Karina Galytska

# EUROPEAN-RUSSIAN ENERGY RELATIONS: FROM DEPENDENCE TO INTERDEPENDENCE

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# Introduction

> "No one today is ignorant on the part played by energy, not only in science, but in industry, politics, and the whole science of human welfare. From the cradle to the grave, everyone is dependent on nature for an absolute continuous supply of energy in one or the other of its numerous forms. When the supplies are ample, there is prosperity, expansion and development. Where they are not, there is need", Frederick Soddy 1912[1].

In the modern era, the development of national societies, politics and international diplomacy is strongly linked to the economy sector: energy is, *de facto*, what puts in action the mechanisms of this complex apparatus that we call World. From the discovery of fire made by cave men, to the modern use of fossil fuels and advances in nuclear physics – energy played a central role in human development and economic growth. It is indeed a multifaceted concept, which represents a pivotal concern in International Affairs: the oil wars in the Middle East, the construction of intercontinental pipelines, the rise and fall of oil prices, economic and political sanctions regime and energy shortages – can be easily associated with few of the key moments of international diplomacy. We are testimony, today, of the current political and economic situation of destress (both on global and national level), which impacts significantly on world's energy sector and, at the same time, it is also caused and alimented by it. World energy demand is persistently growing and, due to the shortage and geographical distribution of natural resources, dependency rates of national governments are rising[2]: this economic and political bound to third parties shapes the diplomatic relations within the International Community. Because energy supports

[1] Nobel Prize winner, Frederick Soddy was an English radiochemist involved in several energetic, economic and scientific disputes. Cited in Haghighi 2007, p. 1.

[2] According to main International Agencies (Eurostat, EIA and IEA) National Energy Dependency rates are overall increasing worldwide, even if at different speeds. For further information and data see: *Global Energy Consumption.*

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diverse and several (if not almost every) human activities, the current energy crisis gains relevance and complexity; most people, however, do not understand fully the range of this situation of distress, there is more to an augmented price at the gas station[3]. For policy makers and national representatives, instead, energy security and dependence represent a crucial issue deeply interconnected with National Security, therefore a daily concern.

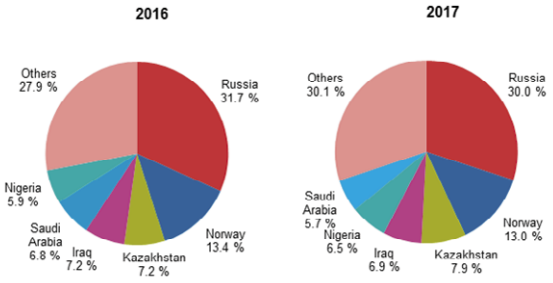
Conventional energy sources represent the major cause of environmental stress due to CO2 emissions, which drive a wide range of environmental changes counting global climate change, acid deposition and air pollution. Coal mining destroys areas of natural habitat, hydropower carries significant ecological and social costs and oil and natural gas extraction impacts on our sensitive ecosystem and are not made to last (United States Environmental Protection Agency – EPA s.d.). The dramatic environmental consequences of high-energy consumption deserves a deeper and more accurate investigation because there is no '*planet B'* in this reality: unless a scientific breakthrough will allow humanity to survive on other planets soon, the Earth is our only home and we must safeguard and take care of it. The main objective of this work, though, is oriented towards a different but related perspective. Neglecting by choice the environmental issues, the purpose of this short analysis is firstly to understand what does energy security really mean, why is it important for Modern States and which are the consequences of high rates of energy dependence; secondly, to analyze the past and current status of energy relations between the European Union and the Russian Federation. Due to the lack of sufficient (able to meet the demand) energy sources within the territory of the Union and the abundance of them in Russia, the trade seems to be a *win-win* situation; however the constant need of primary energy might exacerbate the consequences of EU energy dependence, or convert it in a more balanced form of dependence.

The main subjects of this analytical work, indeed, are going to be the European Union and the Russian Federation, as they represent two main (but very different) powers on the International Arena. The core of this research is going to be devoted to the analysis of the past and current Euro-Russian energy relations; the aim is to demonstrate how outdated is the concept of unilateral energy dependence in the contemporary relationship between the European Union (consumer) and the Russian Federation (supplier).

Each State indeed tackles the energetic issue in its own way according to national demand of energy, production (if there is) and choice of domestic energy mix. In the case of energy-exporter countries, there is no energy dependence problem, which appears when there is not (or not sufficient) domestic production and the consumed energy arrives from third States. This relationship, es-

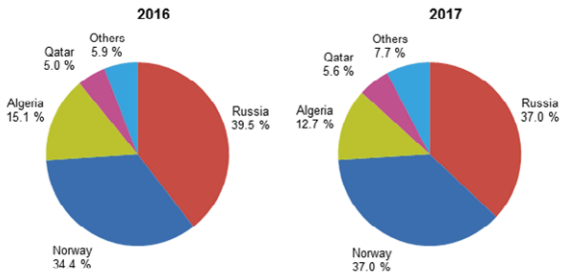
[3] Energy saving represents today one of the main quests for almost all developed centers; power is necessary for everything, especially in households. It is possible to generalize saying that energy is mainly used in three main spheres: Residential uses, Commercial uses and Transportation. See: Dawson 2015.

tablished between the importer and exporter, has remarkable implications for national agendas, especially for the energy import depending country. Considering the economic and political relevance of the European Union in the International System, it might seem unusual that the dependence rate of the EU is one of the highest in the world. According to the Eurostat statistics, indeed, among all energy products the EU in the first half of 2017 imported almost 69% of oil and 20% of natural gas (Eurostat, Statistic Explained, 2018). The Russian Federation was undeniably Europes largest supplier of gas in the last past years, and second in petroleum oils (figure 1 and 2).




*Source:* Eurostat database (Comext) and Eurostat estimates

Figure 1. Extra-EU import shares of natural gas (2016, 2017).




*Source:* Eurostat database (Comext) and Eurostat estimates

Figure 2. Extra-EU import shares of Oil (2016, 2017).

The main purpose of this study is indeed an analysis of the delicate situation regarding the European Union in terms of energy dependence from Russian energy supplies. Starting from a brief overview of the current levels of global energy consumption and a scan of conceivable future trends, the research is going to focus mainly on the evolution of the concept of energy security and energy dependence in order to understand the actual energy relations between the European Union and the Russian Federation. Considering the evolution of common EU Policies and the Dialogue with Moscow in the Energy field, the aim of this analysis is to outline which ties bound Europe and Russia and subsequently, the "nature" of their energy relationship – dependence or interdependence.

The primary question, upon which this analytical research is based, is whether it is still actual to talk about European energy dependence on Russian primary energy supply. The main argument of my hypothesis is that currently the Euro-Russian energy relations are more complex and multifaceted than before, therefore there is no more space for unilateral dependence. The concept of mutual dependence, or Interdependence, better exemplifies the core reason of the current energy trade between the Russian Federation and the European Union; the existence of an already built and ramified pipeline network ensure Moscow stable profits from stable export energy flows making inconvenient a (possible) trade disruption. Even if, the security processes imply further research of more diversity and sustainability in energy supplies and despite the current high percentage of Russian primary energy in the EU fuel mix, in a relatively long-term, the Euro-Russian cooperation seems to be resilient.

The contemporary world is going beyond the binary dependence relationship, the interdependence connecting the actors of the International System creates a new reality where the inclusiveness of Energy Security concept spreads to several different areas. Efforts in diversification are crucial, however mutual benefits still rule the Euro-Russian energy relations.

## Methodology

In order to determine the nature of the Euro-Russian Relations in the energy sphere, it is compulsory to define first the relevance of Energy Security (what it means both to energy importing and exporting counties) and the actual European energy supply system by referring mainly to energy flows from the Russian Federation. To address this important and delicate task, the analysis is mainly concentrated on the most important steps in the history of energy cooperation between Brussels and Moscow and on the current state of primary energy export from Russia to the EU. For these purposes, the methodology adopted in this scientific research is mainly represented by the following general scientific techniques: deductive and inductive analysis, scientific literature and regulatory documents study, descriptive method and economic data analysis. Furthermore, the systematization, classification and processing of a wide range of notions, facts and figures through "*Imaginative thinking*"[4], has allowed reaching a more cohesive outcome. The core of the research is given by the scholars of International Studies, whose works have shaped and developed the theory of security, from the traditional definition to the contemporary one including also the concept of Energy Security.

## Sources

The redaction of this work had required a wide range of different references including books, journal articles, official documents, speeches, statements and

[4] Analytical technique adopted mainly in strategic intelligence and International politic analyses, aimed to develop new insights, different perspectives and/or alternative outcomes.

parliamentary outcomes. The collected bibliography can be divided in five groups according to the source and type of the documents. The first one is vital for the contextualization of the entire study; the Monographs and Energy related Books help delineating the evolution of Energy Security Concept. In particular the most relevant authors for this purposes were M. Verda, S. Zhiznin (Жизнин,), A. Zaharov, P. Bardazzi, A.Tonini, S. Haghighi and Bazilian and Roques. The second group is also very important: the Archives and Documentary Sources includes National Energy and Defence Strategies, official Reports on the domestic and international situation regarding energy consumption and production, Treaties, White and Green Papers as well as the European Energy Directives and Policies. This group represents the skeleton of the Euro-Russian energy Relations. The third group instead includes a wide range of publications, papers and redactions on energetic issues. The majority of the sources is given by the publications of internationally recognized research centres; it is noteworthy mention the *Istituto Affari Internazionali (IAI), International Energy Agency (IEA), Energy Policy Journal, Energy Journal, Istituto per gli Studi di Politica Internazionale (ISPI), International Affairs* among several others. The fourth group consists in Newspapers and News Agencies publication, very useful in order to assess the general perspective on the energy issues in both the Russian Federation and Western States. The *Carnegie Moscow Center* and *Carnegie Europe*, the *Oil & Gas Journal*, *Forbes*, *Reuters*, the *NY Times*, *Forbes, Telegraph, Borsa Italiana* and *Vedomosti (Ведомости)* – proved to be extremely useful for this specific purpose. The last group of sources, instead, includes the most used websites during the redaction of this analysis; the majority of the current data and information were extrapolated from Eurostat, EIA, World Bank and OECD data databases. Particularly useful were also the European portals, such as the European Commission Press Release Database and the European Parliament website, for the acknowledgement of the last news and developments in the Energy sector at the EU-Level. Of course, these represent only in part the huge number of sources consulted throughout the research.

### Structure

The Analysis consists of an introduction, a brief overview on Global Energy Consumption, three chapters, conclusion, three technical appendixes and references. The introduction assesses the relevance and the motives that led to choose this topic, outlining the main objective and aim. The first chapter is dedicated to the historical evolution of the Security Concept, which from a purely military sphere had spread also to different areas including Energy Security; then the notion of Energy Dependence is tackled with a particular attention to some of the most common macroeconomic indicator used to define the level of energy dependence of a State. The first chapter ends with a section dedicated to the European and Russian Energetic Security Strategies. The second chapter is, instead, more focused on the contemporary energy production within the Russian Federation and its export toward the European Union. The core of the chapter is a detailed description of the main pipeline networks – active and under con-

struction – which ensure stable energy flows to the continent; before moving to the last part of the work, a brief overview on the Renewable Energy Sector in the Russian Federation was necessary. The third chapter represents the true objective of this analysis, after recalling the main steps and attempts in the implementation of a common European Energy Policy the work investigates more accurately the Euro-Russian cooperation in the Energy field. From the Partnership and Cooperation Agreement with Russia (PCA) to the EU-Russia Energy Dialogue and the Common EU Strategy on Russia, it appears clear that the relationship between these two important International Subjects was always at the top of their strategic agendas. The conclusions of this analytical work are simple: there is no reason today to consider the Euro-Russian energy cooperation merely as an asymmetrical dependence, the contemporary world processes and evolutions make it a political and economic interdependence.

## Global energy consumption

In the purposes of this research, it is indispensable to dedicate some lines to general energy consumption trends. The World is a heterogeneous organism (and I deliberately have decided to call it "organism" because it evolves and has its own needs), therefore generalizations of any kind are hazardous but in order to understand better the concepts of energy security and dependence we must look at the general rates of primary energy consumption.

In the contemporary world the energy sector, on both global and local levels, is becoming more and more important; the development of human civilization raised up the economic-technological growth, the demographic pressure and socio-political friction. The Energy industry of the XXI century embraces several areas of human activity, providing lifeblood to the population, in form of fuels, electricity, heating and combustion. This kind of industry is very dynamic because interrelated to the development and growth of society. The processes of modernization have led to higher global energy demand rates even if substantial technological breakthrough in energy efficiency would have to decrease consumption. Energy experts and agencies as IEA, indeed, forecast a persistent and moderate growth of world energy consumption for the following years[5] (Figure 3).

This estimation does not come out of the blue: the demographic upsurge and economic growth of developing counties are going to weigh on global demand counteracting efficiency achievements. African and Middle Easter countries are indeed growing fast boosting average energy consumption; in Europe and North America, on the other hand, the demand is slowly decreasing[6]. In addition, some macroeconomic indicators accentuate how economic development and growth

[5] U.S. Energy Information Administration (EIA) – Independent Statistic & Analysis 2017a.

[6] Economic indicators corroborate these trends: according to the OECD statistic data, the total primary energy supplies of the OECD Counties have decreased from 5.30k toe in 2000 to 5.26k toe in 2016. <https://data.oecd.org/energy/primary-energy-supply.htm> (2018-10-31).

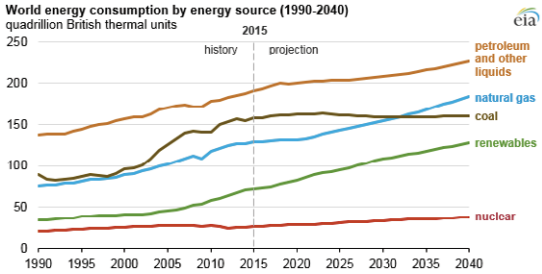



Figure 3. EIA forecast on global energy consumption up to 2040.

on Global and National levels affect energy demand. Considering this different angle, it is possible to highlight several different essential indicators:

*World GDP.* The growth of the average Gross Domestic Product (GDP) reflects the dynamism and progress of economic development and global production. Of course, developing countries play a great role expanding their productive capacity, meanwhile the developed ones follow post-industrial patterns of evolution focusing more on quality than quantity. Thanks to the scientific and technological innovations, the production of one item requires today less energy than yesterday (efficiency), however the production boost in emerging countries weights rising the global energy demand.

*Per Capita GDP.* Population's wealth is increasing due to economic drive and international anti-poverty programs. International organizations, the United Nations and several non-profit NGOs fight poverty on a daily basis, hunger and diseases in undeveloped counties promoting also economic development programs and craft classes; this joint action increases *per capita* wealth, fuel use, economic exchange and, consequently, the growth of energy demand.

*Urbanization rate.* The almost pervasive increase of urban areas has led to a dramatic decrease of rural spaces and inhabitants. If in the XIX century, only 2% of world's population lived in cities, after the "urban Millennium"[7], in developed countries the process ended with 75% of urban population and by 2030 it is going to reach 84%, in developing countries instead the urban inhabitants are going to be 50% at the end of 2020 (The United Nations – Urbanizations, 2001). This means more concentration of energy demand and inevitable rise of consumption.

A tangible example of these forecasts extrapolated from reality; in 2017, according to official energy databases, China's annual energy consumption growth rate has doubled in just one year reaching +2.9% (Enerdata 2018). This national rebound has further stimulated the overall global energy demand, the rates of *acceleration in energy consumption* are indeed astonishing: +1.1% in 2016

[7] Expression that indicates an exceptional historical period, in which for the first time at a Global level the majority of people will live in cities.

and +2.3% in 2017 (Enerdata, "Global Energy Statistical Yearbook 2018"). The annual energy consumption grew not only in the Asian region, but also steadily in Europe, Canada and Russia (meanwhile in the United States it remained quite stable). In order to understand better the issue, it is possible to breakdown World's consumption of 2017 by energy type (Enerdata 2018):

- *Hydrocarbon fuels – almost 60%.* Oil and its derivatives represent still the main source of power, even if in the last two decades its share is gradually shrinking meanwhile the natural gas one is growing (now approximately 22% of total energy consumption).
- *Coal – 27%.* The share of carbon used in energy industry grew significantly in the last years; such upturn originated from the predictions that the planet was expected to run out of hydrocarbon fuels in a short time. However, after the shale gas revolution, which has postponed the deadline of the end of hydrocarbons, and the ecological awareness the rate began to decrease again.
- *Nuclear – 4,4%.* The share of nuclear energy has remained almost the same because only few counties possess nuclear power stations. The level, though, decreased of 2% after the Fukushima-1 catastrophe in 2011; this incident has raised awareness about nuclear risks among the international community leading to the increase of non-nuclear energy production.
- *Renewables (2.5% + 6,8%).* The gap in energy production created by the decrease of nuclear and carbon use, has incremented the production of green energy. The reduction of ecologically harmful sources boosted the green sector initiating a completely new trend of awareness in the developed countries.

These percentages portray the current status quo in terms of World's energy consumption. The numbers represent an ongoing evolution, a trend, shaped by fundamental historical events that have left a mark in our society.

All began with the "Shale Revolution" in the United States of America: in the most vulnerable time in energy history[8], when the reserves of oil where about to use up, a new extraction technique brought light into the market. The country was expecting (as well the rest of the world) a severe hydrocarbon shortage, furthermore the concrete forthcoming possibility to suffer energy dependence form other countries has led the American Government to act promptly. In order to avoid high priced imports, they have managed in the early 2000 to extract oil from shale rocks (Borovskij 2011), making productive reservoirs previously inaccessible. It is important to specify that shale oil industry in America began developing from the XIX century, but it fell victim of the low petroleum prices that made it uncompetitive on the international markets. Due to the rising global demand and the discover of new oil reservoirs now exploitable, the national American crude oil production raised vertiginously (from 5,000 thousand bar-

[8] Here I am referring to the concrete possibility for humanity to run out of fossil fuels in a few decades, not for past or future shortages, supply interruptions due to political or technical reasons or price fluctuations – all-manageable.

rels per day in 2008 to 9,431 thousand in 2015)[9]. Just after a few years, American shale-extracted oil and gas provided more than requested energy supplies in order to meet, and exceed, national demand[10]. The United States of America, indeed, thanks to this national production increase, have managed to stop being the world's largest energy importer[11]; at the same time, but on the other side of the ocean, People's Republic of China began its personal climb to the top of the 'International hierarchy'. National high rates of population, labour force, industry production and economic growth have translated into a very high-energy need, making Beijing worlds' biggest energy consumer and importer[12].

The final level of energy consumption, however, does not represent a simple derivation from rates, numbers of needs; the international community's concerns about the ecological dimension play also a central role in defining the final level of energy demand. The degradation of the global ecosystem compels States (even if not directly, through political and social lobbying) to search new ways of producing and consuming energy in order to prevent further deterioration of the planet. The main problem is that all the documents and reports elaborated during international summit on climate change proclaim very ambiguous and non-mandatory guidelines in the field of the development of green energy, leaving up to the States the decision to choose their own path in energetic field and following environmental policies, since energy is part of national security concern[13]. Even if the environmental awareness movements were born and then spread from OECD countries, which have proved to be the driving force of green consciousness, today the situation has changed dramatically. The BRICS countries (especially China and India), indeed, represent the current most active national promoters of green energy according to their national energy mixes (Bakharyova 2014). Energy efficiency advancements and high-priced traditional energy sources have as well favored investments in renewables; however, the fall of oil, gas and coal prices postponed for the moment the gradual transition

[9] Data extrapolated from EIA official web site, *US Field production of Crude oil*: <https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=pet&s=mcrfpus2&f=a> (2018-09-16).

[10] According to EIA statistics, in 2007, the U.S. shale natural gas production was 1,293 Billion cubic Feet, in less than a decade in 2016, instead it was accounted to 17,032. <https://www.eia.gov/dnav/ng/hist/res_epg0_r5302_nus_bcfa.htm> (2018-06-24).

[11] In addition, for the first time after 1973, the United States of America out formed the Russian Federation's crude oil production. The president of Rapidan Energy Group, Bob McNally, meanwhile celebrating the more than doubled oil production, stated that this represents an historical milestone in American history and it is a reminder for everyone: never bet against the American oil industry. See: Egan 2018.

[12] In 2010, China's energy consumption was more than 2,453 (double than in 2000) after an annual rate growth of +11,2%. For the first time Chinese national energy demand out-placed the total amount of the developed West, including US, France, Germany, Switzerland, UK and other European countries. See: <https://www.iea.org/weo/china> (2018-06-24).

[13] The European Union represents an exception: the environmental legislation of the Union (composed by over 500 Directives, Regulations and Decisions) has significant effects on Member States.

to clean and eco-friendly energy industry leaving the traditional hydrocarbon-based implants more attractive. Indeed, since there is not yet a mandatory green policy at the international level, and all green investments depend on national balances and international oil prices, the development of sustainable energy is precarious and fickle.

Noteworthy are also the current challenges facing the hydrocarbon fuel markets, which make very hard for a precise analytic elaboration forecast on the evolutions of international prices or reserves exploitation. As known, the increase in energy prices does not automatically originate a demand fall because (especially in the short run), fuels or other energy sources are not something easily replaceable by consumers. The rate of oil prices changes constantly and this *fluctuation* discourages economic forecasts: in summer 2015, indeed, it was predicted that the average price was going to grow significantly by 2016, however, this did not happen and the prices continued to fall until the late 2016, when a small augmentation showed up (Taberner 2016). This price drop was provoked by a remarkable increase of oil production: in those years indeed, the United States of America intensified their national production of *'hard-to-extract'* crude oil (shale oil) due to the revocation of the export-prohibition (Overchenko 2015). The OPEC cartel, even if American oil pour out in the market, kept producing more than needed by global energy demand, leading therefore to the creation of an oil surplus and drop of its price. The possibility for Iran to restore its oil export after the lift of international sanctions has influenced as well the 2015's oil price drop.

Recapitulating, the economic growth, social and urban development, as well as the challenges facing hydrocarbon market, environmental awareness and historical and technical progress define the current levels of world energy demand. However, it is important to underline that the geography of the world energy sector is not cohesive; according to Zakharov (2015), indeed, the historical deviation of the main global energy flows required special attention.

The growth or decrease of both national and regional energy productions and the development of new economies and realities, deeply affects the general structure of the international energy sector. Global networks of energy supply adapt to these new conditions shifting and evolving at the same time; energy comes and energy goes to one or another side of the planet. Considering just the last 50 years, it is possible to point out three main causes to the shift of international energy streams:

1. The great revolution of oil production in the United States of America, through the shale technique, has allowed the exploitation of unconventional oil fields. According to the International Energy Agency (IEA), this break though will lead to the American Leadership in world oil production by 2020 reducing at the same time oil flows to the United States: USA's energy dependence, indeed, has already decreased from 20% to 10-15% (Ivanov, Matveev 2017). Regarding the gas market, instead, the American inner gross domestic production meets perfectly national demand, leaving an open door for further development in the international gas-export sector.

2. The *Arab Spring*, among all its consequences brought to the International System, has affected deeply North African's energy export. Due to the expansion of terrorist groups, political instability and military regime, Libyan energy producers have suspended, indeed, their activity on national soil. Similarly, Algerian natural gas production also fell: the political turbulence cut the financing to gas-extraction sector, heavily in need of new forefront explorations works. Consequently, because of the consequences of the Arab Spring, European energetic supplies have decreased dramatically (International Energy Agency – IEA 2016) and only in these last past years, have started to rise again[14].
3. The OECD countries, exception made for Japan and Republic of Korea, are slowly lowering their energy consumption, making the Asian-Pacific region the most attractive world energy market. This area, indeed, is very appealing for energy producers due to a high and stable energy demand; suppliers form the Middle East (especially Iran) are looking closely to the development of this area. The Russian Federation is also checking their neighbour Asian Market, redirecting gas originally destined to European Countries, to China.

Each event mentioned above introduces remarkable changes in the structure of the world energy sector; all of them, together, modify and shape the World energy networks and its regional sub networks adapting them to the new international *status quo*.

The general outline of global energy consumption given by this introductory part represents an indispensable tool for the upcoming research. In order to proceed with the meticulous analysis of the European energy dependence, indeed, it is necessary to be aware of global energy trends and flows: why they are increasing and due to which economic, structural and political factors. To follow, after a preliminary chapter dedicated to the evolution of the concept of national security, a smattering of macroeconomic analysis is going to present a few ways to measure and define the level of energy dependence in order to understand better the positions of the European Union and Russian Federation in the matter.

[14] Furthermore, it is worthy mentioning other few international developments which make obvious and certain future significant increase of European supplies: recently Israel has discovered, indeed, a huge field of non-conventional oil and shale gas; Cyprus, on the other hand, has found a new oil field in its territorial waters and Egypt was also fortunate finding one in its off-shore territory.

CHAPTER 1

# Energy Security and Dependence

> "The world is not necessarily more dangerous, but it has become more unstable, more unforeseeable. New crises, in particular from the Middle East to Pakistan, have come to the fore and have become more inter-connected" (Prèsidence de la Rèpublique 2013, 5).

The concerns for clear distinction between national domestic and external security tend to disappear followed by the blurring of boundaries of foreign defence and security policy. According to David Omand (Neri 2012, V), former Permanent Secretary and Intelligence Coordinator of British Government now professor at the King's College of London, the main components of the National Security concept of the XXI century are a) Uncertainty of the nature of risks that States must face and b) the global scale of issues that must be addressed. These elements are crucial in establishing a clear distinction with past-recognized notions of National Security and they also bring on the table of international rulers a clear need for enhanced State's capability in providing accurate analytical forecasts. The ongoing global economic crisis corroborates Omand's statement on the unsuitability of the old concepts of national security: the current challenges are indeed too complex and heterogeneous to be solved by past strategies and frameworks. There are no more foreign and domestic distinct spheres, but just a big blurred-bordered 'area at risk'; security concerns are definitely several and interconnected, very hard to extrapolate.

The National Security Strategies of States are documents unique in their kind, but even if they are all-diverse and 'customized' they all include an explicit or implicit definition of National Security. For the Dutch Government, for example, National Security means protection of the five core concerns of the State (Neri 2012, V), namely: territorial, economic, ecological and physical security of citizens and socio-political stability. Therefore, National security is jeopardized when "vital interests of our state and/or our society are threatened

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to such an extent that it might lead to societal disruption" (Neri 2012, V). The United Kingdom, on the contrary, has adopted a different strategy whereby National Security is granted by the safety of the Kingdom, safeguard of prosperity and citizen's way of life.

The concept of National Security, however, dates back to very ancient times where the only concern of the rulers was the military defense of their domains from foreign enemies. Today, documents on National Security are very long and complicated; the notion includes now several issues and aspects of different nature, not just military (rather almost not-military).

### 1.1 Historical Evolution of National Security Concept

The evolution of the concept of National security is tightly related to the changes occurring in the structural organization of the international political system. Security is nothing more than pure conservation, the desire to secure something already existing with high denotation (Monteleone 2012, 11). The historical changes witnessed and reflected onto national security policies, provide us useful indicators to understand the real extent of the modifications concerning the main actors, international practices, institutions and norms of political regimes. The concept of security entails, indeed, a thoughtful selection of a specific target: the desire, the need and will to preserve something valuable for the future of the State or the Political Unit analyzed. Besides, past modifications of this notion derive directly from the changes concerning modern States, key actors of the International System.

Modern States, indeed, have been originated within the International System with the purpose to defend, protect, their citizens from enemies; the main role of these new units was the physical "neutralization of rivals external to their territory" (Monteleone 2012, 11). Because, back in the days, this represented such an essential task, the idea behind national security has led to a firm connection with the pure territorial defense[1]. The main belief under this "Security perception" derives from the Hobbesian contract stipulated between the People and the State, where in exchange of absolute power and sovereignty the State takes the burden to protect and delineate its own security-survival[2], and the safeguard of

[1] Indeed, the main concerns of the rulers was the preservation of their hardly obtained territorial sovereignty; the larger the national soil was, the greater State's prestige and power.

[2] "From this fundamental law of nature, by which men are commanded to endeavour peace, is derived this second law: that a man be willing, when others are so too, as far forth as for peace and defense of himself he shall think it necessary, to lay down this right to all things; and be contented with so much liberty against other men as he would allow other men against himself. For as long as every men holdeth this right, of doing anything he liketh; so long all men in the condition of war. But if other men will not lay down their right, as well as he, then there is no reason for anyone to divest himself of his: for that were to expose himself to prey, which no man is bound to, rather than to dispose himself to peace. This is the law of the gospel: Whensoever you require that others should do to you, that do ye to them", Hobbes 1914, 67.

its citizens. Of course, for Hobbes, besides the external threats to the territory, the State had also the responsibility to remove any internal threats within the State. The spreading of the globalization processes has led to the blending of the national borders and the so-defined concept of security was put under discussion. The rise of supranational institutions in security sector, indeed, and the humanitarian movements shifted the light from nations to individuals. The Responsibility to Protect Concept (R2P) adopted by the United Nations in the name of assurance individual security breaks national sovereignty and points out new actors in charge of safety and peacekeeping. The Leviathan's era might be over.

It is possible to state that, without doubts, the most stun evolution of National Security concept refers not to the actual granted, but to the explanation of the term "security": what matters to safeguard and preserve nowadays.

One of the most dramatic developments within the International System is represented indeed by the drastic decline of interstate wars after the end of World War II. According to the Uppsala Conflict Data Program (UCDP)[3], indeed, after 1946 the number of National conflicts tends to almost disappear, but (at the same time), the number of internal and internationalized conflicts has raised without precedent. The nature of conflicts itself has changes during time, as well as the purposes: in addition to being mostly internal, contemporary armed conflict do not have an initial crisis, no war declaration, no organized armed forces and they last through decades or go off in a flash.

In general, in the last 50 years, the net distinction between traditional security issues and other meaningful questions have become less and less clear: due to the globalization processes, indeed, more types of political, economic and territorial problems started to affect national and international security. The widening of the security agenda through the process of *Securitization* included a number of various topics, as well as Energy security. In International Relations, indeed, the concept of *Securitization* refers to the process by which State actors transform several different subjects into matters of National Security. These issues do not represent necessary direct and essential concerns regarding the survival and preservation of the territorial unit; the reasons behind this inclusiveness process are mainly political: in guaranteeing "national security concerns" according to general principles of International Law and custom, States are allowed to use extraordinary means due to the relevance of the topic. National security represents still a sphere of purely matter of National Authorities, no external interference allowed.

In the 2003 Security Strategy of the European Union (ESS)[4], for example, the nexus between security, development, illegal immigration, piracy, global warming, financial crisis, cyber security and energetic supply is very clear.

[3] UCDP is one of the world-leading providers of data on organized violence, and its dataset on armed conflict is the most widely used in research on civil conflict: <https://www.ucdp.uu.se> (2018-10-11).

[4] European Council 2003.

The following Report of 2008 on the Implementation of ESS-2003[5], in its first chapter, *Global Challenges and key threats,* identified indeed an updated range of threats concerning the security of the European Union in the following order:

1. Proliferation of weapons of mass Destruction.
2. Terrorism and Organized Crime.
3. Cyber Security.
4. Energy Security.
5. Climate Change.

It is important to notice that the fourth point is entirely consecrated to the theme of Energy security. Although, all the five threats persist in time becoming more significant and complex, for Nations or Unions[6], which do not have enough inland energy production to meet domestic demand, Energy Security represents a huge concern. The duty to provide energy to the country, in order to support all the system, is one of the most important points in any Security Agenda[7].

### 1.2 From Military Security to Energy Security

Traditionally, therefore, the concept of security referred to the use of force and coercion; "Military force, not security, has been the central concern of security studies" (Baldwin 1997, 9). It is possible to observe national security acting on two parallel levels: at the State level, the main concern is to safeguard the intrinsic unity of the State and at the individual level, security means ordinary protection against threats or actual use of force against citizens, able to deprive individuals form their autonomy. It follows that the concept of security is strictly linked (on both levels) to the control of force and to the capability to use it. In the modern States, indeed, political authorities possess the monopoly of the use of force: they control the national army, police and major quantity of guns and arms and other kind of weapons. The security of individuals (understood as citizens but not necessarily) become with time one of the basic pillars of human and civil rights; however, the means by which the State must safeguard its citizens (and from what) are not so immediate to understand. When tackling National Security, the distinction between roles, subjects, threats and political units, start to blur.

The security of a State depends directly on its ability to control and employ resources: "Security is the first goal on the list of the immutable purposes the political units, it represents the possibility to satisfy the aspiration of survival"

[5] European Union 2008, 3 EN.

[6] According to the 2008 Report on the Implementation of the European Security Strategy, due to the declining production inside the European Members and the steady economic growth, it is forecast that by 2030 up to 75% of total oil and gas used by Members will have to be imported. The European dependence form external energy imports will definitely rise and the Energetic issues will dominate the political agenda.

[7] For more details see paragraph 1.5.

(Verda 2016, 18). This definition given by Raymond Aron is very clear and concise, however, the end of the Cold War has determined the end of traditional security concepts. The debate on the characteristics and possible meanings of security flourished and the definition itself became more and more inclusive.

Adrian Hyde-Price should be recalled for his work in the security field, he managed to summarize in one of the most cohesive analytical description of the evolution of the security concept underlining the main four aspects that have changed the traditional definition of security (Verda 2016, 18):

1. who is to be secured;
2. the nature of the threat;
3. who provides security;
4. with what instruments.

The first two points are more noteworthy because they refer to the definition itself, the last two, instead, derive from the previous ones and are more operative (field of security studies). Stefano Procacci, estimated Italian professor and researcher, on the base of this distinction, has summarized the changes introduced into the definition of security (therefore focusing on Hyde-Price's first two points) analyzing the interaction of two different asses of evolution (Verda 2016, 19):

1. the question of the referent object;
2. the widening and diversification of issues concerned security.

As we can see, Procacci's and Hyde-Price's works are quite similar: both underline the evolution of the objects of security and the following tools and strategies.

The process of *securitization*, thought more and more issues are labelled as "threats to national interest", is one of the consequences which widened the notion of security (or maybe it represents one of the causes due to the stakes). Today some States refer to situation as "threats" even if they have a long temporal horizon and no imminent risk; this happens because the separation between national security studies and foreign public policies is gradually fainting, without bringing any solution to national concerns. In the twenty-first century, furthermore, the intensification of the role of private and transnational actors has spread in all fields, including also national and international security through the diffusion of Private Military Companies and Private Security Firms. However, when it comes to energy security, the main referent subject remains still the National State and its ability to guarantee rates of national energy supply perfectly meeting national consumption. (In some case study, although, it would be necessary to also consider other actors, mainly national and multinational energetic companies).

Hence, from the end of the Cold War, major unprecedented changes were introduced into the International System. The economic and social globalization, the emergence of non-State actors and the redistribution of national sovereignty among new players, as well as the worldwide diffusion of innovative technologies and communication systems, have transformed the nature and

outline of international threats. The States are facing now new type of risks and must adapt their national strategies and policies. The concept of Security itself is completely transformed by the time, it became more inclusive and (at the same time) more undefined; from an exclusively military and State-central security, it shifted to a multidimensional security, disconnected from threats originated just from State Actors. The threats and risks of the XXI century are indeed, diverse, interlinked and global; dynamism and fluidity are the main characteristics of the current strategic field, where increased complexity translates into decreased predictability. Energy, in this scenario, represents the vital support of this concrete jungle; without it, current levels of welfare, production and communications are impossible to reach. Humanity uses power in order to shape the surrounding environment making it more suitable for its needs; this high-level resource should be managed carefully, and if a State does not have it (or do not have enough) it should make sure to get stable access to it. In line with this need, the Italian Government among all the targets appointed to the intelligence has included also the National Energy Security[8] exposed to threats because the national structural dependence on third States in the hydrocarbons sector, the volatility of prices and socio-political instabilities concerned supply and transit areas[9]. All these factors make energy supply hard to control and protect.

Since Churchill's time, indeed, the evolution of humankind and the further economic and social development of the majority of the World have deeply affected the paradigm of energy security, which represents no more an isolated sphere of International Relations between two political units in a merely supplier-consumer relationship. The energy security system created after the 1973 Arab oil embargo was focused mainly on avoiding further disruption of energy supply and the use of the 'energy weapon'; today States' concerns regard a wider range of issues including the control over strategic resources (Russia's main concern), energy prices and national balances (Western economies) and energy self-sufficiency (China and India). Daniel Yergin has stated that, in order to ensure national energy security, States must meet four crucial principles: diversification, security margin as buffer against shortages, recognize the reality of integration of energy markets and the relevance of uncensored information (Yergin 2006). According to Yergin, indeed, the concerns over Energy Security are not just limited to oil and natural gas supply, they include also national shortage of electric power and a new series of vulnerabilities characteristic of the XXI century: evolution of the global energy trade, terrorism, integration of new economies in world market, climate chance and of course the exploitation rate of fossil fuels – basically the overall protection of the supply chain (Yergin

[8] Presidenza del Consiglio dei Ministri 2017.

[9] The need to guarantee safety of supply channels led intelligence to investigate not only the condition of producing countries but also transit areas, crucial for the security of energy streams. Fortunately, in this period, the overall level of supplies has remained adequately high reducing the risks on supply flows.

2006). The work of Antonio Costa Siliva seems to sustain Yergin's vision, for him in fact the European energy security in the XXI century represents a complex field of concerns, characterized by eight main areas of action (Fernandes, Rodrigues 2017, 57):

1. *Security of Energy supply chain*: security of the production and distribution of energy coping with climatic, politic and technical adversities.
2. *Transport*: policies for the diffusion of electric and energy-saving vehicles.
3. *Climatic challenges:* promote green energy, less coal consumption ensuring the general decrease of CO2 emissions.
4. *Strategic Reserves:* enhance energy stocks for time of crisis.
5. *Market:* Focus on the implementation of the EU single energy market.
6. *Atlantic Basin:* as an alternative to LNG and oil supply to Europe.
7. *Diversification of supply sources.*
8. *Cyber security*: fight cyberattacks on energy facilities[10].

Table n. 1 summarizes the main differences in challenges and responses to energy security outlined by Silva referring to the past and present century. It is clear how today the energy security concept is correlated with all the areas on human activity and to which level it affects States' national security concerns.

Table 1. Concept of Energy Security in the XX and XXI century. Source: IDN Cadernos, 2017 N° 24, p. 55.

| | THREATS | STRATEGIC RESPONSES |
|---|---|---|
| **XX CENTURY** | • Disruption of supply by producing countries<br>• Repetition of oil embargo of 1973 Price volatility in the market | • Creation of Petroleum Strategic Reserves (SPR)<br>• Creation of the International Energy Agency (IEA)<br>• Standards for the automobile industry (CAFE / USA)<br>• Build "spare capacity" in producing countries |
| **XXI CENTURY** | • Terrorism<br>• Internal destabilization in producing countries<br>• Erosion of "Spare Capacity"<br>• Increasing dependence on OPEC<br>• Katrina and Rita hurricanes<br>• Disruption of production and distribution power networks<br>• Black-out's<br>• Extreme price volatility<br>• Climatic Threat<br>• Demographic factor<br>• Unsustainability of existing energy model | • Reduction of OPEC dependence<br>• Shift Energy Model<br>• Bid on renewables, biofuels, hydro-electric, nuclear, biomass, micro-generation<br>• New policy on Strategic Oil Reserves<br>• Creation of Strategic Gas Reserves<br>• Diversification of supply sources (axis Mediterranean/Atlantic/Central Asia)<br>• Integration of China and India in the International Energy Agency (IEA)<br>• Building of EU single Integrated Energy Market |

Now that we have ascertained the relevance of secure and stable energy supply for national consumption and what it entails in terms of National Security, the research will proceed with the analysis of the actual rates of energy dependence.

[10] This point might represent a novelty in the EU energy security strategy, but during this time of digitalization and virtualization of main energy systems, cyberattacks become a high concern.

### 1.3 Energy Dependence

The amount of energy consumed by a State is highly relevant in terms of Energy Security. Although it is possible to calculate yearly the national consumption, forecasts are incredibly tricky sometimes due to the price fluctuation and the unpredictability of the International System. For the purposes of this research it is essential to determine the evolution of world consumption curve in order to study the effects of a mutated dependence rate on States policies. The increase or decrease of fuel consumption deeply influences the international supply networks, but at the same time it affects also the nature itself of political and diplomatic relations between energy importer countries and energy producers.

Before proceeding to the macroeconomic calculation of national dependency rate and its consequences for the International System, it is possible to forecast (and later verify) world's curve of energy demand recurring to some paradoxes common to the environmental economics.

#### 1.3.1 The Rebound Effect and the Jevons Paradox

The "Jevons paradox"[11], called also in literature "Jevons effect", occurs when technological progress increases the efficiency of a resource but at the same time leads also to the rise of its rate of consumption due to the increase of the demand – this paradox is perhaps the most widely known paradox in environmental economics.

This assumptions underlines that neither technological progress nor increased efficiency will lead ultimately to the reduction of the use and demand of energy in the industrial field; nevertheless, many governments and environmentalists generally still assume that efficiency gains will surely lower resource consumption, ignoring the possibility of the paradox arising. This controversial issue has been re-examined by modern economists studying consumption rebound effects from improved energy efficiency. In addition to reducing the amount needed for a given use, improved energy efficiency also lowers the relative cost of production using less energy sources causing the following rise of the quantity produced and therefore accelerating the economic growth and further increasing the demand for resources. This way, the increased demand predominates, leading to a further use of energy in production, industry and private lives. The efficiency savings are cancelled: reinvested and then surpassed. This vicious circle seems to be endless.

The *Rebound Effect* (RE), or take-back effect, indeed, is a macroeconomic effect that consist in the reduction of expected gains from the employment of

[11] "Jevons Paradox": formulated in 1865 by the British economist William Stanley Jevons after a research on technological improvements in the coal industry. Jevons noticed that even if the coal-use efficiency increased, the consumption of coal was still rising and he argued that contrary to the common intuition, technological progress will not lead to a reduction of fuel consumption.

new technologies that increase the efficiency of resource's use due to behavioral or other systemic responses, which tend to offset the beneficial effects of these techniques. The take-back effect is expressed mathematically as a ratio of the lost benefit compared to the expected environmental benefit, holding constant the level of consumption; for example, if a 5% improvement in vehicle fuel efficiency leads to only a 2% drop in fuel use, the RE is 60% since (5-2)/5 = 60%). The 'missing' 3% might have been consumed by driving more or faster than before (Gillingham *et al.* 2014). The existence of this effect is uncontroversial as well as its consequences in terms of energy consumptions and security. However, among the economists and analytics, there is no consensus on the Rebound Effect's magnitude or impact in real life. It is possible to identify five different levels of RE[12]:

1. *Super conservation* (RE < 0): the actual resource savings are higher than expected savings – the rebound effect is negative. This occurs if the increase in efficiency actually reduces costs.
2. *Zero rebound* (RE = 0): the actual resource savings are equal to expected savings – the rebound effect is zero.
3. *Partial rebound* (0 < RE < 1): the actual resource savings are less than expected savings – the rebound effect is between 0% and 100%; known also as 'take-back', it is the most common result of empirical studies on individual markets.
4. *Full rebound* (RE = 1): the actual resource savings are equal to the increase in usage – the rebound effect is 100%. This particular effect can be distinguished into three different economic reactions to technological changes[13]:
   - 4.1 *Direct rebound effect*: increase in consumption of a good is caused by the lower use-cost of use (substitution effect).
   - 4.2 *Indirect rebound effect*: lower service-cost increases household consumption of other goods and services (income effect: for example, savings from a more efficient cooling system may be put into another luxury good).
   - 4.2 *Economy wide effect*: fall in service-cost reduces the price of other goods, creates new production possibilities and increases economic growth[14].
5. *Back-fire* (RE > 1): the actual resource savings are negative because usage increased beyond potential savings – the rebound effect is higher than 100%. This last case, in which the use increases beyond the savings, is indeed the Jevons Paradox supported by many energy experts.

[12] UK Energy Research Center 2007.

[13] Rebound effects: <https://www.umweltbundesmt.de> (2018-10-11).

[14] It is possible to observe all the three effects analyzing the case of improved vehicle fuel efficiency. The direct effect would be the increasing of fuel because driving becomes cheaper. The indirect effect would be the increase of consumption of other goods enabled by household cost savings, and since this consumption will rise also the fuel consumption will as it is needed in the production of goods. The economy-wide effect would include the long-term effect of the increase in vehicle fuel efficiency on production and consumption possibilities throughout the economy, including any effects on economic growth rates. See: Stapleton *et al.* 2016.

Most recent researches have demonstrated that direct rebound effects are significant (about 30% for energy), but there isn't enough data about indirect effects (whether or how often back-fire occurs).

In 1992, the economist Harry Saunders coined the term "Khazzoom-Brookes postulate" in order to better describe the modern Jevons Paradox (energetic efficiency unexpectedly turns into the increase of energy consumption) using neo-classical growth models[15] and showing that the postulate is currently verified in a wide range of assumptions. According to the Khazzoom-Brookes postulate, the rise of energy consumption takes place through a) the possibility to use a higher amount of cheap energy (direct RE) and b) the increased economic growth, which pulls up the energy use (Saunders 1992). However, the Rebound Effect affects micro and macro levels differently: in individual markets the improvements of efficiency result in reduced energy consumption and economic profits, but at the macroeconomic level a cheaper production leads to growth, thus, to a rise of demand and use of energy throughout world economy. Considering this, Saunders stated that, overall, any technological progress that improves efficiency will absolutely tend to increase the amount of energy used in the economy (Rubin 2007).

> In the absence of efficiency gains, energy use will grow in lock step with economic growth (energy intensity will stay fixed) when energy prices are fixed. [...] Energy efficiency gains can increase energy consumption by two means: by making energy appear effectively cheaper than other inputs; and by increasing economic growth, which pulls up energy use. ... These results, while by no means proving the Khazzoom-Brookes postulate, call for prudent energy analysts and policy makers to pause a long moment before dismissing it (Saunders 1992, pag. 143-144).

The Khazoom-Brookers postulate provided a crucial theoretical grounding for further empirical studies playing an important role in framing the problem of the rebound effect and reinforcing the existing ideological division between energy economists on the extent of RE effect. It is possible to individuate two main beliefs:

- Technological improvements in energy efficiency enable economic growth that was otherwise impossible without the improvement; as such, energy efficiency improvements will usually back-fire in the long term.
- Technological improvements in energy efficiency may result in a small take-back. However, even in the long term, energy efficiency improvements usually result in large overall energy savings.

After years of active debate and specialized studies in the area, neither position has reached a consensus in the academic field. In general, economists sup-

[15] The mainstream economic theory of capital accumulation, technological progress and long-run economic growth.

port the first position and governments, businesses, and environmental groups adhere to the second, because they promote fuel efficiency as the main strategy to reduce energy consumption and greenhouse gas emissions in the scope of alleviating the impacts of climate change. However, despite political and environmental aims, the first position reflects more accurately the current economic reality: contemporary international efforts to invent fuel-efficient technologies might not substantially reduce the overall energy consumption, and might in fact paradoxically increase the use of fossil fuels and the following greenhouse gas emissions over the long run.

The debate about whether the Postulates are correct, and on their relevance and extend, is not extinguished yet. Most governments, environmentalists and NGOs pursue national and international policies aiming to improve efficiency, holding that this is the only way to lower resource consumption and reduce the existing environmental problems. Others, including many environmental economists and scholars, doubt this 'efficiency strategy' and worry that efficiency gains may in fact lead to higher production and consumption, leaving the sustainability just a pure and innocent illusion. In their opinion, higher efficiency is not enough: it should be paired with specific energy conservation policies in order to decrease the actual level of resources used. Back in the days, in his book *The Coal Question* (Jevons 1865), Jevons warned the society that ANY fuel efficiency improvement tends to increase future fuel use; although this is not purely a pessimistic prediction, as higher efficiency allows greater and cheaper production and consequently a better quality of life.

Undoubtedly, it is possible to state that overall the Khazzoom-Brookes postulate is correct, because today's improvement in energy efficiency are not followed by considerable decrease in the level of fossil fuels exploitation; however, they have led to a meaningful improvement of life standards and enlargement of the international economic system.

A further considerable debate is the one concerning the entity and size of the rebound effect in energy efficiency. Environmental economists have theorized that in order to avoid the Jevons paradox and therefore reach lower rates of energy consumption in the world, it is enough the emanation of strong conservation policies keeping fixed (or higher) costs of energy-use, such as cap and trade regulations, green taxes or higher CO2 emissions standards. These governmental interventions may indeed control the size of the rebound effect, but they do not display the paradox, which applies only to technological improvements. The reduction of energy demand is merely a political goal to be achieved through sustainable energy policies.

As it may seem a pessimistic and unalterable condition, the Jevons paradox is an admonishment for us. The world we are living in is non-stop evolving, we want more and we want it to be better; the rates of consumed energy are higher and higher and we should do something about it because it does not regard only the environment, but it is indeed also a political, economic and social concern. The European Union, exemption made for some states, is not self-sufficient and its energy dependence from other counties influences heavily EU policies and

diplomacy. This need undoubtedly creates a bond, which might partially obstruct fair and unbiased diplomatic relations.

### 1.4 Energy Dependence Calculation

According to the definition provided by Eurostat: "Energy dependency shows the extent to which an economy relies upon imports in order to meet its energy needs"[16]. The main indicator of dependency is calculated dividing net national imports by the sum of gross inland energy consumption plus potential energy stocks. The European Union, for example, for its own sustenance, imports energy from third counties: in 2006, the main type of energy imported was petroleum products (which include crude oil as the main component), accounting for almost two thirds of total energy imports into the EU, followed by gas (24%) and solid fuels (9%)[17]. Of course, the European Union is a melting pot of different units (figure n.4), with different national energy needs and production; however, even if member States show different patterns of energy imports, overall the Union presents a high energy dependence rate.

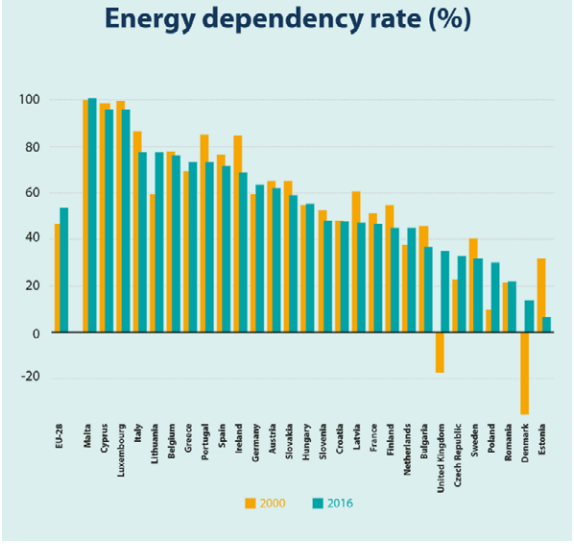


Figure 4. EU Member State's energy dependency rate (%). Source: Eurostat.

Energy dependency, however, is a multifaceted concept and can be measured resorting to several other indexes extrapolated from different economic spheres. For this purpose, it is possible to adopt an "umbrella concept" (Bhattacharyya

[16] Eurostat website: <https://ec.europa.eu/eurostat/web/products-datasets/-/T2020_RD320> (2018-10-31).

[17] See above.

2011, 466) that focuses on three main indicators, which can give a more comprehensive idea of the general level of energy dependence of a certain State:

1. *Import dependence to primary energy supply according to type and origin.* This is the basic dependency indicator used by Eurostat and IEA, ranging from 0 to 100 it shows the percentage level of dependency of a State. It is possible to individuate two example-cases: if the rate is negative, it means that the country is an energy exporter (produce more than national consumption, like Denmark), and if it is higher than 100%, it means that the country keeps national energy stocks (like Malta, which imports more than national consumption). However, if the import dependence rate is high and positive, Countries are more politically bounded to third State's policies.
2. *Market concentration.* This kind of indicator is mostly used in industrial organizations; The Herfindahl-Hirschman Index ($HHI = \sum x_i^2$) is a sum of shares computed for each country ($i$), and it ranges from 0 to 10.000. The HHI represents the number and dimension of the market players, without any references to domestic production and political risks. It can be easily translated into the energy field.
3. *Level of diversity.* The level of diversity is usually determined by variety (number of different types of energy suppliers), balance (size of imports) and disparity (qualitative differences). The most pertinent indicator of diversity is the Shannon – Weiner diversity Index ($SW = - \sum_i x_i \, log$); when SW is equal to 0 we assist to a total import dependence. The index does not have a maximum limit but, in average, if it is around two the dependence is not excessive[18].

The dependency rate of a State or Political Union seems not too difficult to calculate, however, the process behind it is far from being simple. The lack of specific energy related economic doctrines and the adoption of a wide-ranging definition of security of supply, made difficult to the scholars to develop proper analytical approaches in order to guide the actions of policy-makers. Fortunately, analytics could draw inspiration and references from economic and finance theories.

Finance theory, generally, shows that "expected generating cost streams are meaningfully valued only in terms of their market risk" (Bazilian, Roques 2008, XIX). In Energy terms, indeed, fossil fuel prices have fluctuated considerably over the last decades: if expressed through the Capital Asset Pricing Model (CAPM)[19], this price instability make the fossil fuel generation industry mean-

[18] The *Shannon – Weiner – Neumann Indexes* represent two further variation of the original SW Index, which include also indicators of Stability and Quality of exporter counties. The World Bank Indicators and Human Development Index measure the geopolitical risks, computed in it. See: Bhattacharyya 2011, 466.

[19] In finance, the CAPM model is used to determine theoretically the rate of return of an asset, in order to make decisions about the diversification of portfolios: it takes into account the sensitivity of systematic (or market) risk, as well as the expected return. The model itself was built on Harry Markowitz's work on diversification and modern portfolio theory, by

ingfully more, mostly than standard estimation, which ignore the impact of risk. However, even CAMP risk-adjusted estimations are not perfect; they do not include the World's urge of energy and the forthcoming gains. Energy demand, at least in short terms, is inelastic: following an increase in prices, the demand will not change in short term due to the necessity of energy products in daily life. Energy price elasticities are usually higher in the long term, and diverge largely by fuel and region: indeed, they are predominantly low for transport fuels, as only few surrogates are yet available for oil-based fuel cars and trucks. In a recent survey, the International Energy Agency (IEA) assessed that the ordinary crude oil price elasticity of total oil demand (across all regions is): 0,03 in the short term and 0,15 in the long term (IEA, 2006). In the same way, the demand for electricity is inflexible high priced, with estimated range from -0,01 to -0,014 in the long term and even less in the short one.

The main concerns of modern economies are the macroeconomic effects caused by the reduction of national energy mixes and the rising dependence from natural gas and petroleum products. After the liberalization of electricity markets, indeed, National economies faced an even greater dependence from energy imports, vital for the economic development and human sustainment. The central question is whether (and to which extent) the increasing reliance on gas and oil importing countries will affect the economic sensitivity of importing countries due to the current level and volatility of oil and gas prices.

For importing countries, the immediate extent of the direct effect[20] on national income caused by the rise of oil prices can be expressed as "the ratio of oil imports to gross domestic products (GDP)" (IEA 2006). This definition is essentially a function of the total amount of oil consumed for the level of domestic income (oil intensity) and the rate of dependence on oil import of the State (import dependency)[21]. Of course, the magnitude of the direct effect depends also on the response of gas prices to oil price growth; the impact of a determinate change in oil and gas costs on national economy is, indeed, proportionally related to the shift extent in world trade. During the past, we have witnessed various different trends among different countries and regions: since the '80s Europe and the Pacific Region, for example, decrease their overall oil imports, meanwhile in some developing countries (like China and India) the import in-

Jack Treynor, William F. Sharpe, John Lintner and Jan Mossin. See: *Borsa Italiana,* "CAPM. *Capital Asset Pricing Model*".

[20] An increase of Energy Prices, through the direct effect immediately strikes Consumer Prices. If we consider also the indirect effect, then price fluctuation first affects Producer Prices and subsequently the final ones. These two effects are known as the *First Round Effects* due to their immediate timing. The *Second Round Effects* follow the reaction of political agencies and consumers, which have time to change their behavior after the price increase/decrease of goods causing inflation expectations or wages profits. (The reaction of consumers and agencies are influenced by the current phase of the Economic Cycle).

[21] Oil import intensity (net oil imports/GDP) = Import dependency (Net oil imports/total oil use) x oil intensity [(total oil use/ total energy use) x (total energy use/ GDP)].

tensity has risen steeply. On a more concrete economic level, Awerbuch and Sauter[22] have noticed that a wide number of academic surveys suggests that energy (especially oil) price growth and instability, inhibit national macroeconomic growth provoking high inflation and unemployment rates diminishing also the financial value of strategic assets in oil-consuming nations. Since the end of 1940, Awerbuch and Sauter have accurately studied this statistical "Oil-GDP relationship", concluding that, overall, the final impact of oil price fluctuation on national economies severely depends upon the country study-case. The differences are mainly due to individual economic history, national policies and strength of the industrial sector and, of course, the national ability to overcome economic crisis. However, the International Energy Agency, decomposing the quantitative "Oil-GDP relationship", has outlined five main effects that occur generally (in different extent though) in National economies in each study-case (Bazilian, Roques 2008, XXIX):

1. *Terms of trade effect*: the change in purchasing power between oil importing and exporting countries represents the first and major effect of oil price shifts on international economic activities.
2. *Effect on domestic prices and inflation*: whether the rise of prices translates into an alteration of inflation rates depends on the 'second round' effects: the monetary policy regime in force determines if the average workers (or the enterprises) are able to compensate the profit loss recurring to alteration of wages and sale prices.
3. *Domestic demand effect*: since natural gas and crude oil are the main input in heating and producing systems, both final consumers/households and producers would bear enormous losses in case of price rise at least in short-time. In case of price decrease, instead, the demand of goods will increase due to more accessible prices and, in turn, also the average national energy demand.
4. *Supply-side implications: impact on output and employment:* the relative supply responses of labour and capital define the extension of the impact on produced output and employment.
5. *Longer-term outcomes*: the damaging impact on domestic economy (in terms of GDP) of oil price growth will decrease in long-term as both, consumers and producers, are going to adjust their behavior. However, economic research in the field points out the presence of an asymmetric effect to the extent that oil demand does not revert to its original level as prices fall. In this case, the income losses tolerated by oil importers may (eventually) be partly reversed. Without doubt, fluctuations in oil prices create uncertainty in the market reducing economic investments, but the asymmetric extent of these consequences' effects on profitability or capacity utilization is not totally clear.

Although the mechanism, which explains how oil prices fluctuations affect national economic performances, is commonly well known, the specific dynam-

[22] Bazilian, Roques 2008, XXVIII.

ics and magnitude of these effects result undefined – particularly the trade adjustment. Quantitative estimations of macroeconomic damages caused to national oil-importing economies by the severe oil price growth of 1973-74, 1979-80 and 1990-92 diverge substantially. This discord is partly caused by the differences in the analytical models adopted by the economists due to the difficulty in capturing with the same model all the aspects of these interacting effects. Even if the results vary greatly, the IEA (IEA, 2006) has estimated that the impact of a constant increase of 10$ per oil barrel would provoke an average decrease of real GDP by: about -0,30% in the OECD Countries, and by about -0,50% in non-OECD States. These tangible (and politically frightening) GDP effects induce policymakers to act in advance trying to avoid them introducing policies reducing fuel import dependency and preventively increasing national fuel mix diversity, and launching energy efficiency and flexibility regimes. For authorities a severe GDP decrease is more alarming than any consequences in terms of consumer price rise or environmental concerns, not to mention the diplomatic dependence on third State's political choices. Energy dependence seems to matters only in economic terms, and only where associated with an austere welfare fall.

Energy dependence is a fact, a situation that exists and it is common to the great part of the International community. One way to shrink the rate of dependence of a State is by diversifying national energy mix, and even if it is fairly hard to compute all the advantages, policy makers urge normative background in order to promote and support this choice. From this compelling necessity, analytical tools aimed to quantify the cost and benefits of increased fuel mix diversity began to develop.

Stirling, Professor of Science & Technology Policy at the Sussex Business School, has pioneered the research in the application of fuel mix diversity to the energy sector. He studied the electricity sector (at the time more needy of energy inputs) concluding that *uncertainty* and *ignorance*, rather than *risk*, move the economic investments in the energy field, theorizing *diversification* as the most effective response to stubborn lack of knowledge (Stirling 1998, 14). In his analytical research, Stirling demonstrates that diversity can be accounted from different perspectives:

- *Variety:* number of available options, partners, categories, species.
- *Balance:* spread among options, interpreted as the weighted weight of each component.
- *Disparity:* nature and degree to which the options differs from each other.

Variety, balance and disparity taken individually are not sufficient conditions for diversity; together however, they represent necessary aspects of energy diversity. The inclusion of the disparity in the definition of diversity, although, remains thorny due to its original qualitative nature but, it is a necessary stretch (Stirling 1998, 14).

Hill, on the other side, gave a pivotal contribution to mathematical ecology directly addressing the trade-off between variety and balance in diversity measurement. Starting from the definition and classification of diversity as "proportional abundance" (Bazilian, Roques 2008, XXXI), he identified a whole family of potential quantitative diversity indicators. Each of them derives and is subordinate to a common equation:

$$\Delta a = \left( \sum_{i=1}^{I} (p_i^a) \right)^{\frac{1}{(1-a)}}, a \neq 1$$

$$\Delta a = \sum_{i=1}^{I} -p_i ln(p_i), a \neq 1$$

Where:
$\boldsymbol{\Delta_a}$ specifies a certain index of diversity;
$\boldsymbol{p_i}$ symbolizes (in economic terms) the proportion of an option *i* in the portfolio under analysis;
$\boldsymbol{a}$ is a parameter which effectively rules the relative weighting of variety and balance. The greater is the value of the parameter, the smaller is going to be the index relative to the sensitivity of the presence of other lower options.

Analyzing two main cases, where the parameter equals 2 and 1, it is possible to go back to two familiar indexes that we discussed under the "umbrella concept" and energy dependence *(Bazilian, Roques 2008, XXXI)*:

- For $a = 2$
  In ecology, the reciprocal of the function is known as the *Simpron diversity index,* but in the economic field there is the famous *Herfindahl-Hirschman Concentration Index*. Assuming that $p_i$ represents the market share of the $i^{th}$ firm (or the proportion of a particular energy source), it is possible to calculate the HH concentration index through this equation: $2 \sum_{i=1}^{I} p_i^2$. This index takes into account both the relative size and the distribution of each source: it increases in the case the number of firms diminishes or their size increases. The maximum value of HHI is 10.000 in case of monopoly, and it is equal to 0 in a perfect competitive market.
- For $a = 1$,
  In this case, when the parameter is 1, the result is the *Shannon-Weiner diversity index, SW* = $\sum_i x_i \, log x_i$: the simplest and used index, which reflects evenly variety and balance. The higher value assumes the index, the more diversified is the system analyzed.

The results of Hill's equation exemplify the inseparable bond between finance, economy and politics; Energy Security Policies are indeed solidly based on macroeconomics and finical analysis.

A big debate, however, still surrounds the link between energy dependency and security of supply, especially on the extent and existence of dependency effects on national security of a State. The threats to national energy security are more multifaceted and wide-ranging than those portrayed in one crude mathematics equation: there are bigger concerns involved than just import dependence. For example, a counter argument is that in modern economies, a strong relationship of co-dependence between importers and exporters has been creat-

ed, which transcends the dependence threat: the nature of international markets, where everybody depends on somebody neutralizing the dependency-related fear of energy importer States.

### 1.4.1 The importance of greater fuel mixes in electric systems

The core principle of diversity is indeed straightforward: not putting all eggs in one basket, and it applies to a wide range of different scenarios, from economy to political and social sciences. The application that we are interested in, in the energy security, is the one concerning national choices of energy and fuel mix. Undoubtedly, greater energy mix diversity boosts economy, especially national electricity systems safeguarding them from fossil fuel supply shocks and economic threats; however, it is always important to not forget, that a diverse electricity system is not a necessary (nor sufficient) condition of security supply (Bazilian, Roques 2008, XXIII). The concept of energy fuel-mix diversity, analyzed in the previous chapter, is indeed perfectly suitable for a more specific study of the electricity field. Currently worldwide, the ground of every State is covered by grids, which provide electricity to each household present on national area (referring to developed countries). The flaws of high rates of energy dependence will directly afflict the individuals, making this problem more relatable.

According to Bazilian and Roques (2008, XXIII), superior national fuel import dependency leads to different (potential) economic and security concerns in the long and short term[23]. For example, in a case of unexpected, partial or total, gas supply disruption the economies of importing countries will suffer in different ways according to the length and extent of the interruption. On the other hand, in this sector, benefits of larger fuel mix are complicated to achieve; most electricity infrastructures indeed, are long-lived and cannot be easily and quickly modernized adapting them to other energy inputs. In short-term, electricity power stations are bounded to the selected energy sources for the generation processes, in the long-run, though, the authorities can anticipate future disruptions changing the structure of the facilities. The other option is to open new power stations conceived expressly for a certain type of energy input, or rather multi energy-input generation systems, which are indeed, more shielded by short-term supply disruptions due to their innate ability to switch fuels.

Enhanced fuel mix diversity is considered a "manna from heaven" against delicate situations in which one or more types of fuel can become unexpectedly hard to get, particularly when not only the exporting country but also the transit ones are subjected to dangerous situations. Nevertheless, energy diversity is a multifaceted issue: State's primary (in terms of imported quantities) fuel matter, as well as the geographical source and the choice of import strategy: by sea, by land or through

[23] For a further analysis of supply security look at paragraph 1.4.1.

pipelines or ships[24]. All these aspects affect severely the balance between fuel mix diversity and energy security – more precisely the security of supply.

Diversity relief's, to a certain level, the risks related to energy technologies or sources, however (ad I am going to repeat myself) it does not represent a *necessary* feature of a secure system. In this regard, noteworthy is the French case: the French electric supply system is entirely based on a single source: the nuclear power. Despite the focus on just one type of energy input and one single technology, the system works perfectly. The fact that the nuclear energy is directly produced by the State and do not suffer from shortages (at least in a long time) plays a central role in ensuring a high level of security to national electricity production.

The concrete possibilities of a State to produce energy without relying entirely or mostly on third states, the size of national demand, policy priority and the current (if present) dependency rate determine the Energetic Security Strategy.

### 1.5 Energetic Security Strategy

> "We need a national commitment to energy security, and to emphasize that commitment we should install a Director of Energy Security to oversee all of our efforts"[25].

Energy fulfils an essential role in our society supporting several different areas of economic and human activity. The impact of supply or price instabilities can be, therefore, substantial and wide-ranging especially from the economic point of view; this produces incentives for policy-makers in ensuring the availability of safe, reliable and competitively priced, energy sources. Consequently, the guarantee of a steady supply represents a key principle of energy policies and it is usually coupled with two other pillars: environmental considerations and competitiveness. Security of supply is, however, a multifaceted notion and has not an agreed definition: due to the wide amount of related concerns encompassed by this concept and the absence of a single analytical framework, security of supply has a tendency to be an overused, and basically misinterpreted, term. National energy security policies usually contain measures aiming to reduce the risk of supply disruptions below a certain bearable level, ensuring also affordable energy supply always available to meet national demand. Security of energy supply thus incorporates both problems of quantity and price. Howev-

[24] On the global energy market, it is very easy to buy coal and ship it everywhere; gas reserves and extraction processes, on the other hand, these are concentrated in specific areas through the globe and can be imported only by pipelines (the European Union for example imports mainly from Russia and North Africa). In order to decrease the vulnerability of transit routes, due to political crisis and terrorist attacks in the area, the Liquefied Natural Gas (LNG) option is spreading: omitting the debate on safety and cost of this new system of transport, undoubtedly, the LNG market may significantly contribute to differentiating the transit supply risk.

[25] US Senator Barack Obama, 2006.

er, *time* represents also a key factor (Bazilian, Roques 2008, 3-29): in case of an unexpected price hike, society and economy will suffer from different effects compared to those of a persistent and long-term price rise.

Insecurity of energy supply arises from several distinct risks related to: the overall scarcity, uneven geographical distribution of primary energy sources and to the technical reliability of energy systems from specific types of fuel or energy, responsible of delivering services to final users.

Energy Security as a policy problem has emerged in military field, connected with oil supply for armies at the beginning of the XX century; however, academic debates on energy security were forerunners of any political application. With the oil crises of the 1970s and '90s the academic and political interest in energy security (in terms of stable supply) has re-emerged due to the seriousness of the crises. At the same time, another peak in the debate has risen over 2000s rising energy demand that challenged world production: when the de-carbonization of main economies leads to bigger requests of fossil fuels. It is natural, though, that only during critical times, concerns about security are more pressing; nevertheless, a significant difference separates contemporary from 'classic' energy studies (Cherp 2012).

At the end of the XX century, energy security meant for policy-makers, basically, a stable supply of low-priced oil, which was currently under embargoes and price manipulation. On the contrary, the contemporary challenge facing authorities spreads beyond stable supply encompassing a wide range of new issues. Furthermore, today, energy security is strictly linked to other national policies concerns such as the delivery of equal access to energy and mitigation of climate change; it follows an accurate re-examination of the classical energy studies.

The *Energy Policy Journal* is the forefront of the evolution of energy security concept because of its activism and dedication; in the last five years, many of its publication cited the "Four As of Energy Security: availability, accessibility, affordability and acceptability" (Cherp, Jewell 2014), concept coined by Asian Researchers. These four As are new to the energy security approach[26], but they are highly important, especially for policy makers. Indeed, in the definition and determination of supply security the As provide a concise scheme to follow, as well as for the redaction of National Energy Security Strategy (mainly for energy importer countries).

Energy security, indeed, has different meanings and connotations according to different situations and subjects. This happens because all energy systems vary in time and space, comporting diverse concerns, and because National policy makers stretch the concept, including in it other energy related issues. One of these correlated topics is the Security Supply – fundamental for States that are forced to import energy from third parties in order to ensure national consumption.

[26] Jewell is the one who noticed that the four As energy concept is very similar to the "5As" of health care access: availability, accessibility, accommodation, affordability and acceptability. See: Cherp, Jewell 2014.

### 1.5.1 Supply Security

In the energy security context, as mentioned before, the security of energy supplies represents a subject of utmost importance. Energy security connects national security with the availability of natural resources for domestic consumption of energy; the access to affordable supply is basic for the functioning of modern economies and societies. The uneven distribution of oil and gas fields, as well as coal veins, through the Earth entails significant problems for those territories that were not situated on one of those fields.

Therefore, Security of supply represents a central topic for many national energy policies worldwide. The three pillars of the European Union's Energy policy are indeed: efficiency, sustainability and security of energy supplies[27]. Even if supply security embodies one of the main targets of energy policies, the undefined "Energy Security" term makes hard security measurements and the balance in contrast with other policy objectives. We have previously reviewed a multitude of definitions of energy security and they all can be categorized according to the weight attributed to: risks sources, impacts scope and severity of several filters such as speed, size, sustenance, spread, singularity and sureness of impacts. Summing up these features, it is possible to deduce that energy security is in fact the continuity of energy supplies meeting national demand.

Despite the uncertainty still surrounding the notion of energy security, there is a consensus on the fact that it deals with risks. Some authors and academics have mentioned this explicitly, while other gave the same perception in a more implicit way through their researches and publications. The Oxford English Dictionary also endorses this perspective; it defines, indeed, security as "the condition of being protected from or not exposed to danger"[28]. In a more particular situation of energy security, the threats are related, i.e. caused by having an impact on the supply chain. The common ground on which academics agree is that energy IN-security can be explained as "the absence of protection from or adaptability to threats that are caused by or have an impact on the energy supply chain" (Winzer 2011, 9).

It results straight away, obvious that several and diverse threats might be encompassed in this definition. Energy studies, for this reason, limit usually the analyses to a predetermined subdivision of possible threat lists. This sort of 'limitation' represents one of the main sources of conceptual disagreements on the subject between the academics. However, it is possible to extrapolate

[27] Commenting the Green Paper "For a European Union Energy Policy" (COM(94)659/final/2) adopted in Brussels, on 23 February 1995, the commissioner Papoutsis stated: "A sound and sustainable energy policy is critical for our future economic development. [...] We need to secure our energy supplies, both through diversification and better international cooperation". Full comment available on European Commission Press Release Database: <http://europa.eu/rapid/press-release_IP-95-1418_en.htm> (2018-10-11).

[28] Oxford English Dictionary <https://www.oed.com> (2018-10-24).

the main eight dimensions on which the concept of energy security spreads (Winzer 2011, 9):

1. **Sources of risk.** This category labels which type of risks are considered by the study; among them, it is possible to distinguish three general categories:
   a. *Technical risk sources*: given by the failure of infrastructural components (such as transmission lines, power plants or transformers), mechanical or thermal problems, or due to the collapse of interdependent infrastructures such as communication networks.
   b. *Human risk sources*: events like demand instability, intentional withholding of supplies, capacity investment, sabotage, political instability and geopolitical risks (such wars), export embargo and terrorism, are accountable on human factor.
   c. *Natural risk sources*: uncontrollable events such as natural disasters, total depletion of fossil fuel reserves and renewable energy's stochastic intermissions.
2. **Scope of the impact measure.** The scope of the impact measure describes in which way energy security is measured; it is possible to distinguish four broad categories (Winzer 2011, 10):
   a. The *continuity of e commodity supplies* affected by the majority of risks that affect the supply chain altering the availability or the price of energy commodities such as oil, gas, coal or electricity.
   b. The *continuity of service supplies* is affected by changes in the availability or prices of energy services such as heating, lighting, communication or transport, based on the resilience of consumers devices to input disruptions.
   c. The *economic continuity* of a country, affected by the changes in the availability and price of energy services, depends mainly on the dis-utility of service disruptions and its consequences throughout the economy sector.
   d. *Human safety and environmental sustainability* are highly influenced by provisions and consumption of energy commodities, besides manipulating national economies. (For example, in the form nuclear proliferation and water pollution).
3. **Speed of threat impacts.** This category refers to the time-scale on which the impacts of risk materialize; it is possible to distinguish three different levels of speed (Winzer 2011, 10):
   a. *Constant scarcity:* can be seen in renewable energy potential of a country.
   b. *Slow stressed:* as the gradual depletion of fossil fuels, accumulation of greenhouse gasses or growing demand (also long-term impact).
   c. *Fast shocks:* mainly political disruptions, technical failures or intermittence (also short-term impact).
4. **Size of threat impacts.** The Size of threats defines the magnitude of changes in shortages within a region; it is possible to distinguish three different stages (Winzer 2011, 10):
   a. *Impending changes:* threats like reduced reserve margins, which indicate an increased probability of negative future shocks without, although, having themselves a direct repercussion on final consumers.

   b. *Small changes*: such as price instability or marginal rises of global temperature, which do have a direct impact on consumers but without changing the current system.
   c. *Phase changes*: supply interferences or global warming higher than 2°C lead to changes in the system, because they deeply affect consumers.
5. **Sustain of threat impacts.** Known also as the extent of persistence of threats' impacts on the system; it is possible to distinguish three levels:
   a. *Transitory impact*: small interruptions and short-term price volatility
   b. *Sustained impact:* slower speed threats, or sudden ones that exceed a certain size lasting for a significant amount of time.
   c. *Permanent impact:* for example, the depletion of fossil fuels, which make impossible for the system returning to *status quo*.
6. **Spread of threat impacts.** The spread of threat impacts defines the dimension of the largest geographical simultaneously affected; it is possible to distinguish three levels (Winzer 2011, 12):
   a. *Local level:* threats like technical component failures that ranges from individual households to whole regions (always within a certain country).
   b. *National level:* disruptions of exports due to political risks, which affect an import country as a whole.
   c. *Global level:* environmental threats such as climate change or solar storms, which affect more countries simultaneously (also named International Level).

The spread of threat impacts is defined not only by the typical characteristic of the calamity, but also by the geographical dimension of the political units (for example, the sea-level rise represents a national threat for Bangladesh but just a local one for bigger nations like India). The determination of the right administrative level is extremely important for an efficient coordination of security provisions.

7. **Singularity of threat impacts.** This category includes the frequency of recurrence; it is possible to distinguish three general levels:
   a. *Unique threats:* non experienced before, like fuel depletion, anthropogenic climate change and nuclear wars.
   b. *Infrequent threats:* happened before but not frequently, such as political disruptions or natural catastrophes.
   c. *Frequent threats:* alterations of wind-speeds or many types of technical faults.
8. **Sureness of threats.** The concept of sureness defines the level of threat; it is possible to distinguish three broad levels:
   a. *Predicted threats*: as in the case of fuel depletion, where it is possible to forecast the exhaustion-time working on economic assumptions and extraction rates.
   b. *Probabilistic threats*: such as resource intermittence or technical failures, because even if the exact time of occurrence remains unknown the probability of the event can be calculated reasonably precise based on expe-

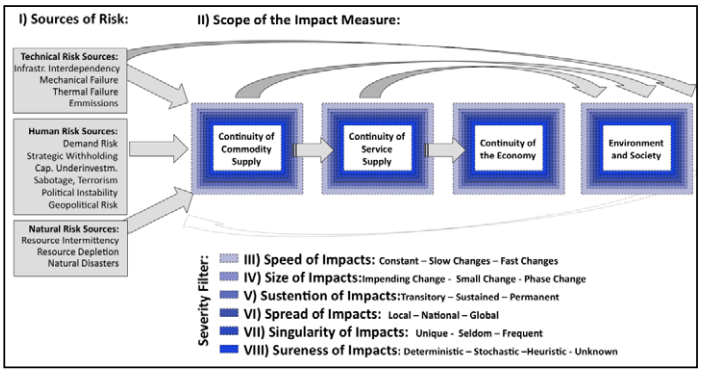


Figure 5. Eight Dimension of Energy Security. Source: EPRG Working Paper n.1123.

rience. However, some threats might be expected by policy-makers but are very hard to forecast mathematically (*heuristic* expectations, as in the case of political disruptions or terrorist attacks).

c. *Unknown threats:* exemplar is the case of global warming, not considered as a potential jeopardy (and discovered neither) until its consequences started to be felt.

The dimensions number 1 and 2 (accordingly source of risk and scope of the impact measure) define the restrictions of the chosen observatory system; the remaining six, instead, gather together the severity filters, used to determine which threats are more relevant for the analysis. Although the list of criteria is far from being exhaustive, the harshness of a threat increases undoubtedly when the speed, size, sustention and the spread growth (and also when the levels of singularity and sureness decrease).

The assignment of different policy priorities according to different dimensions considered by policy-makers translates into National Energy Security concepts and strategies – unique in their kind. The scheme in the Figure N.4 offers indeed a more graphic and concise overview of the concerned eight dimensions.

It follows a brief illustration of two Energy Security Strategy, of the European Union (energy importer) and of Russian Federation (energy producer), in order to grasp the main differences in the redaction of these two policies bearing in mind the eight dimensions of supply security and the main definition of energy security.

### 1.5.2 European Energy Security Strategy

The European Union Global Strategy sets the core interests and principles of the Union to be engaged worldwide. It represents a direction for all Member States and a common ambition to make Europe stronger, more united and in-

fluent, keeping safe European citizens, preserving their interests and values. In this picture, the EU must face upcoming challenges (European Union, EEAS 2017), first of them being more effective in confronting energy security issues, as well as international migration, climate chance, extremisms and hybrid warfare. These challenges must be tackled together, gradually.

Focusing primarily on the energetic issue, the adoption *White Paper* "The Future of Europe – Reflections and scenarios for the EU27 by 2025"[29] represents the outcome of a very long discussions and assiduous consultations among Member States[30]. In the first part, the Paper sets out an energy framework that is going to be the base for further Community and national policies, the second part, instead, includes a rich program of Commission's activities for the years ahead, accounting the juridical limits and budgetary restrictions of the European Community.

According to these guidelines, pursuing energy strategic goals the Union must recognize that the levels of energy dependence are going to increase in the following years and act promptly respecting at the same time Member's national energy choices. High flexibility is mandatory in outlining, and then implementing, energy policy since the energy context is always changing. Considering these restrictions and obligations, the approach of the White Paper focuses on four cornerstones (European Commission 2017):

1. *Market integration*, central factor of the Community's energy policy because its absence definitely would shift main activities to national level.
2. *Competitiveness and environmental protection* for a balanced approach focused on both cost achievement and environmental challenges.
3. *External dimension* of the community, important because main energy supplies arrive from extra EU States (furthermore the economic growth of Asian and other developing counties will increase significantly on world energy demand and for this reason it is important to supervise the external situation).
4. *Security of supply*, constant concern of European countries, must be integrated in a common approach on Union level.

Summing up the text of the White Paper, it is possible to extrapolate the main guidelines (in respect of the four fundamental principles above) for Energy Policy Implementation:

[29] European Commission 2017.

[30] The White Papers adopted by the European Commission, indeed, contain the main proposals and guidelines for the EU and Member State action in a determined area of interest; usually the drafting relies on previously published EU Green Papers, which give support and structure to them. The main aim of these papers is to aviate a strong debate in the community involving the public spheres, stakeholders, EU Parliament and the Council in order to reach a consensus. Due to the relevance of the White Papers the drafting and adoption processes are commonly characterized by deep consultations and debate between Member States and EU organs, <https://www.eur-lex.europa.eu>.

1. Integration of the Market.
2. Managing External Dependency.
3. Sustainable Development.
4. Technology Energy.
5. Work Program.

The second point confirms that energy dependence embodies a massive concern for the European Union, as well as for all the States that relies on external energy import.

### 1.5.3 Russian Energy Security Strategy

Before the Russian Federation, the economy of the Union of Soviet Socialist Republics (USSR) was based on a centralized state-owned system of production, which included collective farming, industrial manufacturing and centralized administrative planning of investments and assets. The Soviet Union heavily invested into infrastructure projects, the most massive ones were the electrification of never-ending Russian countryside and the construction of natural gas and oil pipelines; the pipeline network passed through all the Republics and required enormous maintenance work. All the investments made by the authorities in the Soviet era laid the foundations for the Russian Federation becoming an energy superpower.

The Russian government in 1992 approved the first National Energy Policy launching also a brand-new Inter-agency Commission with the aim to develop an Energy Strategy for the country. After only two years, the "Energy Strategy of Russia – Major Provisions" was approved by presidential decree[31]: the new policy outlined the main challenges than the newborn state had to face and solve until 2010. This strategy, in fact, was emended by Vladimir Putin at the beginning of his first mandate approving and updating the main provisions of the Energy Strategy up to 2020; then in 2010 the deadline was shifted to 2030 (Ministry of Energy of the Russian Federation 2009).

> The Objective of the energy policy of Russia is to maximize the effective use of natural energy resources and the potential of the energy sector to sustain economic growth, improve the quality of life of the population and promote strengthening of foreign economic positions of the country (ES of Russia. Ministry of Energy of the Russian Federation 2009).

The main objective of the Energy Strategy (ES) is indeed defined as an accomplishment of better efficiency enhancing the competitiveness of Russian

[31] On May 7 1995, President Boris Yeltsin signed the first post-Soviet Russian Energy Strategy. The main directives of the Strategy concerned the restructuring of the Fuel and Energy Industry up to 2010; after the fall of the USSR, indeed, new territorial and legal aspects appeared such as the repartition of pipeline's sections and extraction fields among the newborn States.

energy production and services in the world market. The ES defines also other secondary priorities such as reducing the ecological impact on environment, economic sustainable growth and energy and technologic development[32]. Since the Russian Federation is an energy producer, among the main objectives of ES there is no mention of any kind of energy supply security, although, there are some lines dedicated to the national energy mix in terms of enhanced efficiency.

In 2014, the Ministry of Energy of Russia has adopter the Energy Security Strategy for the period up to 2035 (ESR-2035); the draft proposal, elaborated by the Institute of Energy Strategy with the collaboration of the Energy Research Institute of Russian Federation, distinguishes two main areas of key challenges (Silantiev 2015):

- Internal Challenges to Russian Energy Security given by the increased dependency of national budget on energy profits and the urge for modernization in the domestic energy sector.
- External Challenges to Russian Energy Security characterized mainly by the increased competition in the energy market, sanctions and research for regional energy self- sufficiency.

The main aim of this new strategy is ensuring to the Russian Federation an innovative and efficient energy sector able to support the economic growth of the country improving at the same time both citizens' quality of life and the external political position of Russia (Silantiev 2015). According to the comment of the Prime Minister Medvedev the ESR-2035 will support and enhanced investments in the energy sector and the localization of the production of the most advanced technical equipment on the territory of the Federation, in order to decrease the dependence of Russian energy sector on foreign technologies (The Russian Government 2016).

This Energy Strategy of the Russian Federation is indeed very different from the ones adopted before. Due to the current economic uncertainty, the Strategy represents a strong response to the XXI century's energy challenges without forgetting the importance of ensuring to the Federation autonomy and control over its energy sources. The "Energy Strategy of the Russian Federation until 2035" (originally Энергетическая стратегия России на период до 2035 года) outlines several areas of national concern (Ministry of Energy of the Russian Federation 2014):

- *Energy Access priorities:* approaches to sustainable development.
- *Energy Efficiency priorities:* in the perspective of improved energy conservation and efficiency at municipal and federal levels (ESR-2035, Art.5.4).

[32] "The main strategic guidelines of the long-term State energy policy are as follows: energy security; energy efficiency of the economy; budget efficiency of energy sector; environmental safety of the energy sector. The main components of the State energy policy are as follows: subsoil use and management of the state subsoil fund; development of domestic energy markets; promotion of a rational energy balance; regional energy policy; innovative and scientific and technical policy in the energy sector; social policy in the energy sector; foreign energy policy", Ministry of Energy of the Russian Federation 2009, 24.

- *Renewable Energy priorities:* fundamentals for the development of green energy necessary for the transition towards a low-carbon system and sustainability.
- *Energy Environment priorities:* reduce CO2 emissions strengthening domestic regulatory policies.
- *Energy pricing stability:* face the instability of the international energy markets.
- *Energy supply and Infrastructure priorities:* guidelines for the innovative energy path and upgrading of the energy infrastructure (pipelines and transmission lines).
- *Energy trade priorities:* diversification and promotion of the cooperation with Asian partners, especially the LNG export represents a consolidated trend[33].
- *Technology priorities:* increase national production, modernization and investments in both clean and nuclear power.

The Strategy itself represents a balance between the western and the eastern energy routes: the EU still needs and relies on Russian primary energy, Moscow is indeed a reliable partner for Western economies but at the same time, the Russian Federation is investing substantially in Eastern markets[34]. Due to the European research for alternative pipeline routes bypassing Russian territory, the sanctions and the current international situation, the new energy strategy aims to meet the demand of Asian markets glancing also toward the Pacific and Latin America (Ligorio 2015, 193).

The ground for the European-Russian energy relations is still stable even if both the EU and the Russian Federation are looking around. A deeper analysis of the current EU-Russian relations and Russian energy production and export toward the European Union follows.

### 1.6 EU-Russia from Dependence to Interdependence

In the presence of mutual economic dependence, the parties involved are more interested in an enhanced cooperation. In the case of European-Russian relations, both players have indeed the resources and the motivation for a closer cooperation; increasing the economic trade signifies vital interest for both the EU and the Russian Federation. However, the dependence upon a political unit might not be totally mutual, but at a certain degree bigger for one counterpart.

In the case of asymmetrical energy dependence, referring to the EU-Russia energy relations, the Russian Federation (due the high rate of European Dependence) obtains the power to play the *'Energy weapon card'*; suppliers indeed can by choice deliberately restrict or totally terminate energy flows toward a certain

[33] The Article 1.2 indeed, underlines the existing opportunities for the export of the Russian primary energy. See: Ministry of Energy of the Russian Federation 2014.

[34] The Asian and Pacific regions represent indeed a possible alternative to the "Western Route", the growing energy demand is optimal for further Russian primary energy exports. See: Ligorio 2015.

State or political unit for political reasons or other causes. The European largest neighbor, although very rich in primary energy resources, is relatively poor in cash (Dempsey 2017). This could represent indeed a perfect dependence-match if we do not take into account the simple fact that oil and gas are territorially bounded, meanwhile money are not. Despite this logical element, it is noteworthy to stress out two main conditions that discredit the asymmetrical energy dependence and the energy-weapon threat:

1. It is undeniable that the European Union imports yearly huge amounts of primary energy from the Russian Federation[35], but unlike the past decades, the Union is currently engaged in dependence reducing policies. The adoption of the Energy Union, the research for different energy supplies through the promotion of alternative pipeline routes and the increasing concern upon energy security allows to Member States to feel a little more comfortable with their own energy mix and dependency rates.
2. In the International System, States behave in general as *rational actors* focused on profits maximization; hence, energy independent States (suppliers) in any case must assess gains and losses of a potential energy flow disruption. In this perspective, Mansson, Johansson and Nilsson have compared the revenue loss of an energy exporting country with costs bared by the importer in case of a flow interruption, computing therefore if in the event of energy supply disruption[36] the two States are economically interdependent, or if there is a dependency bond. The outcome of this *game theory model* if applied to the European Union and the Russian Federation demonstrates that, currently, the two parties are indeed interdependent (Mansson *et al.* 2014).

The "interdependence concept" represents indeed the most used paradigm in literature in defining the relationship between the EU and Russia. In economic terms, their interdependence is nothing more than a mutual dependence characterized by the balance between export revenues and shared benefits and gains from the relationship; linked to the power implications in political relations, since the exchange advantages are not equally distributed, one partner is intended to hold leverage influencing the decisions of the counterpart. Considering the outcomes of the energetic trade, it is possible to state that the EU and the Russian Federation are involved in a more asymmetrical relationship rather than of pure interdependence. The political analysis concerning the nature of

[35] According to the European Commission, at the moment, the EU imports 54% of the total consumed energy, energy imports accounts for more than 20% of total European imports. See: <https://ec.europa.eu/energy/en/topics/imports-and-secure-supplies> (2018-10-31). The IEA 2016 data, furthermore, show that the Russian Federation exported more than 5.2 million b/d of crude oil and approximately 2.4 million od b/b in petroleum products mainly to European Countries (accounting about 70% of National exports). Online on <https://www.eia.gov/todayinenergy/detail.php?id=33732> (2018-10-31).

[36] Model better applicable to continuous energy flows (through gas pipelines for example), since discrete flows allows storage or redirection. See: Mansson *et al.* 2014.

relationships among States is crucial when it comes to multifaced conflicts or cooperation aroused for the interaction between International Actors, such as States or other political units (Simionov 2014).

### The Economic Perspective

The economic interdependence draws its roots from the international trade; indeed, it is defined as a "mutual dependence" where economic partners withstand to common trade's outcomes. The main aim is therefore intensifying cooperation in order to increase benefits and profits. Nevertheless, these advantages came with a cost; the interdependence cost entails dangerous sensitivity to external pressures, converting some time into vulnerability (Keohane, Nye 1977, 12-13). One of the main concerns of the economists is indeed to evaluate these costs, assessing the sensitivity of international transactions (the risks in case of trade disruption) and their overall impact on the International System. In this theoretical framework, the experts' opinions in regards to the Euro-Russian interdependence can be divided into two different sides (Simionov 2014):

1. *The ones that consider European Union more dependent on Russian Federation*. The main thesis under this belief is that, basically, the European economy is unable to survive without Russian primary energy and, also, the project to totally bypass Russian imports recurring to different sources is almost impossible in a relatively short term. Moscow, on the other hand, results less vulnerable in case the European economic partnership ends because it is totally capable to find other investors and new markets for energy products.
2. *The one that consider the Russian Federation more dependent on the European Union.* The supporters of this idea argue that the European economy is not diversify enough to support a possible energy flow interruption. Considering indeed the fact that the Russian Federation undoubtedly strongly rely on incomes obtained from the European markets and cannot deviate in relative short term energy flows due to the existing pipeline infrastructure, they esteem the EU less vulnerable. The efforts made by the Union in the renewable field, as well as the fuel mix diversification ensure to Member States higher level of independence from the Russian partner.

Besides the economic perspective, the Euro-Russian Relationship entails also political consequences. The classical liberal approach associates high costs to the research of new trading partners; bilateral agreements, therefore, refrain the advancement of aggressive policies or even the use of force as long as there is a meaningful economic (and so political) interest for the maintenance of the relationship with this specific Nation.

### The Political Perspective

Usually, political approaches assume that only on a theoretical level an interdependent relation between two or more parties can be impeccably symmetrical.

Keohane and Nye have examined deeply the concept of asymmetric interdependence connecting it to the political power (Simionov 2014); the State holding the advantages arouse form the relation gains power over the counterpart. This supremacy could express itself in several different situations:

- degree of influence or total control used to achieve predetermined targets;
- the power to decide (or deeply influence) the course of the events at the International level;
- ability to control the resources or a status that States or individual actors possess or not[37].

Referring to this last point, a brief mention to the status control is due. According to Paul, the Accommodation of International established and rising power is a "Mutual adaptation and acceptance by established and rising powers, elimination or substantial reduction of hostility among them" (Paul 2016, p. 4); this process is extremely complicated and sensitive in the International politics. Therefore, the Accommodation can be:

1. full Accommodation, recognition;
2. partial or limited Accommodation due institutional, economic or military gap (e è corretto? USSR);
3. non Accommodation, no recognition at the International level;
4. Region Specific Accommodation, limited primacy (India, Brazil and South Africa in their regions).

In the age of new rising States the non-violent accommodation represented a rare exception, because nobody was thrilled to share power; today the accommodation process is peaceful in mostly all cases and can present itself as:

1. Ideological or Normative, acceptance of the main ideological framework.
2. Territorial, legitimate territorial settlement.
3. Economic, integration in the economic order – multifaceted interdependence.
4. Institutional, challengers share same institutions.

The Accommodation is guaranteed by power, and power is acquired by having advantages upon others; here a huge chapter can be opened on the importance of international recognition of State's relative power and the power to not recognize it (Shakleina 2016). However, for our analysis, the economic accommodation as the integration in a multifaceted interdependence structure among actors is important to recall. The asymmetrical relations always entail significant power to the advantaged counterpart.

Energy dependence is obviously not a simple and linear concept, there is also another paradox to take into account: "A normal view of International

[37] In the International Relations, the power concept is used for the analysis of current (or past) relations among States and for the definition of National policies of International State's behavior. Noteworthy is the contribution of Thucydides, Machiavelli, Morgenthau, Clausewitz, Sun Tzu as well as Waltz and Cohen. See: Simionov 2014.

power politics and related issues of economics is that energy supplier will hold tremendous power and influence over an energy user. But the opposite can also be true, as the user acquires power and influence over the supplier" (Caiser 2011, p. 542). Applied to this particular analysis, according to the paradox, the Russian Federation is dependent on the European demand as well as the European Union is dependent on Russian energy deliveries. 77% of natural gas exported from the Federation is indeed predestined to the Western market[38]; in a case of a total and sudden interruption of energy trade Russian economy will severely suffer – and maybe collapse in the worst scenario. Due to the existing infrastructure, redirecting future energy export to different markets appears very hard in short-term: the construction of new pipeline routes is extremely expensive and involve time and redaction of several agreements. Leaving in disuse the European pipelines means incredible investment loss for Gazprom; for these reasons cutting out the continent from Russian energy export represents almost an illusion.

Conscious of this possible bound and responding to the diversification attempt of the EU, Moscow began to look East in the research of new energy partners; China and generally the Asian markets are inviting for energy producers due to their steady rising energy demand. The European Union, on the other hand, is pursuing actively policies of energy diversification and enhanced security looking over Azerbaijan for further cooperation in energy field. It seems that from a state of dependence, we are gradually moving toward a more balanced Interdependence. But: *who needs whom the most?*

### 1.6.1 EU-Russia Energy relations Reinterpreted

In Europe, throughout the 1990s, energy was considered as a purely economic topic not related to any political or geostrategic issue. The adoption of the European Green Paper (2000) for the first time officially politicized the topic by linking energy supply to "dependence and security" aspects, therefore a long-term partnership with the Russian Federation seemed to be the most optimal solution in line also with the following EU diversification policy (European Security Strategy 2003, Green Paper on energy 2006). However, over time, the relations between the European Union and the Russian Federation experienced several different phases which ultimately translated in a shift of identities and balances.

Throughout the 1990s, the dynamics between the two parties have confirmed the EU to be the more stable economic player and Russia as the weaker one: after all, in those years, the new born state was still in the process of

[38] According to Gazprom Export LLC, in 2019 a total of 198,97 billion cubic meters of gas were supplied to European countries: Western European countries (plus Turkey) accounted for approximately 77% of Gazprom exports meanwhile Central European states took 23%. <http://www.gazpromexport.ru/en/statistics/> (2018-10-24).

finding its own place in the International System and more concerned to avoid political isolation, therefore its economic reliance wasn't much credible. However, after the financial crisis of 1998, this equilibrium started progressively to change: 1999 represents indeed a turning point. After NATO's expansion to the East through the inclusion of three satellites of the former Soviet Union (Poland, Czech Republic and Hungary), Russian elites forged a new consensus based on the necessity of a firm defence of Russian national interests (Caiser 2011). Because of NATO's enlargement and in line with the National Security Concept (2000), Moscow rejected the European Neighbourhood Policy yet insisting to be recognized as an equal partner given its strategic role in the European energy market. Kremlin's adamant position on the necessity to remain still and strong during negotiations in order to do not prejudiced any Russian national interest was further confirmed after Western intervention in Ukraine and Georgia. The support to the *Orange and Rose revolutions* in 2004, the energy activities in the Caspian Sea in 2005 and the European official statements about the situation in Chechnya and in general on the state of democracy in Russia were perceived in competitive terms: considered as forms of interferences in national affairs, these episodes led Russian authorities to the adoption of new foreign policies. The Russian Federation was progressively leaving behind the label of the 'weaker partner' reaffirming itself as a strong counterpart.

On the other side European energy dependence rate was progressively growing: in a decade the EU's gas dependency rate on non-members grew by 13.1%, meanwhile the dependency rate for fossil fuels just by 2,1%[39]. Furthermore, the research of new suppliers and alternative energy routes combined with the delicate enlargement processes have both contributed to weakening the political position of the European Union – different necessities made the EU less cohesive. Therefore, while Russia was focused on the safeguard of its national interests and international status, the European Union was concerned about its energy security and dependence on Russia and it was equally engaged in the diversification of energy supplies.

It is possible to underline how, under this historical and political point of view, there has been a drastic shift in the perception of both the Russian Federation and the European Union: Moscow is no longer perceived as the unreliable economic partner and Brussels is more conscious about the current EU dependence on Russia (Caiser 2011). In this specific interpretation of EU-Russia relations the shift of identities and perceptions is not related only to the growing request of fossil fuels in international economies, but also to a new set of ideas about energy's socioeconomic role. Currently, within the EU, geopolitical and climate perspectives define both energy policy's goals

[39] EU-27 Energy dependance rate 2008-2018, *Eurostat Statistic Explained,* <https://ec.europa.eu/eurostat/statistics-explained/index.php/Energy_production_and_imports> (2018-10-24).

and instruments; these new ideas and principles are adopted and diffused in varying degrees within EU member representing indeed one of the main reasons of disagreement when it comes to energy. The Russian Federation, in the pursue of its foreign policy goals, actively utilizes these internal divisions in order to undermine the European negotiating position, already weakened by the dependence rates.

The existence of economically and geopolitically different states is the origin of the spread of different identities and principles within the EU which translate into the adoption of differing policies mainly concerning the varying degrees of market liberalization and of national intervention in the energy sector, mainly linked to climate purposes (Kuzemko 2014). Without doubts, through time, the politicisation of the energy discourse in terms of supply and dependence has redefined on both sides the EU-Russia energy relations.

### 1.6.2 EU-Russian Energy Relations from Interdependence to Conflict

As this brief analysis points out, the European Union suffers from an energy supply vulnerability. However, it is important to stress out the existing difference between oil and gas dependence: oil, in fact, cannot be used as an instrument of power because it is mostly traded on the international market via a variety of routes: the only way to use it as a leverage is though the creation of a cartel such as OPEC (Caiser 2011). Gas, on the other side, is mainly transported via fixed pipelines and other alternatives, such as the Liquefied Natural Gas (LNG), are very expensive and not feasible in short time, and for these reasons it could be used as an 'energy weapon card'. The Russian Federation holds the world's largest gas reserves and it represents the most important European supplier. In the same way although, Russia is dependent on the EU energy demand: more than 70% of Russian gas export goes indeed to European countries[40].

In a hypothetical scenario where the trade between the two partners may be suddenly interrupted, it would entail severe consequences both for the European countries and for the Russian economy which could be seriously affected because this mutual energy dependence translates actually into a pure relation of interdependence. However, although increased levels of economic interdependence should reduce conflict between states by making them less convenient, in reality energy interdependence might make it less likely for disputes to escalate into direct military confrontation but it doesn't erase the possibility of other types of conflicts. The increased vulnerability to actions taken by the counterpart might indeed exacerbate states' security concerns leading them to adopt policies which, as a consequence, might increase ten-

[40] According to Gazprom, Western European countries (plus Turkey) accounted for approximately 77% of Gazprom export: <http://www.gazpromexport.ru/en/statistics/> (2018-10-24).

sions between them endorsing competitive behaviours. Both EU and Russia have seen grow their dependence on each other over time. The increasing rates represent indeed a significant risk to their national and economic interests and they also led the states to adopt policies aimed to both decrease such dependence and improve their position in relation to the counterpart (Table 1).

As the immediate result of such behaviour, the EU-Russia relationship took the shape of the classic security dilemma: because the existing interdependence concerns just one economic area, neither side can improve its security without threatening the other. Unfortunately, the European-Russian relation is not a complex interdependence because it doesn't spread into different fields of interest, but it is a symmetrical interdependence confined to one single area: energy (Krickovic 2015). According to Copeland (1996), over time the balance in any interdependent relation may be disturbed by several exogenous factors making one state more dependent than the other one (asymmetry); therefore, states must consider that this possible balance modification might ultimately put them under political and economic pressure. Furthermore, the adoption of policies aiming to lessen the dependence on the other state cannot be pursued without increasing the level of dependence of the counterpart: this has been the case of EU-Russian energy relations so far. In particular, future expectations play an important role in undermining eventually this potential pacific economic growth and also the mutually beneficial relationship between states.

As previously stated, Russian and European energy relations meet the definition of "symmetrical interdependence", therefore, both sides would face daunting costs in case of disruption of energy trade. Contrary to common expectations though, according to which interdependence brings mutual benefits, when a relation of interdependence occurs into the energy field, it does not reduce neither mistrust nor conflicts. For this reason and because the fear of a possible retaliations and blackmail, the EU has tried (and it is still trying) to diversify its suppliers by building new pipelines bypassing Russian control while adopting policies and measures aimed to liberalize the European energy market at the expenses of Russian state-owned energy companies. These initiatives prompted Russian leaders to complain and the government has intensively worked in order to secure its control over pipeline routes and gas supply (Krickovic 2015, *9)*.

Looking back, western Europe's energy dependence on Russia developed slowly and steady; noteworthy is the Russian reliability as economic partner in comparison with other European suppliers, in fact, during the Cold War the Soviet Union never disrupted gas supplies for political or strategical reasons. The situation changed dramatically during the post-Soviet period with the rise of the Russian Federation. The fragmentation of pipeline routes under different national jurisdictions, combined with disputes over transit payments, have led to several gas supplies interruptions which have left European consumers in the cold. In those occasions, the energy leverage was indeed used by the Russian government in order to both expand its influence and to pursue its geopolitical agenda aiming to restore its status of international superpower.

However, the blame rarely falls on a single side: these tensions and conflicts more likely stem from two different world views. On one side indeed there is a post-modern Europe that gave up on the pursuit of hard power and, as an energy buyer, it has a big interest in diversifying its suppliers and in increasing competition in energy markets in order to keep down the prices. On the other side there is a state-centric Russia focused more on zero-sum terms relations and, as an energy producer, it has an interest in establishing a monopoly over the energy market in order to obtain the highest profits possible (by raising the prices). In the end it all comes to energy prices because low prices are crucial to the European economic growth and competitiveness on the international markets considering current Asian low labour costs and American competitive shale gas.

It is fair to say that, on its own, Russian energy supremacy represents a *necessary* but not sufficient explanation of the reasons which lead the authorities to use it as an instrument of the Russian foreign policy; however, the further inclusion of other political goals represents a *sufficient* reason. The Soviet Union, followed by the Russian Federation, has indeed demonstrated its willingness to use energy for the accomplishment of its international agenda purposes firstly through different pricing and then by exercising a strict control over energy transit[41]. The resort to the 'energy weapon' though is not suitable for achieving specific targets: the presence of costs for both sides linked to the use of this kind of leverage makes it most suitable to be used as a 'deterrence', not a 'weapon'.

Nevertheless, the idea of a mutual beneficial dependence failed because both states showed to be unable to take advantage of the interdependence in order to develop further cooperation. In addition, they struggled to accept their own levels of dependence until it was too late. The future uncertainty worries both sides because the current symmetrical interdependence may easily transform into an asymmetrical one: concerned about this possibility, the European Union and the Russian Federation have securitized and politicised their energy relations. Moreover, the Russian Federation and the European Union failed to achieve a relationship of complex interdependence, as the one currently existing between the EU and the USA. A complex interdependence spreads into different fields and it is able to mitigate the concerns regarding possible shifts from symmetrical to asymmetrical interdependence.

In the end, however, it is possible to identify trends of cooperation in EU-Russia energy relations specially in the infrastructure field, promoting projects aimed at enhancing gas trade, and in dispute settlements. The shared goal is to prevent crisis ensuring peaceful and mutually advantageous relations. Ac-

[41] During the Soviet Union it was considered natural to apply different energy export prices according to the state of destination. Then, partly due to pressures from the EU and the WTO, but mostly in line on the Russian ambition to maximise profits from energy sales, the Russian Federation raised the energy prices for the CIS (Commonwealth of Independent States) to market level.

cording to Proedrou (2007) this cooperation is the consequence of the current mutual high vulnerability of the two sides since they don't have viable alternatives if not for being "the market and the source" of each other. Cooperation does not mean absence of conflicts though, the high level of vulnerability and sensitivity on both sides forces the European Union and Russia to take appropriate measures in order to decrease these levels: Moscow tries to lock its presence and role in the European market, while the EU tries to diversify energy suppliers and further liberalise the market. The neoliberal paradigm of interdependence can be used to explain the reasons which transform cooperative relations into conflict; however, the autarky of the International System creates uncertainty which obstructs (but does not permanently eliminate) cooperation (Proedrou 2007).

It follows a deeper analysis on the Russian energy production and export in the European Union.

Table 2. EU vs Russian Energy Strategies. Source: Krickovic A. (2015).

| EU strategies | Russian strategies |
|---|---|
| *Liberalization of energy markets*<br>• Legislation to 'unbundle' vertically integrated energy companies<br>• Legislation guaranteeing equal access to pipelines and energy infrastructure<br>*Energy pricing that benefits consumers*<br>• Advocating short-term contracts and spot pricing for the natural gas market<br>*Diversifying energy supply*<br>• Establishing pipelines that bypass Russia (e.g. BTC, Nabucco, TAP, and TCP)<br>• Developing LNG and shale gas technologies | *Maintaining Russian state control of energy sector*<br>• Legislation to limit foreign ownership in 'strategic sector'<br>• Informal procedures to keep foreign companies out and discipline Russian business<br>*Energy pricing that benefits producers*<br>• Insisting on long-term contracts rather than spot pricing for the natural gas market<br>*Maintain control over Eurasian energy supplies and transit routes to Europe*<br>• Buying up energy transit infrastructure in the Commonwealth of Independent States<br>• Pressuring central Asian energy producers to use Russian pipeline infrastructure<br>• Building pipelines that bypass transit countries, (e.g. North Stream, South Stream, and Blue Stream pipelines)<br>*Diversification of markets*<br>• Negotiating long-term gas and oil contracts with China and other Asian countries<br>• Power of Siberia natural gas pipeline to China |

CHAPTER 2

# Russian primary energy production and export in the European Union

> "... Being a leading energy nation, Russia understands well its role and responsibility in providing sustainability and the development of the Global Energy sector. Our country exports energy to dozens of countries in the world and has repeatedly confirmed its status as a reliable and stable partner", V. Putin[1].

The current Russian gas industry is a direct heritage from the Soviet gas industry developed in the late 1970s and 1980s. The core point of all Soviet energy directives was the raving exploitation of huge deposits and reserves disseminated on the soil of the Union; the extensive territory and its natural configuration indeed, has led logically to the creation of an impressive national energy network. The long distances between the exploitation points and consumption centers required the construction of a wide-ranging pipeline infrastructure, able to reach all the soviet Republics guaranteeing a safe and stable energy supply. The scale of this project has laid the foundation for the modern Russian energy empire, born from the ashes of the Soviet Union.

In line with Soviet ideals, the centrally planned economy back in the days has prioritized the gas extraction in order to provide electricity and heat to the population at very low prices (and so affordable to anyone); oil production, on the other hand, was destined to very remunerative export. The previous gas-priority in electricity and heat generation processes is still unmistakably visible in the Russian consumption structure; in 2015, indeed, the use of gas in the power sector ranged around the 40% of the total gas consumption in the Federation (Aune *et al.* 2015).

Before the establishment of the Russian Federation, the energy extraction and transport processes where entirely organized within the Soviet Ministry of

[1] Official Internet Resources *of the President of Russia* 2017.

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the Gas Industry, until 1992, where, after the introduction of economic reforms, new specialized industries and organizations were created. Following the reform process, in the oil sector several companies were born and afterwards totally or partially privatized; however, in the gas field the situation evolved quite differently. Gazprom, established in 1989, represented indeed a unique entity born outside the ministerial structure (although state owned) which had the control of the entire Soviet gas supply structure; after the collapse of the Union, Gazprom has maintained its centralized and state-linked features. In the 1992 reform process, the top management of the company won over reformers demonstrating that the gas sector required a centralized structure in order to maintain efficiency and control over production; accordingly, Gazprom became a joint-stock partially privatized company[2]. The main idea lying under this specific decision was the fear of a possible social revolution due to high gas prices, not affordable by the countless population of the Federation – in this transition process, stability was the key.

The brand new partially privatized Gazprom, therefore, acquired for-free the ownership of all physical gas industry assets, the autonomous decisional power in investments and output targets (previously decided by State organs), final distribution infrastructures and the final word in the gas export sector. During the Soviet time indeed, organs external to the company managed all these important tasks and after the conclusion of the Russian reform process, the Russian gas industry paradoxically became more centralized and monopolized than it had ever been before. However, "big privileges entail big obligations"[3]: the company, indeed, was forever bound to endure domestic gas procurement at low prices, with the possibility to keep for itself a big share of profits[4]. This peculiar juridical clause derives from Russian economic and social contest: the restructuring process has triggered crisis in all spheres of human activities and in the whole society, stable gas supplies and low electricity prices were vital in ensuring social stability. This explains why the gas sector followed a different pattern of evolution than the oil one (focused more on export).

Meanwhile the gas sector was ensuring domestic economic and social stability, oil (and also gas) exports have guaranteed enormous cash flow into the economic development of the country – this is where '*big money was made*'.

[2] Gazprom represent indeed the largest joint-stock company of the Russian Federation, which controls over 50% of the shares (38,37% Federal Agency for State Property Management; 10,97% Rosneftegaz; 0,89% Rosgazifikatsiya). According to the data of December 31, 2017: 23.673.512.900,00 shares were issued at a nominal value of 5 RUB for share (total nominal values of an issue RUB 118.367.564.500,00). The first launch on the stock market was on May20, 1993 when RAO Gazprom issued 236.735.129,00 shares for the price of 1 rouble each; at the end of 2017 the market capitalization of the Company accounted for USD 53,4 Billion. Online on: <http://www.gazprom.com/investors/stock/> (2018-10-24).

[3] Unknown author. Quote cited by Ben Parker in the *Spider Man* movie, 2002.

[4] Decree on Establishment of Russian Joint Stock Company Gazprom, Moscow February 17, 1993. Online on: <http://www.gazprom.com/about/history/chronicle/1989-1995> (2018-10-31).

The modern Russian oil industry draws its roots straight form the Russian Empire: the first oil well was constructed and drilled indeed in 1846 on the Absheron Peninsula, close to Baku, today capital of Azerbaijan. The discovery of petroleum represented a huge breakthrough worldwide, significant changes were made in national economies, production techniques, and daily life; for an entity as large as the Russian Empire this particular discovery was a proper turnover – oil revenues became shortly the main pillar of national economy. The blooming industry right away attracted foreign investments, which continued even during the Soviet revolution of 1917[5], which deeply affected the outcome of the sector.

The most producing and long-lived Russian oilfields were situated in the Caucasus and Caspian regions then, during the Cold War, the deposits of the Volga region and Urals were discovered. The war has brought a compelling energy need for military use, the deep exploitation of the new discovered fields accounted for the 45% of the total oil produced in the USSR (Egorov 2017). The Russian territory, although, was endless and rich: the massive oil reservoir situated in the wildness of Western Siberia was discovered years later, in the 1960, and new oil and gas deposits are still revealed gradually. During the Second World War, the petroleum industry worked constantly at an intolerable rhythm: the military, the economic growth and the arm race needed enormous quantities of oil, causing even sometimes the complete depletion of existing wells. At the end of the Cold War and after the following collapse of the Soviet Union, the Russian economy shrunk, between 1989 and 1995, losing over 40% of national GDP[6]; this economic crisis followed the Soviet collapse decreased drastically domestic demand and international energy export. After the introduction of the 1993 reforms, the privatization process led to the creation of new *titans* in the oil sector; from the exploration to the export of already refined products, major companies such as Rosneft, Yukos and Lukoil dominated the oil sector, finally totally overcoming the crisis at the end of the XX century. Today, despite past several oil crises, Russia leads the sector: among all world's energy leaders, the energy industry of the Russian Federation still represents a solid ground for the economic development and growth of the country, as well as for its partners.

### 2.1 Russian energy production and export

Standard analysis frameworks of energy production do not apply easily for the Russian Federation; we are talking about the largest State in the world with high inconsistencies in both populated areas and energy field locations. The major natural gas and oil reserves are indeed located in eastern Siberia and Far East, meanwhile the main residential areas are concentrated in the

[5] Rothschilds and Nobels (accordingly French and Swedish families deeply involved in international energy businesses) invested in Russian petroleum industry, then were replaced with Vacuum (later known as Mobil) and Standard Oil of New York. See: Egorov 2017.

[6] Data extrapolated from World Bank, <https://www.databank.worldbank.org> (2018-10-31).

Western part of the Russian Federation. The territory of the Federation can be divided indeed into three separate units, due to its congenital climate, territorial and social differences: Western Russia, Mid Russia and Eastern Russia, where are applied different policies in terms of investment, extraction, production, trade and consumption of energy[7]. (For a more precise overview of Russian domestic oil production by region, it is possible to refer to Table.1 in the Appendix A). Final energy products, such as gasoline and electricity, indeed, have altered prices according to the region where they are sold in due to the discrepancy of wages and social life standards; however, in terms of primary energy production and export, it is possible (and preferable) to bypass these inner differences referring to general national data. According the EIA *Beta* – International Energy Statistics for Russian Federation[8], indeed, on the soil of the federation in 2013 were extracted exactly 1,397.159 Million Metric Tons of Oil Equivalent of primary energy – the historical pattern is the following (Fig. 6):

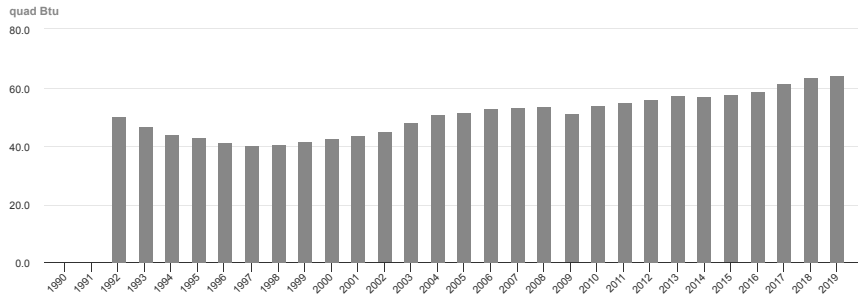


Figure 6. Total Primary Energy Production, Russia (EIA Beta source).

The numbers and achievements of the Russian energy industry are impressive. Given the proved oil reserves of approximately 80 billion barrels, according to the *Oil & Gas Journal*, Russian energy producers are ready for a potential increase of more than 500,000 b/d (*Oil & Gas Journal* 2018); this space capacity derived from forecast revenues of new projects and fields yet to exploit. Russia is indeed today the world's first crude oil producer (including lease condensate) and the second for dry natural gas, following the United States' inland produc-

[7] The Russian Federation is indeed subdivided into 83 federal regions in turn grouped into seven official federal districts. The application by economic analytic of the LIBEMOD Model (Liberalization Model for the European Energy Markets) referring to the Russian energy market follows special directives: the Federation is indeed split into three auxiliary counties where the model is separately applied. More precisely: RU1 (Central Federal district, Volga Federal district, Northern Caucasus Federal District, North Western Federal district and Southern Federal district); RU2 (Ural Federal district) and RU3 (Siberia and Far Eastern Federal district). See: Aune *et al.* 2015.

[8] U.S. Energy Information Administration (EIA) – Independent Statistic & Analysis 2017b.

tion. Energy export revenues have made and still make the fortune of this immense country; the spread between domestic consumption and total energy production (Fig.7) allows allocating daily massive amounts of crude oil and gas for export to international markets.

The domestic energy consumption of the Russian Federation is mainly based on natural gas (52%) due to national gas-based electricity and heating systems, followed by petroleum (22%), coal (13%) and Nuclear, renewables and other sources, which in total account for almost 13% of inner primary energy consumption[9].

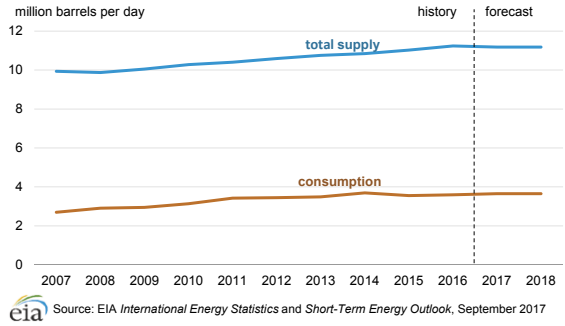


Figure 7. Russian oil total supply and consumption.

In 2014, according to the data of the Federal Customs Service of Russia (Aune *et al.* 2015), Moscow has exported more than 4.7 million barrels per day in favour of Asian and European Countries, in accordance with the following pattern (Fig.8 and 9):

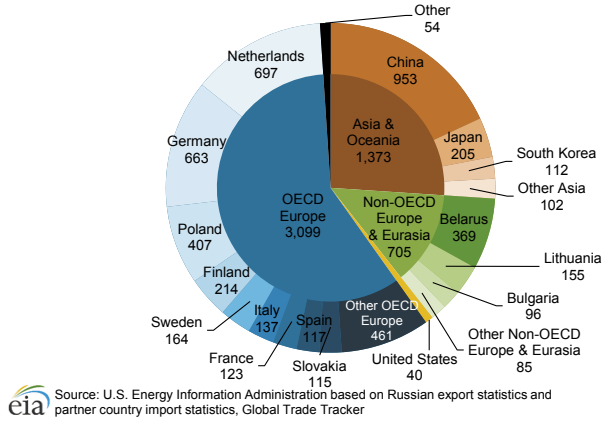


Figure 8. Russian Crude oil exports by destination, 2016.

[9] Data extrapolated from EIA Beta countries Analysis, Russia, <https://www.eia.gov/beta/international/analysis_includes/countries_long/Russia/russia.pdf> (2018-09-23).

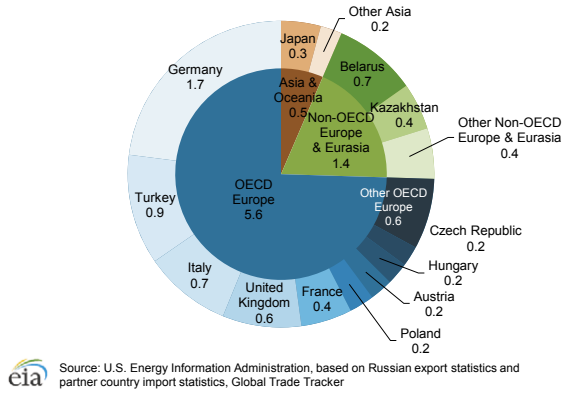


Figure 9. Russian Natural Gas export by Destination, 2016.

As it's possible to see, OECD Countries heavily rely on Russian energy imports, as well as some Asian and non-OECD States; noteworthy is the German dependence on Russian gas and the Netherland dependence from crude oil.

Before proceeding with a more detailed analysis of European energy dependence, it is crucial to underline the importance and the path of Russian energy export. As stated before, during the Soviet Union, the Republics constituted the main transit territories through which the pipelines network spread; in 1991, after the collapse of the Union, the Republics become new independent States triggering, never existing before problems in terms of energy export. 90% of energy flows crossed the territory of Ukraine and the rest Belarus; Russian authorities urged the need to establish special agreements with transit Counties without compromising energy revenues, vital for the stability and formation of the new Russian Federation. In that particular sensitive moment, the profits from energy export accounted one of the few active voices of the Federal budget; consequently, the stable and safe energy flows to Europe represented a necessary condition, in order not to trigger an unpleasant domino effect.

In the adjustment of the International System right after the end of the Cold War, the energetic card paradoxically represented a stable point in National Agendas: the Soviet infrastructure was working non-stop without problems, excluding the political ones. The money derived from the sale of energy products ensuring to the Russian Federation the capability to maintain basic functions and focus on the reform process, and on the other hand, the energy import allowed European States to recover and rebuild.

Gazprom strategy was based mainly on two pivotal points: enhance and consolidate its control over the existing infrastructures and diversify the flow streams by creating a new grid of pipelines[10]. Russian and European

[10] Mainly this was a direct heritage of the Soviet strategy of energy exports based on the construction of massive pipelines across its territory. Due to technical factors (liquefaction pro-

interests converged in the common will to guarantee stable and affordable long-term energy flow, as well as in the desire to reduce expenses. For these reasons, the European Union corroborated the projects proposed by Gazprom, aimed to increase energy volumes through Europe meeting the rising demand and to circumscribe geopolitical risks deriving from the energy transit across the Ukrainian territory[11]. The Russian target to enhance control over the already existing infrastructures originate directly from the consequences of the dissolution of the Soviet Union and the following fraction of the pipelines network among the new territorial units. Most of the Gazprom's budget available right after the end of the Soviet system was spent in the acquisition of shares of new foreign energy partners consolidating its control over the system. For what concerned the second point in agenda, the Company drafted a new diversified path of energy flows made by separate and distinct pipelines; the main reasons behind this decision are private safety ones. First, a more diverse grid allows to meet several national demands and joint numerous markets consenting to deviate energy flows according to the need. Second, separate export pipelines decrease the impact of technical and political problems (incidents or terrorist attacks). The choices made by the heads of Gazprom at the end of the XX century have molded the existing pipeline infrastructure.

The current pipeline network, indeed, allows stable and substantial energy-flows from the Russian Federation to the European continent. Its complex pattern is adequately capable to bear the forward coming forecast energy export increase due the rise of world energy demand; however, new projects are always on the negotiating table.

Following is a closer look on the main pipeline's projects active on the European territory.

### 2.2 Russian energy export in Europe

> "If Oil is a Queen, Baku is her throne", Winston Churchill (Egorov 2017).

The data are indisputable: the Russian Federation does supply substantial volumes of fossil fuels, oil and natural gas to the European Union. Indeed, on

cesses not yet discovered), geographical (shortest and easy way to connect interest points) and political factors (long-term contracts and stability of political relations) pipelines were the most valid option for the time.

[11] Furthermore, the European cooperation with the Russian Federation was boosted by the speed with which the newborn Eastern European States approached Western Institutions. In 1999 Czech Republic, Poland, Hungary joined the NATO, followed by Bulgaria, Estonia, Lithuania, Latvia, Romania, Slovakia and Slovenia in 2004. At the same time, in 2004, Czech Republic, Estonia, Latvia, Lithuania, Poland, Slovakia, Slovenia and Hungary have joined the European Union, meanwhile Bulgaria and Romania waited until 2007.

March 2, 2018, Gazprom set the historical record for daily gas exports to Europe accounting 713.4 million cubic meters in one day[12].

The complex energy network built during the Soviet Union established the passage of raw materials through the territories of its Republics directly to the heart of Europe. The first pipeline was built in 1982, the Urengoy – Pomary – Uzhgorod pipeline[13], with the explicit task to extend energy supply to Western Counties and consequently join the European market. During the preparatory works of this project, the Reagan administration made several efforts to persuade European counties (which the pipeline was supposed to cross) to deny to soviet companies the possibility to purchase construction materials and other facilities on their soil, in order to jeopardize the construction of the pipeline. The presence of persistent Russian energy flows through Europe alarmed the American Administration, worried of a possible political and ideological spill out, which could trigger instabilities and the rise of communist parties in Europe during those delicate times. Nevertheless, after only two years the pipeline project was completed: Russian energetic companies (such as Gazprom[14]) faced the new market increasing the Russian domestic fuel production. The Urengoy – Pomary – Uzhgorod pipeline represents the first of several common projects between the Russian Federation and the European Countries.

Currently, crude oil embodies the largest energy product imported by the EU Members (69,0% of total imports in the first half of 2017), followed by natural gas (19,9% in the same time period)[15] and the Russian Federation has reaffirmed itself again as the main strategic energy partner of the Union. As stated, several times before, it is important to not forget that the European Union is not a uniform entity, but made indeed of several different States with its own energy related issues; for this reason, the share of Russian energy in national fuel mixes is very diverse case by case (Table 2). The table below illustrates the level of energy dependencies of the 28 Members of the EU (still accounting the United Kingdom) from Russian imported oil and gas. The 'worse' scenarios are indeed

[12] Gazprom Chronicle 2018, <http://www.gazprom.com/about/history/chronicle/2018/> (2018-10-11).

[13] In 2017, the share of Russian natural gas in the European Union energy import accounted for 37.0% (39.5% in 2016) and the petroleum oils share was approximately around 30.9% (31.7% in 2016). The Russian Federation reconfirms itself as the largest supplier of natural gas and oil of the EU, ahead of Norway, Algeria and Qatar. See: Eurostat 2018.

[14] Gazprom (in Russian *Газпром* – **га́з**овая **пром**ышленность, literally "gas industry") represents the largest Russian state-owned energy company specialized in extraction, production, transport and sale of natural gas. Besides being the main gas export, the company owns also a large number of subsidiaries including several infrastructure assets. The liberalization of the European energy market has paved the road for Gazprom's expansion in the continent increasing its shares in the downstream market and establishing joint ventures, building intra-continental pipelines and storage deposits in many European countries.

[15] Data extrapolated from: Eurostat 2018.

proper of Balkan counties, isles such as Malta and Cyprus and other Counties, which cannot rely on sufficient domestic production[16].

Table 3. Share (%) of Russian energy in National extra-EU28 Imports, 2017.

| | Share (%) of Russia in national extra-EU28 imports | |
|---|---|---|
| Country | Petroleum oils | Natural gas |
| Belgium | 50-75 | 0-25 |
| Bulgaria | 50-75 | 75-100 |
| Czech Republic | 50-75 | 75-100 |
| Denmark | 0-25 | 0-25 |
| Germany | 25-50 | 50-75 |
| Estonia | 75-100 | 75-100 |
| Ireland | 0-25 | 0-25 |
| Greece | 0-25 | 50-75 |
| Spain | 0-25 | 0-25 |
| France | 0-25 | 0-25 |
| Croatia | 0-25 | 0-25 |
| Italy | 0-25 | 25-50 |
| Cyprus | 0-25 | 0-25 |
| Latvia | 0-25 | 75-100 |
| Lithuania | 50-75 | 50-75 |
| Luxembourg | 0-25 | 0-25 |
| Hungary | 50-75 | 50-75 |
| Malta | 0-25 | 0-25 |
| Netherlands | 25-50 | 25-50 |
| Austria | 0-25 | 75-100 |
| Poland | 75-100 | 75-100 |
| Portugal | 0-25 | 0-25 |
| Romania | 25-50 | 75-100 |
| Slovenia | 0-25 | 75-100 |
| Slovakia | 75-100 | 75-100 |
| Finland | 75-100 | 75-100 |
| Sweden | 25-50 | 0-25 |
| United Kingdom | 0-25 | 0-25 |

*Source:* Eurostat database (Comext) and Eurostat estimates

The plan of diversification of export routes adopted by Gazprom board at the end of the XX century has led to an essential infrastructure development, which ended with the establishment of three main pipeline routes through Europe: North Stream, Blue Stream and Yamal-Europe.

At the beginning of the XXI century, the natural gas delivered by the Russian Federation reached the European continent by passing through 12 main pipelines:

- 3 direct to Finland, Estonia and Latvia;
- 4 crossing Belarus directed to Lithuania and Poland;
- 5 crossing Ukraine directed to Slovakia, Romania, Hungary and Poland.

The strategic relevance of transit territories in terms of the guaranteed final supply is very high; after a few uprisings and instabilities risen in the main pipeline-crossed countries, Moscow began to think on cutting out the intermediaries. In 2011, indeed, an additional pipeline directly headed to Germany through the Baltic Sea was accomplished: the *North Stream*. Today the main target of Russian Authorities is to stabilize energy supply, increase its volume and find safe

[16] More precisely, according to the table the larger natural gas importers are Estonia, Lithuania, Bulgaria, Germany, Hungary, Czech Republic, Poland, Austria, Finland, Sweden and Slovakia. For what concerns non-EU Members, Ukraine, Turkey and Belarus are deeply dependent form Russian imports.

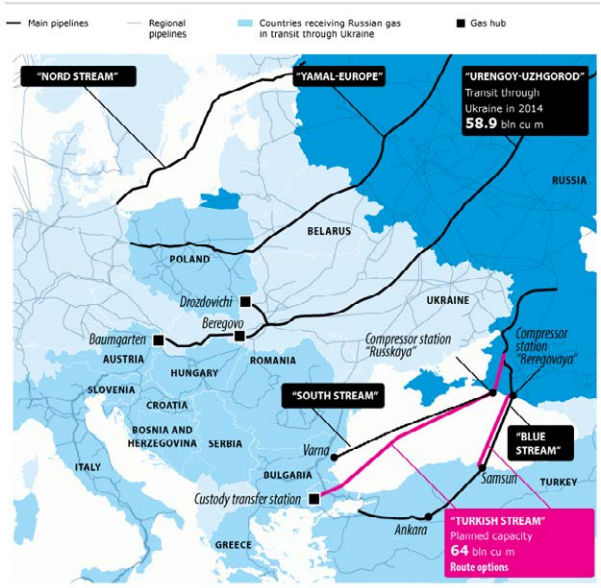


Figure 10. Gas pipelines from Russia to Europe by 2018. Source: <https:www.tass.com>.

streams through international markets; after the Ukraine crisis especially, the need to cut out problematic intermediaries revealed to be compulsory.

For the purpose of this analysis, the relevance of the main energy itineraries from Russia to Europe is very high; it is not merely an infrastructure issue, rather a political and diplomatic matter, which includes several substantial consequences. For this reason, a further in-depth analysis is due.

### 2.2.1 Yamal – Europe pipeline

The Yamal-Europe pipeline is the first post-Soviet project realized in order to ensure a stable gas supply to Russian main buyer – Germany – by the shortest route. The pipeline line is 4.196 kilometers long and it connects Western Siberian natural gas fields with Germany, passing from Belarus and Poland[17].

The construction planning started right after the fall of the Soviet Union, in 1992, through international agreements between the brand-new Russian Federation, Belarus and Poland; after few years, in 1997, Russian gas was finally

[17] The Yamal-Europe pipeline stars in Torzhok (Siberia) and until it reaches the European Union Gazprom is the only owner. The Polish segment of the line is indeed property of a joint venture between Gazprom and *Polskie Gornictwo Naftowe i Gazownictwo* (PGNiG, Polish state-owned monopoly company), called EuRoPol. From 2011, the management of the infrastructure is entrusted to a PGNiG affiliated company by European Commission's decision. See: Verda 2016, 113-4.

safely delivered to Berlin. The Yamal-Europe pipeline represents the most effective gas route, economically speaking, with a total capacity of about 33 billion cubic meters (Dharma 2013).

### 2.2.2 Blue Stream

The second main project in the Euro-Russian energy cooperation field to be concluded was the Blue Stream Pipeline (active from 2003), which supplies natural gas from the south of the Russian Federation right to the Turkish coasts passing though under the Black Sea. The realization of this specific project represented an important achievement for Gazprom because for the first time Russian energy was able to reach a vast international market outside the post-Soviet space without crossing any transit State. This accomplishment was mainly possible thank to the participation of substantial foreign capitals and technologies and it uncovered a wider ground for cooperation with new partners boosting remarkably the Russian energy sector[18].

Even if the Blue Stream project involves directly only two States (Russia and Turkey), the construction and the draft of the proposal was more debate that the Yamal-Europe pipeline due to the competition on the regional level between the two parties. The rivalry between Moscow and Ankara crystallized during the Cold War, interests indeed not only the Balkan Region, but also the Caucasus; after the collapse of the Soviet Union security issues surrounding the areas dominated both national agendas – Chechens separatists were supported by the Turkish Government and the Russian backed up the Kurdish movement. Of course, the situation was definitely more complex and articulated however, in the '90s the two Governments were able to overcome the frictions favored by the increase of the regional political stability. During this year, indeed, the preparatory works of the Blue Stream has started – 1997 first bilateral agreement (Verda 2016, 115).

### 2.2.3 Nord Stream

The Nord Stream, also called North European Gas Pipeline or Северный поток (Severny potok) in Russian, represents the third project of the Gazprom diversification program and is the world longest sub-sea pipeline with its 1.222 kilometers. Starting from Vyborg, passing through the Baltic Sea and ending in Greifswald, Germany, the pipeline annually transports over 55 billion cubic meters of natural gas[19], planning to be doubled by 2019 by adding two more lines to

[18] Russian energy exports in the Turkish energy market were indeed still regulated by a treaty stipulated in 1984 by Botas. The agreement provided for an annual delivery of only 6 Gmc through Bulgarian and Romanian pipelines. Turkish energy market was indeed growing and required a more stable and consisted energy import in order to meet a higher domestic demand. See: Verda 2016, 115.

[19] However, only half of the pipeline's capacity is actually exploit (approximately 22,5 billion cubic meters) because of EU restrictions on Gazprom. See: Villa 2016.

the main structure (already composed by two lines). As well as the Blue Stream, the Nord Stream has contributed to erase the risks and vulnerabilities concerning transit states decreasing at the same time the realization and maintenance costs.

Even if the pipeline was inaugurated in 2011, the original project dates back to 1997 when Gazprom and Neste (Finnish energy company) joined together in the "North Transgas Oy" with the aim to construct a direct gas pipeline from Russia to Germany crossing the Baltic Sea (Verda 2016, 116-117). After some feasibility studies including onshore Finland and Sweden segments, finally in 2002 the Management Committee of Gazprom has approved the project implementation; the North Transgas Oy become a multilateral joint venture, including German and Sweden firms too, but in May 2005 when the preparatory works started, Gazprom became the only shareholder of the company after partner's recessions. From this moment, under only the Russian leadership, the construction of the pipeline proceeded at sustained pace until the complete dissolution of the North Transgas Oy a year later. In 2007 the Italian Snamprogetti (subsidiary of Saipem) has contributed noteworthy to the detailed engineering of the pipeline, finally completed on the 4th May 2011 (Verda 2016, 116-117). Later, in August, the North Stream was united to the Opal pipeline and the first Natural gas was pumped from Russia September 6. Angela Merkel, Dmitry Medvedev and François Fillon officially inaugurated the Nord Stream in a ceremony held Lubmin, German coastal town.

The project, however, was not done yet: several transmission pipelines were constructed by Western European countries in order to draw directly from the stream (Nord Stream 2005-2012).

1. *Opal Pipeline*. The southern pipeline, it connects Nord Stream with the Yamal-Europe pipeline (Jagal) directly from Greifswald to Olbernhau near German-Czech border.
2. *Stegal Pipeline*. Connects the Czech Transgas pipeline to the Jagal and Midal (connection between North Sea and Southern Germany) pipelines.
3. *Gazela Pipeline*. Operated by Czech energy companies, this pipeline was opened in 2013 with the purpose to connect to the Opal pipeline, directly linked to the Nord Stream.
4. *NEL Pipeline*. The Norther European natural gas Pipeline (NEL), starts from Lubmin (Nord Stream) through the Rehden-Hamburg gas pipeline, a branch of the *Midal* pipeline.

The Nord Stream offshore pipeline is, as stated before, operated exclusively by Gazprom through the Nord Stream AG; for a total length of 917 kilometers and working pressure of 100 standard atmospheres, this complex integrated infrastructure connects the Russian Gryazovets grid to the coastal compressor station in Vyborg (Nord Stream 2005-2012). Besides being the main gas supply stream to Northern Europe, the Nord Stream ensures also energy supplies to the Saint Petersburg Oblast (region).

Just after the inauguration of the line, the Nord Stream AG began a meticulous evaluation for a further expansion of the project including the construc-

tion of two additional lines, named *Nord Stream 2 (2018)*. This decision arose from the possibility of further energy supply to European countries and, consequently, to a substantial profit rise for Gazprom and the Russian Government. The expansion project, however, was suspended since the already existing lines were not running at full capacity due to European contractual restriction on Gazprom. The President of the European Council Donald Tusk, indeed, stated that the Nord Stream 2 project was not in the interest of the European Union (Sytas 2016) and the Italian Prime Minister Matteo Renzi, joint by the Hungarian Viktor Orbàn, has expressed his concerns regarding the possible violation of EU long-term strategy aiming to diversify gas suppliers (Lewis, Guarascio 2015). Although several criticizes, which divides the European States into two main position (pro and against), Gazprom has created a joint venture with the purpose to establish this projected expansion; even if the pipeline does not have formal approvals, the North Stream 2 AG has scheduled the end of the construction for 2019-2020 (Keating 2018).

The original Nord Stream pipeline has decreased the threats to European energy security at the price of an increased energy dependence on Russian supplies. The possibility to increase the primary energy flow by building additional two lines has worried Western authorities. The European Commission has criticized the Nord Stream 2 project also due its role as an alternative to pipelines crossing the Ukrainian territory in line with the European manifest support to the State (Avis 2017). Overall, the main international criticism moved to the project concern mainly four separated fields:

1. *Political worries*. The main concern of European and national authorities is the shift of traditional energy streams, which bypassing the main transit counties such as Ukraine, Belarus, Poland and Czech Republic put the control of energy supplies only in the hand of the Kremlin. This is seen as a long-term plan of Moscow to influence Western politics by playing the energy card: threatening disruption of supply. This further (possible) Russian gas in the European market will also increase dangerously the dependency rate of several Western States, causing also problem to the Russian Federation in meeting energy demand on both international and domestic levels. The response of the Russian Federation is that this project aims only to increase European energy Security by ensuring the increasing amounts of energy supply requested by the current growth rates; the bitterness is only generated by transit countries due to an inevitable loss of energy revenues and political influence. The main concern for Moscow is to guarantee a direct access to its energy production, without depending on unreliable transit regions and reducing supply risks (Nord Stream 2 2018).
2. *Security concerns*. The main security concern regards the Sweden national security policy; according to Mikael Odenberg, former Swedish Minister of Defense, (Bakst 2006), the pipelines will undoubtedly lead to Russian military navy presence in the national economic zone. President Putin itself has stated that the Baltic Fleet of the Russian Navy will ensure the safety of the project (Bakst 2006); the main question is indeed if the fleet deployment

will be limited merely to security issues and not for espionage or Strategic Intelligence. (For example, with the application of optic fibers in the security sector and not just for construction purposes).

3. *Economic aspects*. States as Russia and Germany, in favor of the Nord Stream 2, claim that this expansion will decrease gas final prices due to the elimination of transit fees. The bypass of transit counties, on the other hand, may provoke national economic crisis following the loss of energy transit revenues and consequently political and social tensions. The maintenance costs of submarine pipelines are definitely higher than the land one and much more complicated to achieve.
4. *Environmental concerns*. Every construction made by humankind represents an environmental disturbance and damage, especially if they are highly invasive as the construction of a submarine pipeline. The possibility to dislodge World War II mines and other toxic material is concrete, but also the pure construction works will undoubtedly damage the sea ecosystem – not mentioning possible accidents or future malfunctioning. The environmental impact could be sensitively lower in the construction of alternative land-based streams[20], decreasing also the financial expenses of shareholders.

### 2.2.4 South Stream

The South Stream (in Russian Южный Поток) was a pipeline project aimed to transport natural gas from the Russian Federation to Austria through the Black Sea, Serbia, Hungary and Slovenia. The project was abandoned due to the controversy originated at the European Union because of the discordance with the core of the Third Energy Package, which demands the net separation between energy generation and sale companies from the transmission grids.

The pipeline, after an onshore segment on the soil of the Russian Federation, would cross under the water the Black Sea cutting off the Ukraine and Romanian territories reemerging in Bulgaria. Especially after the tensions between Moscow and Kiev, the pipeline had to pass through Turkey's national waters avoiding the Ukrainian exclusive economic zone. (Highlight: it is important to notice that the Crimean annexation of March 2014 would allow to the pipeline to follow a direct route to Bulgaria. This may represent one of the many issues surrounding the Crimean vicissitude). According to the original project, in Pleven (Bulgaria) the pipeline should have branched off in:

1. Southwestern route to Greece and Ionian Sea to Italy (possibility shortly set aside).

[20] The Amber Project was indeed endorsed by the European Union as a valid land-based alternative to the Nord Stream 2; the construction of a natural gas pipeline passing across Tver, Novgorod and Pskov Oblast, through Lithuania and Poland in order to re-connect to the Yamal-Europe pipeline, represents a shorter, cleaner and cheaper alternative. See: European Parliament questions 2008.


Figure 11. South Stream Pipeline Map by 2012. Source: <https:www.euractiv.com>.

2. Northwestern route to Serbia, then split into Hungarian-Austrian and Hungarian-Croatian branches.

Russian authorities canceled the South Stream project in December 2014 due to Bulgarian and European impediments, exasperated also by the Crimean crisis and the sanction regime imposed on the Russian Federation[21]. On the first of December, indeed, president Putin has announced during an official state visit in Turkey, that Russia was withdrawing from the South Stream projects accusing Western sanction and lack of building permits on European territory (Klimentev 2014). From that moment, the Russian Federation started to work on two replacing projects: the Tesla Pipeline and the Turkish Stream.

The *Tesla Pipeline* embodies merely a planned connection between the Turkish Stream pipeline and Central Europe, precisely Vienna passing through Greece, Macedonia, Serbia and Hungary.

The *Turkish Stream (Gurbanov 2017)* is still under construction; the pipeline system would lead natural gas from the Russian federation to Turkey passing under the Black Sea. This project replaces the previously deleted South Stream and avoids the Bulgarian National Territory. The TurkStream agreement was signed in 2016 and the construction followed few months, however this is not the first direct pipeline connection between Russian energy sources and the Turkish territory. In 2005, indeed, was accomplished the *Blue Stream* – first straight line from Moscow to Ankara.

[21] Other implication that have led to the cancellation of the South Stream project are: a) it was seen as a strong rival to the Nabucco pipeline project; b) the refusal of Italian Former Prime Minister Romano Prodi to became the Chairman of the South Stream AG deeply upset Gazprom board; c) the Timchenko scandal that disclosed that behind the Bulgarian Stroytransgaz (in charge of building the main land-bases pipeline segment) was the sanctioned Gennady Timchenko due to its interference in the Crimean referendum.

### 2.2.5 Nabucco Project

The Nabucco project is also called the Nabucco-West or Tukey –Austria pipeline, and it represents a possible all land-based route for natural gas. The main purpose of the Nabucco project is to increment supply diversity decreasing European dependence rate from Russian energy imports. The project in question was strongly promoted and supported by the European Union and the United States of America and it was also seen as a valid competitor of the South Stream project and of the increased accessibility of LNG from Middle-East and African countries. The main gas supplier was supposed to be Iraq, to which Azerbaijan, Turkmenistan and Egypt gas would have been added; however, after the discovery of the Shah Denix's reservoirs[22] the Trans-Adriatic Pipeline projects sub-classed the Nabucco pipeline in June 2013.


Figure 12. Nabucco Project, TAP and TANAP pipelines. Source: <https:www.aa.com.tr>.

For the European Union, indeed, the Nabucco project represented a strategic development: a direct and stable connection to natural gas sources of the Caspian and Middle East Region, bypassing the Russian ones. The intention to decrease European energy dependence from Russia was (and still is) the top point of the European Commission's Agenda; the European energy demand, as well as the world's one, is expected to increase in the forthcoming years, and it is possible that Moscow would not be able to meet the increased demand. The search for new stable and safe energy sources is vital for importer States: Nabucco, indeed, aimed to diversify energy suppliers increasing competition and security of supply.

[22] The Shah Deniz is indeed the largest gas field present in Azerbaijan, situated in the Southern part of the Caspian Sea (70 km from Baku). Discovered in 1999, the reservoir has the same area of the Manhattan Island and its reserves amount to approximately 1,5-3,0 billion barrels. The South Caucasus Pipeline connects the field to Turkey passing across the Georgian territory; in 2008, the authorities began to project an expansion of gas extraction and export (Shah Deniz 2). In 2013 the final agreement was signed in Baku, Shah Deniz is considered the main alternative for non-Russian gas import to European Countries. Nabucco Pipeline project overview online on: <https://www.hydrocarbons-technology.com> (2018-10-13).

The main concerns regarding the projects had to do with security and economic issues. First of all, the opponents of Nabucco stressed out the unsafety of the pipelines that should pass near instable regions in the South Caucasus. Second, the pipeline was criticized because convenient only for few European Member States, and so considered uneconomic. As a matter of facts, the main criticism was moved from Russian authorities due to the actual possibility to cheaper and more secure gas supply for the continent coming from not-Russian fields. The only political condemnation was moved from the non-Governmental sector due to the support given to the authoritarian regime in Turkmenistan by the accomplishment of the Nabucco project, which would challenge the fundamental EU policy of Human Rights. Overall the Nabucco project seems to be a valid alternative to the Russian pipelines network.

Unfortunately, after the Ankara Agreement, the proposal was submitted to the Shah Deniz consortium, which firstly agreed to join as a 50% partner and then has chosen the Trans Adriatic Pipeline as export route for the extracted oil and gas – marking the end of the Nabucco project in 2013 (Dempsey 2013).

### Southern Gas Corridor

The main aim of the Southern gas Corridor (SGC), as well as most European energy projects, is to moderate the European dependency from Russian gas imports creating a different stream, an alternative route connecting Azerbaijani reservoirs to the continent consisting in the South Caucasus Pipeline, the Trans Anatolian and Trans Adriatic Pipeline.

The European Commission launched the proposal of the construction of such corridor in 2008 (European Commission 2008); Western States severely dependent on Russian primary energy needed urgently to diversify their energy sources. The Commission's initiative intended to develop a stable gas flow from other energy producing countries bypassing Moscow. During the preparatory work of the proposal, the European Union has identified several energy-producing partners suitable for this kind of cooperation, such as Azerbaijan (central player due to the Shah Deniz reservoir), Turkey, Georgia, Turkmenistan, Kazakhstan, Iraq, Egypt and Mashreq countries[23]. Even if the Russian Federation represents still the main energy supplier for almost all EU Members, the ongoing disputes between the Kremlin and key transit countries (see the tension with Ukraine, Georgia and Poland) undermine the confidence of stable future energy flows. In this perspective, the main goal of the Southern Gas Corridor is to further differentiate European Energy suppliers and find some alternative not-Russian energy sources.

[23] Iran and Uzbekistan currently are not enlisted because of the political tension and the domestic politic choices of the Countries, however political conditions allowing, they might represent additional noteworthy supply sources for the continent.

According to the Commission's draft proposal, the Southern Gas Corridor will interest the territories of Georgia, Turkey, Greece, Albania and Italy and it is going to be assembled by the connection of three main projects[24]:

1. South Caucasus Pipeline specific extension (SCPx), which would connect Azerbaijan and Georgia.
2. Trans Anatolian Pipeline (TANAP) across Turkey.
3. Trans-Adriatic Pipeline (TAP) through Greece and Albania reaching the Italian coast.

However, even if the project represents a possible improvement of the energy issues related to the European Union, it is not alien to criticism. The Southern Gas Corridor has attracted indeed very mixed reaction form the International Society and it has been also targeted by several worldwide protests and petitions mainly for its environmental and political possible (and for someone probable) consequences. In Italy, for example, the main concern of Corridor's opponents is the environmental damage of the coast provoked by the construction of the TAP processing terminal[25]. Another noteworthy issue concerns the creation itself of the Southern Gas Corridor which would definitely contributing to finance and support Azerbaijani Government, considered by several international NGOs and think-tank as repressive (CEE Bankwatch Network 2016) where journalistic (and not only) freedom of speech is not always protected[26]. With the construction of the SGC, indeed, and the long-term energy flow, the European Union will bound itself to Azerbaijan.

#### 2.2.6.1 South Caucasus Pipeline

Constructed primarily for the transport of natural gas from the Shah Deniz field, the South Caucasus Pipeline (SCP) is 692 kilometers long. This particular channel starts in Azerbaijan and ends in Turkey, due to its all land-based path it is also known as the Baku-Tbilisi-Erzurum pipeline. Actually, the South Caucasus pipeline runs exactly parallel to the Baku-Tbilisi-Ceyhan line (BTC), reserved for crude oil export; the main difference is that the BTC tours south after Erzurum right to the Mediterranean.

[24] The total length of the Corridor given by the combination of these three main vectors is expected to be nearly 3,500 kilometers. However, the project includes also other side-plans such as the development of the Shah Deniz 2 field in the Caspian Sea and the expansion of the Italian gas transmission grid and of the Sangachal energy processing plant. Southern Gas Corridor overview online on: <https://www.hydrocarbons-technology.com/> (2018-10-31).

[25] For further details, see the "olive trees issue" – paragraph 2.2.6.3.

[26] For this reason, more than 27 different international Non-Governmental Organizations have submitted reclaims letters to the European International Bank in order to stop the founding of the SGC claiming the violation of human right by the Azerbaijan Government (torture, unfair imprisonment and disruption of protests, journalist investigation and human rights monitoring committee). See: CEE Bankwatch Network 2016.

The main purpose of this long gas line is to guarantee a stable energy supply to Turkey and Georgia, without involving the Russian Federation especially after the tensions concerning the territories of South Ossetia. In a more long-term perspective, the South Caucasus Pipeline might ensure natural gas to the whole Europe simply by establishing a connection with the Trans Adriatic or Trans-Anatolian gas Pipelines

#### 2.2.6.2 Trans Anatolian Pipeline

The construction of the Trans-Anatolian Pipeline (TANAP) formally started in 2015 and the 1,805 km long route is planned to be completed for the end of 2018. This massive pipeline starts in Azerbaijan and it should bring natural gas to Europe via Georgia and Turkey. The TANAP represents the core of the Southern Gas Corridor, which ensure the passage of the Shah Deniz's gas to Europe though the TANAP, TAP and SCP[27] – this particular project is very important in geopolitical terms because it deeply strengthen Turkey role as a regional energy player and, at the same time, bypass the traditional Easter Europe transit States.

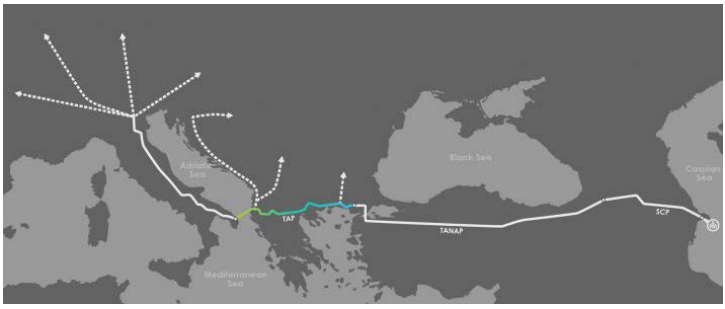


Figure 13. Southern Gas Corridor. Source: Caucasus Business Week, www.cbw.ge.

The TANAP project was announced during the Third Black Sea Energy and Economic Forum, held in Istanbul on 17 November 2011[28]; following the proclamation Turkey, Azerbaijan and Georgia began working on the technical and political ground for this massive pipeline[29]. The main controversies surrounding

[27] More precisely, the pipeline starts from the Sangachal terminal (Azerbaijan) as an expansion of the already build South Caucasus Pipeline (SCP); from the end of the SCP in Erzurum (Turkey) it will follow through the territories of Greece and Albania ending in Italy. At the Turkey-Greece border, the TANAP should branch off connecting with the TAP and proceeding to Macedonia, Serbia and Hungary. <https://www.tanap.com> (2018-10-31).

[28] Ibidem. Ripetere fonte.

[29] On March 17, 2015, both Erdogan and Aliyev met with Giorgi Margvelashvili, President of Georgia, in the city of Kars in Eastern Turkey to formally lay the foundations for the pipeline and marking the work as started.

the TANAP project are environmental concerns due to the construction of a considerable gas infrastructure that will undoubtedly bond Europe to generous fossil fuels consumption for decades leading to increased CO2 emissions. The 1,850 km pipeline was inaugurated during a ceremony held in Eskisehir (Turkey) on 12 June 2018. The Engineering and Design group Manager for TANAP Alper Tasdemir has celebrated with these words:

> This project is the gas bridge between the Caspian Sea and Europe it's incredibly important, not just from a gas supply safety point of view, but because it will create more options in the market and open many jobs to people in Turkey, Greece, Italy, Albania, Georgia and Azerbaijan. […] Seeing the pipeline filled with gas. Knowing that your design works. That's always going to be the best moment for me (WorleyParsons 2018).

#### 2.2.6.3 Trans Adriatic Pipeline

The Trans Adriatic Pipeline (TAP) is a pipeline project aimed to transport natural gas from the Shah Deniz 2 gas field. Since it was projected in order to enhance energy security by diversifying European gas suppliers, this pipeline in particular is highly sustained by all European institutions, State Members and International Organizations as a *Common Interest Project* and further development of the Southern gas Corridor.

The Trans Adriatic Pipeline AG, a joint venture registered in Switzerland, owns and is responsible for the development of the pipeline. The TAP starts in Greece, and it should transport the Azerbaijan gas via Albania to Italy passing under the Adriatic Sea; the Trans Adriatic Pipeline represents an extension of the South Caucasus Pipeline and the planned Trans Anatolian Pipeline.

The main problems surrounding the construction of the TAP were not feasibility problems, although more political ones: in 2007, when the basic engineering was over, Greece, indeed, opposed for the chosen route through Albania, which would become this way a strategic transmission hub for all gas destined to Western Balkans. Also, local citizens and national governments protested actively against the Trans Adriatic Pipeline but mostly for environmental reasons. Noteworthy is the Italian complaint regarding the safeguard of the historical olive grove situated in Melendugno, small town in the countryside in Apulia, where TAP engineers projected the construction of a huge gas terminal. The area where the olives live is quite strategic because it allows the construction of gas station just in where the pipeline is supposed to reemerge from the water; however, moving the century-old trees to alternative and safe location cannot ensure their survival after the transplant. For the environmentalists, deep concerns arise also about the pollution of the coast due to the gas pumping; few of the most beloved Italian summer destination might suffer from touristic decrease not mentioning the ecological damages (Gurbanov 2017). The Italian Government is teared apart because in a certain way, the TAP definitely will benefit National economy, but it might also create opportunities for local organized crime

and corruption to flourish infiltrating in public tenders – and of course there is also the environmental issue.

Despite these concerns, in 2012 the Trans Adriatic Pipeline due to its technical and strategic features was one of the two projects chosen to enter in strictly exclusive dialogue with the Shah Deniz Consortium. The selection was made between the Nabucco Project and the TAP, finally chosen as a referential and selected route for Azerbeijan gas to Europe.

According to the official updates, at the beginning of the fourth quarter of 2018, the TAP project results to be completed for the 80%[30].

### 2.3 Impact of sanctions on Russian energy sector

Starting from 2014, the European Union in alliance with the United States of America has imposed a wide range of sanctions on the Russian Federation in response of its involvement in the Ukrainian domestic political matters. The sanctioned regime did not however target directly the trade of oil and gas, but prohibited for example to American energy companies to take part in several upstream ventures in Russia imposing also firm controls over the provision of finances and technologies to any energy project (Avis 2017). The main aim of those restrictions was to inflict substantial damages to the Russian economy limiting its possibility to export energy and, consequently, make profits on it. Given the small size of the Russian-American energy trade, the evolution of the European energy market towards Russia represented a focal point of sanctions implementation and due to the absence of significant short-term damages on Russian energy trade the US Congress has decided to raise the stake.

In August 2017, the American Administration imposed additional sanctions on Russian energy sector tightening the previous restrictions and including further sanctions against non-US entities supporting or investing in Russian oil and gas pipeline networks. These new measures, indeed, were more focused and represented a bigger potential impact for the European-Russian energy cooperation by delaying and obstructing the development of several projects. Russian authorities, although, have demonstrate an incredible ability in coping with these restrictions reaching significant levels of energy production and export by developing a more "Eastward oriented" strategy. Given the sanction regime and the European desire to reduce energy dependence by diversifying suppliers, Moscow has managed to pursue effectively its energy goals investing in the development of eastern energy fields and in Asian-oriented export[31]. The Chinese, and by generalization the Asian, market offers to Russian companies

[30] See: <https://www.tap-ag.it> (2018-10-31).

[31] Asian crude energy sales have increased indeed over 45% since 2013 and, in 2016, the Russian Federation overtook Saudi Arabia becoming China's first crude supplier accounting for 14% of National total crude oil annual imports. Currently the project of the "Power of Siberia Pipeline" is under discussion but, beside the construction of this direct stream

attractive future prospects given the sustained increased energy demand meanwhile the European oil demand is in long-term decline.

Although the Kremlin's plans for Asia persisted, the Russian Federation never stopped investing in the European Energy market; enhancing and protects its shares of EU import was crucial for National economy. For this reason, on September 13 2018, the US Secretary of Energy Rick Perry has met his Russian counterpart Alexander Novak in Moscow, asserting the possibility to impose sanctions on the new Nord Stream2 project, which would have definitely grave on European energy dependence. The American administration is firm in easing Europe's vulnerability to Russian (energy) influence; threatened increased sanction and export of American LNG to the continent represent Trump's *aces in the hole*. Stopping the German-Russian pipeline project indeed, according to the Senate Committee on Energy and Natural Resources, will benefit national, economic, politic and geopolitical security of the United States of America (Grigas 2018).

According to the Carnegie Moscow Center, the current sanctions imposed on Russia have barely affected the international hydrocarbon marked without provoking any catastrophic destabilization or price shocks (ensured if a total energy embargo would be imposed on an exporter significant as Russia). Nonetheless, these restrictions are completely able to jeopardize Russian future energy production by severely slowing down the development of export infrastructures confining the State to its own domestic market (Mitrova 2018). The sanctions passed in 2014-2017, indeed, were drafted exceedingly vague; the main problem for Russian gas sector is represented by the application of the Countering America's Adversaries Sanctions Act, signed by President Donald Trump in August 2017. This document allows to the US president the power to impose directly sanctions blocking any operation exceeding $5million a year, which delivers technical equipment and services for the building or maintenance of pipelines if: a) The pipelines threat US National Interest and b) The sanctions are implemented after preliminary consultation with Washington's European partners[32]. Despite such initiative, Russian energy companies have adapted to the situation managing even to increase production favored by previous foreign investments, tax privileges and the devaluation of the ruble. In the long-run, in order to reach set goals of production, Moscow must adopt methods for intensifying production of existing wells such as hydraulic fracturing and exploit non-traditional oil reserves both on land and offshore (Western Siberia and Artic shelf).

from Russia to China, new additional sales to all Asia might be delivered as LNG (previous the construction of new export and import terminals). See: Avis 2017.

[32] European States were usual defending Gazprom against American "attacks" not adopting sanctions, however they were unable to block or bypass Washington's imposition of personal sanction on Gazprom's head Alexei Miller in 2018. See: Mitrova 2018.

For the moment, the restrictions are not ironclad; Russian companies are investing nonstop in their growth but the Country seeks international financing in order to maintain its relevance on the International markets and stem all new supply competitors, which may lead to a significant restriction of European export.

### 2.3.1 Russian Approach in dealing with Sanctions

Sanctions represent a common international practice aimed to express political or ideological dissent in a concrete way, 'punishing' in some cases the counterpart for illicit behavior. Without undermining the range of action of the offending country, sanctions close off avenues for future growth and development 'asphyxiating' the State; the consequences of the economic restrictions are not immediately visible, thus, the situation declines progressively resulting in economic stagnation, unless strong action are not taken. Because of this ambiguity, International and Russian analytics are sharply divided over the possible future effects of sanctions on the Russian Federation. On one hand, experts are firmly convinced that the sanctions will have no effect on the energy sector and, furthermore, they will definitely stimulate national technologic and economic development; on the other hand, other believes that they will unquestionably bring catastrophic consequences given the high dependence of the Russian energy sector on foreign investments and technologies. However, current trends, seems to corroborate the forecast of the first group of experts thanks to the proper and prompt intervention of Russian Authorities.

After the Crimean annexing[33] and the beginning of western sanctions on Russia indeed, President Vladimir Putin has adopted a multifaceted approach towards these restrictions mitigating their overall impact, especially in the energy sector; the 1998 fall of oil prices has undeniably taught the Russian authorities the importance of keeping strong international financial reserves, built previously during high energy prices[34]. Learning from experience, the steady and large buildup in financial reserves enabled the Federation to stem successfully the economic impact of international sanctions strengthening the financial stability of the country. The available assets where used to financially support investments in domestic economy and partially compensating the remarkable debts of state-owned companies. As what concerns the energy sector, the ruble's drop and decrease of imports have boosted the development of national

[33] After the Crimean Status Referendum of 16 March 2014, the peninsula was annexed to the Russian Federation and represents still parts of the National territory (Republic of Crimea and the city of Sevastopol are indeed two Russian Federal subjects).

[34] Vladimir Putin was in charge as Prime Minister in 1998, when oil prices have dropped to about $10 per barrel; in order to compensate lost profits foreign imports of good was cut, affecting deeply the purchase of equipment and services destined for the development of national energy sector. Under Putin's leadership in 2004 National international reserves accounted nearly $100 billion, peaking almost $600 billion in 2008 (impressive results compared to the $12 billion reserve of 1998). See: Coote 2018.

production, which was able to replace foreign technological assets and services (Chang 2017 ). National financial reserves were restored in a year, and today the investments in energy production are robust: according to the US Energy Information Administration (EIA) in 2016, indeed, Rosneft (Russian bigger oil producer) increased its investments of 33% (Barden 2016). However, Putin's action was outlined also by other significant elements, such as:

- increasing natural gas exports to Europe;
- enhancing the importance of the Asian market, increasing also the energy export to China and other Asian States;
- sustained effort to decrease the competition in the European energy market by sheltering it from other energy producers (particularly Azerbaijan, Kazakhstan and Turkmenistan).

Despite the sanction regime, Russian energy production did not decrease, but on the contrary, it raised over the years (Fig. 14).

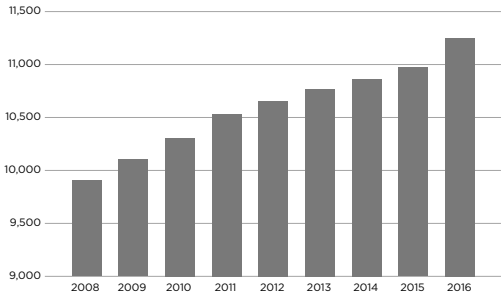


Figure 14. Russian annual oil production (thousand barrels per day). Source: Coote B., "Impact of Sanctions on Russia's Energy Sector", Atlantic Council – Global energy center, March 2018.

The steady growth of oil and overall energy production was possible thanks to a combination of several different factors, including among the ones cited above also the uneven application of American and European Sanction. The European Union has represented (and still is) an important trade-partner of the Russian Federation: the EU exports have declined annually by 20.7% between 2013 and 2016 meanwhile they were substantially rising in the previous years (European Parliament 2017). This mutual economic loss, has led to sanction's non-compliance behavior of States and private firms by bypassing or not adopting the regime. The diversification and redirection of markets allowed to the Russian Federation to continue its energy production and economic growth. Although the energy market currently is giving its lifetime performance, the future of hydrocarbons is uncertain: alternative energy sources are under investigation. Moscow is aware of the need to invest in the development of Russian renewable energy production.

## 2.4 Renewable Energy in Russia

> "In accordance with Russia's national energy Strategy, renewable electricity generation in Russia will increase several-fold in the next 20 years. Also, the development of renewable resource technology will help us gain the competencies needed to shape the global energy field of the future, including the development our own technologies", Vladimir Putin[35].

Even if Russia is generally considered worldwide merely as an "oil and gas country", Moscow is also a top leading renewable energy producer. Today the Russian Federation can count on an expanding green energy sector, which should reach according national forecast 4.5% by 2024 (Heidemann 2018), after a significant wave of foreign investments in new developing projects. In an official statement, President Putin confirms this expectation with the following words:

> Being a leading energy nation, Russia understands well its role and responsibility in providing sustainability and the development of the global energy sector. [...] We are employing effective mechanisms to support investment in renewable electricity generation, so investors can earn guaranteed profits (Official Internet Resources of the President of Russia 2017).

However, the development of renewables still represents an important milestone for this 'fossil-colossal', and even if green electricity seems to be an established practice in Russia, the adoption of green energy in different fields is still a new and challenging trend.

The abundance of fossil fuels, indeed, resulted in no compelling need for the research and development of other energy sources during the economic growth in the Soviet era; nevertheless, in those times some of the largest national hydropower stations were constructed in order to exploit the power of natural territorial conformation. Just in 2008, following the international economic crisis, the Russian Prime Minister Dmitry Medvedev has urged the promotion and development of the renewable sector. The heads of the Federation are indeed aware of energy shortcomings: fossil fuels will not last forever; the need to find alternative energy sources in order to support national economy and society is actual and compulsory. The main legal basis for the current green expansion in Russia lay in the adoption of the Decree 449 in 2013[36], which states that renew-

[35] Official Internet Resources *of the President of Russia 2017.*

[36] More exactly, Russian lawmakers started to focus on renewables in 2007 when the amendment to the Law on Electricity attempted to legally link renewable energy sources to the National Electricity-generation system with no success. In 2011 further changes on the law produced reasonable profit prospects for green-investments, which have led to the Decree 449 creating a legal framework for the inclusion on renewable sources in the Russian electricity market. See: Decree of the Russian Government 2013.

able supplies in the National electric generation system must be accounted for no less than 5MW.

The main innovation introduced by the Decree is definitely the establishment of long-term agreements between renewable energy producers and the Russian energy structure. Tender procedures, indeed, grant to potential suppliers the right to join those agreements; according to the Decree's guideline, tenders have to be conducted by administrators of the trading system (ATS) and ensure to the winner supplier 15-year fixed tariffs payed directly by the State[37]. In exchange of this profitable and almost permanent price treatment, potential suppliers must create under the obligations of the contract renewable energy flows within prearranged parameters of capacity, timing and localization – if not respected, sensible penalties for delays in supply are provided by the contract itself.

The adoption of the Decree boosts Russian green electricity, and the entire renewable energy sector began to develop: today new players are confronting new conditions, working on new challenges and projects. Even if clean energy sources are incrementing, compared to the size of Russian energy production the attempt seems not being enough (especially if it is not paired with proper national environmental policies). However, Moscow is very close in reaching the targets established on State level, becoming a leader also in the green electricity sector.

After the 2013 Decree implementation, the novel suppliers are facing a new range of obstacles and the main ones are the following:

1. tender formal requirements and precise technical drafts;
2. most key technologies required by the renewable sector are currently not produced within the Russian territory;
3. in general, ATC tenders complicate furthermore the creation of joint ventures over lease and constructions deals, requiring necessarily the participation of at least one Russian partner in the supply process.

In this scenario, where bidders are induced to coordinate with third suppliers for precise technical components, the Enel Group has been deeply advantaged –mainly Enel Russia. Enel indeed, through its section *Enel Green Power* and its amazing work in supplying green electricity worldwide, was able to win the tender for one of the most gigantic renewables projects ever made in the Russian Federation: the construction of a wind power plant in the Azov Region.

### 2.4.1 Enel Russia and Green Energy

Enel Russia represents a power generation company founded in 2004 and registered in Yekaterinburg. The Company is a semi-independent branch of the

[37] The agreement include the following conditions: yearly tenders, organized by ATS, specify capacities offered to potential suppliers, which should submit their bids attaching the technical description of the project specifying also the localization of the renewable source and financial guarantees for potential obligations. The ATS is responsible for selecting the winning technical proposals concluding the agreement on energy capacity. See: Decree of the Russian Government 2013.

Enel Group[38]; it follows Enel's main principles and Strategies although maintaining a certain level of autonomy concerning domestic activity. In 2017, the company registered a Net Income record due to an unprecedented increase in EBITDA of +27.5%[39] (*Appendix B.2*) triggered by EBIT increase and lower net financial charges.

Enel Russia owns and directly operates four major energy power plants located within the Russian territory[40]:

- Reftinskaya GRES (3,800 MW).
- Sredneuralskaya GRES (1,578.5 MW).
- Nevinnomysskaya GRES (1,530.2 MW).
- Konakovskaya GRES (2,520 MW).

The Enel Russia administration, according the guidelines of the Group, is deeply active in pursuing maximum energy efficiency and minimum environmental impact.

In the sphere of environmental preservation, indeed, the Enel group has developed in 2009 (and subsequently adopted) the *Health, Safety and Environment Policy*[41], which is based entirely on two main core concepts: ecological safety and balanced use of natural resources. The central aim of this Policy is pushing the company (and its partners) towards constant improvement in environmental performances, adopting at the same time the most efficient and eco-friendly technologies among the Enel family.

In the efficiency pursue, the Enel Russia administration, following the eco-friendly guidelines of the Policy, has installed special bag filters in the coal-fired Reftinskaya power plant reducing n this way the dust particles emissions to 98%[42]. Additionally, in 2015, in the plant was installed a dry removal ash system, which has contributed to was launched decrease sharply the environmental impact. The transition from traditional hydraulic treatment of ashes to a dry one, indeed, never happened in any Russian power generation utility before – Enel Russia represents a true pioneer in the sector.

[38] Enel (National Board for Electricity – Ente nazionale per l'energia elettrica) is an Italian multinational manufacturer and distributor of electricity and gas, established as a public body in 1962. In 1999, after the liberalization of the Italian electricity market, the company was privatized though the Italian Ministry of Economy and Finance represents still the main stakeholder with 23,6% of shares. By revenues, Enel is the 84th largest world company – €70.59 billion. In 2017, Enel's net income increased over 47% comparing to the previous years. See *infra: Appendix B.1.*

[39] Information released on the Enel Russia online website: <https://www.enelrussia.ru/ru/investors.html> (2018-10-11).

[40] The overall installed capacity of the implants is 9.438,7 MW of power and 2,382Gcal/h of heat capacity. See above.

[41] *Health, Safety and Environment Policy* available online on Enel Russia website: <https://www.enelrussia.ru/en/investors/a201612-ecology-.html> (2018-10-11)

[42] See above.

Enel Green Power S.p.A., born as a small branch of the Enel Group, is actively engaged worldwide operating in 16 counties across the globe. This multinational renewable energy corporation is headed in Rome and its main target is promoting renewable energy at an international level, enhancing hydroelectricity, wind, solar power, geothermal electricity and other green sources among States. At the moment of its foundation, in 2008, Enel Green power represented already the largest European company in the Renewable field; furthermore, in 2014 the Company has won the European Solar Prize in the Industrial and Commercial companies or farmers category[43]. This innovative and greed-devoted society, persists to acquire gradually the development of all the renewable projects supported by Enel the Enel Group, as well as all those discussed within the Enel Investment Holdings: Enel Latin America BV, Erelis Enel and Endesa.

In the occasion of the Russian Investment Forum, held in Sochi on the 25 February 2018, the Enel Russia spokesperson has announced a new project: supported technically by Enel Green Power, the company was able indeed to win the National TSA tender for the realization on the Azov Sea's coast of a wind park with a total capacity of 90MW[44]. The General Director of PJSC "Enel Russia", Carlo Pascialano Villamagna and the Governor of the Rostov region have sealed by challenging deal, launching in the region the development of wind energy generation. The deadline of the assignment is set for 2020; initially the preparatory works were entrusted to the German SOWITEC, subsequently passed to the Enel Russia ownership and, therefore, to the Enel Group[45].

> We are very pleased that one of our investments projects which is aimed at development of wind generation, a new field for our company, will be implemented in Rostov region. This agreement underlines the key role and importance of this region for our company and represents a great opportunity of closer partnership and cooperation for successful implementation for our investment project. Carlo Pascialano Villamagna, Sochi, 15 February 2018[46].

Renewable energy projects represent, indeed, one of the main trends of the current Russian energy policy; according to the statements of President Putin, several new green energy projects have been already completed, meanwhile other are still under construction across the Russian territory. With the support

[43] Enel Green Power winner of European Solar Prize 2014 honored in Rome. See: *Eurosolar winners archive:* <https://www.eurosolar.de/en/index.php/events/european-solar-prize-eurosolar/archive-winners/771-winners-of-european-solar-prize-2014-honored-in-rome-new> (2018-11-21).

[44] The investments for the Azov and Rostov regions declared by Enel Russia amount to 132 min Euro. This top priority implementation of green energy in the areas are called also "the governor's hundred projects". See: *Enel Russia website*, News: <https://www.enelrussia.ru/en/media/news/d201802-enel-russia-and-rostov-region-develop-cooperation-in-the-sphere-of-wind-energy-.html> (2018-10-11).

[45] See above.

[46] See above.

of foreign companies and international corporations (such as the Enel Group), the development of green power station results more affordable and therefore more achievable for Russian companies. Additionally, the initial lack of technical requirements on the domestic ground has led to the establishment of new production facilities in the country due to a high demand of locally produced energy components.

Undoubtedly, the green energy market expects substantial further developments due to the strong support of Russian politicians, President Putin included. Today, in the perspective of the definitive end of the *fossil era*, the Russian renewable field offers more potential and opportunities than ever: the physiognomy of the territory, the abundance of water – solar and wind power, (paired to the wide scale of the Russian Federation), blend into an immense rough potential ready to be exploited.

CHAPTER 3

# European Energy Policy: from dependence to interdependence?

> "Energy trade between Russia and Europe started during the Cold War and has expanded significantly during the last five decades. The EU's reliance on Russian energy, particularly gas, has raised political concerns about the bloc's vulnerability to supply disruptions. However, Russia is at least as dependent on this energy trade as the EU is. Approximately two-thirds of Russia's export revenues originate in energy sales abroad, most of which occur in the European market. Without this income, the Russian state would lack the money to provide basic services to its population", Marco Siddi[1].

The debate over what exactly constitutes energy security is not over yet, it represents indeed one of the most sensitive and controversial arguments among international scholars. Undoubtedly, the reliance of the European Union on energy imports from foreign States deeply affects energy security of the Union; high energy prices and substantial annual imports, as well as the concrete possibility of total depletion of international energy reserves and the manifestation of regional supply disruptions, deeply concerns national authorities[2].

As analyzed before, overall, World energy demand is rising due to the pressure of Asian and developing countries; in Europe, however, the demand is mostly static or lightly growing because of more efficient technologies and energy saving policies. The inland production of primary energy in the Union (mainly by France, Germany, Poland, Netherland, United Kingdom, Italy

[1] Senior Researcher at the Finnish Institute of International Affairs, quoted in: Dempsey 2017.

[2] Noteworthy is that currently, according to the 2017 EIA database, only Denmark among all EU Members is not deeply dependent from external energy sources. The Republic of Denmark is indeed able to meet domestic energy demand with its own energy production and, furthermore, allocate part of it on the International market; it is a net oil exporter. See: IEA 2011, 26.

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and Denmark)[3] is not enough to meet the demand; this has led inevitably to the establishment of energy dialogue and partnership with third states, such as the Russian Federation.

It is very important to recall that energy security was (and still is) one of the main concerns of the European Union and several other energy dependent States; the target of the political dialogue is to ensure the availability of sufficient supplies at an affordable price[4]. A considerable rate of energy dependence represents a risk and an uncertainty factor for a Political Unit and decision makers are deeply aware of it: the European Commission, indeed, has made several attempts redacting a common energy policy even if the reluctance of Member States to transfer this kind of decision on a subnational level. Energy Security is still an exclusive of National Security. A further 'obstacle', if we can call it that way, is given by the singular energy situations of Member States, determined by different inland production, use and choice of national energy-mixes. Denmark is indeed the only energy exporter (not importer) of the EU; Romania and Estonia, even if importers, maintain very low energy dependence rates due to the presence of a consistent domestic energy production. In addition, Poland and Czech Republic are important coal producers; Nederland meanwhile enjoys the offshore gas production[5]. These innate peculiarities of the European Union make difficult the redaction of common energy policies and strategies; the *energy issue*, however, is still on top of the European Agenda.

> Europe has depended on Russian energy for a long time. For Central and Eastern Europe, it forms part of a legacy supply chain. However, as Russia is increasingly becoming a dangerous adversary, the commercial convenience of geography yields to strategic considerations. Looking forward, Europe is too dependent on Russian energy [...]. What is missing is strategic thinking about the long-term consequences of Russian dependence. When it comes to energy, European nations focus on their domestic markets at the expense of Europe-wide strategy, Krzysztof Bledowsky[6].

[3] According to European Commission 2014, 35.

[4] The main dangerous elements, which are able to jeopardize State's energy security, are mostly technical factors (accidents, calamities or blackouts), political factors (supply interruptions due to wars or diplomacy tensions) and economic ones linked to the prices' growth. The political activity and emission of targeted energy policies can help to avoid shortages and other types of risks; however, the dependence on external energy suppliers is very hard to eradicate. Especially in Europe, self-sufficiency appears ad a mere illusion, rather a long- term plan.

[5] If we tackle only crude oil import, the picture become more homogeneous: only Denmark, Romania, Estonia and Hungary import less than 80% of total domestic oil consumption. See: European Commission 2014, 35-63.

[6] Council Director and Senior Economist at the Manifacturers Alliance for productivity and innovation. See: Dempsey 2017.

## 3.1 European Energy Policy

### 3.1.1 Historical overview

The energy question represented a pivotal feature during the European integration process; from the European Coal and Steel Community to EURATOM, energy has played primary role. However, this desire and will to share sovereignty in the energetic field at a supranational level slowdown significantly in the next decades – Member States became more attached to their inviolable power authority. Furthermore, the deep divergences concerning specific and diverse needs of each State have significantly contributed in rescheduling the drafting of a common European Energy policy until 1992[7]; the Maastricht Treaty has introduced indeed a free-movement regime of goods, labor force, capital and services including gas and electricity. Nevertheless, the complications in shifting national energy policies to supranational levels were several, buy mainly due to the hesitancy of Member States to overcome their national monopolies and let go their margin of autonomy in the sector.

In this historical overview of the main goals achieved by the Union in the establishment and implementation of a common energy policy, it is vital so underline some pivotal steps. The first one is given by:

1. *1957 Rome Treaty*[8]. In this first attempt, the European Economic Community (EEC) was established as well as a common market consecrated to free movements of good, services, capitals and people. The European Atomic Energy Community (EURATOM), adopted in the same year, was indeed oriented to the energy issues, but mainly to the atomic one and for safety reasons (Allen 2017).

In the '80s the idea of a single energy market in the European Union become stronger allowing the European Commission to include energy products and issues in the agenda. The Commission's work spread into several fields such as:

- Information gathering: sharing information about national mixes and patterns of energy consumption.
- Common target setting: in terms of efficiency, pollution and safety for all members.
- Enabling activities: gaining responsibility in activation of new projects giving permissions or authorizations directly to Members.

These milestones are however merely theoretical, no tangible action was undertaken; the decisional power has remained into National hands. Despite this

[7] Even if in the 80's the community action has indeed gained some momentum, only in the 90's the European legislation did affect the question. With the adoption of the *three energy packages* a more ambitious and concise scheme was pictured: not just liberalization and integration, but creation of a single energy market at the Union level with proper interrelated infrastructures and competition regime. See: Verda 2012, 145-55.

[8] Treaty establishing the European Economic Community 1957.

failure, national energy agendas began to change gradually; the single States have shifted their focus on a more efficient allocation of energy resources, stockpiling and price fluctuations. Due to the energy crisis and the growing dependence rate, the idea of the formation of a European Common energy market regained vigor; it would have indeed assured competitiveness, fair costs and (more importantly) a reasonable level of energy supply security. In parallel with the efforts in the creation of the aforementioned market, the European Union has also inaugurated the beginning of a further pivotal step:

2. *Energy Diplomacy*. The European Union endorsed also political arrangements with external suppliers and partners on a Union level, finally. Noteworthy is to mention few of the most significant agreements in the field:

*1989, EC-Gulf Cooperation Council Agreement:* this particular agreement with Arab Counties excluded Iran and Iraq because of political instabilities (European External Action Service 2016); the main targets were: setting energy prices, technologic exchange, financing research and enhance security of supply. The problem surrounding this political maneuver, was the dialogue with a strong and cohesive Arab organization not mentioning the HR and the International field.

*1991, Tacis Program*[9]: the European Commission played here a bigger role financing entirely the program, based on the assistance to 12 ex-Soviet Republics in the energy field. The package contained, indeed, two different and more specific action plans:

1. TRACECA: active from the 1993, the project provisions aimed to the construction of an interconnected energy infrastructure vital for energy flows toward Europe.
2. INOGATE: this project, instead, promoted regional integration of the pipeline network enhancing the investment and private participation[10]. Noteworthy is the absence of the Russian Federation among the members, as well as any European State, represented entirely by the European Union – huge achievement in the creation of a united front.

*1994, Energy Charter Treaty*[11]*:* entered in vigor in April 1998, the Charter provides to the 52 Members a multilateral framework for increased cooperation in the energy field. The Energy Charter is founded on four wide provisions:

1. The protection of foreign investments, based on the extension of national treatment, or most-favoured nation treatment (whichever is more favourable) and protection against key non-commercial risks.
2. Non-discriminatory conditions for trade in energy materials, products and energy-related equipment based on WTO rules, and provisions to ensure

[9] Technical Assistance to the Commonwealth of Independent States and Georgia (TACIS): <http://europa.eu/rapid/press-release_MEMO-92-54_en.htm> (2018-11-16).

[10] INOGATE in brief: <http://www.inogate.org/pages/1?lang=en> (2018-11-16).

[11] The Energy Charter Treaty 1991.

reliable cross-border energy transit flows through pipelines, grids and other means of transportation.
3. The resolution of disputes between participating states, and – in the case of investments – between investors and host states.
4. The promotion of energy efficiency, and attempts to minimise the environmental impact of energy production and use (The Energy Charter Treaty 1994).

The European Commission has lead the Members (European States, ex-Soviet Republics, Turkey), the Special Observers (Canada, USA, Serbia) and also the simple Observers (Iran, Saudi Arabia, Algeria, Morocco, China etc).

*1995, Euro-Mediterranean Partnership:* very broad cooperation in several fields, including energy security. 38 Members devoted to the promotion of stability, security of trade across the Mediterranean region.

*2000, Euro-Russian Dialogue:* double relation with direct and open tables for further collaboration in the energy sector. This dialogue is indeed crucial for this analysis, therefore it is going to be specifically analyzed in the following paragraphs.

*2004, Baku Initiative:* the European Union began an exclusive dialogue with Russian competitors chiefly for enhancing the energy export from different suppliers, decreasing its dependence on Russia. In this initiative is included also the Nabucco case tackled in the previous chapter.

Despite all these EU achievements, the adoption and implementation of a Common energy market was still far away. Until the Treaty of Lisbon, of November 2009, indeed, the legislative action in the energy sphere has remained contained because the previous treaties did not explicitly provide to the European Union expertise and tools for the draft of its own energy policy. The Treaty of Lisbon, on the other hand, officially identifies finally the energy policy as a common competence of the Union, initiating therefore the liberalization and standardization of the European energy market. The Article 194 of the Treaty on the Functioning of the European Union (TFEU) defines the main objectives of the common policy[12], which can be summarized into three macro areas: lib-

[12] *Article 194*: 1. In the context of the establishment and functioning of the internal market and with regard for the need to preserve and improve the environment, Union policy on energy shall aim, in a spirit of solidarity between Member States, to: (a) ensure the functioning of the energy market; (b) ensure security of energy supply in the Union; (c) promote energy efficiency and energy saving and the development of new and renewable forms of energy; and (d) promote the interconnection of energy networks. 2. Without prejudice to the application of other provisions of the Treaties, the European Parliament and the Council, acting in accordance with the ordinary legislative procedure, shall establish the measures necessary to achieve the objectives in paragraph 1. Such measures shall be adopted after consultation of the Economic and Social Committee and the Committee of the Regions. Such measures shall not affect a Member State's right to determine the conditions for exploiting its energy resources, its choice between different energy sources and the general structure of its energy supply, without prejudice to Article 192(2)(c). 3. By way of derogation from paragraph 2, the Council, acting in accordance with a special legislative procedure, shall unanimously and

eralization and integration of the Internal Market; climate-energy directives and foreign energy security policy.

We have already tackled the energy security aspect and the climate concerns are left aside deliberately from this analysis. Proceeding trough the historical events leading to the establishment of a Common European Energy Market, it is important to dedicate some lines especially to few crucial steps:

- the regulatory paradox of the European Energy Market;
- the European legislation in the gas sector;
  and last but not least
- the establishment of the European energy Union.

### 3.1.2 The regulatory paradox

The European Energy policy represented a "regulatory paradox" (Cameron 2005, 62-64) according to the perspective of vertically allocation of regulatory power within the Union. Energy, indeed, since the beginning of the creation of the European Union, has been placed at the core of the process seeming to be the perfect candidate for a solid supranational regulation. Two of the three founding treaties of the Union, indeed, concerned specifically the energy sector[13] laying a solid ground for a further development of the European energy market (goods and services). However, after this *momentum*, the energy issue gradually become more decentralized; the following Treaties did not provide to the Union sufficient competences to deal with this issue at a more comprehensive and common level. Only the Treaty of Maastricht (1992), indeed, mentioned very broadly the energy policy in the general goals of the Treaty[14] without providing any specific competence.

The Treaty of Lisbon (2007) did not change the situation; energy is recognized for the first time as a European common competence allocating the issue to the Title XXI – Energy:

> 1. In the context of the establishment and functioning of the internal market and with regard for the need to preserve and improve the environment, Union policy on energy shall aim, in a spirit of solidarity between Member States, to:
>
> (a) ensure the functioning of the energy market;

after consulting the European Parliament, establish the measures referred to therein when they are primarily of a fiscal nature. <https://www.lisbon-treaty.org>(2018-09-15)

[13] The European Coal and Steel Community (ECSC, Paris 1951) followed by the European Atomic Energy Agency (EURATOM, Rome 1957) represent indeed examples of energy concerns used as the epicenter of cooperation among European States.

[14] Treaty on European Union, Title II "Provision amending the Treaty establishing the European Economic Community with a view to establishing the European Community", Article 3 (t): "For the purposes set out in Article 2, the activities of the Community shall include, as provided in this Treaty and in accordance with the timetable set out therein: (t) measures in the spheres of energy, civil protection and tourism". Online on: <https://www.ecb.europa.eu/ecb/legal/pdf/maastricht_en.pdf> (2018-11-20).

(b) ensure security of energy supply in the Union;
(c) promote energy efficiency and energy saving and the development of new and renewable forms of energy; and
(d) promote the interconnection of energy networks.
2. Without prejudice to the application of other provisions of the Treaties, the European Parliament and the Council, acting in accordance with the ordinary legislative procedure, shall establish the measures necessary to achieve the objectives in paragraph 1. Such measures shall be adopted after consultation of the Economic and Social Committee and the Committee of the Regions.
Such measures shall not affect a Member State's right to determine the conditions for exploiting its energy resources, its choice between different energy sources and the general structure of its energy supply, without prejudice to Article 192(2)(c).
3. By way of derogation from paragraph 2, the Council, acting in accordance with a special legislative procedure, shall unanimously and after consulting the European Parliament, establish the measures referred to therein when they are primarily of a fiscal nature[15].

Even if the following Article outlines the four goals of the European energy policy, it immediately clarifies that "such measures shall not affect a Member State's right to determine the conditions for exploiting its energy resources, its choice between different energy sources and the general structure of its energy supply"[16], shifting to intergovernmental level. Article 194 TFUE represents neatly the hesitancy of Member States to surrender their sovereignty in the energy field. For this reason, the EU Energy Policy has remained one of the weakest areas of the Union; States still consider energy as National strategic jurisdiction. Additionally, the diverse interest of Member States according to their particular energy mixes and security supply priorities have slow down the harmonization processes (Tagliapietra 2014).

> However paradoxical it may appear, energy seems to be the only sector where the Communities, in their almost 60 years of legal development, have been moving from a high degree of integration down to a lower level, never being able to regain the common vision and courage of their founding years (Andoura, Hancher and Van der Woude. Tagliapietra 2014, 4).

Due the lack, in the energy field, of specific provision guaranteed by the Treaties, the Community had a hard time in elaborating a European Energy Policy. Recurring only to general provisions a consistent legislation process had been re-

[15] Article 194, TFUE, online on: <http://www.lisbon-treaty.org/wcm/the-lisbon-treaty/treaty-on-the-functioning-of-the-european-union-and-comments/part-3-union-policies-and-internal-actions/title-xxi-energy/485-article-194.html> (2018-11-20).

[16] See above.

quired; the result is a body of more than 500 legislative acts and documents (Directives, Communications, Decisions, Regulations, Green and White Papers).

The application of the Single European Act (1986) to the energy sector began since the '90s, with the adoption of a series of directives for the liberalization of the European electricity and gas market. The underlying idea behind this attempt was the creation of a fully integrated internal energy market in the EU, following the European single market integration process. These first E-Directive and G-Directive (1996 and 1998)[17] represented a real breakthrough in the sector, establishing for the first time common rules and not just principles for progressive market integration.

The Internal Energy Market (IEM) however, was influenced only in part by a Euro-hierarchic logic:

1. the Commission abstain from scratching Member State's exclusive rights and field of concern;
2. the E- and G-Directives themselves set a minimum threshold allowing different degrees of liberalization. They have prepared just the ground for an integrated energy market[18];
3. lack of the decisive support of the European Court of Justice in the legislative harmonization of the Common energy policy.

Due the absence of a stable European framework, member States began to pursue national liberalization strategies contributing to the creation of a European patchwork; thus, the European Commission was compelled to launch alternative and informal paths of coordination. The *Forum concept* was endorsed by the Union, providing to National ministries and policymakers a common (and entirely voluntary) platform for energy related dialogue. Just in 2009, (six years after the last attempt), the European Community managed to adopt a Third Internal Energy Market Package[19], aiming to fully liberalize the electricity and gas markets.

It is important to underline that since 2005, mainly thanks to the activism of Tony Blair, the evolution of the European energy policy increased sharply linked to environmental concerns. In 2006, indeed, the EU Green Paper on sustainable, competitive and secure energy was issued, flowed by the Energy and Climate package of 2007 and the famous "20-20-20" energy policy targets. However, this only confirms the fails of the EU to create the IEM, still in the developing phases with addition of climate policies.

[17] Directive 96/92/EC of the European Parliament and of the Council of 19 December 1996 concerning common rules for the internal market in electricity. Directive 98/30/EC of the European Parliament and of the Council of 22 June 1998 concerning common rules for the internal market in natural gas.

[18] Considering also the different speed of implementation of the following directives, the EU has adopted a further couple of Directives aiming to liberalized the two markets for large consumers by 2004 (and by 2007 for all). See: Tagliapietra 2014.

[19] Also known as the "Third Energy Package", it target full liberalization of national electricity and gas markets and the completion of the Internal European Energy Market.

From March 2011, the European Agency for the Cooperation of Energy Regulators (ACER)[20] began promoting cooperation on both National and EU levels, monitoring closely the development of gas and electricity infrastructures and grids.

Generally, the European Parliament strongly sustained the creation of the IEM by supporting the transmission of ownership unbundling the electric sector, promoting investments and transparency in the market, cooperation between regulatory powers and enhancing the harmonization of network access. Furthermore, the Parliament has dedicated special importance to consumers' rights obtaining, for example, the recognition of *energy poverty* concept[21]. Other major achievements are[22]:

- 12 September 2017: rules allowing neighbor States to help each other to manage gas crises (cross-border solidarity and transparency of gas supply contracts);
- 2 March 2017: Member State compelled to inform the Commission their intentions before negotiate energy supply with third countries;
- 25 October 2016: Parliament supported the redaction of an EU strategy for liquefied natural gas (LNG), in order to enhance security, decrease CO2 emissions and ensure affordable prices.

Notwithstanding these achievements, the risk is the incomplete advancement of the European energy policy concentrated exclusively on the establishment of the IEM and adoption of environmental-friendly policies, excluding totally the third element of the EU Energy policy's paradigm[23]: Security of supply. Here we can see the EU energy policy regulatory paradox: from epicenter to borderline of the European Union.

### 3.1.3 Current European Energy Dependence

> "The future can wait; the present is Putin's gas", Gianni Riotta[24].

Europe needs energy, Russia has abundance of energy; this could represent a perfect deal if only the energy imports do not entail further consequences. The rise of the energy dependence of the European Union is followed by an increas-

[20] Regulation (EC) No 713/2009.

[21] According to the IEA glossary, Energy Poverty is defined as a "lack of access to modern energy services. These services are defined as household access to electricity and clean cooking facilities (e.g. fuels and stoves that do not cause air pollution in houses)", <https://www.iea.org/about/glossary/e/> (2018-09-15)

[22] From Fact Sheets on the European Union – Internal Energy market: <http://www.europarl.europa.eu/factsheets/en/sheet/45/internal-energy-market> (2018-11-26).

[23] Defined by the EU as "Sustainability, Competitiveness and Security".

[24] Gianni Riotta, Member of the Council on Foreign Relations, quoted in Dempsey 2017.

ing political influence by the Russian Federation[25]. Of course, dependence is a double-edged sword, but for the moment we will consider just one side[26].

The Russian Federation represents indeed the major energy supplier of the European Union; the stability of Member States and the Union itself might be threatened due this concentration of high levels of imports among a small number of partners. According to the EUROSTAT[27] indeed, in 2016, most of EU crude oil supplies arrived from:

- 32% Russian Federation
- 12% Norway
- 8% Nigeria and Saudi Arabia
- 7% Kazakhstan

As what concerns natural gas, the main suppliers were:

- 40% Russian Federation
- 25% Norway
- 12% Algeria

Meanwhile solid fuel (manly coal) were mostly imported from:

- 30% Russian Federation
- 23% Colombia
- 15% Australia

As we can observe, the Russian Federation occupies the top position in the import of any energy related good, with a more than significant share. For what concerns the destination of energy imports, the 80% of oil products are headed to Cyprus, Malta, Greece and Sweden, approximately a third to Austria, Hungary and Italy. Meanwhile about 15% of solid fuels is destined just to Slovakia and Germany[28].

The dependency rate, as we have analyzed in the first chapter, shows the extent to which the economy of a certain State relies upon energy imports in order to meet perfectly its domestic demand[29]. Because the European Union imports yearly more than half of it total energy needs, chiefly from Russia, this energy dependence entails severe consequences for all Member States. In this perspective, the EU has engaged policies aimed to decrease dependence, enhance cooperation with different suppliers increasing energy mix and energy supply security; furthermore, the Union has made important steps in the implementation of a common gas and electricity market at the EU level.

[25] Dempsey 2017.

[26] For further in-depth analysis see paragraph 3.5.

[27] EUROSTAT 2018.

[28] See above.

[29] In 2016, the EU dependency rate was 54%; at the Members level the rate ranges from more than 90% (Malta, Luxembourg, Cyprus) to less than 20% (Estonia, Denmark). See above.

The European Union is aware of its lacks and disadvantages – this represent merely a starting point for a more rosy future.

### 3.2 *Case Study*: European Gas Legislation and regulation pre and post 2008

During the 'monopoly era' of European gas industry, mainly three actors dominated the sector (Stern, Rogers 2014, 50-57): producers (or exporters) that sold gas to merchant transmission companies setting up the shape and value of the market, and local distribution companies (LDCs), which had the duty to resell to final and smaller customers.

International oil and gas companies, such as Shell, Exxon, BP and several others, as well as state-owned joint ventures as British Gas, NAM, Statoil and ENI represented the trend of gas production and export in Europe. Subsequently joined by Gazprom and Qatargas, these titans started to expand downstream their interests only after the liberalization process outclassing European national companies accountable for coordination of demand and supply. The national Merchant transmission companies creating robust long-term contracts with producers, indeed, ensured the presence of gas and energy sufficient to cover national need. These long distant transmission entities, often called "monopolies", covered and dominate entirely domestic markets until the privatization process. The local distribution, mainly under municipal ownership, instead, using low-pressure networks supplied gas to household, small commercial facilities and generally end-users[30]. All the three phases required different precautions and entailed several duties and possible risks.

At the end of the XX century, the European Union aware of the problems concerned the gas and electricity field, began to integrate it in the Single European Market Initiative. Several attempts were made in order to increase competitiveness and enhance liberalization (Haase 2008, 22-43):

1. *First Gas Directive (May 1998).* Initial steps towards innovation, included legal unbundling of the structure and regulated the access of third parties to the market.
2. *Second Gas Directive (June 2003).* Boosted the process demanding the liberalization of access for business companies and all consumers respectively by 2004 and 2007. The separation of subsidiaries for transportation and final supply was necessary, as well as the general regulation by independent authority.
3. *Regulation 1775 (September 2005).* Finally defined the comprehensive regulation for third parties' access: capacity allocation, congestion management and transparency principles.

Overall, before 2008, the strategy adopted by national authorities and biggest energy stakeholders was a sort of extreme slow march toward a common

[30] Characteristic is the Britain case where such companies were all abolished after the nationalization of the gas industry; the British Gas Corporation (BGC) dealt with both the transmission and national distribution. See: Stern, Rogers 2014, 50-57.

goal; most of the European Governments indeed have obstructed, or at least not supported, the liberalization process. However, despite this hitch, positive achievements did take place: the abolition of centralized gas sale organization, abolition of destination clauses[31] and progressive access of third parties.

Because the Second Gas Directive did not ensure the achievement of set targets, in 2009 two further documents were adopted in order to finally accomplish competitiveness and transparency in the internal markets[32]:

1. *Third Gas Directive*[33]
   - Ordered to unbundle of utilities networks from supply businesses by selling them to external companies or entrusting them to independent subsidiary companies.
   - Created the Agency for the Cooperation of Energy Regulators (ACER) in order to coordinate the regulation at the European level and reach a single gas market.
2. *Gas Regulation 71534*
   - Introduced mandatory certification of unbundling requirements to all transmission systems.
   - Established that the entry energy capacity should be decided *a priori* independently from the exit one, with tariffs set according to the market.
   - Required the construction of 12 compulsory pan-EU Network Codes on cross-border rules for guidelines and control purposes.

Differently from the pre-2008 framework, these directives belong to the same model and follow the same speed of progress; the creation of a single market under the Third Package was expected for an established date agreed and defined by all the stakeholders involved.

In 2014, four of the twelve Network Codes were adopted (capacity allocation, balancing, interoperability and tariffs) and the introduction of entry and exit zone tariffs was integrated in mostly all EU gas markets. However, it was very clear that the achievement of a complete liberalized gas market was yet to come: the gears were in motion and the system was unstoppable. After the adoption of the Lisbon Treaty, and especially of the article 194, the compromise between national sovereignty upon energy mix decisions, exploitation of natural resources and taxation and European competences was mastery crafted. The Energy Union of 2015 represents the "biggest chance since the 1951 Coal and Steel Community Treaty" (Bros 2017, 6), and the best is yet to come. Undoubt-

[31] Traditional European long-term gas contracts forbidden the re-selling of gas excesses to markets different from the original destination. As consequence of enhanced competitiveness, this clause was removed from future contracts.

[32] Adopted in June 2009, these two integrations formed a larger set of Internal Energy Market Directives and Regulations, launched within the *Third Package* (means to the EU for the achievement of a single liberalize gas market by 2014).

[33] Haase 2008, 23-28.

[34] Haase 2008, 30.

edly, the achievements have been impressive but the future of the Single European Energy Market (as well as the future of the European energy dependence) is still to be defined.

### 3.3 European Energy Union

The Energy Union Package, adopted in 2015, represents a "Framework strategy for a resilient Energy Union with a Forward-Looking Climate Change Policy" (European Commission 2015). It embodies the bigger change since the Coal and Steel Community Treaty of 1951; the Energy Union is a vision of a fully integrated energy system at the European level, based on the core principles of free competition, liberalization and efficient use of resources. The aim is to ensure free energy flows across borders.

> To reach our goal, we have to move away from an economy driven by fossil fuels, an economy where energy is based on a centralized, supply-side approach and which relies on old technologies and outdated business models (European Commission 2015).

Currently, the EU has several energy rules set at the EU-level, in practice however, it subsists in 28 different National regulatory frameworks. The creation of an integrated energy market is vital for the establishment of a more enhanced competition; for this reason, the documents outlines five correlated dimensions (European Commission 2015):

1. *Energy security, solidarity and trust*:
   - Diversification of supply (energy sources, suppliers and routes).
   - Working together on security of supply.
   - Stronger European role in global energy markets.
   - More transparency on gas supply.

The Commission, indeed, will evaluate options for collective gas purchasing in time of crisis for those Member States that are deeply dependent on a single supplier. Furthermore, with favorable conditions, the Union will consider the reframe of EU-Russian energy relation ensuring the market opening, fair competition, environmental protection and safety, ensuring mutual benefits.

2. *A fully integrated European Energy Market*:
   - The internal market's hardware: connecting markets through interconnections.
   - Implementing and upgrading the internal energy market's software.
   - Enhanced regional cooperation within a common EU framework.
   - A new deal for consumers.
   - Protecting vulnerable consumers.

Citizens must take the ownership of the Energy transition and benefit for new technologies, mainly by reduced bills and expenses.

3. *Energy efficiency contributing to moderation of demand*:

- Increasing energy efficiency in the buildings sector.
- Towards an energy-efficient, decarbonized transport sector.

A new proposal is adopted at the European level, namely bind the EU target for improving energy efficiency to 30% by 2030.

4. *Decarbonizing the economy*:
   - *An ambitious EU Climate policy.*
   - *Becoming the number one in renewables.*

The ambition of the European Climate policy is to reduce greenhouse emissions by 40% (compared to the 1990 levels) and reach the share of 27% of renewables in the 2030 energy mix. The foundation of the European Climate policy remains a well-functioning EU Emissions Trading System.

5. *Research, Innovation and Competitiveness*.

Even if the European Union has engaged in the legislation of the energy area for many years, the comprehensive framework given by the Energy Union Strategy represents an unprecedented event. As we have seen in the paragraphs before, the path toward the creation of a common and fully integrated energy market was no stranger to adversities since the first steps of the Union. The main aim of the Energy Union, launched in February 2015, is to create a secure, sustainable, competitive, and affordable energy flows through Member States. The five core dimensions stressed out by the document embody these targets and represent the main guideline for further sectoral policies.

In November 2017, the EU Commission has adopted the third Report on the State of the Energy Union, showing the achievements already reached. According to it, indeed, the Union is on the track in implementing the project, as well as in the delivering of new jobs, economic growth and investments in the energy sector (European Commission News 2017). The Third evaluative Report states also that the transition to a low-carbon society is not possible without a matched adaptation of the infrastructure to future needs of the new energy system; the transition, however, is forthcoming. Despite all the accomplishments, the electricity sector remains in a quandary; in order to overcome this hurdle, the Commission has adopted a target of 15% by 2030 in electricity interconnection (European Commission News 2017), paired with several other infrastructure projects aimed to complete the IEM. In line with the European energy policy and climate goals, affordable, secure, sustainable and more clean energy must be guaranteed to all citizens.

For the purposes of this particular analysis is very important to linger on the first and the third points. The European desire to enhance energy security of the Community was indeed boosted by the Crimean crisis of 2014; due to the EU's strong reliance on Russian energy exports, the search for alternative suppliers and diversification become more pressing. The target of 30% in increased efficiency, on the other hand, is very meaningful on the paper, but as we have seen before, increased efficiency not always translate into decreased consumption (and subsequently decreased energy dependence and greenhouse emissions).

### 3.3.1 Energy Union: different sides and voices

According to the Briefing of March 2015 on the Energy Union (Erbach 2015), Member States support the initiative to different levels[35]. Germany, for example, endorse specific governmental approaches in achieving the 2030 climate and energy goals calling for enhanced coordination of single national policies. On the other side, the United Kingdom and the Czech Republic were more oriented to a soft and non-legislative approach. As for the first dimension of the Energy Union, the Commission's proposal to institute collective gas supplies, only Poland supports this idea; Norway in particular, as one of the major European gas suppliers, strongly opposed such proposition defined (also by Germany) "incompatible with the liberalization of gas markets in Europe" (Szulecki et al. 2015).

Taking in account expert's opinion, the International Energy Agency (IEA) in the 2014 report (IEA 2014) already has recommended a further integration of the IEM with the establishment of: interlinked networks, EU governance rules for the post-2020 climate and energy framework, high priority to energy efficiency and low-carbon technologies. All point tackled subsequently also by the Energy Union Strategy. The position of the Center for European Policy Studies (CEPS), on the other hand, is slightly more cynical. The Center is concern on some possible risks (Anger, Zannier 2017) brought by the adoption of this document, precisely:

- It might remain a simple bureaucratic attempt.
- Member States might use the Energy Union just for EU funding.
- It could be used as an anti-Russian platform.

The Deputy General Secretary of the European Trade Union Confederation, Jòzef Niemiec, contrarily to the CEPS sees the Energy Union a project with several potential benefits for numerous areas (industry, labor, consumers and environment), (Erbach 2015). Furthermore, the European Alliance of Companies for Energy Efficiency in Buildings (EuroACE) shares the Niemiec's opinion, finding that in order to achieve all the potential advantages the Strategy should provide also a stronger action enhancing the existing building stocks boosting growth and strengthening energy security (Erbach 2015). The NGOs' community, instead, had criticized mainly two different aspects on the Energy Union (Erbach 2015):

- the Energy Union focuses more on diversification of energy suppliers in terms of security instead being focused on the promotion of renewable energy sources;
- the diversification of suppliers might bring the European Union to cooperate with States that lack in Human Right defense or are more subject to terrorist or political risks.

[35] The main position of EU States on the Energy Union can be summarized as: Germany the silent *energiewende* hegemon; France still getting its house in order; Poland between Russia and de-carbonization; Norway securing petroleum interest. See: Szulecki *et al.* 2015.

In response of the EU Energy Union Strategy, the reaction of the Russian Federation is clear: the Kremlin will not be holding hands. With the tangible possibility to lose commercial levers and energy profits, Russia had proposed immediately the construction of the Turkish Stream hoping to persuade Greek's Authorities interfering also with the EU Trans-Anatolian pipeline project (Berzina 2015). Despite the European efforts in diversify its energy supply creating alternative routes, Gazprom still can count on few friends in the Continent – exception made by the Viktor Orban's Hungary (Nougayrède 2015); the energy strategy of the Russian Federation, however, is progressively moving to East.

The Energy Union Tour, foster by Vice-President Šefcovic, promotes increased ownership by all the parties interested by the Strategy[36]. The goal of this itinerant promotion is to transform the Energy Union into reality by 2019. The Vice-President does not meet only national governments (reminding them the importance of National Energy and Climate Plans, NECPs), he tries also to engage European millennials listening to their ideas, concerns and contributions[37]. The implementation of the European Energy Union represents indeed a high concern of the EU – the work never stops.

### 3.4 Euro-Russian Cooperation

The natural outcome produced by the deep gap in European energy production and consumption was the search for cooperation with neighbor energy producing countries, such as the Russian Federation and the former Soviet Union. The Euro-Russian energy cooperation, indeed, dates back to early 1990s when the end of the Cold War offered a unique possibility for overcoming ideological, political and economic divisions investing in the development of the energy sector. Energy, *de facto*, represented a mutual necessity and interest – the growth needs two main things, fuel and cash.

Meanwhile Western Counties were relatively poor in resources, the Russian Federation (and some of the former Soviet Republics) were rich in hydrocarbon but needy of significant investments in the sector and more generally into domestic economies. This combo of mutual benefits has laid down the ground for a stable and institutionalized cooperation. In 1994, the Energy Charter Treaty and the Energy Charter Protocol on Energy Efficiency and Related Environmental Aspects were signed entering into force four years later, in April 1998 (Bahgat 2006, 961-75). The outlined provisions regarded mainly five wide sectors, accordingly:

1. protection and promotion of foreign energy investments;
2. free trade in energy materials, in line with the WTO's directions;

[36] 2017-2018 Energy Union Tour: <https://ec.europa.eu/commission/priorities/energy-union-and-climate/2017-2018-energy-union-tour_en> (2018-11-26).

[37] See above.

3. free energy transit through pipelines and grids;
4. guidelines for resolution of State-to-State or Investor-to-State disputes.

Few years later, the EU-Russia dialogue, launched in 2000, further enhanced the cooperation between the two sides following a simple 'bargain': European investments in exchange of Russian primary energy[38]. According to the IEA forecast, actually, from 2001 up to 2030 the Russian energy industry will require a recurring investment of $22 billion a year (IEA 2017); since the beginning of the cooperation, Western companies have indeed invested in the development of the Russian energy sector, while Moscow actively engaged the construction of several pipeline routes toward Europe[39].

The main purpose of this dialogue it to provide a platform were discuss questions of common interest regarding the energy sector building a closer partnership; regular forums and working groups meeting, as well as the exchanged information through the Technology Centre[40], have significantly contributed to the cause. Even if the European Union has repeatedly confirmed the reliability of the Russian partner as punctual and stable supplier[41], several factors might endanger this fruitful exchange. First, it is necessary to consider the real possibility of Moscow to maintain the current rates of energy production in view of the progressive depletion of reserves; then, the growing European energy dependence from Russian exports rises high concerns. However, in order to understand better the future of the EU-Russian relationship, it is mandatory to dedicate some space at the pivotal points of this partnership starting from the beginning.

[38] After the rise of energy prices and the consequential publication of the EU's Green Paper on Energy Security, this targeted dialogue recognizes the nature of the relationship between Russia and Europe: mutual interests in increasing energy security of the continent. Monaghan, Montanaro-Jankovski 2006, 7.

[39] As mentioned in the previous chapter, the export of Russian oil and natural gas via pipelines represents matter of exclusive jurisdiction of National State-owned companies such as Transneft (oil) and Gazprom (gas). During the Soviet Union, the pipeline infrastructure was projected specifically in order to provide stable energy flows to the Republics and Eastern allies; from 1991 the new Russian Federation has moved towards a growing interest in the European energy market expanding the national pipeline networks.

[40] The International Science and Technology Center (ISTC) was established in 1992 in the perspective of preventing nuclear and WMD proliferation giving to Russia and Newly Independent States intel and cooperation platform. Despite the quite successful, operate of the ISTC, a further boost in energy relationship was given in the second half of 2005, the UK EU Presidency, which involved new dynamism to the dialogue. With the aim to enhance cooperation, the Permanent Partnership Council (PPC) helped to structure the relationship by creating a broader set of interlocutors; the dialogue now comprehends both businesses and political authorities of the EU and Russian Federation. These parties cooperate in four main thematic areas: investment, infrastructures, trade and energy efficiency. Monaghan, Montanaro-Jankovski 2006, 9-10.

[41] Monaghan, Montanaro-Jankovski 2006, 9-10: "The EU has repeatedly confirmed that Russia has been a reliable supplier and has always respected agreed dates, amounts and prices, even during periods of internal political turbulence or dramatic world developments".

The Russian Federation represents indeed one of the most influent and significant World's energy producers, in addition to being the chief actor of European energy-supply security. This complementary economic (inter)dependence[42] has facilitated the creation of a strong relationship between the parties; specifically, the dependence on Russian primary energy has led the European Union to design *ad hoc* several frameworks institutionalizing long-term cooperation.

After the collapse of the Soviet Union, the European Community had to deal with a State involved in internal instabilities and further struggle to adapt to the globalization processes and the new world's map; although these hurdles, the EU pursued firmly the creation of a strong connection with this massive neighbor. The presence of vast human and natural resources attracted the Western interest and the investments in the modernization of the Russian energy industry were believed to facilitate the integration of the European and Russian energy markets (Haghighi 2007, 342). In the International Community, indeed, during those years the concerns on dependence and supply diversification were not raised yet. The Russian Federation, on the other side, has understand the strategic value of the European partnership beyond the political leverage of the "European card" used mainly in US-Soviet relations. After few years, the Russian Duma become closer to the European intents, realizing the existence of a shared concern upon domestic structures and economic interests in both the Federation.

The relations with the EU boosted in number and content, mostly through the Partnership and Cooperation Agreement (PCA), signed in 1994[43], the EU Common Strategy on Russia of 1999[44] and within the Energy Dialogue frameworks, established at the beginning of the XXI century.

### 3.4.1 The Partnership and Cooperation Agreement with Russia (PCA)

The Partnership and Cooperation Agreement with Russia (PCA)[45] represents the legal ground for the cooperation between the Russian Federation and the European Union. With its aim to create a stable economic and technical framework, the PCA also was intended to facilitate Russian accession to WTO. The Chechnya war of December 1994, indeed, heightened the ratification process: the support of Human Rights should be accounted by the PCA. Even if the parties already signed the Partnership and Cooperation Agreement, there was no mention to a common strategy and the EU had no legal ground to assist the Federation in its action.

However, the need of a facilitated trade overcome the Human Rights issue, and in 1996, a provisional treaty was adopted allowing only the trade clauses of

[42] See Conclusions, p.113

[43] See Historical Overview, paragraph 3.1.1.

[44] See: Huakkala, Medvedev 2001.

[45] Partnership and Cooperation Agreement with Russia (PCA) was signed in 1994, into force only in 1997.

PCA to enter into force[46]. After this first tangible achievement, an action plan was also adopted emphasizing the solid development of a substantial partnership with Russia with the aim to promote democracy, economic reforms and Human Rights (Haghighi 2007, 343); all vital spheres of interest to be tackle by the joint agreement. In 1997, finally, the Partnership and Cooperation Agreement with Russia become valid after the ratification, taking into account the strong European willingness to provide technical and economic assistance to the Russian Federation in order to facilitate the implementation of economic reforms in the Country, with the aim to develop subsequently a durable economic cooperation.

As what concerns Energy Relations, the Article 65 of the PCA stated as follows:

> 1. Cooperation shall take place within the principles of the market economy and the European Energy Charter, against a background of the progressive integration of the energy markets in Europe.
> 2. The cooperation shall include among others the followings areas:
> - Improvement of the quality and security of energy supply, in an economic and environmentally sound manner,
> - Formulation of energy policy,
> - Improvement in management and regulation of the energy sector in line with a market economy,
> - The introduction of a range of institutional, legal, fiscal and other conditions necessary to encourage increased energy trade and investment,
> - Promotion of energy saving and energy efficiency,
> - Modernization of energy infrastructure including interconnection of gas supply and electricity networks,
> - The environmental impact of energy production, supply and consumption, in order to prevent or minimize the environmental damage resulting from these activities,
> - Improvement of energy technologies in supply and end use across the range of energy types,
> - Management and technical training in the energy sector[47].

The inclusion of the "improvement of the quality and security of energy supply"[48] as the first area of cooperation highlights the European will to assist the Russian Federation in overcoming possible energy shortages, as well as the common concern to establish a balance between energy security of both the im-

[46] The Interim Agreement on Trade and Trade-related Matters between the European Community and the Russian Federation suggested that, due the importance of the still developing trade between the parties, it was necessary to implement immediately the provisions of the PCA concerning trade and related matters. See: *Official Journal L 323*, Full text of the 1995 Interim Agreement online on Eur-Lex: <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1540776805488&uri=CELEX:21993A1223(01)> (2018-11-26).

[47] Partnership and Cooperation Agreement with Russia, Article 65.

[48] See above.

porter and exporter. In line with this desire, the PCA identifies also the necessity of a European energy policy toward Russia, which should contain a wide range of institutional, legal and fiscal provisions required to increase energy trade and investments in the sector. Furthermore, the Agreement emphasizes the importance of a modernized energy sector, still in the perspective of energy security.

The Partnership and Cooperation Agreement represents a very meaningful document because it lays the ground for the Euro-Russian energy cooperation; the European Union, indeed, had taken on the task of assisting the Russian Federation in improving the management and regulation of the National energy sector in line with the principles of the liberalized market economy.

### 3.4.2 The Common Strategy on Russia

According to the Treaty on European Union (TEU, or Maastricht Treaty), "common strategies" are definite by the European Council and then implemented by the Union[49]. These strategic interests define the guidelines for the European foreign and security policies, and are adopted under the Common Foreign and Security of the European Union (CFSP) framework (or the second pillar) remaining an intergovernmental area of competence. Common strategies, indeed, represents a sort of European political tools compared to the Partnership and Cooperation Agreement with Russia (PCA).

The Article 13 of TEU (now Article 26) mentions the "Union's strategic interests"[50] but it does not clarify exactly what they are, leaving huge flexibility to the European Council in defining them. This un-clarification of the Treaty, indeed, may be the result of an attention lack of Member States, more focused on defining the voting mechanism and not the substance of the strategies. Therefore, the elaboration and adoption of Union's common policies follows the individuation of strong common national interests – intergovernmental concern.

[49] More precisely, the Article 26 of the Consolidated version of the Treaty on European Union (ex Article 13) states that: "1.The European Council shall identify the Union's strategic interests, determine the objectives of and define general guidelines for the common foreign and security policy, including for matters with defense implications. It shall adopt the necessary decisions. If international developments so require, the President of the European Council shall convene an extraordinary meeting of the European Council in order to define the strategic lines of the Union's policy in the face of such developments. 2. The Council shall frame the common foreign and security policy and take the decisions necessary for defining and implementing it on the basis of the general guidelines and strategic lines defined by the European Council. The Council and the High Representative of the Union for Foreign Affairs and Security Policy shall ensure the unity, consistency and effectiveness of action by the Union. 3. The common foreign and security policy shall be put into effect by the High Representative and by the Member States, using national and Union resources". Online on: <http://www.lisbon-treaty.org/wcm/the-lisbon-treaty/treaty-on-european-union-and-comments/title-5-general-provisions-on-the-unions-external-action-and-specific-provisions/chapter-2-specific-provisions-on-the-common-foreign-and-security-policy/section-1-common-provisions/117-article-26.html> (2018-10-26).

[50] See above.

In this scenario, the draft of a Common Strategy on Russia represented a challenging task for the Union; however, it was adopted in 1999 following the 1998's massive ruble devaluation[51]. Besides identifying common strategic goals, such as "creating a stable, open and pluralistic democracy in Russia governed by the rule of law and further maintenance of European stability, and promotion of global security" (Haghighi 2007, 353.), the document outlines several specific areas of action, including the energy sector (European Council 1999).

After the second Chechen war and the adoption of "pseudo-sanctions", the relations with Russia become more complexed. Member States, not enthusiastic to adopt severe measures against the Federation, supported the policy of the European Union disapproving the Russian action but, at the same time, they carried out business with Russia on bilateral basis – especially in the energy sector.

The EU Common Strategy on Russia, however, did not include any reference to concreate measures to be taken, only general objectives to be pursued. The Strategy outlines the joint interest in developing energy policies in order to improve the exploitation and increase efficiency in the management of energy resources – ensuring, therefore stable profits and supply. Noteworthy is the obligation to Member States to develop coherent and complementary policies complying with the Common Strategy; the coordination of National policies is the logical outcome of an efficient European juridical framework toward Russian partnership.

On the other side, in 2000, the Russian Federation has adopted a Medium Term Strategy for the Development of Relations between the Russian Federation and the European Union, establishing their own set of priorities hierarchically different but substantially equal. For example, the reference of the flow of fossil fuels supplies to the Union is shared by both Strategies, but for the European Union it matters security supply, meanwhile for the Russian Federation is merely a guaranteed income – the importance of course is quite different.

### 3.4.3 EU-Russian Energy Dialogue

The energy cooperation represented such a big and complex area of interest that only an Article of the PCA was not enough. Thus, in the occasion of the EU-Russia bilateral summit of October 2000 under the Article 65 of the Partnership and Cooperation Agreement the parties have decided to establish an *Energy Dialogue* in order to enhance energy relation. In the Summit Joint Declaration, the parties have announced the aim to "institute, on a regular basis, an energy dialogue which will enable progress to be made in the definition of and EU-Russia energy partnership and arrangements for it" (European Commis-

[51] During the 1998 economic crisis, the European Union realized that there was no legal instrument in place to face such situation. Although the PCA ensured a balance of interests, it did not addressed any immediate measures. Mainly for this reason, a common strategy between the EU and the Russian Federation was created including (this time) concreate measures. See: Haghighi 2007, 352.

sion 2000). This dialogue was indeed an opportunity to raise all the questions concerned the sector including also the introduction of:

> cooperation on energy saving, rationalization of production and transport infrastructures, European investment possibilities and relations between producer and consumer countries (European Commission 2000).

Since this moment, the EU-Russia energy Dialogue was inaugurated and the establishment of several thematic expert groups followed (European Commission Directorate-General for Energy 2011). The redaction of report concerning detailed proposals and projects in the energy framework has established also the ultimate goal of integration of energy markets by reforming the Russian energy sector and incorporating European energy market's rules. The Joint EU-Russia Statement of 2001, indeed, states that:

> Russia and the European Union share the same concerns regarding the stability of energy markets, the reliability and growth of imports and exports, the need to modernize the Russian energy sector, to improve energy savings and reduce greenhouse gas emissions for energy production and use. The EU recognize Russia as an important partner, a close, reliable and major source of energy resource and a growing supplies of energy products to the European Union [...][52].

The dialogue, indeed, was conceived as a platform for the discussion of common energy interests and concerns with a broadened target of completing the energy market integration and the draft of common energy policies. The main aim of the European Union was the assurance of stable, safe and affordable energy supply; Moscow, on the other hand, had several economic and strategic interest involved too. However, it is very important to underline what the dialogue was about, and what was left aside. The actual participation in the energy field was not tackle by the Dialogue; the infrastructure upgrading, redaction of long-term contracts was matter of the private sector and national energy companies.

Several *Round Tables* on gas, energy strategies and electricity surrounded the Dialogue; here the latest sectoral development were discussed and communicated to the counterpart. This meeting, indeed, were specifically planned for updating purposes; in this vein, the EU has also suggested the construction of an Observation System for Oil and Gas Supply, assisting the common "designing and properly applying Community legislation regarding oil supplies" (Haghighi 2007, 346).

The creation of the EU-Russia Technology Center (November 2002) represents also an important achievement of the EU-Russia energy dialogue; the main purpose of this structure is to reinforce the cooperation in areas of oil, gas, coal, electricity, and renewables advanced technologies. This initiative is indeed

[52] Join Declaration of EU and Russia Summit, Brussels, 3 October 2001, quoted in Haghighi 2007, 345.

one of the most important steps in the establishment of the European energy security, totally in line with the recognized principle of mutual interdependency between importer and exporter countries.

It is appropriate to stress out again that, for the purposes of this analysis, all the cooperation within the Environmental and Climate Change areas achieved under the EU-Russian dialogue was left aside.

### 3.4.4 EU-Russia Common Spaces, 2003-2005

Another important point of the European-Russian relations is the instauration in 2003 of four "common spaces" – fields of enhanced cooperation. In the occasion of the Saint Petersburg Summit in May 2003, indeed, the European Union and the Russian Federation have adopted a Join Statement[53], in the framework of the PCA, reinforcing the cooperation and integration in four strategic areas, accordingly:

- *Long term common economic space: a* blueprint for economic integration and progress in the energy dialogue and trade.
- *Common space of freedom, security and justice: e*mphasis on democratic values (Human Rights and Rule of Law) and ground for an agreement between Europol and the Russian Interior Ministry.
- *Space of cooperation in the field of external security: e*nhanced crisis and migration management, disarmament and non-proliferation WMD processes.
- *Space of research and education, including cultural aspects*[54].

The redaction of this statement is very important since, after the EU enlargement of 2003, the Euro-Russian relationship needed a stronger framework; the strengthening of this strategic partnership symbolizes the convergence on many concerns, such as supporting multilateralism under the UN, the peace in the Middle and fighting international terrorism and the proliferation of weapons of mass destruction[55]. The following Moscow Summit of 2005 represents a crucial step in the implementation process because, through the adoption of a single package of Roadmaps, the four Common Spaces were finally created (European Council 2005a). These Roadmaps define the main common objectives of the EU-Russia relations, a common action plan and the mid-term shared agenda.

However, it is only with the London Summit of 2005 that the four spaces become concrete: the 16th EU-Russia Summit was indeed devoted to the "practical

[53] EU-Russia Summit 2003.

[54] See above.

[55] There are however also dome significant divergences between the Russian Federation and the EU, especially regarding the ratification of the "Kyoto Protocol, Siberian overflight rights, PCA extension and veterinary agreement negotiations and export certification", see: Communication from the Commission to the Council and to the European Parliament on relations with Russia (COM/2004/0106 final). Online on <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52004DC0106:EN:HTML> (2018-11-21)

implementation of the Road Maps for the Four Common Spaces accordingly to the previous Moscow Summit" (European Council 2005b). During this meeting, the leaders have tackled also the Energy Security issues in the framework of the creation of the Integrated Market[56]; furthermore, the authorities have expressed the joint desire to dedicate an entire chapter to Energy Security in the new Partnership Agreement (PA)[57] – the PCA did not possess, as we have already pointed out, such section.

Undoubtedly, the Four Common Spaces represent a real breakthrough in the Euro-Russian (energy) relations.

### 3.4.5 Partnership for Modernization (2010) and Energy Roadmap 2050

Another *momentum* for the Euro-Russian relations was the launch of the Partnership for Modernization (P4M) in 2010 (European Council 2010); the Joint Statement adopted in Rostov-on-Don represents a framework for the promotion of reforms, economic growth, competitiveness and of course modernization of economies and societies. The priority areas outlined in the document are (Longdi 2011):

- increase of investments in medium-small businesses and key sectors for growth, innovation and trade;
- alignment of technical standards;
- improving national and international transports;
- promotion of sustainable and clean economy, as well as energy efficiency;
- enhance the cooperation in R&D, space and innovations.

The P4M represents indeed a stable platform for the coordination and governance of several different national priorities and strategical interests and, of course, a further advancement in the establishment of the four Common Spaces. All the summits and joint declaration adopted between the European Union and the Russian Federation signify additional strengthening and advancement of the relationship between the parties; it is a flexible and endlessly evolving dialogue between two main actors of the International System.

Among all the areas concerning the bilateral cooperation, the energy field represents a pivotal aspect of the Euro-Russian relations. For European Member States the most important guideline for the development of national strategic policies in the perspective of the total transformation of the current European energy system is the "Energy Roadmap 2050" (European Commission 2012) adopted in 2011, which outlines the common EU strategies for de-carbonization

[56] The adoption of the Four Common Spaces ha also laid the ground for the visa liberalization dialogue; however due to the 2014 Crimean Crisis the dialogue on a visa-free regime between EU and Russia was temporary frozen and it is still 'on the paper'.

[57] The European Commission, however, has received the mandate for the PA redaction only in late 2008, after the June 2008 Khanty-Mansiysk Summit and the Nice Summit held in November of the same year. Konoplyanik 2009, 260.

processes, security of supply and increased competitiveness. This paper embodies a long-term strategic framework with defined goals and target to be reached within 2050, such as for example the reduction of greenhouse emissions to 80-95% below 1990 levels (European Commission 2012). Among all the spheres of joint action, the Strategy tackles also the energy sustainability[58] and electricity prices and in the perspective of the Euro-Russian cooperation, this is, indeed, noteworthy. For this reason, in order to implement actually the guidelines and targets of the strategy, a further Roadmap dedicated exclusively to the cooperation between the European Union and the Russian Federation was adopted in 2013 (European Commission 2013); the main aim of this document is enhancing diplomatic ties and economic collaboration. The Roadmap

> should concentrate on an analysis of different scenarios and their impact on EU-Russia energy relations, look into their consequences for the energy sectors, elaborate long-term opportunities and risks of the overall energy supply and demand situation and investigate the potential for long-term cooperation in the field of energy (European Commission 2013, 2).

The growing global energy demand, the relentlessly exploitation of natural energy resources and the following environmental and sustainability issues make compulsory the redaction and adoption of a long-term strategies. The Energy Dialogue between the Russian Federation and the European Union is more active and stronger than ever – we need each other.

[58] However, due to the persistent focus and reliance on fossil fuels and nuclear energy in the majority of EU States, the Roadmap 2050 is accused by many green parties to be merely a "wasted chance". See: Langsdorf 2011, 9.

# Conclusions

> "No one today is ignorant of the part played by energy, not only in science, but in industry, politics, and the whole science of human welfare. From the cradle to the grave, everyone is dependent on nature for an absolutely continuous supply of energy in one or other of its numerous forms. When the supplies are ample, there is prosperity, expansion and development. Where they are not, there is want", F. Soddy 1912[1].

Energy is power. The World is a complexed and multifaceted entity; during the course of time, it has witnessed a *power shift* from traditional powers to emerging ones, but most importantly, it is still witnessing a *power transition*, a reshuffle of traditional energy sources (Quercia 2012). This reallocation of energy flows to new markets occurs in the middle of a delicate alteration of the balance of power between States. The energy security debate takes place inside this double transition; nor for nothing, "power" can relate to the political sphere as well as for the energetic one. In this scenario, energy represents the lifeblood of our system, it allows the aforementioned changes and it supports human activity. Currently, due to the exploitation of international reservoirs, natural energy sources are not only rare, but also expensive and disputed among States – therefore, strategic. In these last years, the *Securitization* process has embraced several diverse factors accountable for the National Security of a political unit; it is no more an army speech. As we have seen, it took time to include energy in the traditional security concepts, and today it might seem unnatural not to do it. The deterrence theory has offered de facto a durable theoretical ground, but at present, other subjects play the leading role.

The rise of global energy demand paired to the uneven geographical distribution of energy resources represents indeed a dangerous combo for any energy importer State. At the European level, the increase of energy dependency rates

[1] Quoted in Haghighi 2007: 1.

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has substantially contributed to the spread and intensification of the energy security debate. The partial interruption of energy supplies to Ukraine[2], heavily affected the relations between the European Union and the Russian Federation. Even if it was (probably) just a power-move without concrete damages to the EU, the European Commission seized the moment promoting the adoption of a Common Energy Policy in order to be prepared for a possible energy disruption (in the best case avoid it) and reshape the EU energy dependence. Diversification of supplies and Liberalization of energy market was the strategy chosen to fight the deep EU reliance on Russian primary energy[3]. In this perspective, the European Union began its work on the construction of alternative pipelines bypassing Moscow, such as the expansion of the Southern Corridor and the Nabucco project, and focusing on the implementation of the common energy market. At the end of the days, Europe needs energy as well as it needs to guarantee its security.

Currently, diversification undeniably is the key for European energy security; the Russian Federation, indeed, is not able to cover for the long-run the growing energy demand of its trade partners and, more significantly, the EU must reduce its dependence in order to decrease the risks and consequences following a disruption of energy supply (Closson 2008). The challenge facing European administrations is not just establish direct, reliable and long-term relations with other partners such as Azerbaijan, but also institute new transportation routes especially for natural gas supplies.

Actual energy consumption trades and future forecasts confirms the core of the Jevons paradox: despite efficiency related breakthroughs, energy demand is intended to rise – and it is steadily rising[4]. Even if the EU demand is proved to be more constant (see chapter one) the increase of the overall energy consumption, due to non-OECD countries, China and other developing States, weight on European energy security. The natural 'evanescence' of hydrocarbons makes them a competitive good: if someone takes a bigger share, for others will remain less. Even if the renewable sources of energy are acquiring increasingly greater role, State's economies remain mostly based on natural gas and oil combustion. En-

[2] On January first, 2006, the Russian Federation did indeed cut off the natural gas planned for Ukraine. Besides the political frictions between these two countries, the Russian actual possibility (and power) to interrupt energy flows opened a window onto imminent severe crisis to Europe. Russia represents indeed one of the biggest energy suppliers for almost every EU Member State. See: Kramer 2006.

[3] The outcome of the Commissions' initiative was the European Green Paper published right in mid-2006; it prescribed the guidelines for Member States national policies and activity, highlighting especially the concepts of "Diversification" and "Liberalization". See: Quercia 2012.

[4] According to the preliminary estimations of the Italian Ministry of Economic Development, indeed, in 2017 World oil demand is increased by 1,6 Mb/d (+1,2 Mb/d comparing to 2016) reaching a total of 97,8 Mb/d, meanwhile the gas demand in increased by 3% (by 1.5% approximately superior than the average growth of the past 5 years). See: Ministero dello Sviluppo Economico – DGSAIE 2018.

ergy relations between European States and the Russian Federation (as well as with the former Soviet Union) had history, but not always a symmetrical one. Since the first energy delivery to the European continent to the beginning of the XX century, it is possible to generalize by affirming that Europe was more dependent on energy than Russia on energy profits, even the position of the European Union in the Energy dialogue was less incisive due to a series of factors (Forsberg 2013). Despite the political restrains and the traditional realist's assumption of EU weakness due the lack of military power might, the Russian Federation neither has used the 'energy weapon' as political leverage in this trade relation. According to Foresberg (2013), objective resources of force are incomparable with the extent of perceived power; in his opinion, the main cause of misunderstanding in the EU and Russia relations is accountable to the "ontology of power". Moscow, always according to Forenberg, did not perceive its dependence on Europe in terms of primary energy export revenues (Forsberg 2013).

This last point is easily contestable although; according to Russian experts, in 2017, the dependence of Russian economy and national budget on energy revenues has begun to grow again. According to the conclusions of the research of the Institute of Economic Growth and Institute for Economic Planning (Институт экономики роста им. Столыпина П. А. совместно с Институтом народнохозяйственного планирования РАН) (Siluanov 2017), the influence of primary energy prices still affects substantially National GDP, despite political denial. The study pointed out also that in 2016 the increase in primary energy exports (due the rise of price and demand) has allowed the growth of the entire budget system by 36% (Siluanov 2017). In order to erase Moscow's "oil dependence", the Ministry of Finance is relaying on the adoption of the 2018's new budgetary system (Siluanov 2017), which would reduce sharply the dependence of the budget on opportunistic revenues (the so-called "easy money"). Therefore, after the policy modification, oil and gas revenues accounted according to average price forecast would determine maximum levels of national expenses, the surplus instead (in case of exceeded forecast) would be transferred to the National Wealth Fund.

Therefore, the European Union, although engaged in supply diversification attempts and dependency reduction, cannot totally turn down Russian gas; the Russian Federation, on the other hand needs Europe too. Marco Siddi, Senior Research fellow of the Finnish Institute of International Affairs, stated that 67% of Russian tax revenues comes from energy exports (Kottasovà 2018); this number is telling. The Euro-Russian energy relation is indeed a strong and balanced Interdependence; is it true that somehow it is possible to live with less income and it is not possible with a consistent reduction of energy power, but neither party is determined in the nearest future to shut down the relationship with the other.

The European and Russian energy policies must acknowledge that this interdependence represents the core of the current World energy setting. Only a straightforward dialogue is likely to enhance EU energy security – no 'energy weapon card' is needed. EU Member States, indeed, acting as rational subjects in line with the Westphalian system would be willing to give the Union part of

their sovereignty and energy-authority to act if this would secure more stable, affordable and secure energy supplies for the years to come. The post Sovereign System is merely an illusion, but we are on the path to a greater energy cooperation at the Euro-level (Kovacovskà 2007) liberalization, diversification and transparency are the steps.

Concluding the redaction of this short analysis, I personally can say to disagree, with the statement of Andreas Kraemer[5]: "Europe needs gas from Russia less than Russia needs to sell it" (Dempsey 2017), and with any other asymmetrical dependency related positions. Like inter-culturalism had took over on multiculturalism[6], after the evolution of the Euro-Russian relations, today in the European Union Interdependence, and no more pure Dependence, reflects the energy relations with the Russian Federation.

[5] R. Andreas Kraemer: Senior Fellow at the Institute for Advanced sustainability studies in Potsdam and Funder and Director Emeritus of the Ecologic Institute.

[6] According to Anthony Giddens, "multiculturalism" has described the integration within the society of alien groups before the current state of the globalization processes; now, "inter-culturalism" provides a better vision of the society where different groups interact in "super-diversity reigns" creating dynamic cultures not merely adaptation and inclusiveness into one cohesive culture. This is the reality of a high-risk-high-opportunity society. See: Giddens 2015, chapter 1.

# Appendixes

## Appendix A

Data extrapolated from IEA website.

Table 4. Russian Oil Production by Region, 2016.

| Region | Thousand b/d |
|---|---|
| West Siberia | 6,294 |
| Khanty-Mansiisk | 4,830 |
| Yamal-Nenets | 977 |
| Other West Siberia | 487 |
| Urals-Volga | 2,498 |
| East Siberia and the Far East | 1,338 |
| Krasnoyarsk | 426 |
| Irkutsk | 364 |
| Sakhalin | 344 |
| Yakutia | 204 |
| Arkhangelsk | 328 |
| Komi Republic | 284 |
| Caspian | 41 |
| Arctic offshore | 36 |
| Other | 57 |
| **Total** | **10,875** |

Source: U.S. Energy Information Administration based on Eastern Bloc Research

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Table 5. Russian Natural Gas Production by Region, 2016.

| Region | Tcf |
|---|---|
| West Siberia | 19.3 |
| Yamal-Nenets | 17.9 |
| Khanty-Mansiisk | 1.2 |
| Tomsk | 0.2 |
| East Siberia and the Far East | 1.7 |
| Sakhalin | 1.0 |
| Krasnoyarsk | 0.5 |
| Irkutsk | 0.1 |
| Yakutia | 0.1 |
| Urals-Volga | 1.1 |
| Orenburg | 0.7 |
| Astrakhan | 0.4 |
| Komi Republic | 0.1 |
| Others | 0.4 |
| **Total** | **22.6** |

Source: U.S. Energy Information Administration based on Eastern Bloc Research

Table 6. Russian Major Crude-oil Pipelines.

| Facility | Status | Capacity (million b/d) | Total length (miles) | Supply regions | Destination | Details |
|---|---|---|---|---|---|---|
| **Western pipelines** | | | | | | |
| Druzhba | operating | 2 | 2,500 | West Siberia and Urals-Volga regions | Europe | completed in 1964 |
| Baltic Pipeline System 1 | operating | 1.5 | 730 | connects to Druzhba | Primorsk Port on the Gulf of Finland | completed in 2001 |
| Baltic Pipeline System 2 | operating | 0.6 | 620 | connects to Druzhba | Ust-Luga Port on the Gulf of Finland | completed in 2012 |
| North-West Pipeline System | inactive | 0.3 | 500 | connects to Druzhba | Butinge, Lithuania and Ventspils, Latvia on the Baltic Sea | completed in 1968; inactive since 2006 |
| Caspian Pipeline Consortium (CPC) | operating | 1.3 by end 2017 | 940 | Tengiz and Kashagan fields in Kazakhstan and Russian Caspian fields | Novorossiysk, Russia on the Black Sea | completed in 2001 |
| Baku-Novorossiysk Pipeline | operating | 0.1 | 830 | Caspian and central Asia, via Sangachal Port, Azerbaijan on the Caspian Sea | Novorossiysk, Russia on the Black Sea | completed in 1996 |
| Omsk-Pavlodar-Atasu Pipeline | operating | 0.2 | 650 | West Siberia and Urals-Volga regions | Pavlodar refinery in Kazakhstan and China via the Kazakhstan-China Pipeline | part of a series of pipelines originally completed in the 1980s |
| **Eastern pipelines** | | | | | | |
| TransSakhalin | operating | 0.2 | 500 | Sakhalin fields (offshore northern Sakhalin) | Pacific seaport of Prigorodnoye (Southern Sakhalin Island) | completed in 2008 |

Table 6. Russian Major Crude-oil Pipelines.

| Facility | Status | Capacity (million b/d) | Total length (miles) | Supply regions | Destination | Details |
|---|---|---|---|---|---|---|
| Eastern Siberia-Pacific Ocean (ESPO) Pipeline | operating | ESPO-1 – 1.2 currently, 1.6 by 2020<br>ESPO-2 – 0.6 currently, 1.0 by 2020<br>China spur – 0.4 currently, 0.6 by 2018 | ESPO-1 – 1,700<br>ESPO-2 – 1,300<br>Daqing spur – 660 | East Siberian fields and, via connecting pipelines, West Siberian fields and Yamal-Nenets region | Pacific seaport of Kozmino with a spur to Daqing, China | ESPO-1 (Taishet-Skovorodino) completed in 2009<br>ESPO-2 (Skovorodino-Kozmino) completed in 2012<br>Skovorodino-Daqing, China spur completed in 2010 |
| Purpe-Samotlor Pipeline | operating | 0.5 | 270 | Yamal-Nenets and Ob Basins | connects to ESPO Pipeline | completed in 2011 |
| Zapolyarye-Purpe Pipeline | operating | 0.6 (expandable to 0.9) | 300 | Zapolyarye and Yamal-Nenets region | connects to ESPO pipeline via the Purpe-Samotlor pipeline | completed in 2017; initially expected to operate below capacity as development at connected oil fields has been delayed |
| Kuyumba-Taishet | operating | 0.16 (expandable to 0.3) | 440 | Yurubcheno-Tokhomskoye field and Kuyumba field | connects to ESPO Pipeline | completed in 2017; initially expected to operate below capacity as development at connected oil fields has been delayed |

Sources: U. S. Energy Information Administration based on Transneft, Sakhalin Energy, Caspian Pipeline Consortium, State Oil Company of the Azerbaijan Republic, European Parliament, and Orlen Lietuva.

## Appendix B.1

### Enel's net income up 47% in 2017[1]

Rome, March 22nd, 2018 – The Board of Directors of Enel SpA (Enel), chaired by Patrizia Grieco, approved the 2017 financial results in today's meeting.

**Francesco Starace,** Enel CEO and General Manager, said:

> In 2017 the Enel Group posted an extremely positive performance with over 14% growth in net ordinary income and shareholder remuneration up 32%, both above guidance. These results are testament to the effective implementation of the Group's strategy and the ongoing evolution of the business model, despite a challenging market context. Significant progress in delivering on our key strategic pillars and enablers was made throughout the year. We invested about 1 billion euros in digitising distribution networks and generation assets, and customer focus has delivered pleasing results in all of the Group's main geographies. We have improved cash flow generation while keeping net debt below full year guidance, notwithstanding our continued focus on deploying growth capex, acquisitions and distributing dividends. Renewables remain the engine of our growth, with over 3GW of additional capacity delivered in 2017, mainly in South America and in the US.
>
> Moving forward, we remain focused on the execution of our strategy. The flexibility embedded in our well-diversified, integrated model will enable us to continue delivering sustainable growth and long-term value for all stakeholders. We confirm our financial targets for 2018.

**Revenues:** 74,639 million euros (70,592 million euros in 2016, +5.7%); the increase reflects higher revenues from electricity sale and transport and greater electricity trading, as well as favourable exchange rate developments.

[1] Data extrapolated from Enel Russia official website.

**EBITDA:** 15,653 million euros (15,276 million euros in 2016, +2.5%); growth attributable to investments, to the efficiency enhancement policy pursued by the Group and to favourable exchange rate developments. These factors were only partly offset by changes in the scope of consolidation.
**Ordinary EBITDA:** 15,555 million euros (15,174 million euros in 2016, +2.5%), net of extraordinary items relating to certain disposals.
**EBIT**: 9,792 Million Euros (8,921 Million Euros in 2016, +9.8%); the increase reflects lower amortisation and impairment.
**Group net income**: 3,779 million euros (2,570 million euros in 2016, +47.0%); the above growth was attributable to an improvement in EBIT, a decrease in debt-related financial expenses, to the gain on the disposal of Bayan Resources and to lower income taxes.
**Group net ordinary income:** 3,709 million euros (3,243 million euros in 2016, +14.4%).
**Net financial debt**: 37,410 million euros (37,553 million euros at the end of 2016, -0.4%), a slight decrease on 2016.
Proposed **dividend** for 2017: 0.237 euros per share (of which 0.105 euros per share paid as interim dividend in January 2018).

2017 results and objectives of the Group strategic plan

Results outperform guidance:
- Italy and South America drive growth, despite low water availability.
- Over 3 GW of additional renewable capacity.
- Ordinary EBITDA and net ordinary income growing.

**In 2017, significant progress was made on** achieving the targets set for the enabling factors and the key pillars of the Group strategy:

Enabling factors:
- Digitalisation: around 1 billion euros invested in digitalisation of distribution grids as well as thermal and renewable generation assets.
- Customer focus: 20 million customers on the free market, with growth in all the main geographies. Enel X business line launched.

Key pillars:
1. Operational efficiency: cash cost of 11 billion euros, improving compared to 2017 guidance, with a reduction of 4% in maintenance capex.
2. Industrial growth: reached the EBITDA growth target, 90% of EBITDA growth for 2018 has already been addressed. Additional renewables capacity amounted to 3.1 GW[2].

[2] Including 300 MW of managed capacity.

3. Group simplification & active portfolio management: achieved 60% of target to reduce operating companies in South America, sold minority interests in Electrogas in Chile and Bayan in Indonesia. Reacquired minority stakes in the distribution grids in Romania and Peru; restructuring of Group's shareholdings in Chile began through Enel Chile. Asset disposals of about 2 billion euros carried out, while acquisitions amounted to around 2.1 billion.
4. Shareholder remuneration: the total dividend proposed for 2017, with a 65% implied pay-out, is equal to 0.237 euros per share, 32% higher than the dividend paid in 2016 and approx. 13% higher than the 0.21 euros per share minimum guaranteed dividend for 2017.
5. Creating sustainable long-term value: made substantial progress towards the commitments with regard to the United Nations' Sustainable Development Goals.

- SDG 4 (quality education): 600,000 beneficiaries;
- SDG 7 (clean and accessible energy): 1.7 million beneficiaries;
- SDG 8 (decent work and economic growth): 1.5 million beneficiaries;
- SDG 13 (climate action): closed 2017 with specific CO2 emission of 400 g/KWhe.

Appendix B.2

Enel russia posted record net income in 2017[3]

- The increase in EBITDA is explained by higher DPM revenues received by CCGT units, higher capacity sales, as well as continuous delivery on fixed costs optimization.
- Net income growth resulted from EBIT increase and lower net financial charges.

MAIN FINANCIAL HIGHLIGHTS (*millions of RUB*)

| | 2017 | 2016 | Change |
|---|---|---|---|
| Revenues | 74,400 | 72,211 | +3.0% |
| EBITDA | 17,732 | 13,909 | +27.5% |
| EBIT | 13,970 | 10,334 | +35.2% |
| Net income | 8,544 | 4,387 | +94.8% |
| Net debt at the end of the period | 17,889 | 20,348 | -12.1% |

Carlo Palasciano Villamagna, General Director of Enel Russia, said:

Last year, our company posted a record in net income since its listing in 2005. This result was achieved through the contribution of higher capacity

[3] See: <https://www.enelrussia.ru/en/media/press/d201803-enel-russia-posted-record-net-income-in-2017.html> (2018-10-11).

payments as well as managerial actions, which were able to offset the negative impact of overcapacity affecting our operational results and electricity pricing. This positive set of results allows Enel Russia to stand out in the Russian power utility sector, meeting all of its investment targets – including in renewables development – whilst also paying an attractive dividend to shareholders[4].

Moscow, March 15th, 2018 – PJSC Enel Russia has published its audited consolidated financial statements for 2017 in accordance with the International Financial Reporting Standards (IFRS).

- **Revenues** increased, mainly due to:
  - higher DPM revenues received by both CCGT units that entered their seventh year of operation (as provided for by the DPM pricing methodology approved by the government);
  - increased volume of delivered capacity, explained by higher capacity sales from Nevinnomysskaya CCGT (as the unit was in outage at the beginning of 2016), as well as lower unplanned outages at the majority of other facilities;
  - higher revenues from regulated power and capacity sales due to annual tariffs increase.

This increase in revenues offset the lower production of conventional gas units that was mainly attributable to the System Operator's lower use of the equipment due to overcapacity in the Central and Urals regions.

- **EBITDA** grew significantly, largely due to higher revenues additionally supported by the decrease in fixed costs. This cost decrease was mainly attributable to lower costs related to property tax, lower use of raw materials and supplies, as well as a long-term personnel cost optimization program.
- The increase in **EBIT** reflected EBITDA growth.
- **Net income** reflected EBIT growth, additionally supported by lower net financial charges that were mainly attributable to:
  - optimization of the company's debt portfolio structure, including a reduced exposure to euro/ruble exchange rate fluctuations;
  - decreased interest expenses as a result of the lower average debt level compared with 2016 and downward trend of the key rate in Russia;
  - the recording in the first quarter of 2016 of a one-off accounting adjustment associated with the early repayment of a loan from the Royal Bank of Scotland.
- **Net debt** at the end of the reporting period decreased on the figure posted as of December 31st, 2016, mainly due to solid operating cash flow compensating the payments made over the period.

[4] See above.

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PREMIO CESARE ALFIERI CUM LAUDE

Due to the exploitation of international reservoirs, natural energy sources have become rare, disputed among States and therefore strategic. The reliance on these resources is linked to energy security and dependence in both terms of energy imports or exports. Furthermore, the access and reallocation of energy flows entail an alteration of the balance of power among States as well as the raise of national energy security strategies and debates. The aim of this volume is to analyze the evolution of energy relations between the European Union and the Russian Federation from a state of pure Dependence to the establishment of a balanced Interdependence, underling also the challenges facing the EU in terms of dependence and diversifications in the framework or the EU-Russian energy cooperation.

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