategical and advantageous geographical position in the Eurasia. According to Demiroglu then Turkey has become a major energy hub in the world. Due to its location Turkey is in the middle of energy rich states. From one side is Middle Eastern countries, then Russia and Central Asian countries and also borders the high consumer as EU. He mentions that Turkey's energy policy goals are to secure, diversify and stabilize energy transport routes and in annually nearly 6-7% of world's oil supply passes its territory. Being a transit state is also beneficial for economic perspectives. In case of EU, then Turkey has a very strategic value for bypassing Russia and having Azerbaijan's gas (Demiroglu 2015:27-28).

However, for being a transit state towards EU then Turkey must at first meet domestic natural gas demand. Currently Turkey imports about 75% of their total energy need, half of the coal it uses as a solid fuel and almost all its oil and gas need according to Austvik and Rzayeva They add, that Turkey is interested in long term contracts related to gas import which include large volumes of gas. Due to their ambitions they increase LNG share in the market and negotiates with Middle Eastern countries for increasing and developing related infrastructure. The main policy goal is to increase their gas related capabilities (Austvik, Rzayeva 2017:540-543).

While Turkey is a member state of NATO, then their strategy is to balance geopolitical situation because their scope of interests as a consumer and as a transit country has main role in politics. EU dependency, according to Austvik and Rzayeva, on natural gas in case of Turkey may influence their relations bilaterally. Failed coup in 2016 initiated the president of Turkey to strengthening the institutions of the Presidency and bolstering civilian control over military. They also add that Turkey faces with their current Kurdish

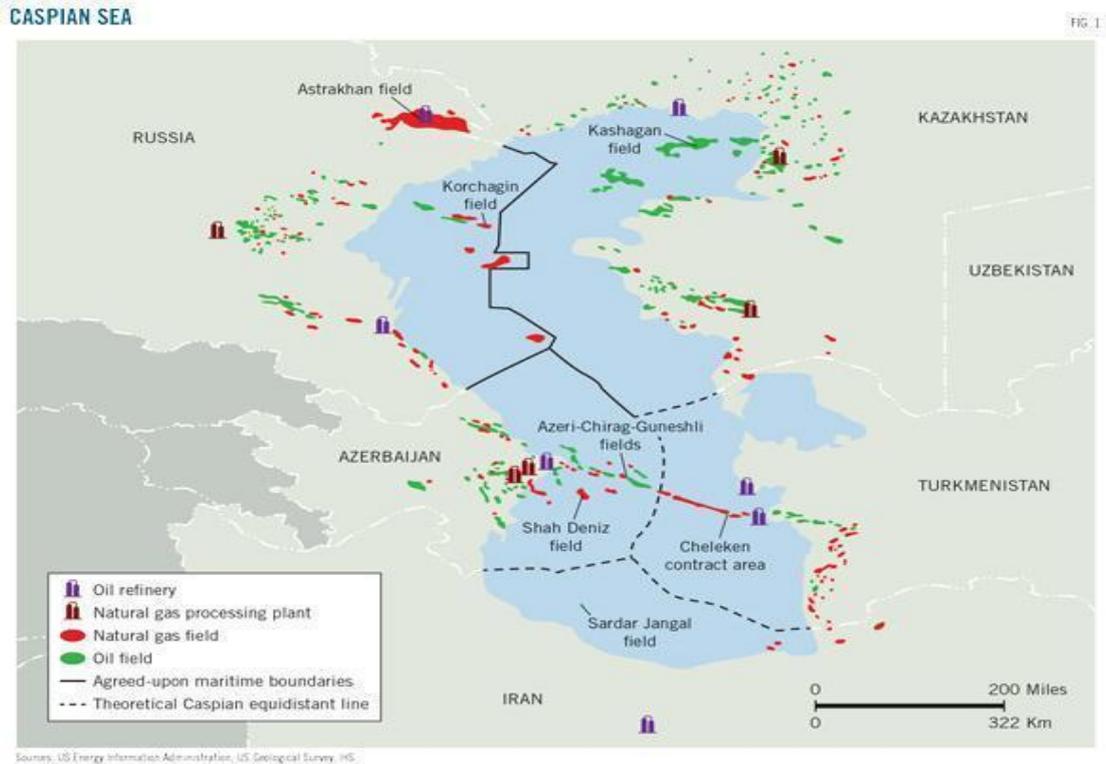
issues which may hinder the claims for becoming international gas hub (Austvik, Rzayeva 2017:546).

Turkey as a transit state understands its potential as being a gas hub due to its strategical location. For an example, EU sees Turkey potential to absorb Northern Iraq gas additionally to Azerbaijan gas to further supply EU market (European Commission 2014(c):47). Firstly, this is also an option to meet its natural gas demand and economic growth, but on the other hand EU will be more dependent on supplies that are coming from Turkey. In case of Turkey to use gas as a weapon of influence seems to be less likely, because they have interests placed to Southern Gas Corridor project through national firm of BOTAS, which means high incomes for providing gas to EU. One factor comes out in energy field, that reputation also matters, which affects investors interests and their investment safe atmosphere.

### **Legal Status of the Caspian Sea as a potential threat to reliability**

The Caspian Sea legal status plays a great role in future energy landscape related to Caspian region and gas potential. Moreover, it is the largest inland water body in the world with five littoral states Azerbaijan, Iran, Turkmenistan, Kazakhstan and Russia. Additionally, in case of energy exploration, then the seabed holds great amount of energy resources and all littoral states want to have their share and influence. The hindering factor is that that it is called as a sea, but there is no connection to oceans. As being inner land water body, then having resources from the sea needs all littoral states consensus.

According to Boban and Lončar, Caspian Sea represents itself an opportunity to realize economic growth and strengthen political power. Caspian basin is estimated to contain 48 billion barrels of oil and 292 billion cubic meters of natural gas. The problems started when Soviet Union Collapsed and Caspian Sea was not anymore bordered by two, but five littoral states. The question if it is lake or sea has great meaning. If the status of the water body is defined as sea, then the resources and water border would be regulated by United Nations Convention on the Seas. In that case the Caspian Sea would be open to littoral states and for multinational corporations on energy field. Additionally, they bring out that if the status would be defined as a lake, then waters and resources should be divided by the five states and it makes them not open to international community in their opinion (Boban, Lončar 2016:81-83).



**Figure 3. Caspian Sea littoral states with sea division. Oil and Gas Journal<sup>5</sup>**

Kazakhstan has the largest share of Caspian Sea and they have largest oil reserves also based on Pannier. Azerbaijan continues developing and exploring its coast and main aim is on Shah Deniz fields. Iran on the other hand is one of the poorest in case of oil and gas in their share of Caspian, where water is saltier in their section which makes difficult for getting gas in technical reasons. In the end of 2017 meeting with the foreign ministers of five littoral states took place. Lavrov, Russia’s foreign minister, claimed that they have found solutions to all issues regarding to the legal status of the Caspian and agreement should be signed in the first half of 2018 in Astana where Caspian Summit takes place. This means that idea for Trans-Caspian Pipeline (TCP) will be possible between Turkmenistan and Azerbaijan, but on the other hand 2018 Turkmenistan and Russia were discussing cooperation on production and sale of Turkmen gas to Eastern Europe and CIS countries which can danger the TCP (Pannier 2017). Additionally, the Convention on

<sup>5</sup> Map picture from Mammadov, Q. (2015) Turkmenistan Positions itself as a natural gas power. In Oil and Gas Journal. Retrieved 12.05.2018. <https://www.ogj.com/articles/print/volume-113/issue-12/transportation/turkmenistan-positions-itself-as-eurasian-natural-gas-power.html>

Legal Status of Caspian Sea was signed by all five littoral states, but from Iran's perspective there are still unsolved matters on territory and excluding foreign military presence referring on US cargo shipments from Azerbaijan to Kazakhstan (Pannier 2018). From the Iran's perspective it is understandable, because it has the smallest share of Caspian Sea, while back at Soviet times it was divided by half and their influence over sea was higher. Yet, still TCP is under question and time will show, what will be Turkmenistan's motivations towards EU, where they aim to sell their huge amount of gas, which is the main income source for them. Hence, when there is no final consensus between littoral states on sea borders and use of the sea, then still Caspian Legal status must be considered.

### **Russia's role in the region**

For Russia, Azerbaijan is the most important state in the region and the influence over Caucasus largely depend on its influence over Azerbaijan based on Demiroglu. Due to Azerbaijan's strategic location bordering Georgia and Armenia, then maritime roads to Central Asia and bordering the Middle East in case of Iran. Since the collapse of Soviet Union Russia still considers Azerbaijan in their interest sphere. While the Caucasus has the strategic value in connecting it with the West, Russia rather aims to plug up this corridor in the aim of making it as a dead end for Western pursues to develop their security presence and related infrastructure. Energy is seen as a main policy tool over the region and also one way to have control over EU (Demiroglu 2015:26-27).

According to Demiroglu, the Russian policy concerning South Caucasus has following main aspects: Russia's control over the production and export; holding a monopoly on acquiring gas at cheap price from the region; increasing dominance over European consumer markets and finally utilizing dominance over both the import from and export to Common Wealth of Independent States (Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, Armenia, Moldova, Russia itself, Tajikistan and Uzbekistan) countries of gas for political purposes. He adds that Russia is increasingly capitalizing on energy in case of the less fungible commodity which is natural gas. According to him, the Russia's plan is clear, which include dominating Eurasian energy to have effect on European Union. Not to mention Russia has been blatant to use energy, gas specially, as a political tool over former Soviet states of which some are now members of EU (Demiroglu 2015:27).

Gazprom as one of the main exporter to EU provided 178bcm of natural gas in 2016 and 192bcm in 2017 to EU (Gazprom). Gazprom as giant gas firm has become effective policy tool for Russia. In case of Azerbaijan, Russia is not interested that Azerbaijan would export their natural gas to EU without that it goes through Russia's territory or excluding Gazprom owned pipelines. Russia also tries to grow its influence through energy in Azerbaijan also and new deals may be warnings to EU. While Azerbaijan's domestic need for developing gas production is still in work then Gazprom gas deal was signed in 2017. The aim of the gas deal was to test the gas storages in Azerbaijan which were 3.5 billion cubic meters in total and supply the market (Azernews).

The emergence of Russia's Gazprom to Azerbaijan's market means growing influence over Baku. Azerbaijan's gas production is aimed to foreign markets, but increasing domestic demand left no choice to have Russia's gas, because Azerbaijan must fulfil export promises to contract states.

### **3.1.3. Reliability of Azerbaijan**

#### **Azerbaijan as most desirable option for diversification**

Azerbaijan has promising outlook for long term natural gas cooperation with the EU. Based on Ratner et al, from there it is possible to access to other gas suppliers also in Caucasus and Central Asia to meet the EU gas consumption need in future. Ratner et al. claims that Azerbaijan can be the "best hope" for diversifying gas in future. In their view, developing main gas fields in Azerbaijan will give a strong base of resource for Southern Corridor and possible future growths (Ratner et al: 2012:20-21). The possible future growth of Caspian gas is optimistic, because in case of MENA states, which are still affected or recovering from Arab Spring makes EU investors to be careful and think twice for further investments.

**Table 1. Proven Natural Gas Reserves in trillion cubic meters. British Petroleum<sup>6</sup>**

State	2017 (tcm)
Azerbaijan	1,3
Kazakhstan	1,1
Turkmenistan	19,5
Uzbekistan	1,2
Algeria	4,3
Iran	33,2
Libya	1,4
Egypt	1,8

In case of potential diversification plans for EU, cooperation with Azerbaijan can offer positive results. Considering potential in case of MENA states, where political situation is rather complicated and security threat is high, their proven resources number clearly are left behind of Caspian Region potential. Firstly, there is ongoing Southern Corridor Project in progress to link the region with European Market. Secondly the potential of Turkmenistan gas remains an option, if there will be positive dialog forwards leading to TCP. Thirdly, Iran has the largest amount of gas, and it may be an option for future, depending highly on politics between USA and Iran.

In case of cooperation, there is seen an opportunity for EU increasing dependence from Russia by bringing new gas supplies to the market with future potential given by the Caspian region. The creation of Southern Gas Corridor does not mean that Azerbaijan will be the end supplier because it can be expanded for diversification if the ground is suitable and the demand is high.

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<sup>6</sup> British Petroleum (2018). Total Proven Natural Gas Reserves. pp 26. Retrieved 31.12.2018 <https://www.bp.com/content/dam/bp/en/corporate/pdf/energy-economics/statistical-review/bp-stats-review-2018-natural-gas.pdf>

### **Azerbaijan as a supplier**

Azerbaijan geographically is situated in Europe, South Caucasus state and littoral state of Caspian Sea. The Republic of Azerbaijan was declared in 1991 due to collapse of Soviet Union at the same time with Georgia and Armenia. It shares border with Turkey, Russia, Iran, Georgia and Armenia also. As Azerbaijan is surrounded by local three “superpowers” in case of Turkey, Iran and Russia, then Azerbaijani foreign policy is balanced and avoids taking sides. Azerbaijanis sometimes refer to themselves as a buffer zone state between Russia-Iran and Russia-Turkey.

The role of energy resources cannot be unnoticed in case of Azerbaijan. According to Nuriyev, this is one of the main factors consolidating their independence through decades. Also, Baku-Tbilisi-Ceyhan pipeline project with Baku-Supsa helped them to strengthen their position in the region. One aspect, which has been important for Azerbaijan is strengthening US-Azerbaijan ties. It helped to open cooperation towards EU in case of France, Germany and UK (Nuriyev 2010:2).

In case of EU, then Azerbaijan has strong economic relations with the union. The EU is Azerbaijan’s biggest export and import market with 60% and 31% share in Azerbaijan’s total volumes. Since 2004 Azerbaijan has been added to European Neighborhood Policy program and also in 2009 to Eastern Neighborhood initiative (European External Action Service(b)). It shows that EU is actively coordinating its policy and trying also to promote EU values as economic reforms, democratic development and integrate them to their market model through cooperation.

Based on Anar Valiyev, the main cooperation aim is deeper political cooperation and to establish closer relationship with Azerbaijan which can stretch beyond economic integration. On the other hand, according to Valiyev, then BREXIT referendum 2016 impacted the Azerbaijan’s perception regarding future cooperation with EU. While UK has been promoter in different pipeline projects and it is one of the major investors in Azerbaijan, then in future it can be difficult to have same level support as before from the EU. That could shift their interest of further integration (Valiyev 2018:131-132).

Due to Azerbaijan’s geographical position it is open to three major integration initiatives like European Union, Eurasian Economic Union and One Belt One Road. Additionally, Valiyev says that it is hard to imagine Azerbaijan abandoning pro-European development and one of the reason is Karabakh conflict. Azerbaijan need a balancing power against

Russia's growing interest in the region and pro-Kremlin Armenia in fear the fate of Ukraine (Valiyev 2018:144-145).

The relationship between Armenia and Azerbaijan has been one of the main issues in the region. While the population of Armenia is three million people, then compared to Azerbaijan they have large Armenian Diaspora which supports Armenia's interests and also gives a considerable financial support to the state. Not only... but also Armenia is considered as a last loyal ally for Russia in South-Caucasus which reflect from their positive relations (Demiroglu 2015:28).

While Azerbaijan owns a lot of natural resources in case of oil and gas, at the same time consisting a great share in GDP, then Armenia is not so rich by resources. 2016 estimated GDP for Armenia was 26 billion dollars and the share of expenditures on military was 4,1% (CIA World Factbook). Azerbaijan on the other hand had almost 40 billion dollars of GDP, which of 3,6% was spent on military (CIA World Factbook (a)). It shows the power and capability contrast between these states while giving Azerbaijan a stronger position, yet Armenia has friendly ties with Russia.

The ongoing situation in Nagorno-Karabakh has been a key issue since end of 1980s. There has been lack of progress if any. The current situation seems to continue on the same line as previous years. In terms of gas, escalation of the conflict can give severe impact on Azerbaijan's pursues to transport gas to EU. Also, EU face great confrontation with Russia in the region and Armenia is rather pro-Kremlin as previously mentioned being part of Eurasian Economic Union. Therefore, for EU it is important to continue conflict resolution to increase its influence in the region and Southern Gas Corridor can be a source of influence and cooperation with in the Caspian region.

### **Azerbaijan: natural gas profile**

Azerbaijan has a long history in hydrocarbon production based on Rzayeva. As historically Azerbaijan has been known for producing oil, being first state in the world to start industrially oil exploration in 1847 when they successfully drilled first oil well and exceeding U.S, which drilled first one in their soil in Pennsylvania 1860. Azerbaijan was one of the main suppliers of Soviet Union through the time of existence and on the period of Second World War it provided 75% of Soviet Union's oil need. The gas production started in the beginning of 20<sup>th</sup> century and was quite modest, but through the century it

has been rising due to new technology and exploring new reserves in Caspian basin (Rzayeva 2015:4-6).

While the oil has become main export article over a time, Azerbaijan needs to find new sources to export. One of the main reasons is that oil starts to run out slowly due to its long time exploiting since 19. century. Currently Azerbaijan has about 7 billion barrels proven oil reserves based on and has 0.7% share of global proven oil reserves based on British Petroleum. Within the last two decades there have not been discovered new oil fields that would be affordable to pursue and export with current technology. The resources to production ratio (R/P) estimates, that Azerbaijan will have 24,1 years left when oil supplies will run out with current tempo of production (BP 2018:12). Currently they are producing 795 thousand barrels per day, but it has been decreasing since 2010, when they produced about 1037 thousand barrels per day (BP 2018:12). This gives a good opportunity for gas to maintain their position as energy exporter and give some certainty to their long-term economic situation.

The natural gas as a rescue option for their economy cannot be underestimated. Since 1997 Azerbaijan's natural gas proven reserves have almost been doubled from 0.7bcm to 1.3bcm (trillion cubic meters), which is 0.7% of global total share of natural gas proven reserves (BP 2018:26). Due the reason, that over time the technology in energy sector has improved and now it is possible to have gas from underwater reserves through deep drill holes. Considering the Shah Deniz shareholders, as mentioned before, then due to high gas potential Azerbaijan attracts investors and big multinational energy companies and further exploration in case of gas reserves their interest towards Azerbaijan can increase. Additionally, R/P ratio for Azerbaijan is 74.4 year based on current production (BP 2018:26). Hence production has been growing and periods 2006-2016 annual growth per annum was about 10.7%, but in 2017 it slightly decreased to 17.7bcm/y, which is related to low oil prices at the period (BP 2018:28). In case of production, domestic consumption must be also considered as self-sufficiency. Azerbaijan consumed about 10.6bcm of natural gas and domestic need for natural gas increases almost 1% per year considering 2006-2016 consumption patterns (BP 2018:29).

Azerbaijan total export of natural gas in 2017 was 8.9bcm, from which it exported 6.3 to Turkey's market and 2.1 to Georgia, yet 0.6bcm was exported to Iran (BP 2018:34). To give a comparison moment, then Russian Federation total export volume was 215.4bcm

of which 189.3 was aimed to EU market (BP 2018:34). Additionally, if we compare Azerbaijan's domestic consumption, production and export, then 1.8bcm natural gas must be at least imported to fulfil all needs and obligations. This gas is provided by Gazprom. While Azerbaijan's capability to export is low at the current moment, extensions for Southern Gas Corridor pipelines are possible and it can increase their export in future. Even when the corridor is finished and first 10bcm of gas is imported by TAP to EU's market in 2020 as expected, from total gas consumption it would be between 2-3%, if total consumption in EU was about 467bcm/y (BP Statistics)

Considering that, it still serves EU and Azerbaijan's cooperation as noteworthy and would give a positive touch on energy security in general. These almost 2-3% would mean firstly as an achievement to open new supplier states opportunities for European Union.

### **Concluding remarks on Reliability dimension**

Considering the EU's diversity projects, Azerbaijan appears to be the most promising one. Existing possibilities and MENA states serve their purpose, but further expansion on gas supply due to high disruption risk makes the EU to look further into the Caspian region. STAN states are still considered as potential sources of supply, but they are more susceptible to Russia's influence, as geographical, technological situation leads them to lean towards China or continuing commercial relationship with Russia. Azerbaijan, on the other hand, has clearly committed itself towards the EU market and cooperation prospects seem to be high for future.

Considering supply chain and possible negative impacts, Azerbaijan's gas supply may be affected mostly by an external actor. While Azerbaijan also imports natural gas from Gazprom, then it future by increasing production they could supply their own demand. In case of Azerbaijan's energy profile, R/P shows long perspective for export, but, notably, when volumes will increase, then the ratio will fall. Yet, there are still gas fields to discover, probably proven gas amount will increase and outlooks for exports are positive. Also, considering the location, Azerbaijan is rather a buffer zone between Iran, Turkey and Russia which makes it to choose carefully their politics and strategy. Georgia, on the other hand, due to its occupied territories can have serious disruption impact in the supply chain. Therefore, EU continues promoting its values and integration towards Georgia. On the other hand, Azerbaijan keeps positive relations through low rate gas prices to

Georgian market which makes Georgia's interest to be a transit state. In the meantime, Turkey seems to be a reliable transit state because it wants to become a gas hub and increase its influence in the region.

Importantly, Russia stands as an unpredictable actor, and in case of tensions and contradictions with its interests, it can cause negative effects on transit and influence over STAN states makes it unlikely to have extra gas on the EU market without using Russia's gas network. Finally, while Caspian legal status seems to be solved, yet there remain acute questions posed by the situation with Iran, therefore, the issue remains somewhat open.

Based on IPE liberal approach, then in case of transit and reliability, company importance is high together with states. It is well seen on SOCAR's role in investing together with the government through SGC. This also serves IPE assumption, that privatization of utilities seen desirable and the total supply chain is not controlled by one actor (Van de Graaf et. al 2016:15). The whole Southern Gas Project is aimed towards liberalizing energy market in EU and it creates further interdependence also between transit states, who have economic gains in the game.

The conducted analysis suggests that cooperative bilateral relationship is likely to continue between the EU and Azerbaijan in the case of natural gas, and while other spheres of cooperation may not be so strong with some inevitable frictions, increasing needs for energy diversification will eventually overcome them. Through that, future possible interdependence in energy sector, in liberal IPE perspective, can lower the potential risks in the future, and through Southern Gas Corridor, stronger EU interests will be represented in the region. Yet total perfect interrupted supply scenario cannot be reached in case of reliability, because there are a lot of factors, that can be potential risk for supply.

## **3.2. Affordability dimension**

The affordability dimension on evaluating energy security has always been as one of the main components and in case of EU, IPE liberal approach is seen through free market. Globalized world's energy market shapes the oil and gas prices for customers and states energy prices are main drivers for economies. Therefore, this chapter on Azerbaijan's gas affordability and EU's gas prices looks into whether Caspian gas has potential on EU market in case of Azerbaijan's gas. Yet, since there is no gas trade between EU and Azerbaijan, volatility of gas prices looked with consumption patterns of oil and gas. The aim is to find out, if gas is more preferred or not and what impact would it have on EU states. Also, Azerbaijan's export price for gas is taken to account to see volatility and hypothetical future price.

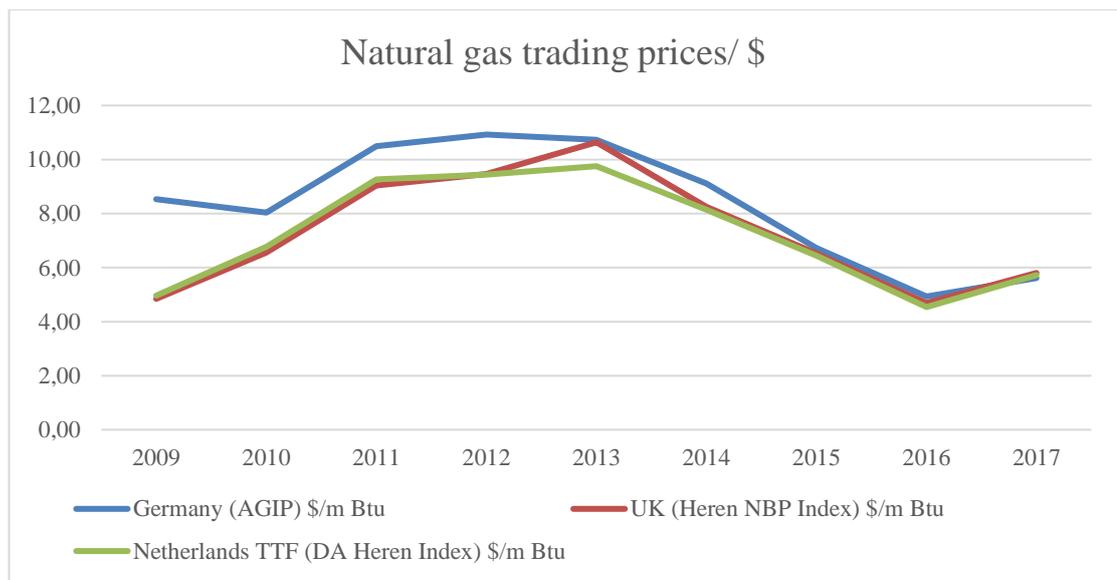
### **3.2.1. The volatility of energy prices in EU**

In European Union liberalized market, natural gas price on market depends on demand and on market trade. The three EU natural gas trading spot gas platforms prices and indicators are usually considered. They are Average German Import Price for natural gas (AGIP), UK National Balancing Point (NBP) on natural gas price, and Netherlands Title Transfer Facility (TTF) on virtual trading on gas. One of the reasons that these price indicators are chosen is due to these states position in EU in case of natural gas. Based on British Petroleum, then Netherlands and UK are biggest producers of natural gas in EU (not considering Norway) and Germany is biggest importer of natural gas due to their economy, hence their own production in 2017 was 6.4bcm/y and it has fallen twice since 2007 15bcm/y. UK produces 41.9bcm/y and Netherlands 36.6bcm/y and NBP and TTF indicators reflect the spot gas trade in main EU hubs (BP 2018:28-29).

In more specific, natural gas trading on market depends is based on million British thermal units (m/Btu). The logic behind shows how much gas is possible to convert to heating energy and one cubic meter of natural gas is around 28 m/Btu-s. It depends on converting and different energy information providers convert is differently, but in the same magnitude, but decimal points differ. Additionally, in EU natural gas is mainly used by domestic consumers and industrial consumers first hand focus on generating electricity.

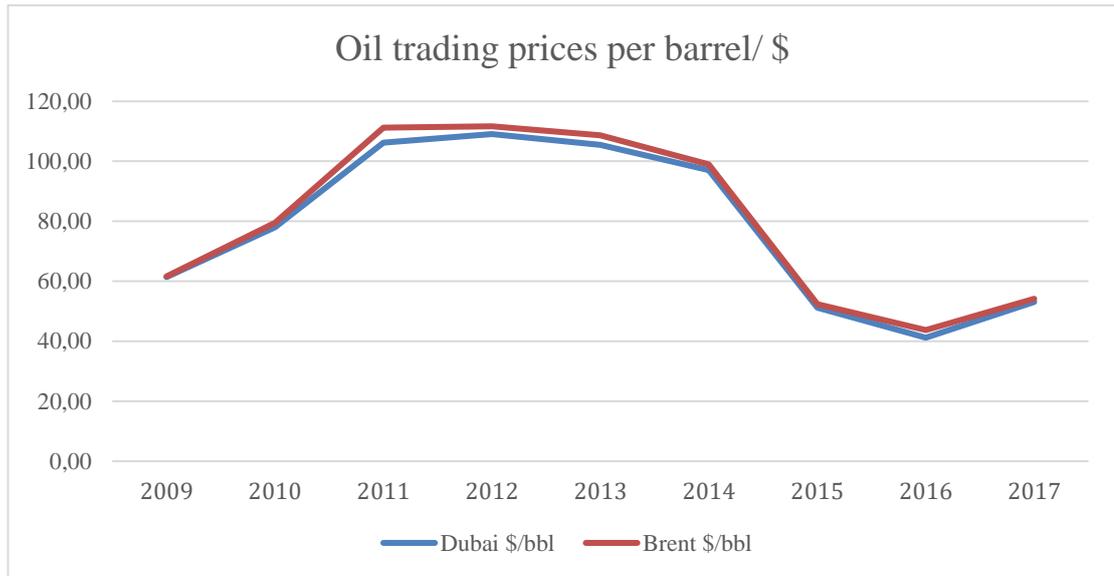
When we compare oil and gas, then these two commodities are highly dependent of each other pricings on global market. We can see the same increases and decreases on both price trends.

In case of gas, then it is same volatile as oil price. In 2009 one m/Btu was almost 5\$, yet Germany's AGIP was higher due to strong dependence from Gazprom and supply routes, from who it imports half of its natural gas (BP 2018:33). Previously, before 2009 high price was also affected by Moscow's winter energy conflicts in 2006, 2007 winters with Belarus, Georgia and Ukraine, which spurred Europe gas markets (Shaffer 2009:161). After 2012, when Nord Stream from Russia to Germany was fully operational, the AGIP price started to close to TTF and NBP prices and since 2016 it has been cheaper than others. On the other hand, total natural gas price volatility has been high. In the 2016 was twice cheaper than in 2013, when price was around 10\$.



**Figure 4. Natural Gas Trading Prices: British Petroleum<sup>7</sup>**

<sup>7</sup> Data derived from British Petroleum Statistics. Natural gas trading prices. Retrieved 31.12.2018 <https://www.bp.com/en/global/corporate/energy-economics/energy-charting-tool-desktop.html>



**Figure 5. Oil trading price. British Petroleum<sup>8</sup>**

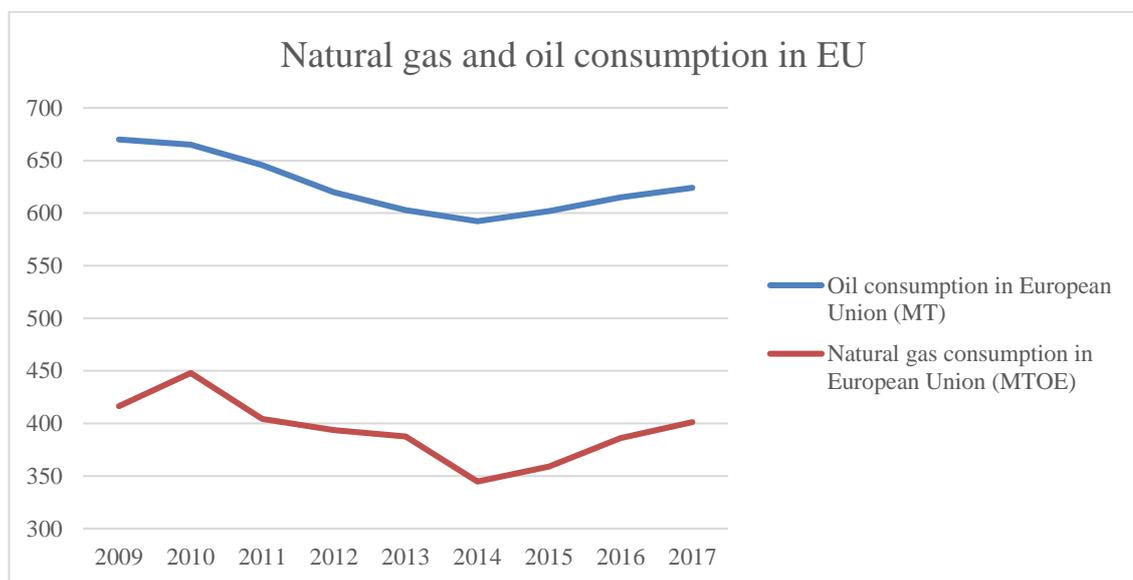
In case of oil then the prices, then two main indexes affecting showing global prices was chosen. Dubai price in case of United Arab Emirates and Brent index related to North Sea oil and London prices. Compared with natural gas, volatility since 2009 has been higher when in 2012 was about 110\$ per barrel and in 2016 it was Dubai 109\$ per barrel and 111\$ Brent per barrel (BP 2018:20). The price shift was almost three times, while gas price shift was two. In this scenario, assumption can be made, that natural gas price fluctuated less than oil, but on the other hand still their prices are strongly connected on global market.

The global market prices have also impact on consumption. The consumption table reflects oil consumption in millions of tons and gas consumption in millions of tons oil equivalent. Considering the high prices on oil and gas from the rise to the fall 2010-2014, then bottom in 2014 was reached based on current time gap. The natural gas did the biggest fall, from 447Mtoe in 2010 to 344Mtoe in 2014 and the oil from 664Mt to 592Mt (BP Statistics). After 2014 towards 2017 and after both have raised, but natural gas usage is raising faster as 57Mtoe compared oils 32Mt, which indicates to the growing usage of natural gas instead of oil in EU.

<sup>8</sup> Data derived from British Petroleum Statistics. Oil trading prices. Retrieved 31.12.2018

<https://www.bp.com/en/global/corporate/energy-economics/energy-charting-tool-desktop.html>

While the demand has grown, it means in free market rules, that price will also rise. Considering that, World Bank forecast on commodity prices will predict the growth. The forecast shows that from 2018 and in the beginning gas price will continue growth but after will decline until 2020 and reaches 7\$/mbtu. From 2020 it will continue the growth steadily, reaching 7.5\$/mbtu by 2025 and will be about 8\$/mbtu in 2030. Hence, it must be considered, that forecast is done in 2018 October, and reflected that moment's conditions for forecast model, which from producer perspective are rather positive than negative (World Bank 2018:1).



**Table 6. Oil and gas consumption in EU. Source British Petroleum<sup>9</sup>**

### 3.2.2. Azerbaijan's gas affordability

Azerbaijan through the last decade has advanced in producing gas in values. The future aim to sell gas EU's free market, which follows liberal model based on demand and offer, then Azerbaijan's potential price for the single market must be considered. Yet, there is no current trade in natural gas and transport prices are unknown, still it is possible to give approximate evaluation to potential gas prices and compare it to EU price trends.

<sup>9</sup> Data derived from British Petroleum Statistics. Oil and gas consumption in EU. Retrieved 31.12.2018 <https://www.bp.com/en/global/corporate/energy-economics/energy-charting-tool-desktop.html>

Current data base on export quantity and earnings on natural gas in Azerbaijan. This data reflect export to the main trading partners, which are Turkey, Georgia and Iran (BP 2018:34). From the prices it can be seen, that they depend on oil price volatility and global market prices. Yet Azerbaijan's gas prices do not show so high volatilities as EU gas markets present with their periodical ups and downs. Yet, it must be said that certain transport fees are unknow and there will be continues struggle, because in case of low gas prices, the long distance natural gas transportation from deep-seabed makes it hard to compete on EU South-Eastern gas market (Hall 2018).

**Table 2. Azerbaijan's natural gas export price and quantity. The State Statistical Committee of the Republic of Azerbaijan<sup>10</sup>**

Year	Million m <sup>3</sup>	Million \$	\$/1000 m <sup>3</sup>	\$/m <sup>3</sup>	<sup>11</sup> Price m/btu \$
2009	671,7	125,3	186,57	0,19	5,32
2010	1 792,9	288,5	160,94	0,16	4,59
2011	2 885,8	574,6	199,10	0,20	5,68
2012	2 714,0	648,7	239,03	0,24	6,82
2013	3 035,1	702,0	231,29	0,23	6,60
2014	1 825,7	304,7	166,89	0,17	4,76
2015	8 432,7	1 505,0	178,47	0,18	5,09
2016	8 396,0	1 096,7	130,62	0,13	3,73
2017	7 543,5	1 193,7	158,24	0,16	4,51

Additionally, the Southern Corridor's gas through TAP leading to Italy will affect mostly on Southern-Eastern Europe. Yet in case of diversification and free market principles, it would serve EU's aim to reduce the Russia's gas share in given area states. For example, especially in case of Greece, Bulgaria and Italy would have effect on Southern Gas Corridor. In Greece, the dependence share of Russia's gas imports is between 50-75%,

<sup>10</sup> Data derived from The State Statistical Committee of the Republic of Azerbaijan. Dynamics of main commodities export: natural gas export quantity and price. Retrieved 31.12.2018

[https://www.stat.gov.az/source/trade/en/f\\_trade/xt009\\_2en.xls](https://www.stat.gov.az/source/trade/en/f_trade/xt009_2en.xls).

<https://www.stat.gov.az/source/trade/?lang=en>

<sup>11</sup> Calculation is based on million British thermal units=28,52m<sup>3</sup>. Retrieved 31.12.2018 from <https://www.convert-me.com/en/convert/energy/mymmmbtu.html?u=mymmmbtu&v=1>

Bulgaria 75-100% and Italy 25-50% (Eurostat 2018:9). Based on European Commission gas market report, then estimated second quarter of 2018 natural gas cost for domestic users is 6.44€/kWh and for industrial consumers 2.35€/kWh. In case of Bulgaria, gas price is on average level or low, for industrial consumers it is 2.04€/kWh and domestic 3.95€/kWh. Greece has domestic estimated price about 5.77€/kWh and one of the highest industrial price 2,77€/kWh. On the other hand in Italy, domestic users price is one of the highest in EU 8.89€/kWh and industrial is below average 2,27€/kWh (European Commission 2018(a):30-31).

Considering Azerbaijan's current export prices, then the price on EU market will depend on oil and gas prices. Yet, Southern Gas Corridor project gives a good opportunity for extra diversification on gas market and specially in South-Eastern Europe.

### **Concluding discussion on Affordability dimension**

The growing consumption of gas compared to oil and low prices makes EU to have greater benefit, because Azerbaijan takes a risk being a supplier, but outlooks for it are positive based on World Bank forecast. While the taken commitment to provide first 10bcm/y to EU market, then despite the prices, it must be done by contracts, that usually bind suppliers and distributors of gas. It serves EU political goals to fewer dependence from Russia's gas in Southern-Eastern Europe and make gas market more liberalized and competitive through Azerbaijan's gas and is related to competitiveness dimension in EU energy triangle.

In case of EU, then IPE liberal approach, which claims that politics and economics are separated, will be suitable. (Van de Graaf et al. 2016:15). The entrance to free market means, that market design the price, if there are other suppliers also. Hence, through energy trade on suitable prices, it will increase the potential interdependence on energy level between EU and Azerbaijan.

In case of cooperation, then affordability makes Azerbaijan and EU more interdependent, yet Azerbaijan is more dependent on EU as it wants to sell gas and potentially grow the volumes. EU on the other hand want to increase the functioning of free market to make it more competitive and further cooperation is high, especially when main aim is to promote low-carbon economies and lowering energy prices for consumers. Considering also the price of Southern Gas Corridor, which costs almost 40 billion dollars, then it also gives a

beneficial boost for economy in total. This can be seen on EC's vice president's Maroš Šefčovič's speech, who is currently in charge of the Energy Union: "*...it will bring significant benefits to its host, transit and destination countries, including their local communities – in terms of investment, jobs as well as lower energy prices for consumers and transitioning to low-carbon economies* (European Commission 2018(b))."

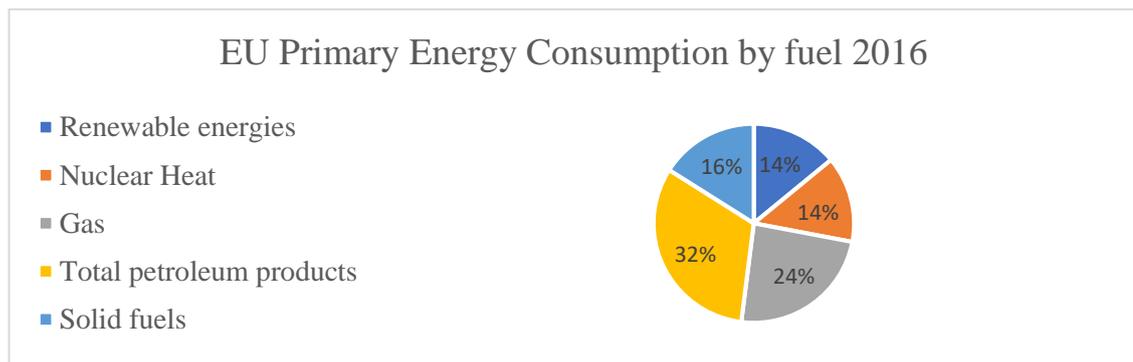
### 3.3. Environmental Sustainability

Firstly considering, that through natural gas policy and diversification, EU pursues towards its climate goals as a long-term measure. Therefore firstly energy mix of the EU based on consumption will be looked with EU gas production, also CO<sub>2</sub> trends and forecasts by IEA will be considered and finally Azerbaijan's role in relation with EU sustainability goals through energy security.

#### 3.3.1. EU energy consumption mix

The long-term energy policy is firstly to cut emission through Energy Roadmaps 2020,2030,2050 by 80-95% from this century (European Commission 2010:2-3). This means the growing importance on environmentally friendly fuels, firstly renewables as wind, solar, hydro-energy, but additionally nuclear heat and gas are also considered. Since the natural gas is seen as a bridge towards renewables due to its properties, lower CO<sub>2</sub> separation than oil and even in case of renewables, then natural gas is easy to manage, when there is lack of sun or wind to compensate cost-effectively heat generation instead doing it with electricity (IEA 2018:172).

Based on European Environmental Agency (EEA), then still petroleum products oil and gasoline have the highest share of consumption energy mix 32%, since it has been the main commodity since 20<sup>th</sup> century and now the shift towards new energy resources is occurring (EEA).



**Figure 7. Primary energy consumption by fuel 2016 EU28. European Environmental Agency<sup>12</sup>**

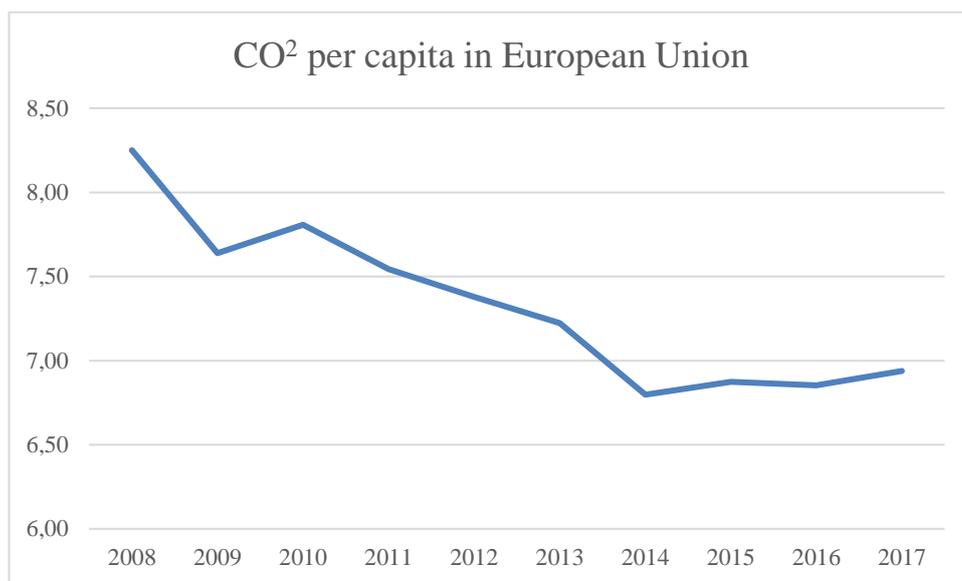
<sup>12</sup> European Environment Agency. EU consumption mix by fuel. Retrieved 05.02.2019

<https://www.eea.europa.eu/data-and-maps/indicators/primary-energy-consumption-by-fuel-6/assessment-1>

While nuclear and renewables pose together 28%, then firstly the aim is increase renewables and decrease coal consumption with oil. Firstly promoting gas serves the purpose to decrease oil share. IEA energy forecast for natural gas trend is that by 2030 it will become second-largest source of energy after oil in the world, which on EU level already has happened. The gas consumption in New Policy scenario tends to be 45% higher than it is now in 2040 and China will import as much gas as does it EU region as total (IEA 2018:171).

### Greenhouse gas emission

The overlook shows of CO<sup>2</sup> emission, as most primary indicator of greenhouse gases emission, that since 2014 CO<sup>2</sup> emission has slightly risen (BP Statistics). It can be due to cheap global oil prices and gas prices, but it is an alarming signal for the EU, if they want to continue their goals to decrease emission.



**Figure 8. CO<sup>2</sup> per capita in EU. British petroleum<sup>13</sup>**

The IEA sustainability goal in 2040 is to have CO<sup>2</sup> index per capita decreasing and around two, but based on IEA New policy scenario, it seems complicated. Firstly, the predicted energy demand is growing faster by 2040, then EU assumed. While now in EU, index is

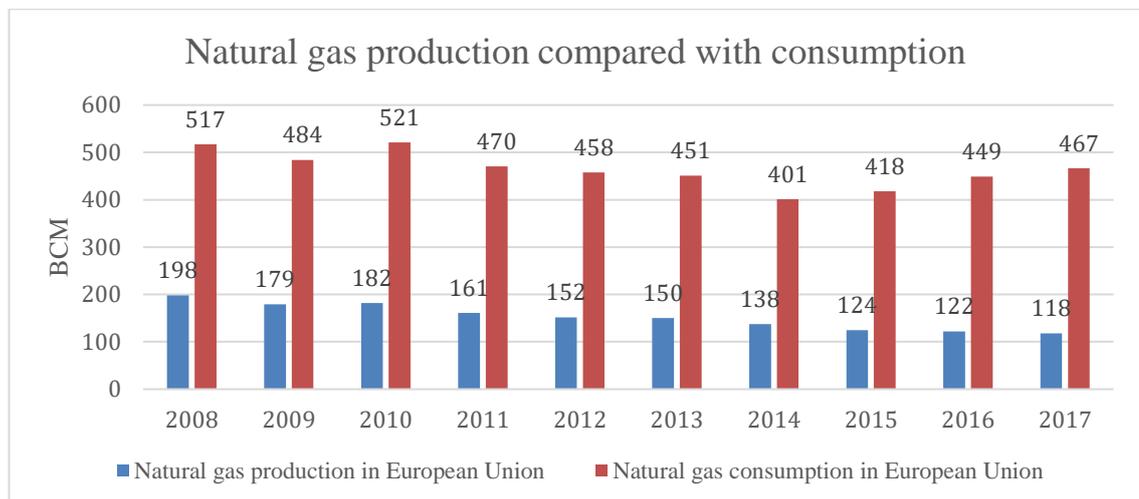
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<sup>13</sup> Data derived from British petroleum Statistics. CO<sup>2</sup> per capita in EU. Retrieved 31.12.2018  
<https://www.bp.com/en/global/corporate/energy-economics/energy-charting-tool-desktop.html>

6.94 co2/per capita, then based on new policy scenario, it will be close to four, not two as predicted before (IEA 2018:117).

### 3.3.2. EU long term forecast

The role of natural gas as key issue on EU sustainability, then firstly production and consumption must be looked at. Since 2008 natural gas production in EU has continuously decreased while since 2014 is shows growing trends (British Petroleum Statistics). One of the main reasons is that EU states are restricting natural gas production or reserves are depleting. Based on IEA, then decision from major intra-EU producer Netherlands to restrict production from Groningen fields leads to a major decline in production and from current 25bcm/y will be reduced to zero by 2030. Netherlands scenario indicates, that they will be able to produce about 10bcm/y in 2040 (IEA 2018:181). The scenario presented by IEA sees drastic fall in production for EU. In 2025 EU produces 65bcm/y, 2030 49bcm/y and 2040 only 45bcm/y (IEA 2018:179). The drastic fall leads to increasing import need from outside the European Union. Considering the demand for import, which in 2017 was 73% of natural gas total consumption, then on EU, IEA scenario predicts imports to be 409bcm in 2025, which is 86% of its consumption and in 2040, imports 373bcm share 89% of total demand (IEA 2018:182).



**Figure 9. EU Natural gas production and consumption. British Petroleum<sup>14</sup>**

<sup>14</sup> Data derived from British Petroleum Statistics. EU Natural gas production and consumption. Retrieved 31.12.2018 <https://www.bp.com/en/global/corporate/energy-economics/energy-charting-tool-desktop.html>

### **3.3.3. Azerbaijan and EU's sustainability**

Azerbaijan, who serves a role of supplier of natural gas for EU pursuing security and climate goals, then increasing potential importance to cooperate with EU, gas potential must be considered. While both understand the importance of climate change, which EU promotes through market regulations and Eastern Partnership Program, then gas as a physical matter to EU is most important.

Considering previous forecasts on growing share of extra-EU import, then Azerbaijan can help it two ways. Firstly, providing gas themselves and secondly adding Turkmenistan in future to the supply chain of gas. IEA forecast to Azerbaijan a rapid growth of production. In 2017 Azerbaijan produced 18bcm, but by 2025 it is predicted to be 32bcm/y. Afterwards production will be increased 39bcm by 2030, 44bcm by 2035 and finally 46bcm in 2040 scenario (IEA 2018:179). Considering the domestic demand previously discussed, then Azerbaijan is clearly motivated towards EU market with potential of supplying Turkey with extra exports when needed in future. The share of EU's import may be in positive scenario about 5-8%, when Azerbaijan will be capable to export about 25-30bcm.

Secondly, the pipeline system is set place between Azerbaijan and EU through Southern Gas Corridor can link other potential suppliers as Turkmenistan. IEA gives an estimate, that from 2017-2040 Turkmenistan's production annually rise from 80bcm to 154bcm/y (IEA 2018:179). Also, Iran can be considered to supply EU in future, when political situation is suitable. Between 2017-2040 Iran is estimated to expand it's production volume from 214bcm to 315bcm/y (IEA 2018:179). Considering, that due to Azerbaijan's lower resources than Iran and Turkmenistan (also other possible Middle East states to export gas to EU), then in long perspective Azerbaijan would win from that. Since their R/P is decreasing and new field discoveries depend on further exploration, then Azerbaijan as a major shareholder in Southern Gas Corridor pipelines would earn forwards transit rent fee, even when it's EU export may decrease. It can be seen a long term strategical plan for Azerbaijan's future and also same plan for EU having extra gas.

### **Concluding remarks on sustainability dimension**

The sustainability dimension seems to be most important considering energy security. The future decrease of production and increasing import dependence of natural gas makes

them extra actively to look diversification opportunities and not to be more dependent on Russia's natural gas reserves. Also considering Azerbaijan's role and cooperation, then in long term sustainability situation, where EU needs resources, both will benefit. One of the reasons is that gas share in energy mix will increase and Azerbaijan's production volumes are growing. This also serves the reducing risk of conflict purpose in liberal thought, because through trustable supply on market, the possibility for gas supply disruptions will stay low.

Hence considering CO2 level increase in the EU, then it seems, that economic needs and aims overcome climate change goals, but based on this time period, no certain conclusions cannot be made because gas share in mix will increase and ideally it will bring down emission level. Based on IPE liberal approach, then in case of EU, European Commission as supranational institution coordinate member states actions in energy sector to cut down emissions through sustainability dimension in their energy triangle. Additionally, promoting new suppliers on energy market can be also somehow seen an emergency response to deal future energy market shocks, to continue its security and climate goals. Still the potentials base on IEA forecasts on models based on current situation. Considering all that, then future relationship between Azerbaijan and EU is likely to be more interdependent and stronger firstly to fulfil climate goals through new natural gas supplies and also.

### **3.4. Assessment of Azerbaijan's fit to EU energy security framework**

Considering the neoliberal assumption, in the case of EU there is no hierarchy in policy issues, whereas military would dominate in neorealist assumption. When considering energy security, natural gas diversification through new suppliers would dictate the future EU aims in energy cooperation in order to have sufficient supply on the gas market. This would mean bilateral relationship between EU and Azerbaijan to keep Southern Gas Corridor supply chain reliable and pursue their policies, that would not cause any tensions to transit states or vice versa. Additionally, it is especially important for EU since it becomes a potential for new suppliers in the future from gas rich regions.

Considering the theoretical framework of neoliberalism, explained by IPE liberal approach shows the complexity of issues EU faces. While the gas is considered a commodity, the EU liberal approach on market liberalization has led to take extra steps to have new sources of supply and to decrease the role of Russia's gas. The positive attribute of IPE liberal approach is that it helps to explain EU energy triangle through different aspects and economic/environmental goals are considered, which allows us to look closer at three energy security dimensions towards Azerbaijan.

Therefore, based on three dimensions, this thesis tried to answer the research question "How would Azerbaijan's natural gas fit in to the EU long-term energy security framework?" and assess it as it "fits perfectly", "fits partially", "does not fit" or "fits good enough but other factors might be involved".

Considering EU energy triangle topics in relevance to Shaffer's components of energy security, findings through energy security indicators and relevant matters affecting potential gas supply, this thesis finds that Azerbaijan fits into the framework good enough, but other factors may be involved. All dimensions fit with EU energy security goals and to framework but not perfect considering IPE liberal application, of how the potential energy trade helps to lower the conflict and is beneficial to all.

The reliability dimension firstly indicates, that natural gas supplies are available in sufficient volumes and serves EU diversification aim. On the other hand, Azerbaijan is influenced by Russia and Georgia, because the growing domestic consumption has made them import gas from Russia and Gazprom and having a share of their market, which makes them more dependent on Russia. Georgia as transit state benefits from gas transportation and has positive relations with EU and Azerbaijan, but due to occupied

areas, the potential escalation can affect gas supply to EU. This also applies to Armenia-Azerbaijan confrontation on Nagorno-Karabakh area.

Considering Turkey, who wants to become a giant gas hub, the growing demand may affect future possible supplies to EU. Yet, considering Trans Adriatic Pipeline, the Azerbaijan government, SOCAR and STEAS have a majority of the pipeline, 58%. It gives them a majority and they can do favoring decisions upon transport, which makes EU-Azerbaijan positive relations more important.

Considering all that on reliability, perfect non-interrupted gas supply scenario cannot be achieved, because they are assumed to be reliable partners due to their wish to sell their resources to EU, but Russia's factor is high in the region, and it must be taken in account considering also occupied and disputed areas.

The affordability dimension in the case of Azerbaijan's gas highly depends on oil prices and the seabed gas from Shah Deniz makes production costs a bit higher. Therefore low gas prices would not serve their profitable outlooks and would make them try to keep gas price possibly high. From the EU perspective, it serves their purpose to have gas supplier on market from which competition will rise and ideally make it cheaper for consumers as IPE liberal approach assumes as well. Also, currently there is no trade between EU and Azerbaijan, but considering their export prices on gas, they are not as volatile as EU has been which show the stability from producer.

Considering the affordability, it fits perfectly to EU energy security perspective to have gas on an affordable price to mainly Gazprom dominated markets in Southern Eastern Europe. But with Azerbaijan, it still mostly depends on global oil prices and no guarantee can be given on future prices. So, considering growing gas consumption trend in EU and World Bank forecast on growing gas prices, then cooperation between EU and Azerbaijan natural gas trade is likely to grow.

The sustainability dimension is firstly based on the EU's goal to change its energy mix towards renewables, but gas is seen as a bridge to move towards more environmentally friendly consumption, which is one of the policies of European Commission to deal with climate change and avoid future market shocks. Yet, there are other reasons, such as decreasing production and increasing dependency on natural gas import, which makes EU especially important for diversifying suppliers. While EU natural gas reserves are depleting and production decreases, in the IEA policy scenario, by 2040 it has fallen

almost three times to 45bcm/y while it consumes about 373bcm/y. Also, when we consider Britain leaving the EU, then production in the union would presumably be smaller.

Considering sustainability, Azerbaijan fits perfectly to EU energy security framework to continue low-carbon goals in long term. Azerbaijan's production will grow almost three times to 46bcm/y by 2040 in IEA policy scenarios and considering Southern Gas Corridor expansion capabilities, then supposedly it will continue export to the EU market. Considering EU's demands and Azerbaijan's potential output, in a positive scenario, Azerbaijan's gas share in EU market can reach up to 5-8% by 2040, which means, that pipeline exporters share in total will change.

Considering three dimensions, the hypothesis based on theory "through pursuing energy cooperation with Azerbaijan, European Union will benefit on long-term energy security" concludes, that EU will benefit on long-term energy security. As Southern Gas Corridor is promoted by Azerbaijan and EU, it is one of a kind by length and holds a potential in future for EU. Both Azerbaijan and EU benefit from the project, but it serves EU energy security goals to have more potential supplies like Turkmenistan's gas or maybe Middle-Eastern gas, but still the political situation and security of supply will be the main factors. While the gas consumption will grow in the world, EU must continue increasing its suppliers amount who would trade and compete in single market, to fulfill their demand and Southern Gas Corridor as an example can encourage future projects.

## **Summary**

The aim of this thesis was to evaluate how Azerbaijan fits in to the EU energy security framework through three energy security dimensions: reliability, affordability and environmental sustainability. The theoretical framework laid down to examine cooperation in energy security based on neoliberalism. Neoliberalism was chosen because of various problems that EU energy strategy needs to cope with and neoliberalism application on energy through IPE liberal approach helped to understand cooperation between EU and Azerbaijan. Firstly, both sides will benefit from gas trade and through diversification EU can have more supply on single energy market and it hypothetically slightly decreases Russia's influence in Southern Eastern Europe.

The research question "how would Azerbaijan fit to the EU long-term energy security framework?" as an exploratory single case study was approached through concept of energy security. The exploratory single case study was chosen, because there is no gas trade between EU-Azerbaijan as of 2019 and it takes into account forecasts and potentials for future in relation to EU energy security goals. Finally, the fuzzy energy security concept does not have a common approach on analysis and it is context dependent.

Shaffer's three components on analyzing energy security, reliability, affordability, environmental sustainability, reflected EU energy triangle main objectives and IEA goals for sustainable energy development. The simple indicators added to analysis reflect the basic components of evaluating energy security. The main data relied on British Petroleum Statistics as proven natural gas reserves, consumption, prices, trade and CO<sup>2</sup> per capita indicator. Yet, other statistics by various organizations can have different data, for example dissimilar proven reserves amount, but BP has long history in Azerbaijan and it's information is widely used for analyses. Eurostat and European Environmental Agency and Azerbaijan's Statistics were also used for energy mix information and for Azerbaijan's export and income on natural gas. Forecasts based mostly on IEA outlook scenarios and secondly on World Bank future gas price predictions.

This thesis claimed, that Azerbaijan would fit good enough, but other factors are involved. In case of reliability dimension, Azerbaijan as potential diversification state suited well with physical gas supplies and resources to production ratio considering long-term relationship. The supply chain in case of transit states and potential influencers showed, that Russia has still a high influence in the region and Azerbaijan imports gas from it to

supply domestic consumption. Furthermore, Georgia has territories occupied, which can be used as Russia's interest to destabilize the state. The same applies to Azerbaijan in the context of Nagorno-Karabakh conflict. Therefore full reliability in terms of security of supply cannot be achieved due to complicated political situation in the region.

For EU, Azerbaijan's gas will be affordable, when oil prices are low and hypothetically could fit supplying for the increasing EU gas consumption on single market. Azerbaijan's gas production on the other hand is more expensive, because they produce it from a deep seabed in the Caspian Sea. Therefore, higher gas prices are preferred by Azerbaijan and World Bank forecast predicted a growing gas price for the next decade. Additionally, previous gas export prices were not as volatile as were EU market prices in relation with oil prices. Considering all that, it fits to affordability dimension and Southern-Eastern Europe gas market will be more diversified, where Gazprom has high share of imports.

In sustainability dimension, the fit was seen. Due to decreasing production of natural gas due depleting resources, EU's import dependence will grow around 90% of total consumption. Additionally, when the aim is to decrease greenhouse emission, the previous years up to 2017 have shown slight increase on CO<sub>2</sub> per capita indicator. To continue gas promotion in energy mix towards environmental goals in EU, EU needs to cooperate with new suppliers in terms of fulfilling its climate goals. Azerbaijan was seen as a potential for sustainability, because based on 2017, their production will increase almost three times to 46bcm/y by 2040, while EU production falls almost three times to 45bcm/y based on IEA scenario.

Based on these three dimensions, the hypothesis "through pursuing energy cooperation with Azerbaijan, European Union will benefit on long-term energy security" is accurate. Both will benefit in energy security cooperation through trade as IPE liberal approach assumes. Azerbaijan can sell its gas and EU can achieve its energy security goals through Caspian Gas.

In conclusion, this thesis tried to fit Azerbaijan into EU energy framework through three dimensions, while there is no gas trade and is only a prospective potential outlook for the future. One thing can be said for sure, that through Southern Gas Corridor, new future potential supplies to EU can be thought of, like Turkmenistan and Middle-East states.

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