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RUSSIA’S INTERNATIONAL ENERGY COOPERATION

The Yamal LNG Case

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International cooperation is an important but often neglected topic. In 2017 the Russian Federation together with Asian and European partners completed the Yamal LNG project, one of the biggest in the world and the first within the Arctic Circle, only with a small delay in the schedule despite the Ukrainian crisis and the subsequent financial sanctions and ruble crisis.

The dissertation aims to understand how and why this project became reality and how international energy cooperation emerges by using the social–structurationist model of energy policy formation. Cooperation in IR is defined as 'policy coordination' but because energy policy constitutes its antecedent, the impact of domestic factors is also researched.

The topic is approached by a descriptive-explanatory case study with theory–driven qualitative content analysis as its method which permits to extract information from a text and to process it independently of the text. The data are diverse and include companies' press releases, governmental and ministerial documents and transcripts of press interviews and meetings.

From the analysis it resulted that the socio-economic development of Russia was the primary interest of the government whose support allowed the project to run on time. Other actors held mainly a business frame whereas foreign partners were also fundamental in providing technology and financings. The importance of domestic factors also emerged as so did the way in which the structural dimensions enabled and constrained the outcome.

Few broader considerations can be drawn from this study: first, it appears that politically motivated financial sanctions might obstruct but not halt international energy projects. Second, with low oil prices Russia seems to be more cooperative. Third, it appears that the backing of a strong central government to a private energy project can positively affect cooperation. Fourth, with limited financing and technology a country could seek partnership only if its resource base is wide enough and it can preserve advantageous or best returns for itself.

Keywords: JSC Yamal LNG, international energy cooperation, Arctic, Russian energy policy, qualitative content analysis, structuration.

CONTENTS

1. Introduction…....……………………………………………………………………………1

2. Theoretical Background……………………….…...………………………………………..4

2.1. Definition of the concept: international cooperation and the role of domestic policies.............4

2.2. Previous theoretical orientation in studying Russia's energy relations…………………..……7

2.3. Theoretical foundations: The Social Structurationist Model of Energy Policy Formation……8

2.3.1. Actors…………………………………………………………………….……...9

2.3.2. Interests and cognitive frames..……………………………………………………10

2.3.3. Structures...……………………………………………………………………...10

2.3.4. Further considerations pertaining the model…………………………….……...11

3. Methodology…...…………………………………………………………………………...14

3.1. Preliminary considerations on research design and method...……………………………14

3.2. Case study……………………………………………………………………….……..15

3.3. Qualitative Content Analysis………………………………………...…………...16

3.3.1. Analytical phases and techniques employed……………………………………...18

3.4. Data & research questions…………………………………………………….........19

4. Russian Gas Policies: Between Domestic Drives and International Cooperation…………..22

4.1. Preface……………………………………………………………………….………22

4.2. The Tsarist Era……………..…………………………………………………….........22

4.3. The Soviet Time……………..…………………………………………………………23

4.3.1. The 1920s–1940s….………..……………………………………………………23

4.3.2. The 1950s–1970s.…………………………………………………………………......24

4.3.3. The 1980s–1991.……………………………………………………………….…….29

4.4. Natural Gas in the Russian Federation……………………………….………………..32

4.4.1. The 1990s…………………………..……………………………………………32

4.4.2. The 2000s..……………………………………………………………………........35

4.4.3. The 2010s……………………………………………………………………...….38

5. The Actors, Their Interests and Schemata………...………………………………………..42

5.1. Russian Government and State Institutions…………………………..…….………42

5.2. Energy companies, sub-contractors and partners…………………………..………43

5.3. International Financial Institutions……………………………………………………44

5.4. Russian regional and local actors……………………………………………….……..45

5.5. Interests and cognitive frames in formulating Russian Arctic Energy Policy…..…….........46

6. The Four Structural Dimensions: Enablers and Constraints………………………….…………49

6.1. Resource Geographic Dimension…………………………………………………………49

6.1.1. *Geography and geology of Arctic offshore/onshore gas resources*……...……………49

6.1.2. *Energy technologies for exploration, extraction and production of resources*………51

6.1.3. *Maintenance and transportation infrastructure*…………………………………………..52

6.2. Financial Dimension……………………………………………………………...55

6.2.1. *Infrastructure, production, investment/credit and social investment costs*……………….56

6.2.2. *Taxation regime*……………………………………………………………………….59

6.2.3. *Oil prices and supply/demand balance in global markets*…………….…………………..60

6.3. Institutional Dimension………………………..……………………………………........61
6.3.1. *Formal state institutions regulating the relations among the Russian and other involved actors including legislation, licensing and agreements*…………………………..62
6.3.2. *Informal institutions including practices, norms and rules*……………………..……....63
6.3.3. *Energy diplomacy, international interaction. institutions and tensions*……..…….......64
6.4. Ecological Dimension…………………..………………………………………………..65
6.4.1. *Environmental risks of Arctic gas projects*………………………………………………65
6.4.2. *Climatic consequences of Arctic fossil fuels*…………………………………….………67
6.4.3. *Energy transitions: diversification away from fossil fuels, shift towards renewables and energy efficiency*…………………………………………………………………………68

7. Outcome: International Cooperation in the JSC Yamal LNG Completion……….….........70

8. Conclusions…………………………………………………………………………………...77

Bibliography 82

List of figures

Figure 1. The social structurationist model of energy policy formation 9
Figure 2. Basic proceeding of qualitative content analysis 19
Figure 3. Western Russian gas regions and pipelines 33
Figure 4. Eastern Russian gas regions and pipelines 34
Figure 5. Russia’s Arctic hydrocarbon deposits 50
Figure 6. The Northern Sea Route 55

List of abbreviations

A5	Arctic Five
APG	Associated Petroleum Gas
BASF	[*Badische Anilin und Soda Fabrik*] Baden Aniline and Soda Fabric
BSI	British Standards Institution
CDBC	China Development Bank Corporation
CEO	Chief Executive Officer
CIS	Commonwealth of Independent States
CNOOC	China National Offshore Oil Company
CNPC	China National Petroleum Corporation
COFACE	[*Compagnie Française d'Assurance pour le Commerce Extérieur]* French Export Credit Agency
CPC	Council of People's Commissars
DES	Delivered ex-ship
ECT	Energy Chart Treaty
EEZ	Exclusive Economic Zone
EKN	[*Exportkreditnämnden*] Swedish Export Credit Agency
ENI	[*Ente Nazionale Idrocarburi*] National Hydrocarbons Authority
EU	European Union
EURIBOR 6M	Euro Inter Bank Offered Rate at 6 Months
FRG	Federal Republic of Germany
GDP	Gross Domestic Product
GLASEVMORPUT	[*Glavnoye Upravlenya Severnovo Morskovo Puty*] Chief Directorate of the Northern Sea Route
IEA	International Energy Agency
IFI	International Financial Institutions
IGOs	International Governmental Organizations
INGOs	International Non-Governmental Organizations
IPE	International Political Economy
IR	International Relations
JBIC	Japan Bank for International Cooperation
JGC	Japan Gasoline Co.
JSC	Joint Stock Company
LNG	Liquefied Natural Gas
MET	Mineral Extraction Tax
MRTS	[*Mezhregiontruboprovodstroy*]
NATO	North Atlantic Treaty Organization
NGV	Natural Gas Vehicle
NSR	Northern Sea Route
OBCOM	*Oblast* Party Committee
OECD	Organization for the Economic Cooperation and Development
OPEC	Organization of the Petroleum Exporting Countries
PSAs	Production Sharing Agreements
QCA	Qualitative Content Analysis

R&D	Research and Development
RAZ	Russian Arctic Zone
SACE	[*Servizi Assicurativi del Commercio Estero*] Italian Export Credit Agency
SCF	Sovcomflot
SHIBOR 6M	Shanghai Inter Bank Offered Rate at 6 months
TNK–BP	[*Tyumenskaya Neftyanaya Kompaniya*] Tyumen Oil Company - British Petroleum
UK	The United Kingdom
US	The United States of America
USSR	The Union of Soviet Socialists Republics
VEB	[*Vneshekonombank*] The Bank for Development and Foreign Economic Affairs
WWF	World Wildlife Fund
YaNAD	Yamalo–Nenets Autonomous District

Currencies

CNY	Chinese Renmin
EUR	Euro
RUB	Russian Ruble
USD; $	US Dollar

Units of measure

bln	billion
bcm	billion cubic metres
C°	temperature in Celsius degrees
dwt	deadweight tonne
kg/m^3	kilogram on cubic metre
km^2	square kilometre
m^3	cubic metre
mmt	million metric tonnes
MW	Megawatt, 10^6 W
t C/TJ	Emission factor expressed in carbon content
tcm	trillion cubic metres

1. INTRODUCTION

On 8th December 2017, a Russian owned ship built in South Korea, named after a Frenchman loaded 170,000 cubic metres of locally produced LNG from the port of Sabetta, north of Arctic Circle, in the Yamal Peninsula (Sovcomflot 2017a). The ship 'Christophe the Margerie', named after the former CEO of Total, is the first of 16 vessels capable of navigating in the Arctic seas breaking ice as thick as two metres (Yamal 2017b). The loading of the ship officially seals the completion of the international JSC Yamal LNG. The project is a joint venture between Novatek, the biggest Russian independent gas producer, the French Total, and the Chinese CNPC and Silk Road Fund. With a final nameplate production capacity of 16.5 tonnes of LNG per year, it is the largest LNG production facility in Russia, one of the largest in the world and the first located north of the Arctic Circle. The project was developed and completed during the lustrum 2012–2017 amidst the Ukrainian crisis, the financial sanctions and the ruble crisis, with only a small delay on the schedule, and it involved several Europeans and Asian companies and financial institutions.

The research aims to understand how and why this project became reality in the Russian Arctic. More generally, the thesis tries to comprehend how international energy cooperation emerges by the merging of several factors at diverse levels of aggregation even in turbulent international situations. The topic is scrutinized by means of a descriptive and explanatory case study having qualitative content analysis as its method. The primary data utilised include relevant policy documents as well as federal law and companies', governmental and ministerial press releases, transcripts of meetings and interviews. Following the constructivist approach in IR, with the help of a preexisting model akin to Giddens' structuration theory; this case study will investigate the duality of actors and structures involved in the process. The output produced, namely the international energy cooperation which resulted in the completion of the Yamal LNG project, is seen here as a social practice. Social practices are, in Giddens' words, recursive; but always grounded in space and time, in fact they are: "continually recreated by them [actors, *author's note*] via the very means whereby they express themselves *as* actors. In and through their activities agents reproduce the conditions that make these activities possible" (Giddens 1984, 2). The objective of this thesis is ultimately, through a case study, to contribute to knowledge production about international energy relations to make sense of mutually beneficial results obtained from projects often deemed unfeasible.

IR literature agrees to define cooperation as an adjustment process of policy coordination (Milner 1992, 476). The preexisting literature on international cooperation (Axelrod 1984; Keohane 1984; Lipson 1984; Waltz 1979; Grieco 1988) largely focused on exogenous factors at international level, and because of the assumed anarchy and rational-unitary model of agency, it neglected the inquiry of domestic factors (Milner 1992). Several authors (Katzenstein 1976; Keohane & Nye, 2011; Milner 1992, 1997; Putnam 1988; Schultz, 2013) have pointed out the importance and potential of domestic politics in explaining international cooperation. Using Keohane's definition in the study of Russia's international energy cooperation, I argue that the focus should shift from policy coordination to the antecedent policy formation, the very process that creates "…the policies actually followed by one government..." (Keohane 1984, 51). To succeed, there is the need for a theoretical approach that considers also the impact of the domestic level in policy formation and as well as some specific features of energy policy such as the technology and other material factors. In the contemporary analysis of energy issues, few shortcomings also exist such as the focus on the state as a unit of analysis which neglects the role of transnational companies; and the neglected role of international cooperation (Kuzemko *et al.*, 2012, 2).

Thus, in the studying of Yamal LNG case will be employed the structurationist model of energy policy formation. By using this analytical model, it will be possible to focus on all the relevant elements which have concurred to produce the realization of this energy project in the Russian Arctic through international cooperation. In fact, in contrast to most of the preexisting social sciences' theories and approaches, which focus either on actors or structures; the structurationist model of energy policy formation combines the actors to the structural dimensions in which they must operate developing schemata; in order to pair their core interests and the policy environment given by the structural dimensions (Aalto *et al.* 2012, 37).

This idea of structuration is present also in constructivist IR theory by Alexander Wendt (1999) who moved the discussion to the international level where state actors and international social structures interact. In these processes states define and re-define identity and interests which in turn constrain or enable their behaviours. Although the theory is important for the evolution of international structures, it has received heavy criticism for bracketing domestic structuration which was the main concern for Giddens. Constructivist endeavour to re-establish such attempts include Carlsnaes (1994 in Aalto *et al.* 2014, 4), and others who have called for theorizing which can be applied in further empirical research (Adler 2002, 106–109; Fearon and Wendt 2002, 52; 68 in *ibid.*). (Aalto *et al.* 2014, 4.) The previous attempts have underlined the need to consider the extensions of structuration processes from domestic to international level. The ideas from Giddens and Wendt are included in this analytical model which applies them in the study of energy policy. In this way it is possible to move beyond the constructivist bias for studying the social aspects of structuration (Fearon & Wendt 2002, 58–59 in Aalto *et al.* 2014, 5). The so called social, cultural and linguistic turns in IR are prone to consider material issues such as natural resources as inconsequential. Thus, the model tries to contribute to relink material forces and ideas in IR theory (Sørensen 2008 in *ibid.*). (Aalto *et al.* 2014, 5.)

In practical terms, the components of the model will serve as basic units for qualitative content analysis in the retrieving, summarizing and organizing of the information needed to explain the outcome of this energy project. Specifically, the thesis aims to answer to the following research questions:

- How and why was the Yamal LNG project completed?
- Which Russian actors were responsible for what?
- In which way the structural dimensions have constrained and enabled the international cooperation needed for the realization of the project?
- How the interests and cognitive frames held by the Russian actors have ultimately shaped the decision to cooperate with foreign partners to complete the Yamal LNG project?
- Can domestic energy policies' impact in shaping international energy relations be assessed? If so, can this impact be considered fundamental?
- Which broader considerations on international energy cooperation be inferred from this case study?

The whole thesis is comprised of eight chapters roughly divided in two sections. The chapter 2, after a brief presentation which includes a working definition of 'cooperation' as well as the context of its birth, introduces the scholarly debate which argued for the insertion of the domestic political factors in the study of international cooperation. And since cooperation is defined as policy coordination (Keohane 1984), the focus should shift to the antecedent moment of policy formation, the very process that creates the policies which will then be coordinated. Moreover, the need to include specific features of energy policy such as the technology and other material factors (Katzenstein 1976) requires the use of a more comprehensive theoretical approach such as the social structurationist model of energy policy formation by Aalto (2016, 43). The chapter 3 is the methodology section which presents the choice of case study and continues exposing the way in which qualitative content analysis is applied to the data guided by the theoretical approach. The data are also described in this section. The chapter 4 treats the history of Russian gas policies, including its domestic drives and the decisive role played by international cooperation. Chapter 5 starts the empirical part of the thesis describing the actors, their interests and cognitive frames. Chapter 6 analyses the four structural dimensions, resource–geographic, financial, institutional and ecological which have enabled and constrained the actors of Yamal LNG. Chapter 7 is dedicated to the exposure of the events which led to the completion of the project thanks to international cooperation. Chapter 8 contains the conclusions, the limitations of the study and the recommendations for further research.

2. THEORETICAL BACKGROUND

As the dissertation attempts to investigate the international cooperation in the field of energy, and the alleged role of domestic policies in its determination, a few more general remarks are in order before moving on to introduce the theoretical foundations utilized in this case study. The purpose of the following section is not to describe in detail the vast literature about international cooperation, which spans several decades and comprises every major theoretical approach in IR, rather the task is limited to delineating a working definition of cooperation as well as the context of its birth in the 1980s. In the process there will be mention of preceding and subsequent approaches, together with an outline of their strengths and weaknesses, with the latter being underlined which in turn requires a different theoretical approach in studying international energy cooperation. The chapter will then continue with a brief overview of previous theoretical attempts to study EU–Russia energy relations before finally proceeding to introduce the social structurationist model of energy policy formation.

2.1. Definition of the concept: international cooperation and the role of domestic policies

Although cooperation and its absence are a hot topic in IR (Lebow 2007, 295), it constitutes a difficult subject to study, and is regarded as elusive because its sources are both multifaceted and intertwined (Keohane 1984, 10). It is perhaps for this reason that the term ‘cooperation’ itself, although a popular object of inquiry in IR theory, has rarely been defined (Lebow 2007, 295). One of the most cited definitions in IR was produced by Keohane, a neoliberal: “cooperation occurs when actors adjust their behavior to the actual or anticipated preferences of others, through a process of policy coordination’ (Keohane 1984, 51). He formulated this more formally as:

> Intergovernmental cooperation takes place when the policies actually followed by one government are regarded by its partners as facilitating realization of their own objectives, as the result of a process of policy coordination.
>
> (Keohane 1984, 51–52)

However, this definition has been criticized due to its vagueness, as it does not consider reciprocity, and because Keohane uses the term ‘policy coordination’ which, similar to ‘collaboration’, is only a sub-category of cooperation (Stein 1993, in Fossati 2017, 19). In political science Stoppino (1995 in *ibid.*) defined cooperation as: “an interaction among actors that is intentionally and reciprocally favorable to them”; while Fossati (*ibid.*) states that the level of reciprocity can vary and be more or less symmetric. (Fossati 2017, 19.) Despite these reservations, Keohane set a common definition which has been widely accepted in IR and is regarded as one of the two general contribution that the literature on international cooperation has produced in the 1980s (Milner 1992, 476).

Before neoliberalism, structural realism conceived cooperation as embedded in a zero-sum game logic where states act to counterbalance other more powerful actors or coalitions (Waltz 1979, 70). According to Waltz (*idem*, 106) a self-help system influences the prospect of cooperation in two ways: a state worries about divisions of possible gains which may later favour others more, and about becoming dependent on others through cooperation and import-export. The disagreement between realism and neoliberalism consists in the latter believing that there is much more unrealized or potential cooperation, and both disagree about the quantity of conflict in world politics which is unnecessary or avoidable (Jervis 1999, 47). Before treating the conditions in which cooperation could emerge, an important last point should be noted. Cooperation is different from harmony which is a complete identity of interests, thus cooperation happens where there are both conflicting and complementary interests (Axelrod & Keohane 1985, 226).

The second contribution of the literature of the 1980s on international cooperation consisted of the use of game theory to model relations at the systemic level in an attempt to reveal the necessary conditions for emerging of cooperation (Milner 1992, 476). The game theoretic approach in cooperation theory was suggested by Axelrod and Hamilton (1981) and later formalized by Axelrod (1984), who posits self-interested individuals who must find a way to interact since there is no central authority. Self-interest is assumed because it allows an examination of cooperation in the case in which it is not fully based on the welfare of the group or on concern for the others (*idem*, 6). The prisoner's dilemma is one game that explains some of the basic features of cooperation or conflict. In its simplest form two players are assumed to be self-interested, self-reliant maximizers of their own utility as in a realist conception of sovereign states in IR (Lipson 1984, 2). Other games include the 'stag hunt' and 'the chicken'. However, since game theory in international cooperation is beyond the scope of this dissertation, I will not proceed to cover this topic in greater detail (for further reading see Axelrod, 1984; Snidal, 1985; Oye, 1985; Orkin, 1987, and Jervis 1988).

In such games, firstly Axelrod (1984, 20) found that a Tit for Tat strategy emerged as the most common and effective: it implies cooperative stance in the first move and then respond to the actions of other players with reciprocity (more on reciprocity in Keohane 1986). This discover demonstrated that cooperation can effectively start in a world of unconditional defection and it can protect itself from less cooperative strategies (Axelrod 1984, 21). In practical terms, this cooperation theory based entirely on external stimuli did not work when run in an experiment with real Soviet and American defense analysts as the players justified their moves, mainly defection, with prior expectations about each other's motives (Axelrod 1997, 30 in Lebow 2007, 301). Thus, Tit for Tat may facilitate cooperation in the long-term, but it does not tell us anything about the reasons behind an actor's choice (Lebow 2007, 301).

Secondly, Axelrod (1984, 145) noted the necessity of social structures to ignite cooperation. The role of information in cooperation is also crucial as it is from its quality, quantity and distribution that states' conception of their interests and the modalities with which goals are pursued depend, a trait which realism has failed to understand (Keohane 1984, 245). Thus, neoliberals believe change in preferences over strategies is enough to provide mutual benefits by means of better information and a lowering of transaction costs by establishing institutions which can outlive the original conditions in which they were set. However, if the first condition is not satisfied, change in information cannot explain states' behaviour when vital interests clash. (Jervis 1999, 51.)

Another disagreement between structural realism and neoliberalism is precisely about the role of institutions defined as "enduring patterns of shared expectations of behavior that have received some degree of formal assent"; in contrast to neoliberalism, in realism institutions are merely a tool lacking an independent impact. (*idem*, 53–54). To sum up, in a neoliberal account of cooperation states are atomistic actors trying to maximize absolute gains and they regard cheating as the main constraint to cooperation; on the other hand, in realism states are positional and care about relative gains as a consequence of fear for their survival as independent actors in an anarchic environment (Grieco 1988, 487).

The centrality of anarchy as the divide between international and domestic politics, and the assumption of unitary and rational actors in game theory result in the main weakness of the 1980's literature on international cooperation, namely the neglect of domestic politics (Milner 1992, 481). Such a stance also continued in Wendt's (1999) thin constructivism which posits state as the main actor in IR with a focus on a systemic level governed by 'logics of anarchy' (*idem*, 13), and the deliberate neglect of domestic factors (*idem*, 11). Thus, assumptions regarding domestic policies such as national interest, a state's strategies to alter systemic conditions and a state's capacity to ratify and implement cooperative agreements focus only on the international dimension (Milner 1992, 489). Lebow too (2007, 302) criticizes the shared focus on autonomous and egoistic actors which explains cooperation only as a result shaped by external stimuli. The deficiencies in rational choice-based theories failed to acknowledge who the key actors are, what their interests are, and what the origins of institutions are and how these change (Snidal 2013, 86).

As such, existing IR cooperation literature neglects domestic political influences because they treat the state as a unitary actor. Milner argues that sometimes international negotiations to realize cooperation fail because of domestic politics; hence they often initiate negotiations. She claims that all aspects of cooperation are influenced by domestic factors because cooperation is a continuation of domestic struggles by other means. (Milner 1997, 10.) Domestic actors share power over decision–making and have different policy preferences influencing the conduct of the state with polyarchy. Policy preferences are derived from basic interests which are captured by their utility functions that actors seek to maximize. (*idem*, 33.)

In explaining international outcomes with reference to interests and institutions at the domestic level, the main actor to scrutinize is the government and the actors upon whom the government depends to implement policies and stay in power. This focus can account for both the formation of interests and the role of domestic politics in hindering or constraining cooperation. (Schultz 2013, 479.) Similarly, Putnam (1988) focused on the domestic factors composing the ‘two-level game’ which influences the international relations and for instance the ratification of international agreements.

Writing about economic foreign policy, Katzenstein (1976) also stresses the importance of the analysis of domestic policies. Scrutinizing the literature, Katzenstein (*idem*, 21) ascribes the energy policy to a realist paradigm of vulnerability of states and concludes that domestic politics play an essential role in the formulation of energy policy (*idem*, 42) in its study, the size and level of technological development must also be included in the analysis (*idem*, 43). In the study of interdependence and international processes including cooperation, Keohane and Nye also acknowledged the shortcomings of research at the systemic level alone and the need to scrutinize how a combination of domestic and international processes shapes preferences. They called for attention to be paid to the interplay between the constraints and opportunities of the international system including its structure and its process as well as to the perception of interests held by influential actors within states. (Keohane & Nye, 2011, 281.) On the interdependence, Rosenau (1976) also stressed the role of the states’ domestic capabilities as well as natural resources such as technical and scientific knowledge in the need for international cooperation.

To conclude, IR literature agrees to define cooperation as an adjustment process of policy coordination. The preexisting literature on international cooperation largely focused on exogenous factors at international level, and because of the assumed anarchy and rational-unitary model of agency it neglected the inquiry of domestic factors. Several authors have pointed out the importance and the potential contribution of domestic politics in explaining international cooperation. Using Keohane’s definition in the study of Russia’s international energy cooperation, I argue that the focus should shift from policy coordination to the antecedent policy formation, the very process that creates “…the policies actually followed by one government...” (Keohane 1984, 51). To succeed, there is the need for a theoretical approach that also considers the impact of the domestic level in policy formation as well as some specific features of energy policy such as technology and other material factors.

2.2. Previous theoretical orientations in studying Russia’s energy relations

On a more general level, among the shortcomings of contemporary analysis on energy issues, there is the narrow division into traditional realist/geopolitical or liberal/neo-liberal approaches.

Moreover, the focus is often solely on the role of the state as a unit of analysis, ignoring the transnational actors such as national energy companies. Most notably there is also the marginalization of the role of international cooperation in energy together with the developments in international law and treaties, given that these are also important cornerstones in economic interdependency. (Kuzemko *et al.* 2012, 2.)

More specifically, with regard to Russia's energy relations, studies range from scrutinizing Russia's energy power and its assertiveness in foreign policy (Perović *et al.*, 2009) to describing Russia as using coercive diplomacy also in energy issues (Maness & Valeriano 2015), or to focusing on energy security regimes in terms of interdependence (Esakova 2012). Other studies specifically about gas are more centered on the international political economy (IPE) and the role of transnational markets (Belyi 2015). In the field of IR, empirical themes are more recurrent than theoretical frameworks, these studies include themes such as energy diplomacy, energy security and the geopolitics of energy (Aalto 2012, 11–12). Theoretical efforts are rare, a more realist analysis has been outlined by Orban (2008 in Aalto *et al.* 2014, 2–3), labelling Russia's action in Central and Eastern Europe 'imperialist'. A study between realism and liberalism made by Stulberg (2007 in *ibid.*) focuses on Russia's level of awareness in using its resources to pursue political goals in Central Asia, with the awareness varying between the type of energy source, nuclear, oil or gas. (Aalto *et al.* 2014, 2–3.)

None of these theoretical efforts focus on Russia's energy policy formation and the multilevel influences which act upon it. As energy policy is a more specific and fundamental problem than energy security, the former is a prerequisite to talk about the latter, hence it needs a more systematic attempt to theorize. (Aalto 2012, 13.) Comprehensive structurationist approaches have emerged in foreign policy analysis such as those by Carlsnaes (1994 in Aalto *et al.* 2014, 3) or by Hudson (2007 in *ibid.*), but they do not consider the multidimensional structural challenges proper of energy (Aalto *et al.* 2014, 3).

2.3. Theoretical foundations: the social structurationist model of energy policy formation

The study of the Yamal LNG case will employ the structurationist model of energy policy formation. By using this typology, it will be possible to focus on all the relevant elements which have concurred to produce the output namely the realization of this energy project in the Russian Arctic through international cooperation. In fact, the structurationist model of energy policy formation, in contrast to most of the preexisting social science theories and approaches which focus either on actors or structures, combines the actors with the structural dimensions in which they have to operate. The actors develop schemata in order to pair their core interests and the policy environment given by those structural dimensions (Aalto 2012, 37) as shown in the model below:

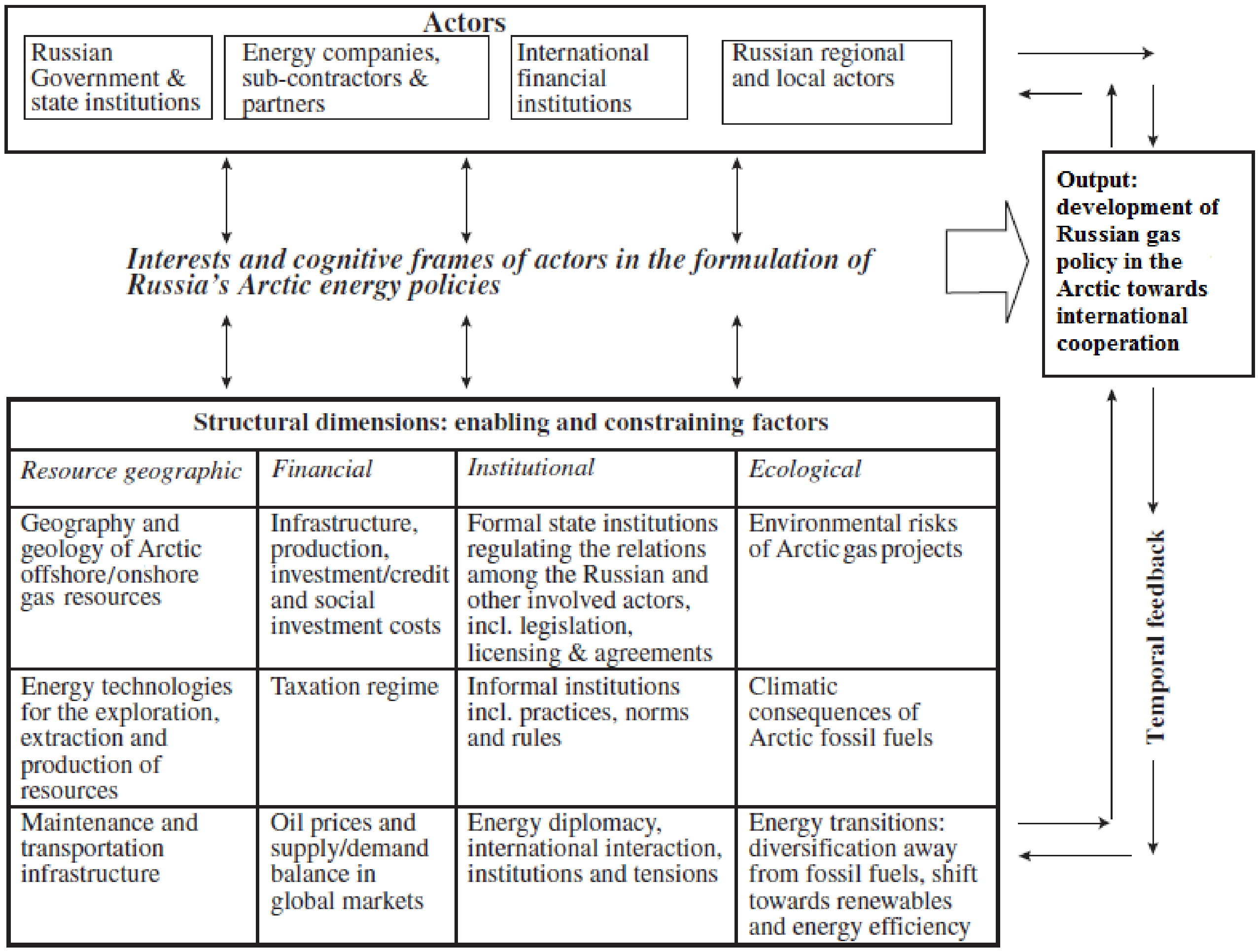


FIGURE 1. The social structurationist model of energy policy formation, source: adapted from **Aalto (2016, 43)**.

2.3.1. Actors

At the top of the figure we find several types of actors cited, these include the Russian government and its state institutions, the energy companies with their partners and subsidiaries, the international financial institutions (IFI), and the Russian regional and local actors. The reason behind this choice is represented by several considerations some of which are broader and pertain to the topic of energy policy analysis while some others involve political features of the Russian Federation. On a more general level, the energy policy analysis requires the awareness of the existence of different actors such as states, regimes and intergovernmental organisations (IGOs) but also stresses the importance of transnational actors (Prontera 2009, 16 in Aalto *et al*. 2014, 5) such as energy companies, trans-governmental coalitions and networks, IFIs and other non-governmental organisations (INGOs and NGOs) (Aalto *et al.* 2014, 5).

Regarding the political features of the country in question, as Russia is a centralized state, the president is almost always involved in some capacity in the processes of forming energy policy along with or through its presidential administration, prime minister and government (Aalto 2012, 21) to an extent that we can speak of the 'bureaucratic politics of energy' (Aalto *et al.* 2014, 6).

Furthermore, given the territorial vastness of Russia, one must also acknowledge the role of the 'regional politics of energy' (Tkachenko 2007 in *ibid.*). To conclude, an element of political economy must be always present in the analyses (Strange 1994 in Aalto 2012, 21) because the ground work of implementation and funding is carried out by specialized energy and services companies acting on behalf of ministries and the instructions of governmental agencies (Aalto 2012, 21).

2.3.2. Interests and cognitive frames

The middle level of figure 1 is composed of interests and cognitive frames which link the actors to their policy environments. The interests of the actors are the key to understanding the energy policy formation and they are difficult to individuate because they are influenced by the contexts in which they are formulated. To make the situation clearer it is better to treat interests as embedded to schemata, or cognitive frames within which actors operate. Schemata, which have different degree of coherence, help actors to articulate their interests and to assign meaning to and make sense of surrounding policy environment (Wendt 1999, 133–134 in Aalto 212, 26). The model mostly focuses on 'frame' in Goffmann's (1974 in *ibid.*) acceptation of a relatively coherent form of scheme which establishes clear-cut conditions for expectations and interaction. Frame makes an actor coherent and able to decide a course of action. (Aalto 2012, 26.) A second type of schemata, or cognitive frame, is represented by 'sense-making' which accounts for less coherent action and the role of uncertainty and imperfect information, in this situation actors lack clearly formulated interests (Aalto *et al.* 2014, 7), "it stresses the internal, self-conscious process of developing a coherent account of what is going on" (Fiss and Hirsch 2005, 31 in *ibid.*).

2.3.3. Structures

The lower square in the figure 1 contains the four structural dimensions: resource geographic, financial, institutional and ecological, which represent analytical categories describing the policy environment faced by the actors. These policy environments possess both material and social qualities which can enable and constrain. The dimensions are analytical in the sense that they assist to map empirical matters as evaluated by the actors. To make choices on what they want, actors must act according to the acquired knowledge of these structural dimensions, which is filtered through the cognitive frames they utilise (Aalto 2016, 43). (Aalto *et al.* 2014, 7–8.)

Before we move to the description of the structural dimensions, a brief reflection is in order and it concerns the role of knowledge and information. The analytical model reported here, assumes that actors have incomplete information which can lead to sub-optimal choices; this means that socially and culturally produced information and knowledge have a pervasive influence on energy policy formation, while that knowledge is too rarely critically examined (Foley & Lönnroth 1981, 6; 16;

19–21; Prontera 2009, 6–7 in Aalto 2012, 29). This leads to the consideration that we must study how actors observe and assess their policy environments and how in these processes they are guided by their policy frames (Aalto 2012, 29).

The resource geographic dimension is fundamental to the energy policies of any resource-rich countries similar to Russia (Aalto 2016, 47) it includes the finiteness of resources, the distribution and the level of access to them. It also includes the technology involved in exploration, extraction and production of resources and the physical geography of their transportation and distribution infrastructures (Aalto *et al.* 2014, 8) such as pipelines, road and railways networks, seaports etc. The focus of this dimension concerns energy as material, but at the same time, it encompasses social qualities such as social capital and technological expertise (Aalto 2012, 31).

The financial dimension encloses both material and social qualities and it includes financial transactions, incentives and constraints related to energy. Some of the social aspects involved are the global speculation in currencies and the market price fluctuations (*ibid.*). A social component in this dimension is also present in credit which in financial crises might freeze regardless of a company health status (Aalto *et al.* 2014, 9). Other aspects considered here are production, infrastructure and social investments costs and taxation.

The institutional dimension pertain to both formal and informal institutions which regulate the relations between the actors. It spans from domestic to international level of regulation of production, distributions and consumption of energy resources. (Aalto *et al.* 2014, 9). At the national level there are also informal institutions such as customs, norms and tacit rules of the game resilient to change, one example can be represented by the tendency to centralize and create big energy projects (Aalto 2012, 32). At international level we find formal state institutions, laws and agreements, the energy diplomacy, international interactions, institutions and tensions.

To conclude, the ecological dimension concerns several aspects including risks related to gas projects, the consequences of use of fossil fuels in the Arctic and the energy transition which includes the shifting away from fossil fuels and energy efficiency. This multidisciplinary dimension is not yet integrated with the mainstream approach of social sciences in energy issue also because of the dichotomy between natural and social sciences (Aalto 2016, 10).

2.3.4. Further considerations pertaining the model

The use of this typology is justified, or even required, by the intrinsic features of the subject dealt with; in fact, the topic of energy policy is, by its nature, complex and multidimensional (Bressand 2013, 18–19 in Aalto 2016). Moreover, especially in the Arctic, the variety of actors involved is considerable as is also their level of aggregation and the problems related with the four dimensions (Aalto & Jaakkola 2015 in *idem*, 43).

As this is a case in which domestic and international politics overlap, I have retained this model especially because of its explanatory strength and because a recursive methodological problem in IR concerns the level of analysis (Singer, 1961). In particular, often in IR the actors are the states which are taken as a basic unit of analysis, omitting everything else which is placed at the intrastate level. In the concept of the state as a non-monolithic entity made of officials and politicians who work inside and for the state, the so-called 'phenomenological approach' (*idem*, 89–90), human factors must also be considered whilst performing an inquiry as it has the prospect of enlarging the analytical and explanatory potential of IR (Aalto *et al.* 2011, 178). This is especially relevant when considering the outcomes of energy policy-making, due to its peculiar characteristics described above, especially when it involves an international dimension. Hence the model used here allows for a multilevel analysis, considering actors at various levels both domestically and internationally and their interplay within the structures in which they are embedded; in this case the main focus will obviously be on the Russian actors.

What the model describes is akin to Giddens' process of structuration originally defined as "the structuring of social relations across time-space in virtue of the duality of structure" (Giddens 1984, 376–377). Duality of structure in Giddens refers to both rules and resources used for system reproduction, which are at the same time also means of structure reproduction (*idem*, 19). Resources are of two types, allocative and authoritative, in this context the first is represented by natural gas; the second by the ability to transform natural resources into goods, demand for which generates command over other actors (Aalto *et al*. 2014, 4). Moreover, the model also considers a few other features including the limited knowledge of human actors and the presence of unintended consequences and events which can give temporal feedback for further action (Giddens 1984, 8). This is to say that the model acknowledges the complexity of social action and tries to consider all the relevant elements in its quest for the explanation of social outcomes.

This idea of structuration is also present in constructivist IR theory by Alexander Wendt (1999) who moved the discussion to the international level where state actors and international social structures interact. In this processes states define and re-define identity and interests which in turn constrain or enable their behaviours. Although the theory is important for the evolution of international structures it has received heavy criticism for bracketing domestic structuration which was the main concern for Giddens. Constructivist endeavour to re-establish such attempts includes Carlsnaes (1994 in Aalto *et al.* 2014, 4), and others who have called for theorizing which can be applied in further empirical research (Adler 2002, 106–109; Fearon and Wendt 2002, 52; 68 in *ibid.*). (Aalto *et al.* 2014, 4.)

The previous attempts have underlined the need to consider the extension of structuration processes from domestic to international level. The ideas from Giddens and Wendt are included in this analytical model which applies them in the study of energy policy. In this way it is possible to move beyond the constructivist bias for studying the social aspects of structuration (Fearon & Wendt 2002, 58–59 in Aalto *et al.* 2014, 5). The social, cultural and linguistic turns in IR are prone to consider material issues such as natural resources as inconsequential. Thus, the model attempts to contribute to relink material forces and ideas in IR theory (Sørensen 2008 in *ibid.*). (Aalto *et al.* 2014, 5.) However, the model is not intended to provide general explanations, but to allow for causal analysis. The reason resides in the variability of the structural dimensions over time and space, as well as in the causal mechanisms and their combinations, which are different case by case. (Aalto 2012, 38.) In practical terms, the slots of the model will serve as basic units of content analysis in the retrieving, summarizing and organizing of the information needed to explain the outcome of this energy project as will be said in detail in the next chapter.

3. METHODOLOGY

3.1. Preliminary considerations on the research design and method

In designing the research strategy and in the choice of the method, the dissertation will adopt the form of a descriptive and explanatory case study, utilizing qualitative content analysis (QCA) as its method. Specifically, the path followed is akin to that defined by Kohlbacher (2006), who proposes the combination of these two characteristics relying on Mayring's approach to QCA. However, since Mayring's approach, similarly to Schreier's (2012), has been criticized as it weakens the role of theory, and because it limits the openness of the analysis and creates inefficiencies (Gläser & Laudel 2013, 22), I will also consider the modified version proposed by Gläser & Laudel (2013). Nevertheless Kohlbacher (2006, 17) argues that the abovementioned critic may have originated from a misunderstanding of the method which is not comprised of a compulsory list of procedures to be followed, but it is rather a package of techniques (Mayring 2000, 1) (Mayring 2014, Ch. 6) from which the researcher can choose. Thus, in building a method for my dissertation, only some features of Mayring's approach will be borrowed and reported below whilst some will be left out.

The reason to opt for a single case study design resides in the uniqueness of the Yamal LNG project which is the first international LNG project built above the Arctic Circle in a difficult environment, and in a challenging historical period characterized by the Ukrainian crisis and the following financial and currency crises. Yin (2009, 47–48) retains unique, rare, unusual or extreme cases, as this one, to be worth of single case design. Moreover, although regarded as conferring more robustness to an overall study (Herriott & Firestone, 1983 in *idem*, 53), the application of a multiple case design, by definition, cannot apply to the abovementioned records (Yin 2009, 53).

QCA is fit for the task as 'problem driven' content analyses "are motivated by epistemic questions about currently inaccessible phenomena, events, or processes that the analysts believe texts are able to answer. Analysts start from research questions and proceed to find analytical paths from the choice of suitable texts to their answer". (Krippendorff 2004, 340.) Moreover, Gläser & Laudel (1999, abstract in Kohlbacher 2006, 25) state that QCA could be "an interesting form of data analysis for projects that aim to start from theory and contribute to it". Contrary to other qualitative methods of data analysis, such as open coding in grounded theory which leads to overload of coding and texts (Gläser and Laudel 2013, 20); QCA helps to reduce the quantity of material (Schreier 2012, 7) by guiding the researcher to focus only on the aspects related to the overall research questions (Schreier 2014, 170). QCA assists the researcher to describe the material only in a way which must be specified earlier, in this sense it is greatly different from other methods of qualitative data analysis, especially those rooted in hermeneutic tradition (Schreier 2012, 3–4).

3.2. Case study

Case study is mostly considered a research design and not a method (Hartley 2004, 323) (Buchanan 2012, 355) (Hartley 2004, 323; Titshcer *et al.* 2000, 43 in Kohlbacher 2006, 6), however different changeable standpoints exist, and it is sometimes defined as a method (Gillham 2000, 13; Yin 2003b, 4 in Kohlbacher 2006, 6) (Yin 2009). In this dissertation case study is employed as a research design, in explaining its features most of the section is heavily based on Yin (2009; 2016). Because of its role, the section focuses only on a quick overview with a report of the main critics which in turn justify the contribution of QCA. Case study is an advantageous form of inquiry "when 'how' and 'why' questions are being asked about a contemporary set of events over which the investigator has little or no control" (Yin 2009, 13). One of the most known definition of case study by Yin (*ibid.*, 18) says: "A case study is an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident". Moreover, because phenomenon and context are often blurred in real-life situation, integrative technical features must be introduced, and as such:

> ...the case study inquiry copes with the technically distinctive situation in which there will be many more variable of interest than data points, and as one result relies on multiple sources of evidence, with data needing to converge in a triangulating fashion, and as another result benefits from prior development of theoretical preposition to guide data collection and analysis.
>
> (Yin 2009, 18).

The evidence of case study can be collected from six sources: documentation, archival records, interviews, direct observation, participant observation and physical artifacts (*idem*, 101–113). The subsequent analytic strategies are diverse, relying on theoretical propositions is the first and most preferred strategy in case studies (*idem*, 130); it is also the main strategy utilized in this thesis. Other strategies include, developing a description of the case, using qualitative and quantitative data, and testing rival explanations (*idem*, 131–136). In using these strategies, one can employ five analytic techniques: pattern matching, explanation building, time-series analysis, logic models and cross-cases synthesis (*idem*, 136–160). Finally, in reporting the findings, several designs are suggested, on which more will be said in section 3.3.1.

Case study was criticized both because of lack of rigor as it did not often follow a systematic procedure, and because of biased views influencing the conclusions; the first critic can be avoided with the use of other integrative methods (*idem*, 14). The second critic may have originated from the use of teaching case studies in business and law schools which are written with the intention to highlight some features to produce debate. Conversely, research case studies are oriented towards the examination of research questions in their context. (Hartley 2004, 324.) Another critic concerns the feasibility of generalization, here Yin (2009, 15) rebuts that generalizations are not aimed to populations or universes but only to theoretical propositions; that means the "goal in case studies is to expand and generalize theories (analytic generalization) and not to enumerate frequencies (statistical generalization)". A third frequent critic of case study is about their length and the resulting massive unreadable documents, a praxis generated mainly from ethnographic approach and participant–observation (*ibid.*).

The integration of qualitative content analysis as a method of data handling in case studies can help to overcome the abovementioned critics. As already said, QCA unlike other qualitative methods of data analysis, can reduce the quantity of material by focusing on pre-arranged aspects. QCA's other features which are described in the next section, surely help to overcome the other two critics, as the QCA employs systematic procedures and, at least in this dissertation in accordance with the theoretical framework, it does not pretend to generalize the results obtained.

However, before moving to introduce QCA, few more words should be dedicated to the analytic generalisation in case studies. Yin (2016, 105) defines it as a two-phase process, the first phase, utilising a conceptual claim, demonstrates how the findings are prone to inform a particular set of theoretical constructs or concepts; in the second phase these elements are applied to implicate other similar situations. In other words, "the theoretical concepts enable a more general perspective on specific qualitative patterns" (Halkier 2011, 787 in *idem,* 106).

In contrast, the theoretical framework utilised in this dissertation warns against the possibilities of generalisations as the cases are bound to context of time and space. Anyways, in discussing the empirical findings I will attempt to compare and contrast them with the preexisting literature to contribute to the knowledge production about international energy cooperation. My intention is more akin to what Yin (2016, 106) calls 'transferability' of the findings, which expresses more modest claims as it recognizes the peculiarities of a qualitative case study. With the transferability the empirical findings can create working hypotheses (Cronbach 1975; Lincoln & Guba 1985, 122–123 in *ibid.*) on which to build further studies at a higher conceptual level, thus contributing to the knowledge production and to the research debate (Yin 2016, 107).

3.3. Qualitative Content Analysis

Mayring's (2000, 3) content analysis aims to provide qualitative interpretation of text material with foundations derived from the advantages of quantitative content analysis. First, it is a systematic, rule-bound procedure laid down in advance as the method is not a standardized tool but needs to be fitted to the object or material under scrutiny (Mayring 2014, 39). Moreover, theoretical foundations help to strengthen this aspect as "technical fuzziness is compensated for by theoretical stringency" (*idem*, 41). Second, it bears a referent object of study instead of formal techniques which means that the appropriateness of method must be established based upon the specific material in each individual case (*idem*, 40). Third, it is embedded in a communication context (*idem*, 39) and it uses categories as the central point of analysis which contributes to the intersubjectivity of the procedure (*idem*, 40). (Mayring 2014, 39–42.)

Although not manifestly addressed, Mayring's (2000) qualitative content analysis (QCA) seems to embrace a constructivist epistemological stance underlining the importance of researcher interpretation and the multiple perspectives (Drisko & Maschi 2016, 88). Mayring (2014, 8) explicitly suggests that "in the context of justification, [that is of the testing of hypotheses], a post positivistic or moderate constructivism would be adequate to guarantee scientific rigor".

The method conceives two main procedural approaches in handling categories, namely 'inductive category development' and 'deductive category application'. The first utilizes "a criterion definition derived from theoretical background and research questions" which is then applied to the material from which categories are deduced, and it is subsequently revised by a feedback loop. The second approach brings "prior formulated, theoretical derived aspects of analysis in connection with the text", here the qualitative step focuses "on the methodological controlled assignment of the category to a passage of text". (Mayring 2000, 3–4.)

Gläser and Laudel have criticized Mayring who combines theory guided and rule guided approaches to data, derived from quantitative practices "with the qualitative tradition of letting the actual content of data structure the analysis". Most of the techniques propose design categories derived from the theory (*ex ante*), only the most open one relies fully on the data being essentially inductive. (Gläser and Laudel 2013, 21.) The critic stresses that "the inductive correction of a deductively obtained set of categories weakens the role of theory" which is discarded as soon as a controversy arise from the data (*idem*, 22). The first stage openness in the category creation leads to inefficiencies as the coding frame has then to be tested and revised in a pilot phase; the result is a lengthy work to obtain a closed and fixed system of categories. In contrast, Gläser and Laudel propose to derive categories from the theoretical background which can later be changed and extended in the process of data analysis preserving theoretical consideration without forcing them into the data. (*idem*, 21–23.)

In Mayring's QCA, theory "is understood as a system of general principles on the subject to be examined", constituting "the cumulative experience of others in the same field". Theoretical orientation means to use this experience in order to achieve an advance in knowledge. In practical terms, "the focus of analysis must be defined precisely in advance, viewed within the context of current research on the topic, and as a rule divided into sub-issues". (Mayring 2014, 59.)

As the knowledge is derived from a theory, the coding frame will be shaped by a concept-driven strategy in which deductive inference is employed (Schreier 2012, 84–85). The coding frame is a way of structuring the material and is made up of categories or dimensions which represent the aspects on which one wants to focus its analysis (*idem*, 59–61). In this case, the deductive categories application will be dictated by the social structurationist model of energy policy formation (Aalto *et al.* 2012, 39), which will act as the theoretical background of the dissertation. The pilot study phase, as well as the supplementary quantitative steps of analysis will be absent; the former due to the increased workload and loss of time due to the repeated analysis as noted by Gläser & Laudel (2013, 22); the latter as a broad generalization of results is not required (Mayring 2014, 41) because it is out of reach of the theoretical framework employed.

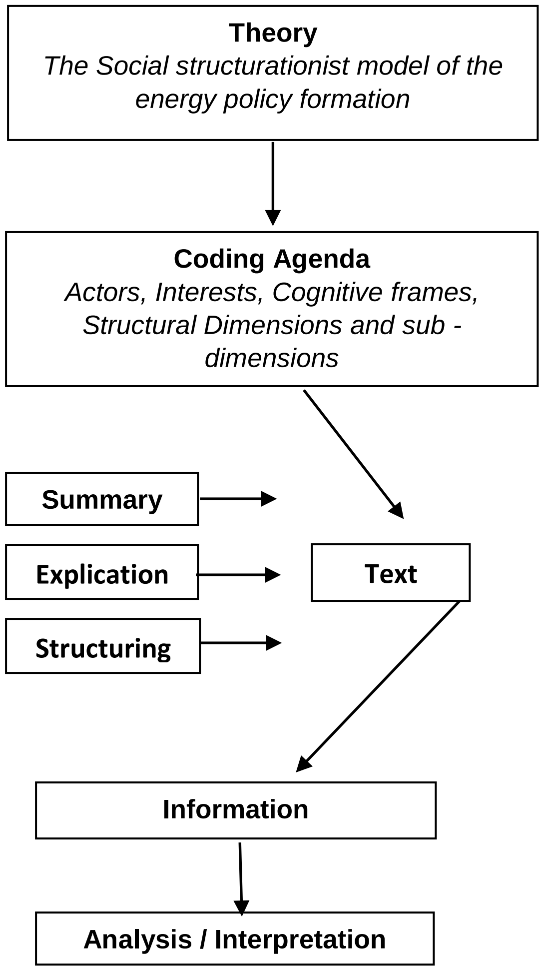
To conclude, few words must also be dedicated to the quality criteria. Given the successful previous use of the model in IR literature (see Aalto *et al.* 2012), the quality criterion represented by reliability of the coding frame is considered proven, as the model is well established and has been already used by different scholars (see *ibid.*). In fact, reliability is usually the result of consistency between coders, in other words how another person understands the same passage, or between different points in time (Schreier 2012, 6). As reliability is precondition for validity, although it does not guarantee it (Krippendorf 2004, 213), any argument against the former also affects the latter (Lisch & Kriz 1978, 87 in Mayring 2014, 108). Reliability and validity form the quality criteria which is the last component in Mayring's QCA (Mayring 2000, 3) (Kohlbacher 2006, 15). However, these 'classical' quality criteria such as objectivity and the abovementioned validity and reliability have been criticized when applied to QCA (Steinke 2000; Mayring 2002a in Mayring 2014, 108). To overcome this *impasse*, more specific QCA criteria have been developed and some other are under discussion; these include documentation of method, interpretation safeguards, proximity to the object, rule-boundedness, communicative validation and triangulation (Mayring 2014, 109).

Since I did not have the possibility to forward data material to different coders and even if I would, critics pointed out that the feasibility of high levels of correspondence would occur only with very simple analysis (Ritsert 1972 in *idem,* 108); I decided to rely mainly upon theoretical background and then on more specific QCA quality criteria which will be explained in the next section. This may indeed represent both a significant weakness of the method as well as one of its utmost strengths.

3.3.1. Analytical phases and techniques employed

The aim of this section is to briefly explicate the supplementary quality criteria and the steps employed to obtain the final results enclosed in the analytic chapter. As for quality criteria, I also plan to utilize triangulation which occurs on two levels: firstly, using QCA in a case study, as this method has not been particularly developed for this purpose to a different research design; and secondly on data (Kohlbacher 2006, 23) (more on this in the next section).

To illustrate the method which will be followed in the thesis, I will report here a modified chart based on the original by Kohlbacher (2006, 18), which illustrates the way of proceeding in using qualitative content analysis.



The general principle in working with this version of the method will rely on "the basic idea to extract information from a text and to process it independently of the text" (Gläser & Laudel 2013, 23). The three general analytical phases in QCA, also called forms of interpreting, consist of *summarizing*, the reduction, generalization and paraphrasing of the *corpus* of data material to have a more abstract mass of information which still somewhat retains its particularity; *extracting* (or *explaining*), additional material or passages in order to explain doubtful meanings in parts of data; *structuring*, assessing the material on the bases of the adopted criteria, obtaining a structure from the data based on the theoretical observations and the code framing, after these passages the results will then be processed. (Kohlbacher 2006, 16) (Mayring 2014, 63–64.)

FIGURE 2. Basic proceeding of qualitative content analysis, source: adapted from **Kohlbacher (2006, 18 based on Gläser & Laudel 1999, 4).**

In reporting the findings, I used a mixture of two compositional structures, the chronological and the 'theory-building' (Yin 2009, 178–179), each chapter reflects a subdivision of the theoretical framework along with its categories and subcategories ordered in chronological fashion. In the analysis of the data utilizing the categories offered by the theoretical considerations, I will try to respect the adherence to the theory. However, in the case of controversies and incompatibility arising between the categories and the structuring of the data according to them these will be noted and dealt with at the end of the analysis in the way earlier described by Gläser and Laudel (2013).

3.4. Data & Research Questions

In treating the base material which is set in a communication context, Mayring (2014, 49) suggests delineating the line of inquiry direction of analysis. In this case, I am interested mostly in unveiling the cognitive background of the Russian actors as it emerges from the data which I am soon going to introduce. Specifically, my attempt was to assess the actors' knowledge background, cognitive frames and interests' formation as they emerge from the analysis of the primary data. These are in turn the substrates through which actors relate themselves to their policy environment and permit to give answers to the research questions. The necessity of introducing triangulation as quality criteria for QCA (Mayring 2014, 108) and its presence in case study, also required the retrieval of diverse classes of data. About data diversity, Hermann (2008, 152) highlights that the focus on speeches, interviews and press conferences do contribute to unveil how actors perceive and interpret their policy environments; nevertheless, caution should be used because speeches can be much less spontaneous than interviews and press conferences. Speeches reflects mostly the 'public persona' or how an actor wants to be perceived by its public whilst the other forms reveal more of the personal side of the actor in scrutiny. (*idem*, 153.) Before describing the *corpus* of data, I here report the research questions:

- How and why was the Yamal LNG project completed?
- Which Russian actors were responsible for what?
- In which way have the structural dimensions constrained and enabled the international cooperation needed for the realization of the project?
- How have the interests and cognitive frames held by the Russian actors ultimately shaped the decision to cooperate with foreign partners to complete the Yamal LNG project?
- Can the impact of domestic energy policies in shaping international energy relations be assessed? If so, can this impact be considered fundamental?
- Which broader considerations on international energy cooperation be inferred from this case study?

The collection and choice of data followed the criteria of relevance regarding the research questions and the framing into categories derived from the theoretical orientation (Gläser & Laudel 2013, 9). Hence the research of data was performed using both the keywords in the research questions and the keywords and concepts enclosed in the slots which form the structurationist model proposed in the theory section of this paper; *e.g.* 'Yamal LNG project' or 'geography and geology of Arctic gas resources'. The research had obviously always considered the relevant timeframe, which spans the period 2000–2017, and place. As websites' English language material was not always available for periods prior to 2008, contributions from secondary sources filled the gaps entering the process of analysis at the step of explanation.

Given these premises, the primary data I used are solely in English, and can be divided into three major groups. The first group encompasses English translations from Russian of governmental and ministerial legislative documents such as different versions of the Energy Strategy, the Arctic

Strategy and the Naval Strategy plus some federal laws. Also reports from international organizations such as the International Energy Agency (IEA) fall in this cluster. The second cluster is made of 71 press releases from several companies' websites as for instance the Yamal JSC website http://yamallng.ru/en/, Novatek website http://www.novatek.ru/en/press/releases/, Sberbank's website http://www.sberbank.com/news-and-media/press-releases and Sovcomflot http://www.scf-group.ru/en/press_office/press_releases/ . The reason for the choice for this class of data rely primarily upon its conciseness and essentiality, as they provided chronological references and insightful technical details which could somewhat add 'impartiality' to the analysis as they are not straightforwardly implicated in political considerations. Finally the last group comprises 68 official transcripts of presidential participations at forums and events, and governmental meetings with relevant actors, such as for example Novatek CEO Leonid Mikhelson, Ministers of Energy Sergei Shmatko (2008–2012), and Alexander Novak (2012– present); and several other ministers and parliament members found at the institutional websites http://en.kremlin.ru/en/ and http://government.ru/en/ and archive material in http://archive.premier.gov.ru/eng/ and http://archive.government.ru/en/. This last group of data perhaps expresses the bigger variety as made by several sources. In fact, it includes 68 transcripts of politicians and other relevant actors' meetings at closed doors, but also answers from press conferences both in specific context (*e.g.* International Arctic Forum, Gas Exporting Countries Forum), and in broader ones (*e.g.* Saint Petersburg International Economic Forum, Vladimir Putin's Annual News Conference). The diversification of data sources ranged from more technical to more political connotations, within the most disparate contexts, and through the entire timespan of this energy project in order to enhance the stability of the findings as suggested by Hermann (2008, 154).

4. RUSSIAN GAS POLICIES: BETWEEN DOMESTIC DRIVES AND INTERNATIONAL COOPERATION

1. Preface

In dealing with the history of natural gas in Russia, I have considered worthwhile to start from the very beginning. The reason of this choice is to expose the dynamics of the Russian gas development policies and in these processes, to assess the presence of international partnerships and cooperation through the centuries. I think that the topic needs to be contextualized for the sake of completeness as the natural gas industry was originally part of the wider crude oil industry until recently. Each section will proceed in chronological order and it will comprise decades as timespans retrieving significant information to understand the current issues in Russian gas policies and international cooperation. This chapter is mainly based on secondary sources.

2. The Tsarist Era

The Russian oil and gas industry began with a strong presence of foreign producers already in its early stage which dates to the end of the 19th century. This presence contributed to the rising of the country as one of the major world oil producers thanks to foreign technology and capitals (Henderson & Ferguson 2014, 8). In the Tsarist period, among the biggest foreign investors, there were the British with $ 85,000,000; Dutch-Shell $ 20,000,000 in Baku with aims in Grozny and the Caucasus, Belgians with $ 21,000,000; France (the Rothschild interests) with about $ 25,000,000; Americans were also involved with marketing and refineries represented by Standards of New York. (Hirsch 1934, 142–143.) Proven presence of hydrocarbons was known, except in the Caucasus, also in the Western Northern regions of Russia; for instance, as far as in 1745 in Uhkta region, Arkhangelsk merchants managed a primitive oil production, the geologic expedition of 1889 lead by Academician Chernyshev confirmed the prospects on the region. (Krems 1964.)

The intensity of Russian explorations of its Arctic regions, started to grow only towards the beginning of the twentieth century, once the Tsarists bureaucracy understood the economic and military importance of the region. The focus on resources, moved swiftly from fish stocks to minerals and fossil fuels. At that time all those considerations persuaded the Tsar Nicholas II to accelerate the construction of the Northern Sea Route to support the realization of the Trans – Siberian Railway as well. (Josephson 2014, 22–23.) Already in the 1910s hydrocarbon explorations had begun in the Ukhta region of Pechora krai. In 1915 the Russian partnership Neft built the first exploration and production well. In the 1910s oil wells were also drilled along the river Ukhta in 1913, 1915, 1918 and 1919 (FEDOIL 1929, 123). However, later site explorations stopped due to the raging of the First World War. (Kontorovich 2015, 42–43.)

3. The Soviet Time

3.1. The 1920s–1940s

After nationalization of the oil industry in May 1920, no foreign oil concessions were made by the Soviet Union, apart from that to the Japanese government in Sakhalin due to the 1925 Moscow–Tokyo Treaties. Nevertheless, the Soviet government still retained satisfactory and profitable marketing agreements with the most important foreign oil companies, including the American ones. (Hirsch, 1934, 143–144.) In 1930 the Chibyuskoe oil field was discovered in the Republic of Komi, the development of which started in the same year (Kontorovich 2015, 213). In the same region, the Ukhtinskaia Expedition lasted from 1931 to 1938 using the forced labor of prisoners to develop deposits of raw materials including gas; among the inmates were some specialists such as Professor Ivan Nikolaevich Strizhov who suggested exploring for gas (Josephson 2014, 145–146).
In 1932 the Yarega oil field was discovered, because of weight and viscosity of the oil (945 kg/m^3) and its reservoir temperature (6–8 °C) the oil was labelled as hard–to–recover, hence requiring the application of innovative technologies (heavy oil processing in 1939 and thermal oil recovery in 1972) . (Kontorovich 2015, 213.)

By signing a decree on June 22nd, 1936 the USSR Council of People's Commissars (CPC) enhanced the political measures for the development of the industry and the region with the creation of the Chief Directorate of the Northern Sea Route (Glavsevmorput). The Directorate was also assigned the organization of the transportation services, the research work in the Soviet Arctic, of the telecommunications, and the exploration of the natural resources and development of production facilities in the Far North. Moreover, the promotion of the economic and cultural progress of the indigenous populations was also among the competences granted to the Directorate. Lastly, the Directorate had the task of completing the development of the Northern Sea Route from the Barents Sea to the Bering Strait and was in control for the Soviet Arctic Ocean, its seas and islands. In the Asian part of the country, it was responsible for the territories north of the 62° parallel. In the 1936 the first traces of methane were discovered in the lower reaches of the Yenisei river. In the 1942 the first flow of gas was pumped from that area. (Kontorovich 2015, 213.) As production of crude oil increased, enhanced volumes of the gas associated with it became available (mixed with or dissolved in the liquid fuel) but due to the lack of long-distance pipelines most of it was wasted (set alight and flared) (Smil 2010, 37.) The associated gas was also consumed as local fuel in near production facilities while the residential and commercial needs were satisfied by gas from coal and oil shale gasification (Hopkins *et al.* 1973c, 17).

It was only during World War II, when the Germans cut the supply lines of coal that the Russians tried to supply Moscow via pipelines from the gas fields near Saratov, located 800 km to the southeast. The project only started in 1944 and took two years for its completion, nevertheless, the Commissariat of the Oil Industry retained its enthusiasm for natural gas. Already in 1944 with the Soviet counter attack, there were made plans to supply Kiev with natural gas from Galician gas field, the operation was completed in 1948. The successful operation saw the extension of the pipelines running for 1500 km until reaching Moscow in 1951. The Galician pipelines were built by Germans and put into operations in 1943, after falling in Soviet hands the line accounted for supplying the metallurgical town of Stałowa Wola located 200 km eastern from the fields. Moscow regarded these fluxes as 'export' and for the first time, gas was not only meant to be kept within the country. (Högselius 2013, 13–14.) However, due to the technological challenges in pipeline transmission, the gas industry became an important global presence only after World War II. (Smil, 2010, 37.)

3.2. The 1950s–1970s

In the 1950s gas was still marginal to overall energy production in the USSR but it was already potentially important for long term economic development and societal prosperity. Indeed, gas was considered to be more akin to nuclear power than oil and coal thanks to its main advantages and intrinsic features: reduced price, uniformity of burning and better handling in industrial processes. Due to the extremely reduced emissions, was also favoured for environmental reasons. Moreover, its importance for the transportation industry had already been foreseen. However, as Stalin still preferred to support the well-proven coal industry, the wartime gas pipelines were to be considered only as a war necessity rather than part of a long-term vision. Only with Khrushchev in 1955, the oil and gas were included as key components in the overall economic planning. Before 1955, the gas extracted was mainly associated gas, which is a byproduct of petroleum extraction (Hopkins *et al.* 1973a, 27). (Högselius 2013, 14–15 .)

In the XX Congress of the Communist Party in February 1956 the petrochemical industry was retained of great significance enhanced by the structural crisis in Soviet economy of 1956–1957. In 1958 Khrushchev presented the petrochemical industry as the solution "for the technological and institutional modernization of the economy" (Nekrasov 2017,169) using hydrocarbon raw material as its base resource. In fact, it would maintain the leading role of the heavy industry but also increase the wellbeing of the population. Secondly, its scientific and technological progresses would allow to address structural problems of the Soviet economy such as the scarcity of metals and the waste caused by burning of associated petroleum gas. And finally, it would also stimulate economic cooperation and external trade policy especially with the US, the Federal Republic of Germany (FRG) and the UK. The goal for natural gas was to raise its share from 31 to 51 %, and its production to 150 billion cubic metres (bcm) by 1965. (*idem*, 168–170.) In 1956 The council of

Ministers in Moscow created a separate government agency from the existent Oil Ministry, named The Main Directorate of the Gas Industry (*Glavgaz SSSR*) and appointed Alexei Kortunov as its first director (Högselius 2013, 15–16).

The first natural gas deposit, Taz, was discovered in 1962 in the Yamalo–Nenets Autonomous District (YaNAD) in the Western Siberian petroleum province, the first of a lengthy list of unique gas fields. In the 1970s Soviet explorers discovered the gas fields of the Yamal Peninsula. Together with the following findings, the YaNAD area became the world's largest gas producing region (Kontorovich 2015, 214). These gas reserves in the northern Tyumen region had started to voice arguments in favour of Big Gas strategy by the local authorities, the first secretary of the Tyumen oblast party committee (obkom) and then Minister of Construction of Petroleum and Gas Industry Enterprises, Boris Scherbina, together with his successor Bogomyakov lobbied for the construction of gas–fueled electric plants in the region, and to prioritize the development of northern Tyumen gas over the Central Asia gas (CIA 1979, 20).

The centralization of decisional processes in the energy industry worked fairly well in creating huge engineering projects with decennial paybacks which became source of foreign hard currency. Conversely the negative consequences for efficiency and economy of the energy industry derived from the practice of setting physical quantities targets without price mechanism whilst centralized bureaucracy impeded the technological innovation. (Rutland 2018, 26.) The development of the Siberian area which contained about one-third of the total Soviet gas reserves (Hopkins *et al*. 1973c, 9), was obstructed by Western sanctions which imposed a NATO embargo on import of large-diameter pipes in response to the building of Berlin Wall and the Cuban Crisis of Missiles. (Högselius 2013, 33). However, the effect of the embargo was just that of delaying the Druzhba oil pipeline construction of one year, it was completed in 1964, with countries such as Sweden, Germany and Italy providing large-diameter pipes for 40% of Soviet demand; moreover, the embargo had the result of Soviet pipe mills switching to producing large-diameters pipes by themselves albeit the quality could not be compared with Western products. Anyways this allowed the Soviet Union to use domestic produced pipes in projects. The embargo was lifted in 1966 on the FRG and France request. (Cantoni 2017, 148.)

After the Khrushchev's removal from power, the Soviet leadership allowed Minister of the Gas Industry Kortunov to start implementing strategy of promoting large-scale projects for gas deposits and to develop high-capacity transport system for natural gas (Nekrasov 2017,187). In 1964–1965 The Trans-European Pipeline was sketched between Glavgas and the Italian Ente Nazionale Idrocarburi (ENI), France entered also in the game with liquid butane imports exchanged for anticorrosion and sulphide extraction technology and the selling of liquefied gases carrying vessels (Högselius 2013, 38). In 1965 the Ministry for the Gas Industry was created, and it started effectively the natural gas industry in the Soviet Union (Pustišek & Karasz 2017, 5). It was only thanks to imports from the Federal Republic of Germany, Austria and Italy which in turn would receive fuel from the Soviet Union that some technical difficulties arising from the impossibility to produce large-diameter steel pipes were successfully overcome in the 1950s–1960s. These agreements were of fundamental importance to the development of the Soviet natural gas network. (Högselius 2013, 23–24.) In addition, it is worthwhile noting that the Soviet gas achievements were at that time solely the merit of Soviet science, the Soviet people and technology. In fact, during the ensuing Soviet period, foreign activity was limited to technical advice or state-sponsored assistance (Henderson & Ferguson 2014, 58). (Kontorovich 2015, 215.)

The fruitful cooperation provided Austria and Italy with Soviet gas imports, and at the same time was granting Soviet Union technology to implement its natural gas grid, hence granting mutual benefits (Högselius 2013, 38). The agreements were in form of the so-called 'compensation format' traditionally used by the USSR, in which the purchasing of pipelines and other technologies were financed by extension of long-term western credits to Soviet buyers, which were repaid from the gas exports receipts. The agreements were usually longer than the time required for repayment, to allow cash proceed. (Hannigan & McMillan 1983, 52.) In the 1970s Japan expressed interest in this form of cooperation and supplied the pipes which the NATO embargo denied export to Soviet Union in exchange for gas import via pipeline to Sakhalin and from there in form of LNG. (Högselius 2013, 38–39 .)

Soviet trade in natural gas was focused on both exports and imports, because of two agreements signed with Afghanistan and Iran, the Soviet Union was a net importer in 1970–1973 (Hannigan & McMillan 1983, 42). The import of gas from Afghanistan began in 1967, a year before the export to Austria, accounting for 2.0 bcm in 1969, 2.6 bcm in 1970 and 2.5 bcm in 1970, the producing fields were developed thanks to the Soviet assistance (Hopkins *et al.* 1973b, 198).
The import from Iran started in 1970 and accounted for 12.5 bcm in 1971–1972. The foreign gas import represented an economic advantage comparing to the raising of domestic production by the same amount, due to the technical difficulties in developing the domestic gas fields in Tyumen region. (*idem*, 200.)

Most of pipeline's use happened since 1970, as for gas deliveries, in 1988 nearly 100% of it was shipped via pipelines. The major gas pipelines, other than Central Asia, Volga–Ural, Baku and north Caucasus regions, were those of western Siberia (twelve large-diametres pipelines). The most famous gas pipelines were: The Northern Lights Line from Komi to Brest on the Polish border, Soyuz line from Orenburg to Uzhgorod near Czechoslovakia and Hungary, and the Export pipeline from Urengoy gas field to L'vov and West Europe. (Zickel 1991, 580–581.) In the 1970 began the construction of the pipeline Northern Lights which stretched from Medvezh'ye in northern Tyumen to Moscow region. However, later the gas plans have scaled down as the leadership in 1972 has aborted the attempt to bolster gas increase in production in the Ninth Five-Year Plan of 1971–1975 (CIA 1979, 20). In 1972 the Ministry of Gas and other organizations were ordered to design a system to solve the Soviet energy problem to the 2000 by delivering 300 bcm gas per year to Urals and European USSR through 10 large-diameter trunk lines, the high cost of 22 billion rubles and 20 million tons of steel led to its rapid abandonment (CIA 1979, 20–21).

This idea of a major project from the West Siberian basin to supply Western European country became to realize thanks to the need of the Western European countries to diversify their energy sources due to the 1973–1974 oil embargo and the subsequent rise of the oil prices. Moreover, the late 1970s recession increased the possibility for the sale of pipes, compressors and related technology to the USSR. (Becker 1984, 68.) Even the US considered a proposal from Moscow to import Soviet gas and several American companies considered the option to be involved in such projects (Perović 2017, 2).

The profitability of pipeline supplies was high hence it hindered the development of LNG even though US companies have proposed to the USSR the construction of facilities in Murmansk and Magadan to export gas to USA; but the lack of proprietary technology and the unwillingness from the Soviet side to engage in deeper cooperation with US for their supply procurement halted the projects. (Mitrova 2013, 9.) Indeed, the USSR feared to become too dependent from Western countries for technology and markets, but the need to boost domestic production eased the reservations and led to the development of the gas field in northern Tyumen region (Perović 2017, 2). To obtain a less expensive strategy of exploiting the northern Tyumen gas, the 1972 North Star project and Yakutia in 1974 saw the Soviet leadership hoping to get access to Western financial resources and large-diameter pipeline (CIA 1979, 21). Nonetheless, the Western equipment was purchased only to cover domestic shortcomings or for especially difficult applications (CIA 1984, 1). This was the case of the gas pipelines on which the Soviet Union was heavily dependent upon the Western equipment as their domestic products were unsuitable for the high pressure natural gas transmission service especially in the Arctic regions (*idem*, 14–15).

In the development strategy for the Western Siberian basin, domestic resistance stressed its economic viability, and the need for a more comprehensive approach than the sole extraction of raw minerals, in an area with prohibitive climatic and natural condition, and lack of infrastructures. Other groups warned about the overdependence on foreign currency earnings. (Perović 2017, 15.) The opposition of the then Minister of Gas Orudzhev to the development of Tyumen region had as reasons to moderate the attendant production and the delivery problems which fell under his responsibilities, the Big Gas strategy was by him rejected in order to save this non-renewable resource for the petrochemical and chemical industry, subsequently in the mid-1970s he favoured the Orenburg region, smaller but in easier location and with less logistic challenges to feed Eastern Europe with energy (CIA 1979, 21).

On the Far East side, international cooperation has deemed crucial in the development of the Far East and Eastern Siberia, because of its long overland distances from the economic core of the USSR and the need to be oriented through maritime export; with an important emphasis on the immediate neighbors. The relaxation of political tensions between east and west and the oil crisis of 1973 favoured the process. Soviet economists have prospected in the mid-1960s to specialize the entire region in productions of goods to export. Its development would have been based on import of technology and credits in exchange for raw materials and fuels with a particular interest towards Japan. Concrete cooperative projects in gas were the South Yakutian Natural Gas Project in 1974 and the Sakhalin Continental Shelf Oil and Natural Gas Exploration and Development Project in 1975. (Pinski 1984, 55–58.)

The oil crisis of the 1973–1974 had also as effect the Soviet growing reluctance to supply Eastern allies with cheap energy below market price. Moreover, the Stevenson Amendment by the US of 1974 limiting the credit to Soviet Union to 300$ million, ended the feasibility of a Big Gas strategy based on foreign credit (CIA 1979, 21). To remain a trustworthy energy partner, the Soviet Union redirected or cut off supplies to Eastern partners to continue delivering gas to Western countries. To end this situation the Urengoy development started in 1977 and in 1978 it was put on production; however, in the development of Urengoy gas field the main priority was the supply of domestic market. Another significant event in this period was the Iranian revolution of 1979 which was fundamental for the creation of the Soviet–European energy links. (Perović 2017, 20–22.) The policy shifting on Urengoy in 1979 was given by the crash construction of the Urengoy–Chelyabinsk pipeline aimed to feed the industrial area of the Urals which showed greater demand of fuel (CIA 1979, 38). The significance of this project is here described by Perović:

> The development of West Siberian energy and particularly gas…also had an important domestic political and social function. The Soviet Union had already carried out similar projects with Western involvement, such as the 2750 km Soiuz pipeline built between 1975 and 1978 as an international partnership. That gas pipeline, which ran from Orenburg in the South Urals to Uzhgorod on Ukrainian–Slovak border (from where it continued as the Transgas pipeline through Eastern Europe to Central and Western Europe), had also been financed with Western loans. The construction of some section of the route involved manpower from natural gas–importing countries.
>
> (Perović 2017, 24.)

To summarize, the gas option in the Soviet Union in this period was favoured by the Minister of Construction of Petroleum and Gas Industry Enterprises Scherbina, by the Tyumen officials in political, economic and institutional positions, the Gosplan and some academicians of the Academy of Sciences, including the head of Yakutsk branch Cherskii. Among the main constraints were listed the high costs of pipeline constructions, including the amount of steel employed plus the restriction given by hard currency on purchasing technology from abroad, R&D delays in lowering costs of transportation and technical difficulties given by permafrost together with the controversy over the use of gas as a boiler fuel and controversies over the pipeline routes (CIA 1979, 91.) The revenues from energy exports were already used to import food and technology and to modernize the industry (Rutland 2018, 26)

3.3. The 1980s–1991

In the 1980s, the Soviet long-term investment planning favoured gas over oil due to bigger reserves and cheaper transport costs (Zickel 1991, 505). These reserves were three times bigger than those of oil and moreover also their extraction costs were cheaper (*idem,* 507). The rise of the oil price from $13 to $34 per barrel after the 1979 oil crisis also favoured natural gas as a cheaper alternative in the eyes of European customers (Krempin 2017, 270). Brezhnev voiced out the absolute political and economic importance of the gas development in February 1981, gas was the only resource that scored the set goal in the 10th Five Year Plan (Gustafson 1983, 32–34). At first the Soviet leaders were oriented to develop the Yamburg gas field located beyond the Arctic Circle, but the idea was aborted due to lack of infrastructures in the area (Krempin 2017, 271). The 11th Five Year Plan in 1980–1981 focused instead on Urengoy field, with a construction of six large-diameter pipelines running for 20,000 km. The plan aimed at increasing the output of natural gas by 50% to become the main source of hard-currency income for the future. (Gustafson 1983, 1.)

To succeed, the USSR sought cooperation aimed to purchase Western technology. In May 1978 were held talks with FRG on the development of north Tyumen region, whose magnitude of the natural resources was posing too inviting incentives to be hindered by political considerations such as the criticism of the Soviet invasion of Afghanistan. (Krempin 2017, 269–270.) The project implied several problematiques, some of which were fairly new for the decision-making process. Among the factors, the harshness of the climate in the North Siberia required higher reliability standards and advanced technologies, the length of the communication lines and the presence of only basic infrastructures called for more precise coordination and better management. To conclude, the project needed a firm political decision to shift the investment priorities and for the first time, the domestic and international issues were deeply interconnected, exposing the USSR to the world economic system. (Gustafson 1983, 4–5.)

In December 1981 the American government posed an embargo towards the USSR which lasted until November 1982 (Gustafson 1983, 9). The export to the USSR of oil and gas equipment produced by either US companies, their subsidiaries abroad or on products built on US licence stopped, in a declared attempt to take concrete measures to reconcile the situation in Poland where martial law was established (CIA, 1981) (CIA, 1982). The sanction regime was an expansion of that imposed already in 1980 by US President Jimmy Carter as a reaction to the invasion of Afghanistan in 1979. As European countries did not follow US decision, the sanctions turned out being opportune for Moscow which exploited the success for propaganda purposes. (Perović 2017, 25.) Sanctions regimes were intended by US administration as a mean of weakening Soviet economy and military power and undermining communism, it tried also to prevent Western companies from supplying technology and equipment to the USSR, but ultimately the policy failed as Western European countries refused to cooperate (Painter 2017, 284). The sanctions had to be abolished in November 1982 after the protests from European companies and governments and from American firms, FRG protested and stated that the trade with the USSR was a stabilizing element (Krempin 2017, 271).

In 1983 the Yamal pipeline was inaugurated boosting the possibilities of use of Siberian natural gas for the exports to Western Europe. Gas was then exported to Austria, France, Italy and the FRG in 1984 despite of the persistent opposition from the US (Zickel 1991, 508), with a flow volume accounting for 40 bcm. However, speed took its toll on the quality in the building process and a series of malfunctions greatly reduce operativity. (Högselius 2013, 197–198.) By the time of its completion, the Urengoy–Uzhgorod pipeline's total length of 20,000 km to be completed within 1985, established natural gas as predominant component in Soviet energy mix and the Western Siberia as its main resource site (Perović 2017, 26).

For the first time, the USSR produced more gas than the US, 536 bcm, with the Western Siberia providing 50% of it (Zickel 1991, 507). Successive environmental concerns, convenient price of Soviet natural gas and the Chernobyl accident in 1986, which questioned the role of nuclear power in Western Europe; opened wider prospects for natural gas use in the energy mix of European countries (Högselius 2013, 200–201). But at the same time, other environmental concerns, lack of suitable equipment and prohibitive costs were delaying the development of the Yamburg fields up north in the Yamal Peninsula (Zickel 1991, 507–508). The lag of technological development behind the Western companies was the legacy from the past when the USSR could enjoy plenty of cheap resources which did not require an efficient apparatus in mechanization and innovation (Gustafson 1983, 9).

Meanwhile in the Northeast Asia, the bilateral energy cooperation between the USSR and China had been normalized in May 1989 after 30 years of disruption due to territorial and political disagreements; and it included future cooperation for the forthcoming period 1990–2000 concerning also natural gas. (Paik 1993, 294.) In September 1990, diplomatic relations were established also with South Korea whereas in the Far East prospects of cooperation have been suggested and implemented in oil and gas development. Some examples are the involvement of Samsung Co. and Hyundai Co. for inland pipeline laying and offshore exploration in Sakhalin; and cooperation with

Palmco Co. mainly interested in gas development of Lunskoye field already since 1989. (*idem*, 295.)

The USSR was determined to continue gas export to the West, even if it entailed costly investments for field and transportation development, partly because gas export represented a source of hard currency, and because of increased domestic gas requirements which needed technical demands and related investments burdens. In fact, the USSR lacked the technology and knowledge to produce suitable machineries and other equipment for its energy industry. Soviet gas industry differs from oil industry because its earnings are earmarked for the purchase of essential imports for the industry itself. (Hannigan & McMillan 1983, 49–50.)

In fact, the development of natural gas has been traditionally constrained in many areas due to the high capital costs of supply projects, as well as the length of development processes linked with their inflexibility. Most notably, such constraints are heavier when international deliveries and a linkage of supplies are involved because of the relationship between the gas industry and the socio-economic environment and its perceived stability. A technique to overcome the financial constraints and the risks and burdens related in developing natural gas projects is to establish joint ventures. (Barnes 1990, 39–41.)

The term ‘joint venture’ usually implies ownership or equity and it is defined as a “temporary partnership formed to carry out a single business enterprise for usually a relatively short period of time”. In Soviet view a joint venture is only ‘an investment without ownership title’ formulated on a multilateral basis between nations. (Kosnik 1975, 12.) At the end of Perestroika about 100 joint ventures were started by foreign capitals in the oil sector (Belyi 2015, 90).

To conclude this overview on the 1980s–1991 period, it can be said that the Soviet gas campaigns were aimed to support the country’s military and its energy intensive economy. Energy in the Cold War era was also a tool to integrate the socialist countries of Eastern Europe with pipelines into an energy space. The primary function of energy exports to the Western capitalist countries was that of gaining access to technology and hard currency. (Perović 2017, 3.) As such the share of natural gas in the Soviet energy production continued to rise until it accounted for the main part in 1990 (Krempin 2017, 272). Natural gas extraction had more than quadrupled between 1970 and 1990 (Smil 2015, 67) and became USSR primary fuel in 1984, making the country the world’s largest producer in 1983 (Smil 2010, 102). The USSR was by then recognized to hold 38% of the world’s gas reserves, the majority of which were concentrated in three super giant fields (Barnes 1990, 11).

However, the enter of new producers in market and the augmented energy efficiency of the US set the oil price from 40$ a barrel in 1980 to 20$ in 1985, hindering the modernization programme launched by Gorbachev as the revenues of the USSR shrank by 15%. Some identified this oil price as a crucial factor that accelerated the collapse of Soviet system (Gaidar 2007 in Rutland 2018, 27). (Rutland 2018, 27.) In contrast, Perović sustains that the USSR failed because it could not overcome systemic crisis, the revenues accounting for 80% of the total foreign currency, weakened the incentives for the reforms especially in agriculture, as the USSR used those revenues to buy grain from abroad. (Perović 2017, 26.)

To sum up, favoured by international events such as the oil crises of the 1970s, domestically the energy priority was shifted from oil towards gas to sustain the Soviet economy and to meet the domestic energy demand. The international cooperation emerged from this period focused on a massive centralized pipeline project featuring Western European countries which provided technology and credits in exchange for cheap raw materials, similar dynamics were prospected in the Far East. The economic sanctions by the US were not able to disrupt the completion of the project. However, the cheap and abundant gas united to the poor technological innovations and the need for hard currency and subsequent low oil prices have doomed the USSR to systemic crisis and put Europe in a situation of dependence.

4. Natural Gas in the Russian Federation

4.1. The 1990s

Viktor Chernomyrdin, the Soviet minister for oil and gas from 1983 to 1989 pressed to transform the Soviet Ministry of Gas into state owned Gazprom as renamed in 1989. In 1993–1994 Gazprom was turned into joint stock company and partly privatized. It served as a stabilising factor amidst economic collapse providing cheap gas at fixed prices to industry and population. (Pirani 2010, 19.) The partial privatization allowed to maintain state control over the production and transport of gas to prevent the effects of fragmentation brought by privatization. (Rosner 2006, 12.) In fact, the state was still the major shareholder, albeit owning only 36% of the company. The company had a quasi–monopoly on production (Pleines 2009, 75) and a monopoly over pipeline exports, and it maintained a vertically integrated structure from production to supply in order to maintain its power. (Belyi 2015, 82.) Comparing to oil industry, the gas industry has never reached such level of privatization, and the Russian government was more involved in developing gas industry controlling the 92% of it (Pleines 2009, 75). (*idem*, 71.)

After the collapse of the Soviet Union, overall gas production in the newborn Russian Federation fell in the 1990s due to the decline in domestic demand, from 643 billion cubic metres (bcm) in 1991 to 571 bcm in 1997 (IEA 2006, 26). The unified gas transmission grid could not be broken up between the new formed countries; because of this reason, the new situation required cooperation between parties in the form of new contractual agreements both for the sales between the republics and for gas transit to Central and Western Europe. (Högselius 2013, 204.) Countries such as Ukraine depends on gas piped from or through Russia for three quarters of its need, building substantial debts, and it is where the 80% of European supplies from Russia pass through (Pirani 2010, 85). The newly created situation of dependence towards the Russian Federation in terms of infrastructures and cheap energy prices (Balmaceda 2008, 2). The following map from IEA (2002, 14) taken from a study covering the period 1995–2000, graphically introduces the natural gas producing and prospective regions and pipelines:

FIGURE 3. **Western Russian gas regions and pipelines**, source: adapted from **IEA (2002, 14)**.

The situation of the pipeline network in Central Asian countries, through which gas is imported, is worsening due to the need of refurbishment and expansion; putting the Central Asians producers in a stronger negotiating position (IEA 2006, 25). In the Far East of Russia, the lack of pipelines and regionally produced natural gas had required foreign capital and technologies to boost the use of natural gas in the economy of the region. The tool to foster regional development and upgrading the economy of the Far East was the idea of establishing joint ventures within a market economy framework, in other words the use of private domestic and foreign financings (Tsvetkov 1993, 158; 161). Japan started to show interest in the gas development of the Far East, allocating USD 1 billion to boost the depressed production in Sakhalin area; the manoeuvre was earlier constrained by territorial disputes on the Kuril Islands, which continued afterwards but with less tense tones (Paik 1993, 298–300). Again, the same map of IEA (2002, 14) helps to visualize the eastern natural gas producing and prospective regions and pipelines:

FIGURE 4. Eastern Russian gas regions and pipelines, source: adapted from **IEA (2002, 14)**.

The interest for liquefied natural gas (LNG) seriously arose only in this period, thanks to its possibility to redirecting supplies more easily, to reach new markets inaccessible by pipelines and to the lack of dependence on a single buyer. Only then did Gazprom and the government started to be interested in it. (Mitrova 2013, 9.) In this decade, Russian elites both political and economic aimed at attracting foreign investments in form of capital, technology and improved management of the new companies. The tool invested with this task is the asset swaps, the first form being concretized in 1992 between German BASF and Gazprom in both upstream sector and pipeline, with also the establishment of joint trading company named WinGas. (Belyi 2015, 93).

In December 1993, President Yeltsin established the regulatory framework for Production Sharing Agreements (PSAs), which acquired status of legally binding contracts compliant with international standards in 1995. In 1999, the Duma passed legislation harmonizing PSAs' law with Russian legislation to attract more foreign investments. (Krysiek 2007, 2.) The unusually generous PSA terms applied to the oil and gas projects Sakhalin–1 and –2 in 1994 with Shell, US Marathon Oil and Japanese Mitsui and Mitsubishi. (Pirani 2010, 81).

In 1994 the Partnership and Cooperation Agreement (PCA) between the EU and the Russian Federation was signed posing the bases for the energy cooperation nevertheless the subcommittees ceased almost immediately to operate, shifting the burden of energy issues only at the intergovernmental level (Romanova 2013, 8). In this positive period of relations, further expansion of the pipeline systems in the early 1990s saw the Yamal–Europe pipeline construction. (Belyi 2015, 97–98.) Anyways, “energy cooperation was seldom mentioned in the PCA and has no reference even in the article 55 of the PCA on legal approximation, as it was intended to be regulated by the Energy Charter Treaty (ECT)” (Romanova 2012, 30) in an optic of progressive integration into the energy markets in Europe; however, since Russia has never ratified the ECT, EU–Russian energy cooperation remained with no clear legal bases. (*ibid*..)

In the financial crisis of 1998 devaluation helped the raw material exporters, gas included (Pirani 2010, 50). During this period, the Russian provisions and directions of energy strategies of 1995, 1999 set a declining outlook for the future gas production; with the ranges of the maximum–minimum quantities set at: 860 bcm / 740 bcm for the year 2010; the minimum was then raised at 700 bcm, 635 / 665 bcm for the 2010. (IEA 2006, 26.) The Russian stance on foreign direct investors have been labelled as ambivalent, with fluctuation between two extremes; from openness in the early 1990s with the legal framework for the joint ventures, to gradual closeness due to popular concerns. A renewed openness rose due to financial crisis of 1998 with new PSA laws, which gradually led to an invigorated tightened state control in the early 2000s. (Pleines 2009, 73–74.) as more in detail below.

4.2. The 2000s

In October 2000 the energy dialogue between the EU and the Russian Federation was launched, stressing the importance of the security of supply and demand and the rational use of infrastructures, including technological cooperation and opportunities for EU investments

(Romanova 2013, 5). This period of good relations also saw the further expansion of the Yamal–Europe pipeline (Belyi 2015, 97). Conversely, on the Asian side, albeit the signature in 2001 of the 'Treaty of Good Neighbouring and Friendly Cooperation', the Russo–Chinese cooperation in energy was still low (Henderson & Mitrova 2016, 13). The Russian Energy Strategy of 2003 set a declining outlook for the future gas production; with the ranges of the maximum–minimum quantities set at 680 / 730 bcm for the 2020 (IEA 2006, 26). The document defines the fuel energy complex as a cornerstone for the development of the country and as such is retained vital (Kuznetsova 2015, 167). The Russian concern for the securitization of access to overseas investments, which means most often security of demand, found as solution the practice of swap assets, the largest concluded was between Gazprom and E.ON. Rurhgas (Germany) in 2006. (Belyi 2015, 93.)

Gas disputes in the 2000s have been produced by rising of gas prices in Europe, Gazprom demanded to end the discount prices to former Soviet customers and political tensions culminated in 'coloured revolutions' in Georgia and Ukraine, brought to interruption of gas supplies in several occasions which moved some European politicians to believe to the Russian 'energy weapon' even though the move was more economic than political. (Pirani 2010, 85–86.) The criticism for the alleged political leverage exerted towards transit countries, derives from the fact that being the successor of the Soviet Ministry of Gas, Gazprom has the monopoly of the pipelines built to supply Western European Countries. With the worsening of relations with Poland and the Baltic States, the Russo–German Nord Stream Pipeline was built to bypass these countries and guarantee the demand for security of supply between Russia and its first gas consumer. The project has sparked political debate and criticism in Eastern Europe. (Belyi 2015, 97–98.)

In the 2000s Putin reasserted the state control over oil and gas sector in its ownership and tax dimensions which in turn made possible to stabilise state's financial situation, attracting more foreign investments than in Yeltsin period. (Pirani 2010, 51). Large-scale foreign investments in Russia are also responsible for the Sakhalin Energy, the very first LNG project in the country, which started already in the 1999. In fact, even with state budget surpluses of this period, foreign banks such as French and Austrians provided most of the capitals, some of them such as Deutsche Bank are active in this field since the Soviet times. To be successful in partnerships foreign companies need to have good ties to the Kremlin and moreover need to have local knowledge at the federal and local levels. Indeed, gas projects in Russia might be capital intensive because of inflated costs due to alleged corruption. (Belyi 2015, 90–92.)

In January 2002 the 'Mineral Extraction Tax' (MET) was introduced to counteract the tax avoidance schemes, and the revenues were moved from regional budgets to the federal government (Pirani 2010, 75). In 2003 Putin also signed legislation which drastically reduced the eligible hydrocarbon fields for development under PSAs and modified taxation to make PSAs less attractive to foreign investors; further regulatory pressures were introduced on foreign-owned energy assets in Putin's second term (Krysiek 2007, 3). Eventually, the PSA formula as a commercial contract was ended because of the difficulties with contracting procedures (Bros & Mitrova 2015, 5). In 2004 offshore oil export revenues conveyed in the Stabilisation Fund for long term investments, which held USD 150 bln in 2007 and it split into two entities in 2008, the Reserve Fund and the National Welfare Fund (Pirani 2010, 47–48). For the first time since the late 1980s tax payments from hydrocarbon companies increased substantially, putting the state finances on solid foundations (*idem*, 76).

In 2005 Gazprom was partially renationalized, the state bought 10.7% of the company's share (Rutland 2018, 29), now controlling 51% of it; in 2006 the Russian government also legally granted export monopoly to Gazprom and its subsidiaries companies. (Belyi 2015, 82.) Nevertheless, Gazprom faced competition from the new independent producers such as Novatek but still retained the 70% of gas production (Rutland 2018, 29). In fact, other minor independent companies were present in Russia, among them Novafininvest which emerged in the late 1990s and was later renamed Novatek. The rebalancing between Gazprom and the independent companies concerning the domestic side is strongly backed by the Kremlin. (Belyi 2015, 82–83.) Domestic prices of gas are state regulated, with independent gas producers being exempted but in need to face the Gazprom's monopoly of infrastructure. Prices for household consumptions are considerably lower than industrial ones that have been liberalized in 2011. (Pleines 2009, 81.) As a result, the overall Russian production rose to 641 bcm with a large share of 547 bcm thanks to Gazprom, from the three supergiant fields Medvezh'ye, Yamburg and Urengoy located in Nadym-Pur-Taz in the West Siberian Basin (IEA 2006, 25). However, the three supergiant fields already heavily exploited are in a situation of declining production, which requires the exploitation of new fields (IEA 2002, 113–114).

In 2007 PSA terms were renegotiated, Shell retained PSA in Sakhalin–2 project but under pressures from the Russian government, which was threatening to close the activities due to environmental concerns (Pleies 2009, 74), Shell sold its 50.1% stake to Gazprom (Pirani 2010, 81). Similarly, in 2007 TNK–BP who was jointly developing a project in Kovytka field in Eastern Siberia was forced to include Gazprom, as TNK–BP wanted to export gas to Far Eastern markets (Pirani 2010, 83). Meanwhile in North America, the production of unconventional gas and the shale gas revolution led to an oversupply of offer in the global markets (Øverland 2010, 876).

The second stage of Energy Dialogue also took part in 2007, with a transformation of institutional modalities of energy cooperation. It included the harmonisation of strategies in an unshared view on market organisation which saw an EU extreme gas liberalisation clashing against

Russian more gradual stance. Conversely, the clean energy chapter saw good results in practical cooperation, from CO_2 emissions to renewables and energy efficiency. However, none of these issues resulted in enhanced energy integration between EU and Russia. (Romanova 2013, 6.) Since Russia has never ratified the ECT (Energy Chart Treaty) and in 2009 it withdrew from it because of the disadvantageous conditions, there is a legal vacuum in EU–Russia relations (*idem*, 11).

After 2008 the importance of Arctic region in energy strategy has gained momentum with the publication of the ‘Arctic Strategy beyond 2020’. The strategy was developed with the help of the National Security Council of the Russian Federation. In this context, by law, national ownership of the major fields must account for at least the 50%, with Gazprom and Rosneft having to be involved in every project. These two companies are practically the only ones who can access Arctic seas. The lack of technology for deep water drilling forced a partnership with ExxonMobil, interrupted in 2014 for political reasons. Cost of oil recovery from the seas is not profitable when oil is below 75$ per barrel. (Belyi 2015, 87–88.) Due to concerns expressed by foreign investors, a clearer legislation was produced in 2008. The law required the governmental approbation which includes security clearance, for shares of more than 10% hold by foreign companies in large gas deposits. (Pleines 2009, 74.)

Of great significance is also the 2009 Russo–Ukrainian bilateral gas crisis which signed a turning point for Russia relations with the CIS and European countries, for the latter side, it represented an energy security event, bearing policy consequences, and in case of Russia, it strengthened the willingness to bypass Ukraine by building new pipelines both in North and in South (Pirani *et al.* 2009, 60; 63). In 2009 the second version of the Energy Strategy to 2030 was also published which continued to consider the fuel energy complex as the base for country development in line with the previous version and it only voiced the necessity of an energy transition (Kuznetsova 2015, 167). In 2009 there was also the opening of the first LNG export facility under the continuation of the Sakhalin–2 project (Rutland 2018, 29).

4.3. The 2010s

The LNG option of Sakhalin–2 paid off after Fukushima accident in 2011 when Japan increased its imports of 8 bcm. (Pleies 2009, 74). Japanese LNG imports for the post Fukushima disaster of 2011 were estimated from 73.6 to 88.7 million tons per year depending whether the country would adopt re-nuclearization or denuclearization (Miyamoto *et al*. 2012, 65). For the Russian government, the export of LNG represents a valid tool to concretize a set of goals, the increase of exports, which also allows the bypassing of transit countries (Mitrova 2013, 34) and the entry to new markets.

However, not all the political factions agree on the issue, in Russian domestic politics the critics of dependence on energy exports comprise the liberals who wish to stimulate the growth of the small business and foreign investment, moving away from hydrocarbons. They lead the Central bank and the Finance Ministry; their most notable achievement has been the establishment of the Stabilisation Fund. On the other hand, nationalist economists suggest both using hydrocarbon revenues to fund state-led investment in infrastructures and manufacturing as well as introducing “capital controls to prevent capital flight” and protectionist excises to dissuade imports. In 2014 the Ukrainian crisis bolstered the nationalist fringe of the Putin administration. (Rutland 2018, 31.)

Also, the 2014–2015 events, with deterioration of relations between Russia and Ukraine–EU–USA, further strengthened the intentions to bypass Ukraine as a transit state by diversifying the approaching routes to Europe. Whilst before 2014 European opposition was regulatory such as in the diminished use capacity of Opal pipeline to 50% and the cancellation of the South Stream pipeline, the post–2014 saw a political opposition to transit diversification projects. (Pirani & Yafimava 2016, 53.) Conversely, Belarus is a strategic partner, with Gazprom controlling the 50% of Beltrangas, the national company, which can be used to bypass Ukraine to deliver gas to Europe (Nalbandov 2016, 235–236). However, unreliability of Belarus for gas transit has fostered plan to bypass it (*idem*, 240).

Because of the Ukrainian crisis, the US imposed a series of targeted sanctions which also affected the companies which dealt with the production, transportation and sales of energy carriers (Gazprom, Gazprom Neft’, Lukoil, Surgutneftegas and Reset) (Nalbandov 2016, 168). These events have halted the EU–Russia shared cooperative solutions and led each other to diversify their partners also in energy issues. Conversely, Russia halted the development of the South Stream in December 2014 and subsequently also the alternative project Turkish Stream in 2015 after the increased tensions with Turkey for the downing of a military aircraft. (Romanova 2016, 781–782.)

This in turn has moved Russia to establish closer links with the long neglected Asian markets, especially with China; the situation has particularly been induced by the Ukrainian crisis. Indeed, earlier the lack of infrastructures has been prolonged by political reasons, with the Kremlin denying authorization to proceed first to Yukos and then to TNK–BP. Only after the Gazprom *de jure* monopoly was established in 2006, have matters slowly started to work out; however, meanwhile the increased competition in the market supply has made the situation more complex. With the demonopolisation of LNG exports in 2013, the Asian supplies were politically made more flexible. In 2014 after a Sino-Russian deal foresaw the exemption from royalties and export revenues in gas fields, CNPC (Chinese National Petroleum Company) acquired a 20% stake in the Vankorskoe gas field in Eastern Siberia with the intention of sending that gas to China. (Belyi 2015, 160–162.)

The LNG export demonopolisation was lobbied by Rosnef and Novatek (*idem*, 85–86), entered into legal force on 1.12.2013, it represents a historical turning point. In fact, other than Gazprom and its subsidiaries companies, new actors were allowed into the game. The new actors included the users of mineral resources with a license to build an LNG plant as of 01.01.2013, and the holders of a license to send their gas production for liquefaction at another plant. The law included also companies, owned by the Russian government for more than 50%, which are liquefying and exporting gas produced or under PSAs, or only from Russian offshore fields including those on the continental shelf, Black and Azov Seas. (Mitrova 2013, 5.)

The development of LNG also affects the overall development of regions such as the Arctic and the Far East, by requiring the application of modern technology, the building of industries and infrastructures as well as restoring the strategic importance of the Northern Sea Route (Mitrova 2013, 6). However, few problems seem to hinder such kind of projects. First, the challenging location of the new fields, often located in permafrost zone or offshore, rise the extraction costs and requires that pipelines must be built in longer distances (Rutland 2018, 30). Nonetheless, despite the high costs needed in developing such projects in the High North, the Russian government has included them in regional long term and large-scale development plans (Mitrova 2013, 34). Second, the lack of seismic technology for geological prospecting, turbines engineering, refining technology and offshore drilling would force Russia to partner with foreign companies and their credits in exploiting the new fields (Rutland 2018, 30).

Conversely, the main reason for the interest of western companies in developing Arctic energy projects resides in the difficulty of replacing hydrocarbon reserves (Øverland 2010, 875). For instance, Total S.A., the French company involved in the JSC Yamal LNG launched a new project for exploration and production of untapped resources in Russia in 2011 (Bros & Mitrova 2016, 5). Within this framework consistent swap assets were performed between Gazprom–ENI (Italy) in 2010; Rosnef–Statoil (Norway) in 2012; Rosnef–ExxonMobil (US) in 2012. The most beneficial aspect of these assets swap is the political trust built between the parts, Russia gets technology, expertise and overseas equity, and foreign partners get portfolio investments in Russia. The cumulative debt as of 2013, was USD 700 billion, unveiling the foreign interest for investing in Russian energy sector (Belyi 2015, 90–92). However, an acute problem in the upright sector of the industry concerns the clarity of property rights, a license is not a property right and can be revoked; this means that Russian state has control also over foreign private companies. (*idem*, 93–94.)

This Russian ambivalent stance in international energy cooperation has been observed earlier, as for example by Pleines (2009). To explain the Russian attitude, Øverland (2010, 871) argues that two factors push in opposite directions: the resource nationalism and the post–communist transition. The resource nationalism manifests itself when oil prices are high, whilst with low oil prices Russia is more cooperative with foreign partners; a pattern found in both Shtokman and Yamal projects. On the other hand, the post–communist transition pertains to the degree of allowed involvement of both domestic and foreign private investors in energy projects. (*idem*, 872.) For instance, Shtokman field development was costly and complex, with target final buyers located in northwest Russia and in the European market via pipelines and in the USA via LNG tankers. The project was completely aborted due to disagreements about some choices between the partners, and because of the effects of the US shale gas boom, a lack of tax incentives and high costs (Bros & Mitrova 2016, 5).

After having identified the factors which influence the decision–making such as the internal and external demand for natural gas and the waves of resource nationalism, which is "influenced by oil price and attitudes towards private companies both domestic and foreign" (Øverland 2010, 877–878); Øverland (*ibid*.) poses the question of "what forms of international cooperation Russia will seek in extracting its resources, especially about partnering with international companies".

The most interesting example of international energy cooperation in the 2010s is the Yamal LNG project. It is the largest natural gas export project in Russia, developed by the Russian largest independent gas producer Novatek together with China National Petroleum Company (CNPC) and the French Total. The project required considerable funding and advanced technological systems for shipments through the Arctic Ocean; it was also financed by the National Welfare Fund, unveiling the Russian government's commitment to support LNG exports (Belyi 2015, 86–87).

As the project is very recent and has been completed only in December 2017, there are not many previous studies on the topic. Bros and Mitrova (2016) found that the rationale of governmental support for Yamal LNG resides in diversify and increasing absolute export volume and at the same time decreasing the dependence on European market. At the same time the project would support the development of regions especially the Arctic and the Far East, reasserting NSR significance and promoting technological modernization and development of the related industries, with strengthening Russia's influence in the Asia–Pacific region. (*idem*, 6.) The goals were achieved also thanks to governmental support in terms of tax breaks and liberalisation of LNG exports (*idem*, 7).

On the tax breaks, Lunded & Fjaertoft (2014) have investigated the role of governmental subsidies in the Yamal LNG, but their detailed study does not focus on the political reasons nor on the strategic significance of the project. Bros and Mitrova (2016, 3) argued that the sanctions together with low oil prices could lead in delays in long and medium-term projects such as Yamal LNG, albeit one must consider also Russia's ability to respond to Western sanctions. The challenge of energy companies having to restore ties with financing institutions would also affect the development of Russian–Asian relations (*idem*). Since their studies were written when the project was under way to its completion, no definitive answers were provided.

5. THE ACTORS, THEIR INTERESTS AND SCHEMATA

This chapter introduces the actors involved in the development of the JSC Yamal LNG project and aims to identify the role they played. Apart from energy companies, and international financial institutions, there is the presence of the Russian government and state institutions at both federal and local level. In fact, as Russia is a centralized state, the president is almost always involved in some capacity in the process of forming energy policy along with or through its presidential administration, prime minister and government (Aalto 2012, 21) to an extent that we can speak of the 'bureaucratic politics of energy' (Aalto *et al.* 2014, 6). Furthermore, given the territorial vastness of Russia, one must acknowledge also the role of the 'regional politics of energy' (Tkachenko 2007 in *idem*). As this dissertation focuses on Russian actors, i.e. how they see the case under examination, the role of international partners was studied with the help of primary data from Russian sources. However, the primary data of this chapter were also complemented with secondary sources. These were especially valuable in case of the regional and local levels due to the scarcity of material and the impossibility to conduct interviews with relevant actors.

5.1. Russian Government and state institutions

According to the analysis of my primary data, the Russian government and state institutions had a determinant role in the realisation of the Yamal LNG project. Similar conclusions have also been drawn by previous studies, especially regarding the tax breaks as for instance in Lunden and Fjaertoft (2014). Although in words of president Putin (2015) the Russian Government has supported the Yamal project after the foreign investors were involved, to show the political support to the project. This is no surprise as the gas sector is the most state-controlled in the Russian energy complex (Kivinen 2012, 49). However, it is the government that produced the policy documentation such as the energy strategies and the Arctic strategies thus allowing range of movement for the energy companies. The most substantial support granted by government was, first, financial, such as tax breaks and funding, and second, political, such as legislative support aimed at administrative and bureaucratic simplification and stipulation of bilateral agreements which favoured the completion of the project. Moreover, state corporations such as Sberbank and VEB were involved in supporting the project and domestic shipbuilders and expertise provided by Rosatom and United Shipbuilding were actively involved in the development of the project (more on the state actors' contributions in chapter 7).

On the regional level, the project was completed in the Yamalo–Nenets Autonomous District, an autonomous *okrug*, it is one of the six diverse types of constituent units of the Russian

Federation (Oracheva 2007, 62). The YaNAD is a peculiar area, it is an economically developed and richer region than the Tyumen oblast (*idem*, 65) of which is part, but being a federal subject with equal rights (Kusznir 2007, 169). The YaNAD managed to retain its political and economic authorities and to avoid the power transfer to Tyumen oblast, despite the 2001 federal proposal of regional amalgamation (*ibid.*).

However, in the 2000s a series of changes interested the state institutions at the regional level. Indeed, the Kremlin abolished the gubernatorial elections in 2004 (Turovsky 2007, 153) and appoints directly the governors of the districts. Moreover, the Kremlin seeks active role in regional affairs in two ways, by combining business and politics towards social responsibility, and by acting as mediator between investors and regional authorities to assist the most loyal governors. This last process is carried out by the presidential envoys in federal districts. (*idem*, 158.) Furthermore, regional powers were also reduced by the legislative amendments of 2005 which transferred the decision-making powers over valuable minerals to Moscow. Likewise, a new federal financial policy has limited the regional and local powers to grant tax breaks and other privileges. (*idem*, 151–152.) All these changes have subordinated the regional and local level to the central authority. Kusznir (2007, 166–167) categorized the situation in the YaNAD as configured in a model of 'privatisation of powers' where the companies perform monitoring functions proper of the central political authority.

The analysis of the primary data seems to confirm the abovementioned considerations, and grants preeminence to the federal level in the Yamal LNG case. However, the regional and local levels were also actively involved in the process as said in section 5.4. The interests and cognitive frames of the actors which emerged from the analysis will be reported and discussed in detail in the section 5.5.

5.2. Energy companies, sub-contractors and partners

The energy companies involved in the project are the Russian Novatek, French Total and Chinese CNPC. The role played by the owner of the project Novatek is interesting, in particular if taken into account what Putin had argued on the future of Russian energy companies. In fact, Putin (2006) declared that the general trend in their development is towards a middle ground between the purely state-owned companies as the Norwegian Statoil and the multinational companies similar to the American ones with the government controlling the major share but working under market conditions. The choice of partners in the liberalized shares often fell on strategic partnerships with German companies present at 10%. The private oil companies are not going to be nationalized. (*ibid.*.)

Novatek, born in August 1994 as Novafininvest, focused on oil and gas asset development, adopted its current name in 2002. It acquired licenses for production and exploration in the YaNAD (East–Tarkosalinskoye, Khancheyskoye and Yurkharovskoye fields) and started the commercial production of natural gas in 1998. With 25 bcm production per annum, Novatek has been the largest independent producer company since 2005. Novatek entered JSC Yamal LNG in 2009 with the purchase of 51% interest which allowed for exploration and development of the South Tambey field. In 2010, a cooperation agreement with Gazprom for LNG production in the Yamal peninsula was signed together with a long-term agency agreement between Gazprom Export and Yamal LNG providing for the export of LNG produced from the development of the abovementioned field. In 2011 Novatek increased the equity interest in Yamal LNG from 51% to 100% by exercising two call options for 23.9% in July 2009 and 25.1% in March 2011 (Novatek 2011b). Subsequently it sold a 20% participation interest to Total. With the launch of the Yamal LNG the company entered international markets. (Novatek 2018.)

The first international partner was the French energy company Total which showed interests in the project and held preliminary negotiations already in 2009 (de Margerie & Putin 2009), it entered in joint venture in JSC Yamal LNG in October 2011 (Novatek 2011c) after the signature of the memorandum of cooperation of March with the 20% share and the overtaking of the 12% stake of Novatek (The Russian Government 2009). The main reason of the interests of the western companies in such Arctic energy projects derives from the difficulty of replacing their reserves (Øverland 2010, 875). Total launched in 2011 a new project for exploration and production of untapped resources in Russia (Bros & Mitrova 2016, 5). Later, they increased their stake in JSC Yamal LNG to 16% in June 2013 (Novatek 2013c).

The second international partner is the China National Petroleum Corporation (CNPC), its main interest in the project was to secure long-term sustainable supplies of LNG to China as Chairman of the Board of Directors of CNPC Zhou Jiping said (Novatek 2013d) (Novatek 2013b). CNPC entered Yamal LNG with a purchase of a 20% equity share in 05.09.2013 with expectation to complete the necessary regulatory approvals by 01.12.2013 (Novatek 2013b). The commitment has then been formalized with a binding contract announced on 20.05.2014. (Yamal LNG 2014a).

5.3. International Financial Institutions

In this section the main subject is represented by the Silk Road Fund, a Chinese fund of USD 40 billion for medium to long term investment and development through outbound investments with acquisition of equity stakes and provision of debt financing established in December 2014. It focuses on infrastructure, energy industrialization and financial cooperation which are considered top priorities to the connectivity of the Chinese economy with the rest of the world. (Novatek

2015a.) The Silk Road Fund entered with a 9.9% equity stake in Yamal LNG in September 2015 and signed the binding agreement in December 2015 with an extra agreement for a provision loan of EUR 730 million in 15 years to finance the project (*ibid.*). The President Wang Yanzhi declared the project as being one of the most prospective and competitive LNG projects in the world hence the willingness to become shareholders. The entrance of the group was made to contribute to an expedited closing of the general external financing and to further develop the Chinese–Russian cooperation in the energy sector. (Novatek 2015b.) The transaction closed in the following March 2016 (Novatek 2016).

Moreover, in 2016 several banks and export credit agencies also contributed to the financing of the project. Other than Chinese IFIs, also the The Japan Bank for International Cooperation (JBIC) provided funds to the project (Yamal LNG 2016a). Among the European IFIs can be mentioned the Italian Intesa Sanpaolo covered by the Italian export credit agency SACE and the French export credit agency COFACE (Yamal 2016b), and also Raiffeisen Bank International AG covered by the Swedish export credit agency EKN and the German Euler Hermes (Yamal 2017d). The dynamics concerning these actors will be exposed later on, in the chapter 7.

5.4. Russian regional and local actors

Perhaps the most relevant NGO somewhat involved in the issue is the WWF Russia which is the largest environmentalist NGO operating in the country. It is considered as a relevant actor because of its active role in the field. Albeit its role is limited because of the political centralization of the Russian state where energy projects are large and state-driven and the energy companies still lack of transparency and information circulate poorly (Aalto 2012, 25); it is important in terms of scientific knowledge as it produced policy recommendations on technical issues such as the LNG bunkering in ships (Klimentyev *et al.* 2017) and environmental impact of LNG projects in the Arctic (Ametistova & Knizhnikov 2016), of climate change in the Arctic (WWF-Russia 2008; 2009).

The federal and regional executive agencies plus the local governments of the YaNAD were actively involved in the implementation of the project from 2013. Their task was that of helping to reduce the workload for the Gulf of Ob sections for geological prospecting operations and related energy extraction activities, as a directive augment Clause 9 of the Government Directive No. 1713-r. (The Russian Government 2013b.) Their role in building infrastructures was also evident in the construction of the railway Northern Latitude Route leading to the seaport of Sabetta, the railway was crucial for the development of the region and the infrastructural integration of the country since it relieved the load from the Trans Siberian and Baikal–Amur railways, contributing to make Sabetta seaport a multipurpose structure (Putin 2013a). The form of participation of the local government was a public–private partnership in the Bovanenkovo–Sabetta section (Putin 2015).

5.5. Interests and Cognitive Frames in Formulating Russian Arctic Energy Policy

As already said in the theoretical chapter, the interests of the actors are the key to understanding the energy policy formation; since they are difficult to individuate because of their context influence, it is better to treat them as embedded to schemata, known also as cognitive frames within which actors operate. (Aalto 2012, 26.) The analysis of policy documents and other primary data has allowed to identify the main interests bore by actors in formulating the Arctic energy policy, and the role of cooperation in the completion of the Yamal LNG Project. For the Russian government, as expressed by Putin (2014d), the Arctic region is a concentration of all aspects of Russian national security: military, political, economic, technological, environmental and resources. Russia strictly follow its strategic planning of restoring and enhancing its position in the Arctic. Putin also claims that the interest in the region's sustainable development is based on cooperation and absolute respect of international law. (*ibid*.)

As we see, the international cooperation plays a substantial as well as an instrumental role in the pursuing of Russian state's interest in the Arctic. Also, the Russian National Security Strategy stresses the extreme importance of international cooperation in the Arctic in the form of equal and mutual [point 99] (Russian National Security Strategy 2015, 26). The importance of the Arctic region is underlined by the decision of designating it as a new separate entity for statistical purposes to monitor and analyze the level of socio-economic development and the state of national security (Government of the Russian Federation 2017). The Presidential Executive Order No. 296 of 02.05.2014 establishes nine land territories of the Arctic zone. (The Russian Government 2014.) The importance of the Russian Arctic zone (RAZ) has also been highlighted by the creation of a dedicated policy strategy called 'Socioeconomic Development of the Russian Arctic Zone' with an original duration up to 2020, which has been extended in August 2017 through 2025. The main aim, as the title suggests is the socioeconomic development of the region. (The Russian Government 2017a).

Pragmatically, the natural resources of the Arctic have been identified by the Natural Resources and Environment Ministry as the driver for the region's development. The other foundation for the development, which is based on the resources, is the infrastructures making use of the Northern Sea Route transit potential. (Donskoy & Ulyukaev 2016.) As written again in the Russian Arctic Strategy, the use of the Arctic zone of the Russian Federation (RAZ) is intended as a strategic resource base providing solution of problems of social and economic development. (Government of the Russian Federation 2009, II.4.a.) In all of this, the role of the Yamal LNG as declared by Putin (2017e) is a cornerstone of the development of the Arctic region and the Northern Sea Route, since it interconnects all the relevant development aspects of the region.

Moreover, the Russian government's interests in increasing the output of gas produced can be seen also as a concrete measure to help domestic development for such regions as the Far East, where energy is more expensive and hinders economic development and encourage depopulation. Raw minerals and resources increased production should help to solve this situation creating thousands of new jobs. (Putin 2012b.) Consequently, also the fast-growing region of the Asia–Pacific serves as a major impetus for the development of East Siberia and the Far East of Russia (Putin 2014b). The role of international cooperation in fostering domestic development is well represented by the agreement with China, which is fundamental to link the Eastern Siberia and the Far East to the national gas grid thus linking together the western and the eastern gas pipeline system (Putin 2014a).

Additionally, the development of LNG market represents a unique opportunity to consolidate the fragmentary regional gas market, a priority task for the Russian Federation (Putin 2014b). The infrastructures needed and related to the gas industry are also top priority of the Russian government as they are multipurpose in nature such as seaports and railways and are enclosed in the wider project of national infrastructural integration (Putin 2013a). The integrated system would redirect supplies more easily westwards or eastwards depending on the market demand (Putin 2014c). Politically, the enhancing of investments also generates taxes which in turn provide resources for further domestic development (Putin 2017b).

The literature has identified that the most common frame aggregating Russian actors' interests (Aalto *et al.*, 2014) is the business frame, which links banks and energy companies in the drive for profit with the Russian state's quest for revenues and tax collection (Aalto 2012, 26). In this case, it also appears to be the main drive for the banks and the energy companies, even more if thinking that for the Russian actors the security of markets it is also part of the profit interest (Aalto *et al.* 2014, 14), and the Yamal LNG grants access to new markets. As for the state actors, the profit interest in form of revenues and taxation it is also present. However, the most frequently encountered interest from the analysis of the documents is the socio–economic development of the country, together with its modernization the so called 'social frame' (Aalto 2016, 46). The cognitive frame of power and influence (Aalto 2012, 27) does not explicitly emerge from this context in strict relation with the Yamal LNG energy project albeit it is found in the development of the NSR to which the project is functional. On the contrary, the frame of sustainability, (*ibid.*) does emerge in the strategies and find practical application in the technological solutions required for the exploitation of natural gas minimizing the collateral effects on the environment.

To summarize, whereas for the energy companies and the international financial institutions, the profit is the main interest, the primary emerging interest of the federal government is that of the socio-economic development and modernization, which is assumed to be also shared by regional and local actors, especially in the Arctic (Aalto 2016, 46). This last assumption is also empirically confirmed by the interests shown in the programme of social benefits bestowed by Novatek and Total in the YaNAD. Business, sustainability and power–influence frames are also present in the state institutions but in a somewhat secondary acceptation. However, being the Arctic about all aspects of Russian national security, it is difficult to clearly delineate and produce an ultimate ranking of interests.

6. THE FOUR STRUCTURAL DIMENSIONS: ENABLERS AND CONSTRAINTS

In this chapter I demarcate the picture, derived from the analysis of the primary sources pertaining to the four policy environments or structural dimensions, that the actors have had to face in the process of completing the Yamal LNG project. Special emphasis was granted to the role of primary sources because they unveil the degree of knowledge and the extent of information availability which in turn structured the way in which actors opted for the international cooperation which successfully allowed to complete this project. However, integrations and comparisons with secondary sources were provided for triangulation purposes, or in case of too technical issues which were only cited, incorrectly cited or poorly addressed in governmental meetings and press conferences which forms the bulk of the primary data.

6.1. Resource Geographic Dimension

The resource geographic dimension includes both material and social qualities (Aalto *et al.* 2014, 7–8), in the first group falls the physical geography and geology of the gas resources and the climate which characterizes the region in question. Material value is also found in the technology availability for the exploration, extraction and production of resources, this sub-dimension includes also the know-how of technology and the human capital such as scientists and technicians which represents a social element (Aalto 2012, 31). Again, more material dimension is embedded into the infrastructure and maintenance sub-dimension. As the social, cultural and linguistic turns in IR are prone to consider material issues such as natural resources as inconsequential (Aalto *et al.* 2014, 5) it is especially important to include this dimension as it characterizes the material base on which policy makers ground their decisions.

6.1.1. The geography and geology of Arctic offshore/onshore gas resources

The emerging picture concerning the gas geography and geology of the Russian Arctic zone is that of an impressive resource base located in a hostile environment characterized by difficult climatic conditions and vast distances. This pool of resources requires joint efforts to be exploited and can grant impressive payoffs to the actors who wants to get involved. The potential of the Russian Arctic gas has been widely understood both politically and scientifically. Hereinafter a brief description of the Russian Arctic zone and its potential has been elaborated from both political sources and academic publications, unveiling an awareness and communion of views from the Russian actors.

Russian politicians understand that the Russian Federation is the largest of the Arctic countries, and that its Arctic zone has an extension of 3.4 million square kilometres (km^2), accounting for 19.9% of the country's territory (Putin 2017g) and for one third of the world's Arctic region (Putin, 2017h). The whole Russian Arctic shelf has an extension of over six million km^2 (Donskoy & Medvedev 2013). On the West Arctic shelf in the seas of the Arctic Ocean, Russia owns large deposits of gas; these exceed 10 trillion cubic metres (tcm), accounting for more than 90% of Russian gas reserves on the shelves of the Earth's circumpolar belt, (Kontorovich 2015, 214); these are the largest reserves among the oil and gas resources owned by the Arctic nations (Bourmistrov *et al.* 2015, 147). Until now, 340 oil and gas fields have been discovered in the Russian Arctic Region, including 33 in the accessible offshore fields on the Arctic continental shelf (Donskoy & Ulyukayev 2016). The peculiarity of these reserves, assessed according to recent declarations at 20 tcm (*idem*), consists in being concentrated around the Yamal Peninsula area in theYamalo–Nenets Autonomous District (YaNAD). The peninsula itself holds 27% of Russian total gas reserves (IEA 2014, 86) accounting for 4.2 trillion cubic metres (Putin 2017f), while in comparison, the subsoil of the Barents Sea alone contains 2.8 trillion cubic metres of gas (Putin 2017g). The following map shows this distribution of hydrocarbon resources in the Russian Arctic:

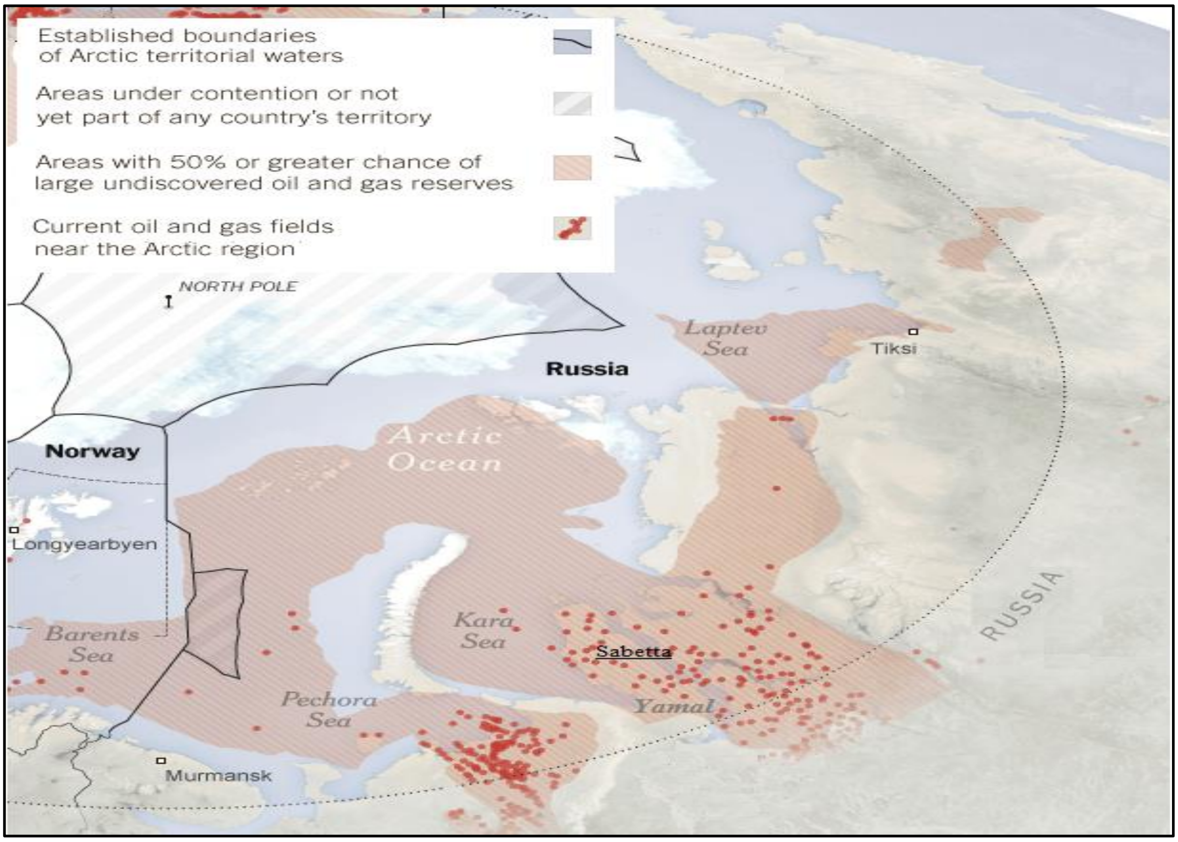


FIGURE 5. Russia's Arctic hydrocarbon deposits, source: adapted from **Copeland & Watkins (2013).**

From the analysis of documentation emerges that the Energy Strategy 2030 underlines how the depletion of main gas deposits in the Nadym–Pur–Taz district of the Tyumen region and increase in the share of hard-to-recover reserves (low pressure gas) lead to the necessity of developing new gas–producing centers such as the Yamal peninsula (MinEnergo 2010, 75). To counter the existent situation, YaNAD has been designated as the major gas–producing region of the country for the period up to 2030; as it holds at least 26 deposits with proven gas reserves of 10.4 tcm. (*idem*, 77.) The value of the YaNAD is also stressed in the Russian Naval Strategy 2030 which at the point 27 depicts the requirements for the naval presence in strategically important areas acknowledging: 'a) the increased aspirations of a range of states to own sources of hydrocarbon energy resources in the Near East, **the Arctic** [author's bold], and the Caspian Sea basin' (Davis 2017, 5).

The Russian actors also acknowledge that the extreme climatic conditions which affect both operations and transports are one of the main challenges in the peninsula and in the whole Arctic zone (Government of the Russian Federation 2009, I.3.a; 2013, II.4.a). Particularly, speaking about onshore facilities and its related waterfront areas, the main problems are represented by wind which reduces visibility and induces wind chill, drifting–snow, and wet airborne snow. The first type designates a concretion or deposit of snow transported by the wind, whereas the second type contributes to icing and ice loads on structures. (Bourmistrov *et al.* 2015, 251–253.)

6.1.2. Energy technologies for the exploration, extraction and production of resources

The state of Russian energy technology, especially in its Arctic offshore capabilities, lag behind the foreign counterpart, posing a huge constraint in the unilateral development of the domestic gas fields and creating a huge push towards international cooperation as noted also by Rutland (2018, 30). A comparable situation is also outlined in mastering some of the LNG related technologies. Albeit the declared governmental support granted to fundamental studies and applied research as a key condition for global leadership in the energy sector and its modernisation and development (Putin 2012c), few difficulties subsist in the technological capabilities of the Russian Federation.

The first problem afflicting policy makers is the lack of modern technical means and technologies for exploration and development of hydrocarbon fields in the Arctic. (Government of the Russian Federation 2013, 2: II.5.b.). It represents a main concern to the implementation of the Russian Energy Strategy 2030 as it hinders the reproduction of the Russian Federation depleting resource's base (MinEnergo 2010, 75). Still in 2012 the Russian government clarified that the unavailability of technologies slowed down both the exploration of deposits on the shelf and the geological prospecting which was reduced by ten times since the peak in the 1980s (Donskoy *et al.* 2012). As such, the lack of modern hydrocarbon exploration and production technologies, including underwater ones, is acute and represents a highly complex issue. A tangible consequence is the poor exploration of the vast and climatically challenging East Arctic waters such as the Laptev Sea, the Chukchi Sea and the East Siberian Sea. (Donskoy & Medvedev 2013.) Likewise, and globally, companies' geological exploration activity also dropped by 22% in 2015 but in this case mainly because of the macroeconomic situation (Donskoy 2016). As a direct effect, a large part of the Russian subsoil resources need to be explored and developed, because their proven amount currently does not match the potential of the region (Putin 2017g). The amount of imported offshore exploration technologies in Russia is 90% (Moseev in Aalto 2016, 51) but the effects of the economic sanctions of 2014–2015 are not as incisive as in the oil sector, because in Yamal LNG the sources used, as above mentioned, are located onshore (Huang & Korolev 2015, 233).

Secondly, the Energy Strategy 2030 voices out the need for development of technologies for production of LNG, especially of gas-processing and gas chemical industries; the development of capabilities aimed at ration utilization of valuable fractions of hydrocarbons and associated petroleum gas must be also kept in consideration. (MinEnergo 2010, 75–76.) In fact, Russian chemical gas production facilities have low capacity and insufficient outputs resulting in suboptimal raw materials (naphtha instead of hydrocarbon gases C_2–C_4). This creates multiple damages such as environmental problems, as these raw materials are burnt, and economic losses, since Russia has then to import petrochemicals. In Yamalo–Nenets Autonomous District, there is a huge production of wet gas, which contains several extractable products (Kidnay & Parrish 2006, 349), but as the technology for production and transportation is missing hence companies simply burn these raw materials (such as ethane, propane, butanes). The problem is widely known and president Putin (2009a) voiced out that overall, the practise of flaring resulted is an estimated loss of 20 billion cubic metres of associated petroleum gas. (Kontorovich, 2015, 55–56). Even if Russian producers have experience in onshore pipeline infrastructures, nonetheless they need to improve their knowledge in LNG technologies (Huang & Korolev 2015, 233), notable is the scientific gap in turbine engineering, foreign equipment in this sector performs better but the domestic produced equipment are easier and cheaper to repair also under severe climatic conditions. (MinEnergo 2010, 124.)

6.1.3. Maintenance and transportation infrastructure

From the analysis of the data concerning the infrastructures and related facilities two main segments emerge, one is terrestrial and the other is maritime. In the terrestrial segment, the energy network lies largely in suboptimal conditions; whilst the same is true for the maritime segment of the energy transportation infrastructure, the recent successes operated by Russian ships in the Northern Sea Route have opened interesting prospects for the future. The Russian Arctic Strategy 2030 gives a description of the overall status of infrastructures in the Arctic region. It depicts an area characterized by the 'underdevelopment of basic transport infrastructure in its marine and continental components, aging icebreaker fleet and lack of small aircraft, together with inefficient development of navigation-hydrographic and hydrometeorological support of navigation'

(Government of the Russian Federation 2013, 2: II.5.b). The key features pertaining the infrastructures are characterized by: ‘the distance from the main industrial centers, high resource use, and associated economic activities and livelihoods depending on supplies of fuel, food and essential commodities from other regions of Russia’ (Government of the Russian Federation 2009, 1: I.3.c; 2013, 2: II.4.c).

To use effectively and develop the Arctic resource base, there is the political intention to implement large infrastructure projects to integrate the Arctic Zone with the developed regions of Russia, this applies also to the Yamal peninsula (Government of the Russian Federation 2013, 5: III.11.d). Moreover, it exists a broader political willingness to develop a nationally unified system of gas supply including its expansion to the eastern part of Russia, and the enhancement of interregional integration on this basis. The main concern in this regard expressed by the Energy Strategy 2030 is the infrastructure constraints of pipeline gas transportations and the high transit risks of gas export to Europe. (MinEnergo 2010, 74–76.)

On more general bases in the terrestrial infrastructural segment, the conditions of the more than 150,000 km long transmission infrastructure in Russia see a general ageing and require special attentions, in fact 70% of this high pressure, large-diameter lines were put into service before 1985 while 19,000 km need to be replaced. Generally, the main line is in better condition than the regional and local low-pressure pipes (IEA 2002, 118). To complete the picture, Russia still does not have large–scale systems of transportation for heavy hydrocarbons C_2–C_4 (Kontorovich 2015, 55).

To ease the infrastructural situation, in 2002 at the 10th Russia–European Union summit in Brussels, was expressed the decision of building a pipeline from the Yamal gas fields (The Kremlin 2002). The intention was included in the ‘Energy Strategy of Russia for the period up to 2020’ and it was completed later (MinEnergo 2010, 75). The construction of a multiline gas transportation system with the length of 2400 km for the transportation of gas from the Yamal Peninsula to the area of Ukhta compressor station and further to the town of Torzhok became the most important project upon 2010. (*idem*, 79.) In 2005 the presidential plenipotentiary of the Ural Federal District Piotr Latyshev has announced the construction of a railway and a highway from the Yamal peninsula to the Ural Range, a southern developed engineering and metallurgical centre of the Urals. (Latyshev 2005).

In 2012 the issues of gas supplies were also addressed to help the development of the economies in the Urals and the Volga river basins, with a project to build a pipeline to transport broad fractions of light hydrocarbons from the Yamal deposits to the Volga river basin (Khamitov & Putin 2012). Other infrastructural transportation projects include the Baltic Pipeline system–2 and the port of Ust–Luga near St. Petersburg, plus also the North Stream in the Baltic Sea and the South Stream in the Black Sea (Putin 2012c). However also means of sea transportation of LNG started to be taken into consideration to enter new markets such as the USA (MinEnergo 2003, 12) and Asia–Pacific region. (MinEnergo 2010, 79.)

On the seas, there are big prospects of development for the Northern Sea Route (NSR). In the Naval Strategy 2030 the NSR is described as 'historically established as a national sea line of communication of the Russian Federation and where foreign economic, political, international legal and military pressures are now weakening Russian control over it'. (Davis 2017, 5: 24.f). In the Arctic Strategy 2030, the NSR is retained as a single national transmission backbone of the Russian Federation to modernize and develop the infrastructure and the Arctic transport system (Government of the Russian Federation 2009, 2: II.4.d). Operating year-round, the NSR is meant to diversify supply routes for Russian hydrocarbons to world markets by increasing freight traffic along it with government sponsored icebreaker constructions, auxiliary vessels and coastal infrastructures (Government of the Russian Federation 2013, 5: III.12). These include navigation, communication, technical maintenance and emergency relief infrastructures (Putin 2014d), as the NSR requires the creation of security points through its entire length, navigational issues represent a source of development for settlements along the route (Putin 2012a).

On shipbuilding, Sovcomflot is the first Russian company to master the technology of LNG shipping in extreme temperatures and difficult climatic conditions (Frank & Putin 2009). It started building dual purpose tankers before 2008 in cooperation with the United Shipbuilding Corporation and small and medium–sized Russian companies for port vessels such as tugs and bunkering ships (Frank & Putin 2008) thus refocusing its strategy on the needs of the Russian companies and domestic projects on the continental shelf. The navigation improvements have opened an opportunity of five months passage which can be extended to six with the new icebreakers generation. (Frank & Putin 2013.)

In August 2010 Novatek scored the first ever high tonnage shipment through the NSR, using Sovcomflot owned 'Baltica' (117,00 deadweight tonnes and ice class Arc5) to ship 70,000 tonnes of stable gas condensate from Murmansk to Asian-Pacific region with icebreaking support provided by Atomflot (Sovcomflot 2010) (Novatek 2010b). The delivery to the China National Offshore Oil Company (CNOOC) in Ningbo seaport took 22 days, half of the time required comparing to the Suez Canal route opening new prospects for the hydrocarbon development of Yamal and Arctic shelf (Novatek 2010a). Another success was scored in June 2011 when Novatek shipped tanker 'Perseverance' carrying 60 thousand tons of gas to China via a new north route through New Siberian Islands with assistance of Atomflot icebreaking support; the trip successfully opened a 5 months season window (Novatek 2011d). In November 2011 the same ship 'Perseverance' carrying an equivalent load passed the Bering strait on the way to China as the ninth tanker in the season scoring a new record for the longest use of the NSR in a single year. A new route was discovered and for the first time a ship as the ‘Vladimir Tikhonov’ (Suezmax class of 160,000 dwt) passed through the NSR (Novatek 2011a).

The traffic along the Northern Sea Route has increased by 53% from 2011 to 2012 and accounted for 1.5 million tonnes in 2013, with a prospected projection of 4 million tonnes in 2015 (Putin 2013d). Transportation through it can effectively reduce the travelled distance by one-third, resulting in savings as large as USD 1 million per large shipment. (IEA 2014, 91). The Eastern Arctic Sea has more constraints than the Western, thus year-round navigation for the Yamal project is already open, whilst for the eastern route, it is open only for 5–6 months (Frank & Putin 2013). The Russian Government has also taken decision to open to foreign vessels some of the seaports along the Northern Sea Route, such as that in the city of Pevek, in the Chukotki Autonomous Area with Government Directive No 1389-r of 07.08.2013 (The Russian Government 2013c). The map below shows the Northern Sea Route along with its straits, boundaries and alternative routes:

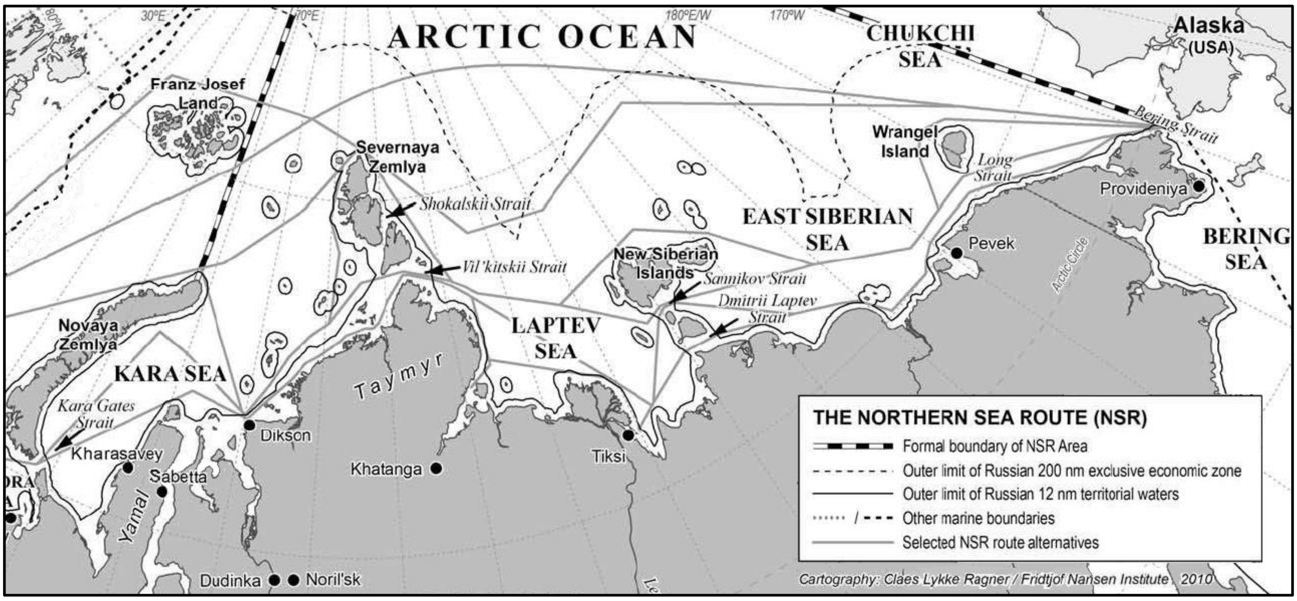


FIGURE 6. The Northern Sea Route, source: adapted from **Brubaker & Ragner (2010, 18).**

6.2. Financial Dimension

The financial dimension includes material and social qualities, some of the social aspects involved are the global speculation in currencies and the market price fluctuations (Aalto 2012, 31). A social component in this dimension is present also in credit which in financial crises might freeze regardless of a company health status (Aalto 2014, 9). More material qualities pertain to the costs involved in building infrastructures and those related to production, the taxation, and the resources employed in social investment costs. The overall picture of the financial dimension is that of a major constraint but also as a huge enabler for cooperation especially in finding a way out of the tightening imposed by the Western sanctions of 2014–2015.

6.2.1. Infrastructure, production, investment/credit and social investment costs

The overview emerging from the analysis of this subsection reveals consistency between the previous literature (Högselius 2013; Krysiek 2007; Pirani 2010; Pleines 2009; Øverland 2010) about big energy projects in Russia in both Soviet and recent times, and the specificity of the Yamal LNG. Some of the resource–geographic characteristics already dealt with in the previous section have a determinant impact on the costs of the projects.

Speaking about infrastructural costs, in the Yamal LNG project, the budget allocated by Novatek was estimated accurately in USD 27 billion (Mikhelson 2016a). The reason of these costs resides in factors which are well explained in the words of Vladimir Putin (2013c) who stated that the main challenges in the infrastructural financial dimension consist in overcoming the problem of economic activity focused around isolated sites separated by big distances with little presence of infrastructures. Among the measures to stimulate investments and to attract partners there is the formula of public–private partnership in which the state would remove infrastructure restrictions and offer preferential treatments. The public–private partnership helps to attract more investments in the economy as it ensures a fairer distribution of risks, academically this view was confirmed also by Belyi (2015, 89–90). Moreover, the Russian Direct Investment Fund offers reasonable or preferential conditions for foreign investors. (Putin 2013c.) The National Security Strategy 2015 cites this practice as a tool to develop the Arctic Region and the Northern Sea Route (Russian Federation’s National Strategy 2015, 15: 62).

To optimize budget spending, the Russian government intends to develop existing infrastructures which in turn makes possible to focus in multiple projects at once. A way to prioritize the development of the area is to bind dual purpose infrastructure facilities (e.g. transport–communications with energy facilities) to the interests of the defence together with security and economic development. (Donskoy & Ulyukaev 2016.) In the view of the Russian government, the role of military facilities to be build next to the production infrastructures aims to enhance security of the area (Putin 2014d). This last point has been also included in the latest version of the Russian Naval Strategy 2030 as a primary objective. In fact, point 29 c) ‘economic’ states “to establish dual–purpose infrastructure facilities in the remote areas **of the Arctic** [author’s bold] and Far Eastern regions of the Russian Federation to ensure basing for the civilian vessels, Navy ships, and vessels of the Federal Security Service agencies” (Davis 2017, 9). In some cases, the structures may have even triple purpose including scientific or meteorological stations for example (Putin, 2017f).

The creation of border checkpoints in Yamal would allow to enhance control on drug trafficking without violations of federal law on free movements of citizens, thus tightening control on criminality (Putin 2012a). The industrial and infrastructural development of Yamal Peninsula is a major impetus for the socioeconomic development of the region and the entire Urals and Western Siberia, as it has important outcomes for the entire country (Putin 2013d). As a result, the region's gross domestic product has doubled in the past five years (Kobylkin 2015).

The rising of costs of natural gas production and transportation are among the challenges underlined by the Energy strategy 2030 (MinEnergo 2010, 75). Production costs are expected to increase in the future, as the supergiant gas fields must be replaced by new fields located in the more challenging Arctic environment, in doing so there will be the necessity to build infrastructure and put these fields on stream. (Gusev & Westphal 2015, 18). These costs come from the changes in gas production geography, as the new major resources are often found in places far from the major gas consumption centres, this will raise exploration, production and shipment costs. In Russia, the Yamal and the offshore fields require also infrastructures and the expenses are estimated in tens billion of dollars (Putin 2008), moreover as an example cost of oil recovery from the seas is not profitable when oil is below 75$ per barrel (Belyi 2015, 88).

However, the Yamal LNG project uses cheap onshore conventional gas reserves as resource base; allowing to keep lower production costs in comparison to foreign gas projects using unconventional or offshore gas deposits (Mitrova 2013, 31). In fact, given the natural sub-zero temperatures in the region, the liquefaction expenditures per unit of LNG production is lower. The location also allows a minimization of transportation costs from wells to LNG plant. (Lunden & Fjaertoft 2014, 10.)

Speaking about financing and credit, already in the early 2000s the future of gas industry was believed to depend on streamlined financing and production; including enhancement of exports and increased output of advanced goods. (Putin 2001.) As the Prime Minister Dmitry Medvedev stressed in 2012, the problems of the Arctic development cannot be solved through the federal budget alone thus it requires different mechanisms of public–private partnerships and the development of modern investment projects (Donskoy *et al.*, 2012). The area is important as the companies operating in the Arctic region account for 10% of Russia's GDP, with a growing outlook (Putin 2017f). The Russian government voiced out to be determined to invest heavily in the Arctic region in its socioeconomic development and to strengthen security (Putin 2014d).

In doing so, Putin (2013f) informed that Russia is ready to use its budget funds, the total amount of 450 billion rubles which is half of the National Welfare Fund, to build infrastructures and furthermore to support the big projects of its private companies such as Novatek and also Gazprom (Putin 2013c). The Reserve Fund was created as a measure to balance the budget while the National Welfare Fund is aimed to fund self-liquidating infrastructure projects and support the relevant banks also in an anti-crisis perspective, thus Yamal got RUB 75 billion (Golikova 2015). Budget funds are financed with the extra revenues generated by high prices of energy export which are saved in form of reserve fund, Putin assured that this strategic policy will persist regardless of the personnel changes at the Central Bank (Putin 2013f); the 'additional oil and gas incomes of the federal budget' amendment has been introduced in August 2013 by Federal Law No. 268–FZ of 25.12.2012 (The Russian Government 2013d).

The Russian government is also aware that to attract investments Russia needs a stable tax policy, different administrative and legal procedures and political stability (Putin 2017a). This is consistent with previous studies, as for instance Barnes (1990, 39–41) noted the relationship between the gas industry and the socio-economic environment and its perceived stability. High capital costs of supply projects, as well as the length of development processes united with their inflexibility, pose great constraints which are amplified in case of international deliveries (*ibid.*).

The Energy Strategy 2030 underlines the use of non-price instruments of investment activity in the gas industry, as taxation, credit, budget and other tools (MinEnergo 2010, 80). Investments are crucial to foster economic growth and strengthening the taxable revenue base of the regions. Particularly important are the logistic networks infrastructures, such as the shipbuilding and port installations, hence the launch of the 'infrastructure mortgage' mechanism to attract additional investments in the sector. (Putin 2017a). The prospect of investments for the Yamal Peninsula (Bovanenkovskoye, Kharasaveiskoye etc.) has a forecast of cumulative capital investments in the amount of USD 166 to 198 billion in the next 25 years (MinEnergo 2010, 77).

The financial situation is further complicated by the Western sanctions imposed to Russia in September 2014, which included a wide range of financial sanctions on major Russian energy companies as well as on Russian banks (Gusev & Westphal 2015, 12). With these sanctions no more long-term loans are possible, with borrowing restricted to 30 days for US sanctions, and 90 days for EU sanctions (Henderson & Mitrova 2015, 8). Moreover, transactions in dollars are also forbidden (Bros & Mitrova 2016, 10). In turns, Russia placed countersanctions leading to an economic isolation, however, Russia disposes of National funds, such as the Reserve Fund and the Wealth Fund which can be used, and were used, to support the national energy companies despite the low oil prices and sanctions (Gusev & Westphal 2015, 12). Concerning the gas sector, the gas industry is considered strategic as it is a source of stable revenues for the State's budget (MinEnergo 2010, 75). It is important to stress that it was not sanctioned by the US *per se*, but Novatek as a company was put under sanctions list (Mikhelson & Putin 2014) (Bros & Mitrova 2016, 11). As a result, the main outcome of the sanction has drastically reduced the effectiveness of Russian energy companies of raising funds among the investors (Henderson & Mitrova 2015, 68).

Regarding the social investment costs, in September 2009 Novatek CEO Leonid Mikhelson met with the then Head of the Yamal District Andrey Nesteruk to discuss the company's future plans in the region, including a presentation to the municipal authorities and the local indigenous communities; at the end of the meeting there was the signature of a Social Partnership and Cooperation Agreement between Novatek and the Yamalsky District Administration (Novatek 2009a). Further agreements with regional authorities in 2010 included an amendment to the 2009–2011 Cooperation agreement between Novatek and The Governor of the YaNAD Dmitry Kobylkin including participation in social projects and cultural, educational health, housing and public utility sectors; also, social and cultural supports is to be provided to the indigenous minorities in the Far North (Novatek 2010d).

Lunden and Fjaertoft (2014, 29–30) found that the social impact of the Yamal LNG project consists mainly in the disruption of nomadic reindeer herding, fishing and hunting, with the interdiction of previously used areas and the need to relocate traditional economic activities far from the project's sites. In 2012 the signature of a new cooperation agreement between Novatek and YaNAD governor Dmitri Kobylkin aimed at the further strengthen and develop the social and economic partnership between the parts to create favourable conditions to solve the abovementioned social problems in the region. (Novatek 2012d.)

6.2.2. Taxation Regime

Russian government acknowledges that taxes are a key factor in determining the amount of investments, and that it should work towards business incentives to encourage investments, modernise existing and open new production facilities in Russia regardless of its strict budgetary constraints (Putin 2013f). However, from January 1st, 2011 for the first time in 5 years, the Russian Government has raised the MET for gas by 61% due to the improvements in the international markets conditions (rising of prices). But at the same time, the government kept the zero-rate tax for districts lacking infrastructures, for those districts labelled as hard-to-reach, and projects to create enterprises to produce LNG. (Putin 2011.) In addition, favourable conditions for joint projects on the Arctic Shelf were posed into being in 2012, with tax exemption for joint oil projects (Putin 2012a) with Executive Order No. 443 of 12th April (Putin 2012b). As a result, the changes introduced in the taxation system, indeed a major element for the development of offshore activity, made possible foreign participation in joint offshore explorations in the Barents Sea as ENI CEO Paolo Scaroni declared (Putin & Scaroni, 2012).

The current Russian taxation regime on hydrocarbons is comprised of two main segments: MET (Mineral Extraction Tax) and export duty tax. Taxation regime has been also set to favour the competition among producers to boost gas production, in fact, smaller companies enjoy lower MET than for example Gazprom. (Gusev & Westphal 2015, 55). For instance, the Federal Law No. 268-FZ of 30 September 2013 granted a special tax regime for export duties on products extracted from continental offshore projects. In fact, this regime provides for an exemption from paying export duties (EY 2013, 8; EY 2014, 3). Although with some limitations, the exemption is valid until 2042 for Arctic resources along with property taxes. The IEA (2014, 88) reports that “for the Yamal LNG project, an onshore project, the government has provided a MET exemption for up to 250 bcm of cumulative production and an unlimited export duty exemption”. (*ibid*.)

In details, the federal tax break concerns the Federal Law 258-FZ, of 21.07.2011 and prescribes MET exemption for natural gas for up to 250 bcm within 12 years from the first gas production and gas condensate for up to 20 mmt within 12 years from first condensate production. The second incentive was granted by the Government Instruction 1029, on 18.11.2013 and seeks exemption for export duties for LNG and stable gas condensate. To conclude, the tax breaks to the Regional Law. No. 151–ZAO of 23.12.2010, provides for the exemption for property tax until 250 bcm of gas which has been produced but within 12 years from when property is registered for accounting. Moreover, the profit tax rate, is lowered at 13,5% compared to the normal 18%, for the first 250 bcm gas production within 12 years from the first gas production. (Lunden & Fjaertoft 2014, 14.)

6.2.3. Oil prices and supply/demand balance in global markets

President Putin declared that there is the awareness among Russian politicians that the Russian economy is very dependent on foreign economic factors such as the prices of oil and gas exports and related petrochemical products, calculated based on the oil and gas prices (Putin 2015). The price of energy resources, oil and consequently also gas affects the Russian economic indexes and national currency (Putin 2014a). Oil prices went from 100$ dollar per barrel to below 50$ during the second half of 2014, to touch the lowest price in 2016 at 27$ per barrel (IEA 2016a, 40). The price of oil results in the main source of budget revenue, its impact was immensely more significant than that of the economic sanctions. However, Putin stated that Russia made it to overcome the two shocks in mid-2014 and in 2015 generated by these plunging fuel and energy prices. (Putin 2017c.)

The projections over the global energy demand expect a 30% rise to 2040, which in turn means an increased consumption for all modern fuels. Natural gas is at the moment the best performer among the fossil fuels as its consumption is expected to raise by 50%. (IEA 2016b, 1). The demand of natural gas was expected to grow by 2% between 2014 and 2020, even if it was obstructed by the renewable energies in OECD countries. Speaking of non–OECD Asian countries, China excluded, also considering the demand uncertainty due to past high prices, the outlook is positive where the natural gas alleviates energy shortages without entering in competition with coal. (IEA 2015, 20). However, at the annual rate of growth of 1,5% in natural gas demand, the markets, business models and arrangements are becoming more competitive and fluid, with the appearance of other sources such as American LNG cargoes and unconventional shale gases. Among other important LNG producers there will be Australia and Qatar in the forthcoming years (Huang & Korolev 2015, 245).

Another reason of uncertainty for the LNG markets is represented by falling costs of renewables. (IEA 2016b, 7). On supply, overall the figure is expected to increase by 1,9% in the same period although with a slowdown comparing to the previous decade. LNG will play a predominant role, accounting for 65% of the market (IEA 2015, 55). As for the dynamics, OECD Countries in Europe plus China and non–OECD countries in Asia, are expanding their share of imports, the latter prefiguring themselves as net gas imports (*idem*, 93).

Putin declared that for the Russian government, the security of supply in the global markets must be paired with security of demand, that is why “practice in asset exchanges and counter-flows of investments are useful to strengthen global energy security and stability”. He also pointed out that “the approach of risk sharing between all participants in energy-chain suppliers, transit nations and consumers remain high on the Russian agenda”. (Putin 2012c.) This aspect has been also observed since the 2000s by Belyi (2015, 93). As Putin stated (2013f), the Russian Federation worked to lower the restrictions on LNG exports to increase opportunities in the Asia–Pacific markets and to gradually liberalize LNG exports which in turn would create conditions to fully exploit the gas potential both offshore and in coastal areas. The development of the LNG market can, in government’s opinion, help the consolidation of the fragmentary regional markets (Putin 2014b), and will also lead to a global gas market for the first time in history (Putin 2016).

However, in Russia’s case LNG export is not meant to weaken or compete with the gas pipeline exports, but to develop as a complementary dimension and in case of domestic consumption to serve remote areas with no pipeline access (Putin 2017d). For the Russian government and energy actors, the international trading infrastructure must be changed, and the creation of new trading channels must be created with related lending institutions and credit as discussed by OPEC members as well as in the Gas Exporting Countries Forum (Medvedev & Miller 2009).

6.3. Institutional Dimension

The institutional dimension analyzes the formal and informal institutions which regulate, at the national and international level, the relations between Russian and foreign actors. These include the legislation, licensing and agreements, the tacit rules and informal norms and at the international level the energy diplomacy, institutions and tensions. The emerging picture from the analysis of this dimension is that of an initial constraint in attracting foreign partners due to the peculiarities of national legislation and the political interplay between the regional and federal levels. The situation was further aggravated by the difficulties experienced at international level because of the growing tensions from the beginning of the 2000s to the culmination of the Ukraine crisis in 2014. The institutional dimension, already favourable in the Arctic, has progressively turned brighter thanks to legislative changes and the renewed tightened federal control on energy issues from 2005.

6.3.1. Formal state institutions regulating the relations among the Russian and other involved actors, including legislation, licensing and agreements

As in other contexts, in this case too, President Putin has emphasized both the importance of international law and state sovereignty. He (Putin 2013e) has stressed the importance of the dialogue, cooperation and partnership; in 2008 the Arctic Five group (A5) included these practices in the Ilulissat Declaration, which form the international legal base for responsible governance of the northern sea areas. Speaking about hydrocarbons, Putin reminds us that Russia fully upholds the principle of sovereignty over national resources (Putin 2014b).

Domestically, the current Russian legal framework is comprised again of two main elements, the first is the 'Tax and Royalty' or 'Licensing System' regulated by the Subsoil Law of 1992. The second is the Production Sharing Law of 1995 (Federal Law No. 225–FZ of December 30th, 1995) which regulates the PSA and it is still applied in some old running projects, but it was replaced by tax breaks in new projects (Lunden & Fjatertoft 2014, 4). (Grigoryev 2007, 127–128.)

The federal strategies are another source of regulation for the energy companies. For the Energy Strategy up to the 2030, the Russian gas export, based on long-term contracts, will see a necessary volume of exports to Europe and an increased multidirectional export to the eastern countries (China, Korea, Japan). As for the exploration and development, Russia will search active engagement in north Africa and Iran and Central Asia. (MinEnergo 2010, 80.) Moreover, the latest version of the Energy Strategy to 2035 underlined the increased dependency of the budget on fuel and energy complex and the need for technological development and modernization of the energy sector efficiency, the key aspect is hence the innovation and modernization of the sector. Furthermore, it prospected the increasing of gas production by 35–45% of which LNG must account for 8–11%. (Mastepanov 2014.) These aspects are important as on the governmental level the energy companies depend on federal strategies (Aalto 2016, 55).

However, a negative aspect for innovation arises as Grigoryev (2007, 126) states that foreign business community have struggled over the years against the Russian political and legislative system; sometimes being caught in the middle of power struggles between local governments and federal governments. The issue revolved around the so-called 'rule of key' by which a hydrocarbon licence was granted only after being approved by both the federal government and the regional administration. In the mid-1990s the regional authorities used to grant small deposits to new small companies or friendly big companies, in which often regional government officials held shares. Such practice was common also in the YaNAD, were Novatek appeared under the auspices of the then vice–governor Iosif Levinzon. (Turovsky 2007, 150–151.)

This shared jurisdiction granted by constitution in the field of mineral resources, was finally solved by an amendment of Subsoil Law of 2004, adopted in 2005, which granted preeminence to the federal level (Grigoryev 2007, 129). As also extensively expressed in the section 5.1., this and other changes in legislation of the early 2000s seems to have tightened the control of the federal level over the regional and local ones. Thus, the role of the regional and local administrations appears to be confined to operating within the framework and coordination provided by the federal level.

Donskoy and Medvedev (2013) also spoke about the further need for an understandable and sustainable legislation which represents a prerequisite to take long-term decisions in lengthy developing projects such as offshore projects, which in turn will enable to accumulate the correspondent large and necessary financial resources for its actuation. Several initiatives were then launched to improve the situation in the Arctic area, among them the ‘State Programme: Natural resources Use and Restoration’, in which was included a Reserve Replacement and Geological exploration for the collection of geological data in the Arctic both onshore and offshore and assess the reserve replacement and rational use of mineral resources. (The Russian Government 2013f).

Licensing sector suffered the lack of a single unified system for monitoring and managing subsoil resources, as it was managed by different agencies with different standards which hindered the obtainment of complete data. These included the Ministries of Natural Resources and Environment, of Energy, of Regional Development plus the Federal Agency for Subsoil Use (*Rosnedra*), and the Federal Services for Supervision of Environment, Technology and Nuclear Management (*Rostekhnadzor*), Supervision of Natural Resources (*Rosprirodnadzor*), Registration (*Rosreyestr*) and State Statistics (*Rosstat*). (Putin 2009b.) In 2012 as the Prime Minister Dmitry Medvedev stressed, the existing legislative and institutional instruments were insufficient to attract enough investments to the shelf; and because some difficulties could not be removed, by adoption of targeted programmes and managerial decisions the situation could be improved (Donskoy *et al.*, 2012). The number of issued hydrocarbon licenses in 2016 was 407, which included both onshore and offshore (Donskoy & Ulyukayev 2016).

6.3.2. Informal institutions including practices, norms and rules

In informal practices falls the Russian tendency of centralize and create big energy projects (Aalto 2012, 32); it was also present in the Soviet times and it worked well albeit the constraints produced by the burden of bureaucracy (Rutland 2018, 26). An improvement of the situation was provided by the National Entrepreneurial Initiative which has simplified the federal legal framework by deleting over 50 excessive administrative procedures which posed a considerable waste of time for doing business, shortening the technical times by over a year. Likewise, paperwork to move export goods across borders have become faster from 139 hours to 97 in the period 2015–2017. Putin has claimed that the transparency of administrative procedures has also been improved. (Putin 2017a.)

6.3.3. Energy diplomacy, international interaction, institutions and tensions

Concerning energy diplomacy, president Putin (2006) stated that the presence of foreign shareholders in Russian companies helps to stabilize the international economy and international energy situation, allowing foreigners to control large energy resources in Russia as for instance the British Petroleum which is in a 50%–50% partnership in TNK–BP. The situation of cooperation in the Arctic has developed positively with the Treaty on Maritime Delimitation and Cooperation in the Barents Sea and the Arctic Ocean signed in 2010 between Russia and Norway. As in the words of the then prime ministers Medvedev and Stoltenberg, it represented an important step in international cooperation in the Arctic as it puts predictability because it delimits the parts' interests and draws precise boundaries thus strengthening the cooperation in the region. Indeed, the lack of demarcation and maritime delimitation was a major limit in launching energy projects. With the signature of the treaty, shared natural resources such as mineral deposits are going to be jointly developed. (Medvedev & Stoltenberg 2010.)

Still in the Arctic, a pressing issue is the legal formalisation of the outer boundary or Russia's continental shelf legally defined in 1995 (State Duma 1995) in the Arctic Ocean (Putin 2014d). The Russian Federation has laid claim to extend its Arctic Continental shelf by 1.3 million km^2 by extending its shelf's continental border beyond the outer limit of the 200 nautical miles of the EEZ (Exclusive Economic Zone). The request was submitted to the UN Commission on the Limits of the Continental Shelf in August 2015. (Donskoy & Ulyukayev 2016). Although not intrinsically a matter of energy diplomacy the abovementioned events in the Arctic bear direct consequences in the planning and development of energy projects.

From the analysis of politicians' speeches, including president Putin and Prime Minister Medvedev emerges that elsewhere, international tensions are more pronounced and surely affect the decision-making on energy matters. For instance, the unreliability of gas pipeline transit through third part countries is one of the reasons for the decision of building bypassing pipelines such as the Northern European Gas Pipeline under the Baltic Sea. In Ukraine siphoning off gas in colder months meant for export to Europe, reached the amount of 35 million cubic metres per day. Later, it raised to 70 million cubic metres per day, including siphoning off the supplementary gas that Gazprom was adding to cover the losses for European customers. To comprehend the magnitude of the event, the overall supply agreement accounted for 17 bcm per year. (Putin, 2006.) The issue required the creation of an independent international committee to overview the gas transit in Ukraine, proposed by Gazprom to the European companies which accepted, but Ukrainians did not.

Further Russian proposals to lease the transit system have been discarded by Ukrainian authorities (Putin 2012a). Lack of transparency from the Ukrainian side involved also final consumer prices with money disappearing in the distribution process. The diversification of supply routes is hence the basis of the creation of North and South Stream. (Medvedev & Miller, 2009). Ukrainian authorities have also been labelled as ‘unpredictable’, since they cut off energy supplies to Crimea after the area’s reunification with the Russian Federation. (Putin 2015).

The South Stream project has been hindered by the EU opposition whereas the Turkish Stream has been halted due to conflict with Turkey and the North Stream–2 has been object of protests by some EU countries such as the North Stream–1 which it was completed even though it does not work at 100% of its capacity (*idem*). The development of LNG projects is also linked to this necessity to bypass potentially unstable transit countries (Putin 2012a). Aalto (2016, 56) pointed out that the constraints on international interaction derived from the Russo–Ukrainian conflict with the related sanctions imposed on the Russian Arctic energy industry are severe. This aspect was treated in more detail in the financial section.

6.4. Ecological Dimension

The ecological dimension tells about the risks and climatic consequences of gas projects in the Arctic, and about the energy efficiency, decarbonisation and energy transition. The multidisciplinary of this dimension which include both natural and social sciences is not yet fully integrated with the mainstream approach of social sciences in energy issues (Aalto 2016, 10). An observed trend in the analysis of this dimension is the relatively lack of detailed and abundant information compared to those, for instance, found in the financial dimension, provided by policy documents and transcripts speeches. The bulk of valuable information are here provided by epistemic community, and from WWF–Russia in whose ranks also work scientists whose work has been used as base to bolster legislative production. The analysis of data seems to suggest that the ecological dimension is more framed in terms of economic rather than environmental sustainability as in the results obtained by Aalto and Tynkkynen (2012, 113) for previous cases.

6.4.1. Environmental risks of Arctic gas projects

Oil and chemical spills in the Arctic affect the whole food chain causing immediate and long-term damages. Effects on the fauna includes the hindering of heat-insulating properties of skin, fur and feathers in case of oil contamination. Even minimal accidents can have important consequences if they take place in wildlife breeding areas or bird nesting places. The response to spills are obstructed by weather conditions and long distances, furthermore an oil spill in ice-covered areas is a complex process which counts only few response measures, and as such the main source of safety in the region is represented by prevention. (Klimentyev *et al.* 2017, 36–37.) On the contrary, LNG spills do not cause the same environmental damage due to its physical qualities. There has not been registered serious accidents, the worse spill in LNG shipping accounted for 40 m^3. (*idem*, 40). Hence the prospects of LNG development in the Arctic pose fewer constraints comparing to other fossil fuels as for instance oil. Because of its smaller volume of atmospheric emissions, it is more ecological than other fossil fuels, however, its cycle of production does harm the environment to some extent (Ametistova & Knizhnikov 2016, 32).

The analysis of documentation reveals that the Russian Arctic Strategy in both its earlier and later version continues to recognize the fragility of the Arctic environment and its dependence even on insignificant anthropogenic impacts (Government of the Russian Federation 2009, I.3.d; 2013 II.4.d) and as such the preservation of the environment in the Arctic is listed as a national interest (*idem*, II.4.c; 2013, III.7.g). Concrete steps resulted in Russia adopting the Arctic Environmental Protection Strategy and as such this shows Russia's awareness of the risks in undertaking projects in the Arctic as the policy paper acts as the basis for further legislative production. The regulation in resource extraction allows to proceed only with the use of the latest technology to minimize the possibility of accidents.

Further concrete measures were represented by a work of cleanup which has been completed in Alexandra Land and Graham Bell Island and Hofmann Island, Hayes Island, Rudolf Island and Hooker Island with consistent capitals, RUB 1.42 billion (USD 45 million) from the Federal budget in the period 2011–2013. In Yamal Peninsula more than 500 hectares went to cleanup in Bely Island. Nature conservation areas are to be increased from the current 6% (322,000 km^2). In 2012–2015 a general cleanup happened in Franz Josef Land which had 90,000 tonnes of waste of which 39,000 were cleaned accounting for 44%. Were also cleaned Novosibirsk Islands, Vrangel Island and Novaya Zemlya, more than 9,000 tonnes of scraps of metal were recovered and 150 hectares of land cleaned up also with the help of the Defense Ministry. (Donskoy & Ulyukaev 2016.)

The Russian government claims that their commitment for the environmental protection in the Arctic made it possible to sign the agreement on the cooperation on marine oil pollution preparedness and response in the Arctic, which followed the multilateral decision at the Ministerial Meeting of the Arctic Council in Nuuk (The Russian Government 2013e.) Moreover, a further 'Framework Plan for Cooperation on Prevention of Oil Pollution from Petroleum and Maritime Activities in the Marine Areas of the Arctic' entered into effect in 2015 as the result of the multilateral commitments to preserve the environment from the oil and gas production and transportation activities (The Russian Government 2015b).

Furthermore, given the environmental risks of energy extraction, few legislative devices were introduced to minimize them, such as the compliance for the company operating in offshore shelf to use spill prevention products and reliefs plans which needed to be approved in advance. (Donskoy & Medvedev 2013.) To diminish the practice of flaring associated petroleum gas (APG), a level of APG utilization to no less than 95% was introduced in 2012 with huge fines for excessive air pollution. (Putin 2009a.) The minimization of the environmental impact was included since the early steps of the project with the cooperation agreement between Gazprom and Novatek in 2010 (Novatek 2010c). The Russian companies working on the Arctic shelf collect, pack and send all the waste produced to be processed ashore (Putin 2014c). No serious accident happened to Russian companies in offshore work thanks to the use of the latest technologies (Putin 2013e).

The monitoring of environment pushed for the decision to resume seasonally the North Pole drifting station which was operative since 1937 but closed in 2013 for unfavourable ice conditions. (The Russian Government 2015a). A permanent Arctic scientific expedition on the Spitsbergen Archipelago has been instituted in 2016 within the same framework of the State Environmental protection 2012–2020 (The Russian Government 2016a). A further draft agreement to enhance scientific international cooperation for environmental protection of the Arctic and its development within the countries of the Arctic Council has been approved in April 2017, and it includes sharing of results, simplified cross–borders procedures and the prospect for the joint use of research infrastructures (The Russian Government 2017b).

Scrutinizing the primary data on the owner of the project, it has emerged that Novatek won environmental prizes in 2006 (Novatek 2006). On March 20th, 2013, JSC Yamal LNG received by *Glavgosexpertiza*, the state environmental approval for the construction of the liquefaction plant with its annexed structures, on the Yamal Peninsula. Moreover, the YaNAD Subsurface Management Department issued a construction permit for the LNG plant in the South Tambeyskoye field. (Yamal LNG 2013f.) Later on, *Glavgosexpertiza* granted the state environmental approval also for the seaport facilities including the Navigable Channel in the Ob Bay respectively in August and October 2013. (Yamal LNG 2013b.) Even internationally, Yamal LNG has been confirmed compliance with ISO 14001:2015, the Environmental Management System and OHSAS 18001:2007, the Occupational Health and Safety Management System by the British Standards Institution (BSI); the validity of these certificates have been extended to 24.06.2020, the site has hold this certification since June 2014. (Yamal LNG 2017c.) In December 2017, Novatek also won the National Environment Award for its project Corporate Greenhouse Gas Emissions Control System (Novatek 2017a).

6.4.2. Climatic consequences of Arctic fossil fuels

The impact of the climate change to the Arctic due to greenhouses emissions has few effects, among these the increasing of temperatures, coastal erosion, melting of ice on the sea and the melting of permafrost (WWF-Russia 2008, 10–13). Melting ice at the sea opens the NSR but at the same time increases the risks of iceberg collisions, whilst the melting of the permafrost poses great dangers for human settlements as well as production facilities (WWF-Russia 2009, 45–47). These problems are understood and kept in consideration by policy makers, sometimes even voiced out as for instance Putin (2017a) has acknowledged that a concrete danger for people is represented by the fact that the existing cities in the North are built on piles in permafrost, with the climate changing the permafrost melts with its associated risks. The impact of hydrocarbon extraction and the increasing of traffic in the NSR in the Russia's Arctic seas affects also the carbon–cycle and is responsible for enhanced pollution of the sea, fish stocks and subsequently affects the human health (Vetrov & Romankevich 2004, 284–286).

6.4.3. Energy transitions: diversification away from fossil fuels, shift towards renewables and energy efficiency

The two main segments resulting from the analysis of primary sources pertaining to this subsection are the use of more environmentally friendly resources and the significance of energy efficiency which seems to have an overall financial more than environmental value. In fact, Putin (2012c) declared that a component of energy security is also the use of environmentally friendly energy sources, and the latest Russian energy projects are being implemented considering also international environmental and technological security requirements. LNG is nearly free of sulphur and particulate matter and moreover having a higher hydrogen-to-carbon ratio minimizes CO_2 emissions (Jensen 2004, 13–14). Thus, natural gas is a less carbon-intensive fossil fuel, with an emission factor of 15t C/TJ comparing to that of the coal which is the most carbon-intensive fuel with an emission factor of about 26t C/TJ. The enhanced use of natural gas results in a reduced level of emission per unit of energy generated. (IEA 2007, 2.)

On the second aspect of analysis we find that energy efficiency is said to be one of the constituents of the 'Russian Federation's National Security Strategy' which came into effect as Presidential Edict 683 on 31.12.2015. Its point n.61 states the importance of the development of energy-efficient technologies and its international exchanges in the Russian energy security. (Russian Federation's National Security Strategy 2015, 14.) Politically, as Putin also underlined (2014b) energy efficiency needs to be pursued in the Russian Federation also for financial reasons, to reduce costs. As such, Russia seeks to improve state regulation of greenhouse gas emission aiming to achieve a rapid and economically effective reduction of emissions in line with the Paris Agreement (Putin 2016). Concrete steps were undertaken and Minister of Energy Novak (2016) states that gas chemical production in Russia rose in 2016 by 15% in bulk polymers and 12 new refineries entered in function, even if with delays due to financial difficulties that postponed the launch of 16 facilities, this improvement had succeeded to reduce harmful emissions hundred-fold or thousand-fold.

Moreover, the beginning of switch to Natural Gas Vehicles (NGV) in Gazprom and in other state agencies is also a new crucial decision as it is more eco–friendly and furthermore can save oil product for exports. (Putin 2017a). On the sea transportation, Novatek has joined the Society for Gas as a Marine Fuel and the SEA/LNG Association in 2017 to help promote LNG as a marine fuel to meet the adoption of stricter emissions standards for marine transportation by 2020 (Novatek 2017c). The use of LNG as marine fuel significantly reduces emissions of harmful gases into the atmosphere, sulphur oxides by 90%, nitrogen oxides by 80% and carbon dioxide by 15%, the ARC7 ice–class LNG carriers used in Yamal LNG are designed to boil-off LNG along with traditional fuel. (Sovcomflot 2017c). As an example, in 2011 the voyage of the SCF Baltica through the NSR has demonstrated the possibility to save 700 tonnes of bunker equal to the reduction of 2,500 tonnes in CO_2 emissions comparing with the route via the Suez Canal (Sovcomflot 2011b).

7. OUTCOME: INTERNATIONAL COOPERATION IN THE JSC YAMAL LNG COMPLETION

In this chapter will be retraced both the coordination among Russian actors and more importantly the fundamental contribution provided by international cooperation to untie the constraints which impeded Russian actors from completing the Yamal LNG. The exposition follows a mixed chronological and thematic order based on the categories, the latter prevailing on the former. Before moving on to the more detailed descriptions of the events, an introductory generalization can be drawn. Russian actors, coordinated by the government, were more active in the construction of infrastructures, nuclear maritime technology and the procurement and providing of financings. The international cooperation with both European and Asian partners allowed Russia to obtain the necessary technology in both LNG production, handling, and the maritime technology needed to produce LNG carriers. Moreover, substantial Chinese financings were decisive after the sanctions derived from the Ukrainian crisis. Starting from 2016 other European as well as other Asian IFIs have also provided credit to the project.

The bases were laid in 2000 when the ‘Yamal Resources’ was established, it is the main local geological and geophysical information centre which holds the data collected by geologists, geophysicists and miners, which represent strategic information valuable for the development of the oil and gas industries among the other things (The Kremlin 2004). The Yamal LNG project has been discussed as early as in 2009 between Novatek and Gazprom as part of the general plan to create LNG production capacity at the Yamal peninsula with the Tambey group of fields under licenses of the two companies as resources bases. Since the beginning the parts agreed to hold talks with potential international partners in the project. (Novatek 2009b.) The French company Total showed interests in the project and held preliminary negotiations (de Margerie & Putin 2009). As a general policy guideline, the Energy Strategy 2030 suggested filling the technology gap in LNG industry between domestic and foreign producers with an encouraged programme of scientific and technological cooperation. At the same time to limit the expansion of foreign producers in the Russian market; it advised a protection polity of domestic production with custom and tariffs regulations especially in the first phase. (MinEnergo 2010, 126.)

In June 2010 the Yamal LNG started to take form as a pilot project with a signature of a cooperation agreement between Gazprom and Novatek setting out the key parameters which included a facilitated involvement of Russian equipment manufacturers, including shipbuilders for construction of ice class tanker fleet and employment opportunity for the domestic oil and gas sectors. (Novatek 2010c.) On domestic shipbuilding, the merging of the two Russian state companies Sovcomflot and Novorossiisk Shipping company has provided additional financial stability despite the financial crisis of 2008 and allowed to focus on high-tech assets designed for Arctic's projects in continental shelf (Frank & Putin 2008). In June 2011 the State corporation 'The Bank for Development and Foreign Economic Affairs (*Vnesheconombank VEB*) and Sovcomflot signed a bilateral agreement on cooperation on ship building finance and operation of LNG tankers for LNG production project in the Yamal Peninsula (Sovcomflot 2011a). The project implementation complied with the Comprehensive Plan to Develop the Production of LNG on the Yamal Peninsula approved by the Russian Government (Vnesheconombank 2011).

In February 2011 (Novatek 2011e) and in November 2012 Novatek and Rosatom signed another cooperation agreement to coordinate lines of investments and innovation in safe and efficient navigations in Arctic waters and creation of innovative technologies and developed of competitive products including import substitution to raise the efficiency of geological exploration production and transportation, storage and processing of natural gas and gas condensate. Commenting on this issue, the General Director of Rosatom State Corporation Sergei Kirienko said that one of the company main goals is the development of the Northern Sea Route, hence Rosatom started to build new generation nuclear icebreakers. (Novatek 2012a.)

The French company Total entered officially in joint venture in JSC Yamal LNG in October 2011 (Novatek 2011c) after the signature of the memorandum of cooperation of March with the 20% share and the overtaking of the 12% stake of Novatek (The Russian Government 2009). In January 2012, Novatek and Gazprom held another meeting to discuss the possibility of joint projects aimed to increase LNG production capacity near the port of Sabetta, through the development of new fields in the northern part of the peninsula (Novatek 2012e). In April 2012 they signed another memorandum of cooperation considering the creation of a joint venture Gazprom 75%–Novatek 25% based on the hydrocarbon resources of Gazprom Tambey fields (Novatek 2012c). Hence, the Yamal LNG project was established in June 2012 (Putin 2013g) at the south Tambey field (Putin 2014d).

The first significant international technological contribution to the project came in September 2012 when Yamal LNG announced the signature of a license agreement with BASF to use its Oase technology for the removal of carbon dioxide from natural gas. This step is deemed fundamental to produce LNG. (Yamal LNG 2012b.) Subsequently, the joint venture with Total was officialized with the agreement of January 2013 (Novatek 2013e). Few months later, Total increased its stake in JSC Yamal LNG to 16% in June 2013 (Novatek 2013c).

Another fundamental foreign contribution concerned the seaports and shipping technology. Putin (2013b) particularly praised the cooperation undertaken with South Korea, in which the modernisation of harbors and ships overcomes the simple customer–supplier model, deepening the cooperation between the two countries. On 26th September 2012 Yamal LNG launched a tender for the construction and operation of ARC7 ice–class LNG carriers to cover a period of 20 years. (Yamal 2012a.) In June 2013, a trilateral memorandum of cooperation between Novatek, VEB and Sovcomflot proposed to provide for the construction of two gas-carriers and to operate them for Novatek in the Yamal LNG project (Vnesheconombank 2013) (Sovcomflot 2013). The winner of the bid for the delivery of 16 tankers was the South Korean Daweoo Shipbuilding & Marine Engineering, announced on July 4th, 2013. The agreement also included the transfer of competencies, documentation and training of engineers and staff to a Russian shipyard. (Yamal LNG 2013d.)

On the other hand, domestic producers were responsible for the ship to be used in harbour operations in Yamal, a 10MW diesel powered vessel built by the Russian company Vyborg Shipyard (part of United Shipbuilding Corporation USC), on the estimated delivery time fixed in November 2018. The seaport icebreaker is meant to escort LNG carriers through approach channel and the water area of the Sabetta seaport (Vyborg Shipyard 2015). In this regard, Atomflot signed a port fleet service contract, acting as operator and shipowner, for tug and icebreakers assistance in Sabetta, with a validity up to 31 December 2040. (Yamal 2015b.) The use of nuclear icebreakers makes the development of the Northern Sea Route possible for the medium and long term. (Putin 2017e). The first tug was completed and sent already in May 2016 from Murmansk (Yamal 2016e).

As already said, foreign contribution allowed for the construction of the first ARC7 ice–class LNG tanker 'Christophe de Margerie' which became operational at the end of March 2017. It can carry 172,600 cubic metres of LNG which is sufficient to supply the entire country of Sweden for nearly a month, it can sail through ice as thick as 2.1 metres thus being able to navigate eastward for six months a year and westward year-round. (Sovcomflot 2017c.) The ship has performed its first travel through the Northern Sea Route to deliver LNG from Norway to Korea in 19 days. The ship has also set a new time record for the NSR transit of 6.5 days, overall the journey resulted in being 30% faster than through the Suez Canal route (Sovcomflot 2017b). The first of 15 tankers confirmed into production, the LNG tanker 'Christope de Margerie' does not need escort of icebreakers and can develop navigation in the Arctic Ocean and can also help to increase cargo turnover. (Yamal LNG 2017b.) Moreover, on 2013 April 1st, the completion of the tender for engineering, procurement, supply, construction and commissioning of an LNG integrated facility with an annual capacity of 16.5 million tonnes saw Technip France and JGC Corporation from Japan as the winners. (Yamal LNG JSC 2013e.)

Another significant turning point in Yamal LNG is represented by the intergovernmental agreement signed on 03.06.2013 in effect throughout 31.12.2045 between the Russian Federation and the People's Republic of China, which sets favorable conditions for investment cooperation in the Yamal LNG. With fiscal advantageous conditions, China committed to finance the project by means of national financial institutions, and to buy at least 3 million tons of LNG per year at delivered ex-ship (DES) terms for a period of 15 years with possible supplies extension (Novatek 2013a) (The Russian Government 2013a). (Yamal 2014d.) On 21.06.2013 the parts concluded the framework agreement on cooperation which provided for the acquisition by CNPC of a 20% stake in the project, conclusion of long-term contract for supply of at least 3 million tons of LNG per year and active assistance in organizing the provision of external financing for the project from the Chinese financial institutions. (Novatek 2013d.) The agreement on the purchase of a 20% equity share in the Yamal LNG was concluded on 05.09.2013 with expectation to complete the necessary regulatory approvals by 01.12.2013 (Novatek 2013b). The commitment has then been formalized with a binding contract announced on 20.05.2014 with the involvement of CNPC China National Petroleum Corporation, with the price indexed to the Japanese Crude Cocktail (Yamal LNG 2014a). In December 2015 there was also the signature of the agreement with the Chinese Silk Road Investment fund for 9,9% (Mikhelson 2016b), the Russian Government reviewed and endorsed the Draft at its meeting on 21.01.2016 (The Russian Government 2016b).

With the cooperation agreement with the Belgian company Fluxys for the transshipment of LNG, Yamal LNG gives technical, permitting and regulatory processes to Fluxys in transshipment operations. Because the transshipment platform at LNG terminal in Zeebrugge (Belgium), is an integral part of the Yamal LNG's logistical chain, there are long term prospects of mutually beneficial relationships, with the Belgian attracting investments and more LNG and the Russians having a reliable way of deliver LNG to Asian–Pacific countries during winter months when the Northern Sea Route is closed. (Yamal LNG 2014c.) The agreement was then finalized in March 2015 with a quantity of 8 million tons of LNG per year for 20 years, at the port of Zeebrugge which in turn required the building of new improved facilities due to the increased ship traffic (Yamal LNG 2015c.)

The Russian Government has actively supported the project in its infrastructural dimension, stimulating state owned companies to provide facilities such as the seaport and airport in Sabetta, the icebreaking fleet through Atomflot and the LNG tanker fleet through Sovcomflot (Lunden & Fjaertoft 2014, 15). The Yamal plant was built in modular design which allowed to reduce the construction time by 1.5 to 2 years, the reservoirs were build with concrete shells to reduce distances and to be able to work year-round (Mikhelson 2016b). The construction of Sabetta seaport started in July 2012 and served as key element of the transport infrastructure for the Yamal LNG, it creates the foundations for the development of the peninsula fields and in the Gulf of Ob, it provides year-round navigation along the Northern Sea Route and contribute to the development of Russia's icebreaker fleet (Novatek 2012b).

In 2013, *Glavgosexpertiza* granted the state environmental approval also for the seaport facilities including the Navigable Channel in the Ob Bay respectively in August and October. (Yamal LNG 2013b.) On March 20th, 2013, JSC Yamal LNG also received by *Glavgosexpertiza*, the state environmental approval for the construction of the liquefaction plant with its annexed structures, on the Yamal Peninsula. Moreover, the YaNAD Subsurface Management Department issued a construction permit for the LNG plant in the South Tambeyskoye field. (Yamal LNG JSC 2013f.) The company in charge for the early phase facilities, completed at the beginning of August 2013; was JSC MRTS (*Mezhregiontruboprovodstroy*) one of the largest Russian construction companies specialized in gas pipelines and other facilities in the Far North and Western Siberia. The designation was granted according to Decree No. 1128–r, issued by the Russian Government on 04.07.2013. (Yamal LNG 2013c.)

In 2014 a Presidential Directive made Sberbank “the sole executor of public process and price auditing, construction inspection and banking support for the construction of the seaport” to “ensure transparency and effective usage of government investments by all of the construction participants” (Sberbank 2014). The Sabetta seaport has an important logistic location and can serve as universal port, also acting as relief spot for railways to ship all kind of goods (Putin 2015), it has worked year-round since 2013, allowing for more than 10 million tonnes of freight delivered and unloaded in Sabetta (Mikhelson 2016a).

As for the social investment costs, Yamal LNG has paid between 2011–2013 to the regional government of the YaNAD RUB 3 billion; the payment was meant to sustain the well-being of the population via infrastructural and services development both in urban and rural areas (Lunden & Fjaertoft 2014, 27). In February 2015 also, an airport was built in Sabetta with private funds and in less than a year served 130,000 passengers, a cargo port operates year-round and and from there were loaded 3 million tonnes of construction materials. (Mikhelson 2016b).

The output production of the Yamal LNG was secured in advance in 2014, with agreements stipulated with 27% to China, 36% to Asia–Pacific region countries and 3 million tonnes to the Indian market through Gazprom Export (Mikhelson & Putin 2014) via Western Europe with a term of Agreement for more than twenty years and a crude oil indexed price (Novatek 2014). Other means of financing were placed in different forms, for example in the agreement for the delivery of LNG tankers with Daewoo Shipbuilding & Marine Engineering in 2013; a clause allowed the transfer of rights to finance the ships constructions and purchase the tankers to third-party shipping companies chosen by Yamal LNG. (Yamal LNG 2013d).

Another example of facilitation of financing is via long-term contract for gas supply such as the binding one concluded on 31.10.2013 with the Spanish multinational Gas Natural Fenosa, for 2.5 million tonnes of LNG *per annum*; equivalent to 3.2 bcm of natural gas. The quantity accounted for 10% of Spain total annual gas consumption representing a major important gas supply in absence of access to Russian pipeline gas. (Yamal 2013a.) In the Asian–Pacific area, a 2015 agreement between Yamal LNG and Gazprom Marketing & Trading Singapore, signed a long-term Supply and Purchase Agreement, 20 years, for 2.9 million tons of LNG intended primarily to India, with the LNG price indexed to crude oil. (Yamal LNG 2015d.)

Moving on to the contribution of domestic and foreign credit, there is to note that foreign investments in pre-2014 period were quite substantial, for instance Dutch companies accounted for 75% of them in the Russian energy mix (Medvedev & Rutte 2011), 14 leading Dutch energy companies had taken initiative as early as 2009 to help to jointly develop the gas deposits in the Yamal peninsula and on the Kara Sea shelf. (The Russian Government 2009). However, over the period 2014–2017 the investments in Russia have decreased by 7.9% due to the crisis. But regionally, the investments in the best 10 regions have grown by nearly 40% in real terms, YaNAD is among them (Putin 2017a). Albeit the 2015 global shrinkage of investments from 70% to 60% in fossil fuels upstream (exploration and production) sector, due to the decline in production from existing fields (IEA 2016b, 2); Yamal LNG increased production from its existing fields (*idem*) and increased investments in 2016. In 2015, they accounted for a little over RUB 400 billion (bln), with an increasing trend (Novak 2016).

The budget allocated for the Yamal LNG project by Novatek was estimated accurately in USD 27 bln, and in 2016 it had not been overstepped. Overall, China provided USD 12 bln joining the Yamal LNG project with the CNPC (20%), and the Silk Road Fund (9,9%) (Mikhelson 2016a), with Novatek owning the 50.1% whilst Russian banks have provided USD 4 bln in rubles. More specifically with regards to Chinese financings, on 20.05.2014 A memorandum on project financing signed between China Development Bank Corporation (CDBC), *Vnesheconombank* (VEB), Gazprombank and Yamal LNG stated the prospects of entrance of substantial Chinese capitals into the project. CDBC would act as general coordinator for the Chinese financial institutions to secure financings for a period up to 15 years. (Yamal 2014b.) These prospects concretized on 29.04.2016 with the signature of two 15-year credit line facilities, one from the Export–Import Bank of China and the CDBC for the amount of EUR 9.3 billion and CNY 9.8 bln at EURIBOR 6M plus margin of 3,30% at the construction stage and 3,55% after the full commissioning of the project; and SHIBOR 6M with the same margins. (Yamal LNG 2016f.) The role of VEB helped the project to obtain international financing by issuing bank guarantee which was accepted by China on the bases of long-standing trust-based relationship in the financial sector (Vnesheconombank 2017).

Novatek has also asked financial support from the Russian government for 18% of its financing in 2014 (Mikhelson & Putin 2014). The money obtained from the National Welfare

Fund allowed the project to run on time, as external financings were not organized on time before the crisis (Mikhelson 2016a). In details, the National Welfare Fund, supplied financial support despite of the the economic sanctions with two financing packages of RUB 75 bln (USD 1.16 bln) in form of issuance of 15-year bonds aimed at the LNG plant construction (Yamal 2015a). On domestic financings, Russian banks as Sberbank have financed the Yamal LNG project once they considered it was reliable and profitable even with the most unfavourable oil and gas prices (Gref & Putin 2015). The domestic financings came in April 2016 from Sberbank and Gazprombank for overall amount of EUR 3.6 bln, of which 2.7 bln from Sberbank (Sberbank 2016), at EURIBOR 6M plus 4,7% annual interest rate (Yamal LNG 2016g). The first tranche of domestic financing accounting for EUR 1 billion was withdrawn in June (Yamal LNG 2016d); whilst from the Chinese banks was taken the sum of EUR 0.45 bln; the totality of financings accounted for USD 18.4 bln (Yamal 2016c).

In 2016 Yamal LNG also signed a loan agreement with the Italian bank Intesa Sanpaolo on 14.5-year credit line facilities for the total amount of EUR 750 million at EURIBOR 6M plus 2,5% annual interest rate, with coverage by Italian export credit agency SACE and the French export credit agency COFACE. (Yamal 2016b.) Japan have signed in 2016 a Memorandum of Understanding for strategic partnership with Novatek in Yamal LNG for shipment of gas through the Northern Sea Route (Maeda 2016). In December 2016 an additional credit line facility with the Japan Bank for International Cooperation (JBIC) was signed for EUR 200 million (Yamal LNG 2016a). Speaking about social costs in this period, Novatek maintained in full all the social programmes and continued to carry out all the charity projects in every region (Mikhelson 2016b) (Novatek 2017d). In June 2017 the signing of the agreements with Intesa Sanpaolo and also Raiffeisen Bank International AG accounted for EUR 425 million at annual interest between EURIBOR 6M plus 1,75% to plus 2.3%, with insurance coverage provided by the Swedish export credit agency EKN and the German Euler Hermes. (Yamal 2017d.)

At the end of November 2017, the project was granted state permission to commission the technological facilities at LNG plant first stage, including the first liquefaction train capable of 5.5 million tons per year, 58 wells and their related infrastructures (Yamal 2017a). It is important to note once again that thanks to foreign technology, all the phases of LNG production minimize the pollution impact on the fragile Arctic environment (Putin, 2017f). In December 2017 the project started to produce liquefied natural gas at the first LNG train with a nameplate capacity of 5.5 million tons *per annum* (Novatek 2017b). The first cargo of LNG produced at the Yamal LNG was loaded in Sabetta on the icebreaking LNG carrier “Christophe de Margerie” on 8^{th} December (Sovcomflot 2017a) successfully concluding the project.

8. CONCLUSIONS

> Now, speaking here before you, I would like to thank our foreign friends and foreign partners (many of them are with us in this room), because without their help, without their trust in their Russian friends and partners, this project would not have happened either. I am referring to both financing and technologies. The project involved companies from the East, from Europe, all of them took an active part in it. And today's shipping, the first shipment, is our common victory. I very much count on them continuing to work together, in this case for the benefit of global energy development.
> (Putin 2017e.)

Addressing the reasons of how and why this project was completed, I start by saying that the Yamal LNG project appears to be first and foremost the tangible result of the concretization of multilateral cooperative efforts. Beginning as a joint venture between Gazprom and the independent producer Novatek, it lately saw the withdrawn of Gazprom and the entrance of the French company Total, hence one can say that it began as an international project. The subsequent entrance of CNPC enhanced this international dimension. Foreign partners were responsible for providing LNG and maritime technologies which Russia lacked, whilst domestic producers were heavily involved in nuclear ice breaking development, infrastructure construction and shipbuilding, in the latter case sometimes with competences derived from foreign partners. The financial dynamics saw again a substantial participation of foreign partners, most notably from China which entered the project in 2014, amidst the Ukraine crisis, provided determinant capitals. However, heavy governmental support appeared to be determinant for the success of this project from the very beginning, even though Putin (2015) lately declared that this support came only after the foreign investments. The scarce literature available on Yamal LNG seems to confirm this view, as for instance in Lunden and Fjaertoft (2014) regarding the tax breaks.

The reasons for the completion of the project are to be found in the energy companies drive for profit and diversification. In the case of foreigners these aspects are also united to the desire to access untapped resources in the Russian Arctic. The broad governmental support granted to the project in all its phases, unveils the existence of broader political interests expressed by the Russian state most of which explicitly emerge from policy documents. A similar consideration can be found also in Bros and Mitrova (2016).

In investigating which actors were responsible for what, a heavy role was indeed played by the Russian government, which has introduced changes in field of bureaucratic and legislative simplification to attract foreign investment. Furthermore, it has also introduced crucial tax breaks which have greatly influenced the successful completion of the project. Moreover, the government has granted the utilization of the the resources from the National Welfare Fund, even with the low oil prices and the running financial sanctions, to allow the project to run on time. Finally, it has also coordinated the efforts of several state corporations and institutions to concur in the realization of Yamal LNG. The domestic financings came also by Sberbank, Gazprombank and VEB, with this latter involved also in providing foreign financing. These financial institutions provided also coordination and financial resources with the several departments of the projects such as in the shipbuilding and infrastructure construction. An active and significant role was also played by Rosatom and by the United Shipbuilding corporation. Finally, Novatek worked well and carefully planned all the important steps with realistic timetables and prospects of expenditures which were matched both in regards of the completion time, with only a slight delay, and in terms of capitals needed whose amount was not overstepped.

The foreign actors, as already said, provided technology and financings. French and Japanese companies were especially involved in providing LNG technology along with BASF and some other firms. Whereas South Korea was responsible for the realization of the LNG carriers, China with its banks and the Silk Road Fund provided substantial capitals and the entrance of the CNPC in the project. Other European countries and Japan have also granted credit in 2016, and cooperation with Belgium provided the utilization of the Zeebrugge seaport for the winter route when the NSR is hardly accessible.

The cooperation in Yamal LNG has been shaped and structured by the constraints and enablers represented by the four structural dimensions treated in chapter 6. Starting from the resource geographic, the abundance of gas resources in the Russian Arctic united to the harshness of the climate and the vastness and underdevelopment of the zone have represented a huge enabler for cooperation. Likewise, the low temperatures which favour the liquefaction process, the short distance between the wells and the processing plants united to the the onshore location of the resource base, represented attractive conditions. Also, the level of Russian LNG technological development required in operating in such environment have forced the Russian actors to turn to international cooperation as suggested by policy documents.

The financial dimensions constrained on one hand and enabled cooperation on the other. Starting from constraints, one significant aspects was represented by the prohibitive costs of infrastructural development in the Arctic zone. Other constraints were partially the prospected increase of the production costs, the taxation and the low demand and oil prices. A significant obstacle was also represented by the freeze of the Western credit as part of the sanctions. However, this last element pushed Russia to seek partnership in Asia. Other enablers of cooperation were represented by the innovative approach of dual or triple purpose facility and the opening to private–public partnership in infrastructure construction. Regarding the tax legislation, the introduction of tax breaks for the Yamal LNG is maybe one of the most significant enablers. Other factors included the increased demand of energy in Asian–Pacific region, most notably by China, the prospected increase of LNG global demand, and the actual lower costs of production compared to other gas projects.

The institutional dimension outlined the existence of several constraints at both domestic and international level. Domestically the centralized bureaucracy proper of Russian energy mega-projects and the political and legislative system were partially an obstacle to cooperation due lack of guarantees for foreign investors which was also reflected at the international level in the 'gas wars' of the 2000s and in the Ukraine crisis. With few improvements on administrative procedures and enhanced legislative guarantees for foreign investors, the situation turned brighter. Not the same can be said internationally, the Ukraine crisis has severely damaged the relations between the Western countries and Russia but at the same time was decisive in turning Russia to cooperate tighter with China. However, matters of energy diplomacy such as the question of bypassing transit countries have pushed for a total governmental support to LNG project; this united to the persistent good relations in the Arctic had a positive impact on cooperation.

In the ecological dimension, a clearer situation emerged, the fragility of the Arctic environment and the need for a collective action in its preservation surely defined this dimension as a huge enabler for cooperation. The physical qualities of LNG make it less harmful than other fossil fuels and its impact on environment less devastating than for example oil. Moreover, the prospects of utilization of LNG as bunker fuel in the ships raised interest especially in connection to the development of the NSR hence this dimension can be considered more an enabler than a constraint.

In investigating how, the interests and cognitive frames of Russian actors have shaped the decision to cooperate with foreign partners to complete the project, one must recognize the importance of the Arctic region for Russia. As emerged in the analysis, in the RAZ almost all kind of interests are present, but the most emerging, in relation with the Yamal LNG project, from the government's point of view is surely the socio-economic development and the modernisation of the area and conversely of the whole country.

Regarding the cognitive frames held by the energy companies and financial institutions, the business frame seems to be more prevalent and the most accentuated whilst for the government this appears to count only to an extent. In case of energy companies, business frame and profit appear to be the main drive for cooperation with a potential future competitor as China. As Yamal LNG is also functional to both the development of the infrastructures of the Arctic region, and the restoration of the NSR, the power and influence frame is also present, although not in the Yamal LNG project *per se*. The frame of environmental sustainability was also included in the decision of fostering this LNG project, but always within financial rather than environmental considerations.

Moving on to answering the last research question; I think it is possible to assess the impact of the domestic factors such as energy policies in shaping international energy relations, and in this case, I go as far as to say that the impact was fundamental. From the different versions of the energy strategy, emerged the picture of an energy fuel complex to be used as the base for the country development. In the latest version of the Energy Strategy 2035, the feature of innovation and modernization of energy acquired an increasing key role. The specificity of the RAZ, with a dedicated strategy also pictures the energy sector as the cornerstone of the development of the whole area; a substantially shared vision emerged also from transcripts of the press interviews and speeches of political figures. The highly specific Western financial sanctions aimed to halt the energy projects in the Arctic resulting from the Ukraine crisis also unveil the political attempt to hinder the Russian development as also noted by Bros and Mitrova (2016). The analysis of the domestic factors of energy policy formation helped to comprehend the motivation behind the trajectories within which Russia cooperated with China and other Asian partners at the expenses of other Western partners. By relying only upon the international level, it is not possible to completely understand the outcome of Yamal LNG as well as the reason why the Russian government has granted full support to the project; using the National Welfare Fund despite the low oil prices and the financial crisis and the Western imposed sanctions. The fact that Russia engaged in cooperation with any partner willing to commit, might show that domestic considerations for socio-economic development of the Arctic and the country were actually primary.

Overall, the social structurationist model of energy policy formation is not intended for generalisations. However, few broader considerations can be drawn from this case study also by virtue of the fact that some findings corroborate previous results presented in the literature. The insights from this thesis might be also utilised as working hypotheses for further studies on international energy cooperation.

As Pleines (2009) and Øverland (2010) found, also in this dissertation seems that low oil prices push Russia to seek international cooperation. Moreover, it appears that financial constraints and shortage of technological capabilities move a country to seek cooperation with foreign partners only if its resource base is wide enough and the country can preserve advantageous or best returns for itself.

The thesis also arrived at a similar result of that obtained by Lunden and Fjaertoft (2014) who considered the tax breaks and governmental subsides to Yamal LNG as a significant factor for the completion of the project. These findings seem to suggest that in periods of strained relations, a strong central government backing a private energy project might positively influence the outcome of cooperation.

A final broader consideration could be elaborated when thinking that despite the economic sanctions imposed on Russia, the Yamal LNG project run on time with only a small delay of few months on the schedule. Similar dynamics were observed in the 1980s in the Yamal pipeline project (Perović 2018); Bros and Mitrova (2016) defined the sanctions on the two projects as politically motivated. From these observations one might posit that politically motivated economic sanctions seem to obstruct but to not decisively affect international energy projects.

After these broader remarks, there are also some limitations in this study that should be mentioned. One of them is the sole use of English language sources which have reduced the opportunities to perform a deeper inquiry especially at the national and local level. In addition, I was not able to conduct interviews with relevant actors. However, the use of secondary sources that investigated the primary data available in Russian partly compensated for the loss of information. Furthermore, the novelty of the object of study, which unfolded during the dissertation writing, means that there are very few previous studies on the topic. As for the theoretical model utilized, the abovementioned limitation influenced also its application, with some subcategories resulting in much less content processed than others; nonetheless this aspect did not invalidate the explanatory strength of the model nor reformulations of the model based on empirical data were necessary. One may also wonder whether the over-reliance on the social structurationist model of energy policy formation, albeit consciously, represents another limitation. However, its application in the study of international energy cooperation allowed to bring new interesting views on the subject and as such, for my opinion, is fully justified.

Albeit this work produced significant and fresh findings, further research is required to deepen those aspects which were not possible to investigate due to language barriers. This is especially relevant at the regional and local level. A broader pool of data in Russian language should also be gathered and analyzed, and if possible, interviews should be conducted. Regarding the energy actors, it would be also interesting to produce more research on the reasons why Novatek, an independent gas producer, and not Gazprom carried out the realization of the project. Moreover, it would be also extremely interesting to carry a multiple case study which compares the Yamal LNG to the Sakhalin–2 LNG or to the development of Shtokman gas field.

Despite these limitations and the need for further research, this study contributed to shed some light on one of the most challenging and impressive international energy projects of the decade by applying the social structurationist model of energy policy formation on a new case. Moreover, it contributed to expand the study of international energy cooperation under a light constructivist point of view including its domestic and material factors; and it also produced some broader consideration which can be used as working hypotheses for new interesting studies.

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