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Topic: Natural resources as a source of conflict in International Relations: A comparative analysis of the cases of hydrocarbons and rare earths.

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ΣΧΟΛΗ ΟΙΚΟΝΟΜΙΚΩΝ, ΕΠΙΧΕΙΡΗΜΑΤΙΚΩΝ ΚΑΙ ΔΙΕΘΝΩΝ ΣΠΟΥΔΩΝ

ΤΜΗΜΑ ΔΙΕΘΝΩΝ & ΕΥΡΩΠΑΪΚΩΝ ΣΠΟΥΔΩΝ

ΔΙΔΑΚΤΟΡΙΚΗ ΔΙΑΤΡΙΒΗ

Θέμα: Οι φυσικοί πόροι ως αίτιο σύγκρουσης στις διεθνείς σχέσεις: Συγκριτική ανάλυση των περιπτώσεων των υδρογονανθράκων και των σπανίων γαιών.

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Preface and Acknowledgements

Rare earths are a natural resource that caught great public attention back in 2010 but has not received efficient academic attention and analysis with regards to its impact on International Relations. As it will be revealed through the following pages, the rare earths are full of paradoxes. One of them is that, although they are of high importance to many industries and they are included in the critical materials list of many significant players in the international system, there has not been systematic research around their potential to cause conflict among the actors of the international system nor has research on the conditions under which they could cause such a conflict been conducted. However, there are other natural resources, especially energy resources such as hydrocarbons, which have received widespread attention and have been extensively researched for decades. These were the reasons that led to the examination of this field and the comparative analysis between natural gas and rare earths, which is presented in the 7 Chapters that follow.

Rare earths first caught my attention when I heard about them during a class of my 3rd or 4th year of undergraduate studies at the International and European Studies Department at the University of Piraeus, taught by Professor Mary Bossis. Therefore, I would like to thank her in the most expressive way for sowing the first – ever seed of this dissertation.

Special thanks to my Department of International and European Studies at the University of Piraeus not only for believing in and accepting my research proposal but also for making this research the first PhD conducted in English to ever start in the Department.

This study would be a lot different and even – I will dare to say – non-existent had it not been for the encouragement, support and open-mindedness of my supervising committee. Special thanks to my Supervisor Professor Aristotle Tziampiris for honouring in the most substantial way the definition and the essence of *academic freedom*. He has provided me with all the necessary space, literally and metaphorically speaking, which has been the cornerstone for developing my research and reaching the conclusions of this study. Furthermore, his to-the-point comments triggered significant thinking on critical topics of this dissertation.

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However, this PhD would not have been a reality without the great and constant support, encouragement and patience of my mother and my sister, whom I thank from the bottom of my heart.

Finally, I carry the sole responsibility for the arguments presented in this study.

Enjoy your journey through the pages of this research!

Palaio Faliro and Piraeus,

March 2021

Contents

Abstract

The goal of the present study is to answer the question "When does a natural resource become a source of conflict?". In order to address this question we have compared and contrasted natural gas and rare earths and we have applied the securitization theory and the theoretical tool of energy security to the case studies presented. The case studies selected for this comparative analysis are: the Russio-Ukrainian dispute over natural gas in 2006, 2009 and 2014; the case of the Eastern Mediterranean, where the behavior of Israel, Cyprus, Greece and Turkey in relation to the natural gas findings in 2009 – 2011 is examined; and the Sino-Japanese dispute over the Senkaku/Diaoyu Islands in 2010 together with the Rare Earth Crisis. After presenting the case studies, we compare and contrast them according to the behavior and the statements of the main actors involved in each case and we reach some conclusions. Then, we present the Natural Resources Index of Conflict (NRIC), a tool created in an attempt to measure the possibility of and to forecast future conflict over natural resources. Finally, we reach our final conclusions where we check the validity of the research hypothesis, we provide answers to the main research question as well as to the minor ones and we argue on a theoretical level about the roots of interest and conflict in the international system.

Περίληψη

Στόχος της παρούσας μελέτης είναι να απαντήσει στο ερώτημα «Πότε ένας φυσικός πόρος γίνεται αίτιο σύγκρουσης;». Προκειμένου να απαντηθεί αυτό το ερώτημα, έγινε σύγκριση του φυσικού αερίου με τις σπάνιες γαίες και επιπλέον έγινε εφαρμογή της θεωρίας της ασφαλειοποίησης και του θεωρητικού εργαλείου της ενεργειακής ασφάλειας επί των περιπτωσιολογικών μελετών που παρουσιάζονται. Οι μελέτες περίπτωσης που επιλέχθηκαν για αυτήν τη συγκριτική ανάλυση είναι: η Ρωσο-Ουκρανική διαμάχη για το φυσικό αέριο κατά τα έτη 2006, 2009 και 2014· η περίπτωση της Ανατολικής Μεσογείου, όπου εξετάζεται η συμπεριφορά του Ισραήλ, της Κύπρου, της Ελλάδας και της Τουρκίας σε σχέση με τα αποθέματα φυσικού αερίου που ανακαλύφθηκαν το 2009 – 2011· και η Σινο-Ιαπωνική διαμάχη για τα νησιά Σενκάκου/Ντιαόγιου το 2010 σε συνδυασμό με την Κρίση Σπανίων Γαιών. Έχοντας παρουσιάσει τις περιπτωσιολογικές μελέτες, βρίσκουμε ομοιότητες και διαφορές εξετάζοντας τη συμπεριφορά και τις δηλώσεις των κυριότερων δρώντων που εμπλέκονται σε κάθε μία από τις περιπτώσεις και εξάγουμε συμπεράσματα. Έπειτα, παρουσιάζουμε τον Δείκτη Σύγκρουσης για Φυσικούς Πόρους (ΔΣΦΠ), ένα εργαλείο που δημιουργήθηκε σε μια προσπάθεια να μετρηθεί η πιθανότητα μελλοντικής σύγκρουσης με αίτιο τους φυσικούς πόρους, καθώς και να προβλεφθεί. Τέλος, εξάγουμε τα τελικά μας συμπεράσματα, όπου ελέγχουμε την εγκυρότητα της ερευνητικής υπόθεσης, απαντάμε τόσο στο κύριο ερευνητικό ερώτημα, όσο και στα δευτερεύοντα ερευνητικά ερωτήματα και παρουσιάζουμε επιχειρήματα σε θεωρητικό επίπεδο, σχετικά με τις ρίζες του συμφέροντος και της σύγκρουσης στο διεθνές σύστημα.

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CHAPTER I

1.1 Introduction – Theoretical Framework and Methodology

Research examines facts and research on conflict usually examines the reasons that led to a conflict, the causes underlying and the factors that affect the escalation, intensity or the level of a conflict. This has also been the case regarding conflicts over natural resources. The point is that this leads research to (over)focus on certain natural resources that have led to conflict or that repeatedly lead to conflict, such as energy resources and 'neglect' other, less 'famous' ones, such as rare earths.

Given that research examines facts, it is a fact that energy resources such as natural gas have led to conflict more times during the period 2005-2015 than rare earths. Typical examples of that are the Russo-Ukrainian natural gas conflict that had a 'frozen' impact on Europe as well, and the conflict over natural gas fields in the Eastern Mediterranean region. Both are conflicts with a duration of more than just a few days, that have affected several states and that have caused intense political discourse, as well as political and military actions. During the same period, there was a Sino-Japanese conflict over rare earths in 2010, which lasted for some years (until 2015) and although it involved political discourse and actions, it did not involve any military actions. It was considered as a trade conflict and it was settled through the WTO (World Trade Organization) in 2015.

The question to be posed here is why certain natural resources become the stake of international conflicts more often than others? Are there specific conditions which determine when a natural resource ignites a conflict as well as the level of this conflict? Or is it just that certain natural resources such as natural gas are more important to everyday lives compared to others such as rare earths?

Natural resources are defined by the OECD (Organization for Economic Co-operation and Development) as:

> *[…] natural assets (raw materials) occurring in nature that can be used for economic production or consumption. The naturally occurring assets that provide use benefits through the provision of raw materials and energy used in economic activity (or that may provide such benefits one day) and that are subject primarily to quantitative depletion through human use. They are subdivided into four*

categories: mineral and energy resources, soil resources, water resources and biological resources (OECD).

Research Purpose

The purpose of this study is to examine and present the conditions under which natural resources can become a source of conflict in the international system.[1] Furthermore, what is examined is whether these conditions already exist or whether they are being formed with regards to rare earths, making them another source of conflict. As Powell-Turner and Antill (2015) state, there is still lots of research to be conducted concerning several aspects of rare earths including economic and national security while taking environment and environmental sustainability into serious consideration and at the same time not impeding *"economic and social growth, especially in relation to defence"*.

Research Question(s)

Mining the literature on conflict, I have noticed two paradoxes. Firstly, whereas some natural resources have become sources of conflict time and again, there are some others that have never become so or at least they do not make the headlines every day. Therefore, our primary purpose in this dissertation is to answer the question: When does a natural resource become the source of conflict? Apart from answering this primary question, we have also tried to provide answers to questions such as: Why is it that some natural resources have been securitized and have become sources of conflict whereas others have not? Why is it that some natural resources have become the source of a conflict more times than others? What are

[1] Natural resources are among the sources of conflict as discussed in the works of J. Humphreys (2012), "Resource wars: searching for a new definition", *International Affairs*, Vol. 88, No 5, pp. 1065-1082, A. Gat (2009), "So Why Do People Fight? Evolutionary Theory and the Causes of War", *European Journal of International Relations*, Vol. 15, No 4, pp. 571-599, DOI:10.1177/1354066109344661 (3/4/2015) p. 594, C. C. Held (2000), "Middle East Patterns. People, Places and Politics – Riches Beneath the Earth: Underground Resources", Westview Press, on TeachMideast.org, http://acc.teachmideast.org/texts.php?module_id=4&reading_id=1027 (14/3/2015), Michael L. Ross (2012), *The Oil Curse: How Petroleum Wealth Shapes the Development of Nations*, Princeton: Princeton University Press in K. M. Morrison (2013), "Whither the Resource Curse?", *Perspectives on Politics*, Vol. 11, No 4, pp. 1117-1125, DOI: 10.1017/S1537592713002855 (3/4/2015) p. 1118.

the determinants of a conflict? What are the determinants of a conflict over natural resources? Is it possible to predict a conflict?

Secondly, although some natural resources such as energy and minerals are of 'key' importance in international relations, *"there has been limited direct application of IR theories to understanding energy- and mineral- related conflicts"* (Dannreuther, 2010, p. 1). Furthermore, it seems that the classical IR theories such as (neo-)realism, liberalism and Marxism do not explain the upgrade of such issues from low politics issues (economic issues) to high politics issues (geopolitical/geostrategic issues) thoroughly (Dannreuther, 2010, p. 14). This is exactly where the theory of securitization fits in. It explains exactly this transition and most importantly, it has not been *"explicitly applied to international energy or mineral politics"* (Dannreuther, 2010, p. 15)[2]. That is the reason why securitization was chosen as the theory to be applied on the case studies of this dissertation.

Research Hypothesis

In the light of this evidence, the research hypothesis formed for this research is that if a natural resource has been securitized, then it becomes the stake of a conflict. Or, if a natural resource becomes the stake of a conflict, it is because it has been securitized.

Methodology and Structure

Aiming to answer the research questions posed and find out about the validity of our hypothesis, we have chosen to analyze, compare and contrast natural gas and rare earths. Of course, there are so many natural resources and one could have chosen water or crops which have also triggered conflicts. The reason why we chose natural gas and rare earths is that a) natural gas is a form of energy and energy is of vital importance to any kind of economic, social and technological development globally, and compared to oil it is cleaner, which makes it a key fuel towards a more sustainable and environmentally friendly future; also, its being a form of energy implies that almost all actors of the international system are interested in it, which means that the more actors interested, the more possible a conflict among them becomes; b)

[2] Dannreuther (2010), also suggests historical institutionalism as a theory that explains this transition (p. 15). However, I have focused on securitization since this is the theory used in this dissertation.

rare earths are vital parts for the products of many industries including the defence industry; furthermore, paradoxically, there is a gap in literature concerning the connection of rare earths to international relations and this dissertation aspires to become part of bridging it; but the main reason for picking rare earths is our aim to be more relevant and closer to the heart of contemporary development(s).

For that purpose, first of all, we provide definitions and literature review on the main concepts and theories used in this dissertation. These include: security, threat, conflict, prediction-predictability of conflict, the theory of securitization, desecuritization, the mini-theory of energy security and critical raw materials (CRM). Then, Chapter II is an introduction to natural gas and rare earths. In this chapter we provide necessary information for both natural resources, such as prices and other market-related details, production methods and historical facts. After that, in Chapters III and IV we deal with the case studies. We have chosen three case studies, in total, to examine and justify our argument; two for natural gas since it is in the limelight due to its energy nature and one for rare earths, because it is only recently that it has caught the attention of the players as a possible source of conflict.

With regards to natural gas, first, the dispute between Russia and Ukraine in 2006, 2009 and 2014 has been chosen, since it provides a wide range of facts, moves and actions of the players involved. It is a case in which what started as a conflict over natural gas prices ended up in armed conflict and annexation of Crimea by Russia. It shows that a conflict over a natural resource can easily become an armed conflict leading even to a change of borders on the global map. Secondly, the case of the Eastern Mediterranean natural gas reserves (2009 – 2011) has been chosen because of the geostrategic importance of the area, it being crossroads of continents, sea routes and civilizations. What is more, some of the most economically powerful global players such as the U.S.A., the EU and Russia have turned their attention to this area and have shown their interest in becoming involved. Apart from that, the proximity of the area to the author's country of origin played also some role in choosing to study it.

Concerning rare earths, we have chosen the case study of the Senkaku/Diaoyu Islands dispute between China-Japan back in 2010. The reason for that is that a) not many incidents of conflict involving rare earths have arisen so far and b) this case started as a regional conflict but then spread globally as an economic conflict over rare earths until 2015 when things started normalizing again.

In order to analyze and explain these cases, the theory of securitization is used. This is the theory that better justifies and interprets the reasons why some natural resources become a source of conflict, some others do not and why some natural resources have become a source of conflict more times than others. Apart from this theory, since we are talking about energy issues, the mini-theory of energy security is also applied. This helps us better understand how the supply chains of natural resources and raw materials work and why it is supply chains that have been securitized after all. In addition to this, the energy security framework is also applied to rare earths since we argue that at the end of the day, it is a framework that refers not only to energy but to all supply chains in general.

In Chapter V, the natural gas-related case studies are compared to the rare earth case study. Drawing on the comparison, we highlight the main similarities and differences and we reach conclusions for both natural resources and their relationship with conflict.

Finally, in Chapter VI we present the Natural Resources Index of Conflict (NRIC) where we have compiled several parameters that we deem determinant of when and where a conflict occurs as well as of the nature (kind) of it. We also provide a scale which describes how strong the possibility of the conflict is.

In the end, we summarize all our findings from which we also derive the answers to the primary and secondary research questions. Additionally, we check the validity of the research hypothesis and we make some policy recommendations as well as suggestions for future research.

Importance/Contribution

We believe that the research presented in this dissertation is really important for several reasons. First of all, there has not been enough research concerning the relationship of rare earths with international relations, which, to our mind, has happened due to falsely underestimating the power and potential of rare earths as a tool of pressure. Secondly, there has not been any comparison between rare earths and hydrocarbons (oil or gas) as a source of conflict in the literature. Thirdly, this study has been conducted under the prism of securitization. To the best of our knowledge, securitization has not been much used as a tool of interpreting conflicts over rare earths. This has provided the necessary space to provide pioneering research in the field which in turn will allow for further research on similar topics.

Furthermore, this analysis is going to provide valuable insight to decision makers, political analysts, scholars and people involved in the relevant industries. The language used is English in order to be available to and accessible by a greater range of audience. Therefore, it will reach more people and achieve better dissemination.

1.2 Securitization

Trying to find the theory that best answers the research question, one certainly has to come across and travel through the waters of several different theories and theoretical frameworks before deciding. Having been through this voyage myself, I have concluded that the theory of securitization is the one that best responds to my research question.

In order to understand securitization, one has to understand security first.

The Debate on Security

After the end of the Cold War, the newly transformed international system has changed, and it is not the only one. The concept of security has changed as well. There are two main approaches to security. The first one is the traditional view of military security while the other one is a wider view of security which includes issues from all five sectors (Buzan, Waever, & de Wilde, 1998, p. 1).

Of course, the Cold War ignited a heated debate during 1970s – 1990s on whether security studies should become wider as a concept. The argument and the concern was that by widening the security agenda, the meaning of security would gradually become vague and finally inexistent (Buzan, Waever, & de Wilde, 1998, p. 2).

After the end of the Cold War, there is discussion not only on the military aspect of security but also on *"non military aspects of strategy"* (Buzan, Waever, & de Wilde, 1998, p. 3). Furthermore, the central role of the state in security is being reviewed and questioned given that it is a period when non-state actors are also taking military action; there is also a quest of the *"new focal point"*: Is it the military, politics or the state? (Buzan, Waever, & de Wilde, 1998, p. 3). However, there is a really inclusive view expressed by Chipman (1992, p. 129 in Buzan, Waever, & de Wilde, 1998, p. 3) who argues that the focal point should be *"the possible use of force"* no matter whom it comes from, state or non-state actor. However, Stephen

Walt takes a stronger position by arguing *"that security studies is about the phenomenon of war and that it can be defined as 'the study of the threat, use, and control of military force.'"* (Walt S. 1991 in Buzan, Waever, & de Wilde, 1998, p. 3). He is also a strong opponent of the idea of widening the security agenda because he believes that super-expanding it would challenge the potential of providing solutions to the problems (Walt S. 1991, pp. 212-213 in in Buzan, Waever, & de Wilde, 1998, p. 3 – 4). It should be highlighted though, that he accepts the connection of economics and security but as far as economics is related to military matters (Walt S. 1991, pp. 212-213 in Buzan, Waever, & de Wilde, 1998, p. 3).

What is Security?

According to dictionaries, security can take several forms. As listed in the dictionary, security is

> *"protection of a person, building, organization, or country against threats such as crime or attacks by foreign countries; the group of people responsible for protecting a building; (certainty) the fact that something is not likely to fail or be lost; (finance) property or good that you promise to give to someone if you cannot pay what you owe them; (confidence) the feeling of being confident in one's family and relationships; (freedom from risk) freedom from risk and the threat of change for the worse; (free from danger) freedom from danger, safety"* (Cambridge Dictionary, n.d.); *"1) the quality or state of being secure, such as a) freedom from danger-safety, b) freedom from fear or anxiety, c) freedom from the prospect of being laid off (job security); 2) a) something given, deposited, or pledged to make certain the fulfillment of an obligation, b) surety, 3) an instrument of investment in the form of a document (such as a stock certificate or bond) providing evidence of its ownership; 4) a) something that secures-protection, b) 1. measures taken to guard against espionage or sabotage, crime, attack, or escape, 2. an organization or department whose task is security"* (Merriam-Webster, n.d.).

It becomes obvious that security spreads through several sectors, private or personal life, military, politics, economy and finance but above all, it is mainly a *feeling*, a rather strong one. It is a feeling that is related to freedom, confidence, certainty and the absence of danger. And as all feelings it can be assumed that it can be subjective, which implies that its existence, presence or absence as well as the level of its existence, presence or absence varies according

to the person or actor who feels it and speaks about it. As a conclusion, security is dependent on a specific person or actor simply because it stems from it. Furthermore, what can be declared as a state of security for one actor might not be the same for another; it can even be the opposite: a state of insecurity. And it is exactly that point, when conflict may arise between the side that feels insecure and the side that feels secure, due to the latter's feeling and state of security that may trigger the feeling of insecurity to the former.

On a personal level, people tend to be secure when they believe and accept that their needs (existential, material and emotional ones) are both covered and there are "supplies" to continue providing for them. Given that states and literally any entity, be it institution, organization, company or even group or network, consists of people, we can extend this argument to the collective schemes formed by people as well. This means that any formation of people has needs and when it covers these needs it can declare a state of security. When the people or groups fail to fulfill and cover their needs, then they fall into a state of insecurity which can lead them to take any possible action required to survive and flourish.

With regards to international relations, Buzan, Waever and de Wilde (1998, pp. 21-22), argue that security means different things to different actors across different levels of analysis and they provide a comprehensive description of the connotations of the word security through time:

> *"The history of the word security is complex (Kaufmann 1970; Der Derian 1993; Delumeau 1986; Corze 1984), but in the 1940s it was established in international affairs with a fairly distinct meaning (Rosenberg 1993). Much of this meaning was so easily installed because it rested on an old argument that had used the word security much less systematically—an argument about "necessity" previously contained primarily in the concept of raison d'état (Butterfield 1975). Especially from the mid-nineteenth century, when the state enters a juridical self-limitation and self-control, this "is balanced by the designation of a range of 'governmental acts' which are immune to legal challenge. This juridical reserve area of executive power is . . . the qualification which . . . calculations of security impose as a condition for the political feasibility of a liberal democracy" (Gordon 1991: 33; cf. Foucault 1991 [1978]). The classical argument, which holds that in extreme cases the government can use all means necessary, becomes concentrated as a specific, exceptional case (Wæver 1988, 1995b). This meaning of security evolved separately from the use of security in various domestic contexts (although*

> *connections definitely exist; see Kaufman 1970). This international type of security starts to spread to new referents and new actors; therefore, we want to retain, a focus on international security because it has a distinct meaning, but we do not exclude the possibility that we will meet this kind of security increasingly in domestic contexts."* (Buzan, Waever, & de Wilde, 1998, p. 46)

Security in international relations is highly linked to survival, it stems from power politics and *"At best, security is a kind of stabilization of conflictual or threatening relations, often through emergency mobilization of the state"* (Buzan, Waever, & de Wilde, 1998, pp. 4, 21). However, two points should be mentioned here: security does not mean the complete absence of conflict (or threat) nor does too much security have a positive effect (Buzan, Waever, & de Wilde, 1998, p. 4). Drawing on these definitions two are the main questions arising: "What is a threat?" and "What is a conflict?" followed by the crucial question "What is the opposite of security after all?"

What is Threat?/On Threat

Threat or insecurity? Threat is the factor, the trigger that causes insecurity, thus insecurity is a situation, a state, a variable affected by threat. Lack of threat leads to the state of security, which is the absence of insecurity.

Insecurity is highly linked to proximity. This is because the threat that will create insecurity is of higher importance if the source of threat is closer to the actor; therefore, actors tend to fear more their neighbors than distant (relatively to their position) actors (Buzan, Waever, & de Wilde, 1998, p. 11). This is how *security complexes* are formed. To define this term,

> *"A security complex is defined as a set of states whose major security perceptions and concerns are so interlinked that their national security problems cannot reasonably be analyzed or resolved apart from one another"* (Buzan, Waever, & de Wilde, 1998, p. 12)[3, 4].

[3] See also Buzan (Buzan, 1983, pp. 105-115) where the security complex theory was first outlined (Buzan, 1983, p. 106).

[4] Also, Buzan, Waever and de Wilde correctly predict that the world in the post-Cold War era will become of a more regionalized nature due to the lack of a reason for organisation on a global level (Buzan, Waever, & de Wilde, 1998, p. 9).

These subsystems[5] are groups of actors that are interdependent in terms of security because one's security problems are directly connected to the behavior of its geographical neighbors (Buzan, Waever, & de Wilde, 1998, pp. 11-13). To illustrate that point, let us think of the Eastern Mediterranean security complex. Greece's and Cyprus' security problems are highly connected to Turkey's behavior rather than the USA's behavior. The principle of mutuality always present, from a Turkish perspective, Ankara's security problems are highly linked to Athens' and Nicosia's behavior rather than the USA's behavior.

However, Buzan, Waever & de Wilde (1998), open up classical security complex theory (CSCT) by including more sectors in their analysis, apart from the political-military, ending up with two possible complexes, namely *Homogeneous complexes* and *Heterogeneous complexes* (p. 16). The difference between the two is that in *Homogeneous complexes* it is assumed that security complexes remain within specific sectors, whereas in *Heterogeneous complexes* it is assumed that the action of the actors involved expands over several sectors at the same time (Buzan, Waever, & de Wilde, 1998, p. 16). This is perceived as an asset of the former category over the latter. The reason is that it allows the researcher to have a single picture of the case, tracking the numerous connections and interactions among sectors (Buzan, Waever, & de Wilde, 1998, p. 17).

To sum up, threat, just like security, is a feeling. It is the feeling of fear. It is the state when one is afraid of being harmed by someone else. In international relations, this feeling is caused to actor A by the behavior of a geographically proximal to it actor B, when the behavior of B is perceived by A as being likely and sufficient to cause damage to it. This is how security complexes are formed. When the possible damage is deemed to harm specific sectors, the complex is homogeneous, whereas when it is perceived as possible to affect several sectors simultaneously, the complex is called heterogeneous.

[5] Buzan, Waever, & de Wilde (1998, p. 13) also refer to them as *"miniature anarchies"* which firstly, shows that they are small systems within the international system and secondly proves, that the pieces of the international system maintain the main attribute (anarchy) of their "parent".

On Conflict

Natural resources have often been the stake of conflicts all around the globe. The conflicts in Chad, DRC (Democratic Republic of Congo), Sierra Leone, Sudan are only few examples illustrating that point. But what is a conflict?

Conflict can be armed or non-armed. According to the Uppsala Conflict Data Program (UCDP) (Uppsala Universitet, Department of Peace and Conflict Research),

> *"An armed conflict is a contested incompatibility that concerns government and/or territory where the use of armed force between two parties, of which at least one is the government of a state, results in at least 25 battle-related deaths in one calendar year."*

Although this is the most standard and respected definition of conflict when it comes to armed conflict (Uppsala Universitet, Department of Peace and Conflict Research), there are certain points that need clarifying. Firstly, this definition states that there is use of armed force between two parties but does not mention anything about cases when armed force is used by more than two parties. Secondly, it states that at least one of the parties using armed force is the government of a state. What about those cases where no government of a state is involved because it simply does not exercise effective control and the two parties using armed force are not governments of a state? Are these cases not considered as armed conflicts? Thirdly, it is stated that the use of armed force must result in at least 25 battle-related deaths in one calendar year. How was this number chosen? What if there are 24 deaths? Will that signify the absence of a conflict?

It seems that conflict is a term that has not been clearly defined and is still puzzling research and literature. Even research on natural resources and armed conflict refers to conflict without distinguishing among civil wars, ethnic conflicts or interstate wars (Varisco, 2009, p. 41). However, there are several papers in the literature concerning the connection and correlation of natural resources with civil wars. These studies are mainly quantitative and it really worth mentioning here, that there is little convergence among the findings of each of these studies (Ross, 2004, pp. 337-338)[6]. This proves that conflict in relation to natural resources is a field of study where a lot of different parameters exist and one has to take into

[6] Ross (2004) examines 14 different quantitative studies concerning this topic and provides a comprehensive table of them. For the table see: Ross, 2004, p. 339.

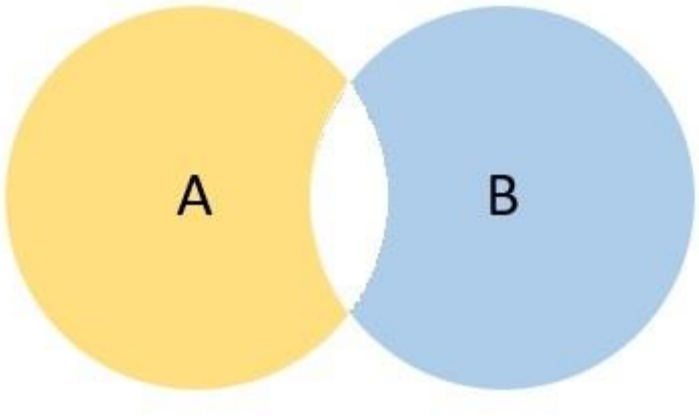
account as many of them as possible, if they are to reach safe conclusions, valid for other cases as well. Therefore, it is a field of study that needs to go under more intensive research.

For this dissertation, conflict is defined as the situation when the interests of two or more actors are mutually exclusive. To put it simple, it is the situation during which if one's interest(s) materialize(s), then the interest(s) of the other(s) cannot. For example, let's assume there are two actors, A and B and each of them has different interests. If P(A) stands for the probability of A's interests to become true and P(B) represents B's probability respectively, then the conflict situation between A and B can be described by the following formula

$$P(A \cup B) = P(A) + P(B)$$

where the subject of the formula, which is P (A U B), represents the conflict situation between A and B. To illustrate this point, I have also used the following Venn diagram

Figure 1: Venn diagram representing a conflict situation between A and B



in which the yellow part represents A's probability of interest materialization, the blue part represents B's probability of interest materialization and the white part in the middle represents the fact that certain part of A's interests conflicts with certain part of B' interests and vice versa. Therefore, the white part represents the conflict between A's and B's interests. With regards to interest, in this dissertation it is defined as anything essential to an actor's survival in the international system.

Natural resources have been involved in conflicts several times. For example, the mines in the DRC, especially in the eastern regions of the country, were perceived by Hutus and Tutsis

as a means of funding their armed conflict (Heath, 2014), (Kaye, 2011). This is also how the term 'conflict minerals'[7] emerged.

There are certain points in the literature with regards to natural resources and conflict which were considered important and therefore worth mentioning. First of all, the impact natural resources have on conflict does not depend on *"state strength"*; secondly, natural resources are usually linked to wars of shorter duration; thirdly, these wars will most likely *"end with military victory for one side"*; and finally, when supplies of natural resources are under threat, external actors are more likely to get involved in order to end the war (Humphreys, 2005, p. 508). This highlights the existing dependence of the consumers on the suppliers and proves the interdependence between them. It is also a proof of the importance of natural resources to the actors in the international system. It becomes obvious that actors need to know that the supplies of natural resources, especially of those they are more in need of, are secure, available and constant or uninterrupted.

These are only some of the conclusions Humphreys (2005) draws after analyzing the mechanisms that create the correlation between natural resources and conflict as well as the duration of such conflicts. Furthermore, Humphreys concludes that econometric tests that test the impact of natural resources on conflict have certain weaknesses (2005, p. 533).

On the other hand, Varisco (2009) suggests that *"neither practical evidence nor extensive literature have thus been able to clarify whether and how natural resources are inter-related with armed conflicts"*, arguing that this lack of clarity between natural resources and armed conflict is attributed to the variety of characteristics of different countries (p. 41). He justifies his argument by providing a contrast using examples of natural resources-rich countries that are peaceful such as Japan, Norway and Botswana, natural resources-rich countries that have faced armed conflict, such as the Democratic Republic of Congo (DRC) and Sierra Leone and natural resources-poor states that have also faced armed conflict such as Haiti and Uganda (Varisco, 2009, p. 41). Based on these examples, he further concludes that research has not succeeded reaching a consensus on whether it is abundance or not of natural resources that is connected to armed conflict (Varisco, 2009, p. 41).

[7] Main conflict minerals include gold and the 3T, tin, tantalum and tungsten, produced out of cassiterite, Coltan and Wolframite (Heath, 2014), copper and 3 of the rare earths, neodymium, dysprosium and terbium (Kaye, 2011).

Prediction – Predictability of Conflict

In my attempt to answer to the research question "When does a natural resource become a source of conflict?" I have thought that it would be really great if we were able to know beforehand where and when conflict will start. However, this requires a universal model of conflict prediction which IR analysts all over the world would use as a common ground to predict conflict. The construction of such a model seems difficult since there are numerous variables, parameters and dimensions related to conflict, that should be taken into account. Nevertheless, there is an ongoing discussion on this topic and there have been certain attempts to create such models.

For example, Weidmann and Ward (2010) have created a spatial and temporal model in order to assess the role of geography in conflict prediction. The case study they used to apply the model was the spread of conflict during the Bosnian War on a municipality level. They concluded that both space and time are factors upon which the occurrence of conflict is strongly dependent.

In addition, Humphreys (2005) has researched the range of mechanisms likely to link natural resources to conflict occurrence and duration. The author concludes that literature has focused more on correlations rather than on tests that will help in identifying the mechanisms and highlights the low efficiency of the relevant econometric tests.

The purpose of this dissertation is not to discuss extensively over the topic of conflict prediction. However, there are certain questions arising, such as "Is conflict predictable after all?", "What are the parameters that should be taken into account?" and "What is the parameter that will give a dynamic character to this model, allowing it to adapt to the changes made in the parameters through time? Because if the model is stable and cannot adapt to change, we will soon be in need of a new model addressing new facts and transformed parameters." In an attempt to add a small contribution to the conflict prediction literature, I have tried to make a Natural Resources Index of Conflict (NRIC). I have gathered several parameters that seem to affect the start of a conflict over natural resources and have created a scale the score of which measures the possibility of a conflict to arise.

The Theory of Securitization

This is a theory attributed to Barry Buzan, Ole Waever and Jaap de Wilde of the Copenhagen School. According to them (1998), securitization is a procedure. It is the procedure when a topic that was *non politicized* and was out of the public debate, now becomes *politicized* and is part of the public agenda and the issues that the state/actor deals with and at the same time this topic is also *securitized* because it is considered as a matter that could challenge the survival of the actor (Buzan, Waever, & de Wilde, 1998, p. 23). A point to be stressed here is that a securitized topic requires urgent, immediate action and this justifies any action taken that is out of common place (Buzan, Waever, & de Wilde, 1998, p. 23). In order to achieve this, one has to convince the public about or make the public accept the existential character of the topic under discussion (existential threat) and persuade them or make them accept that not acting timely may have disastrous consequences on the survival of the actor and even cause its annihilation (Buzan, Waever, & de Wilde, 1998, pp. 23, 41). A topic has been successfully securitized only when the public accepts it as an existential threat (Buzan, Waever, & de Wilde, 1998, p. 41). Therefore, the public accepts to legitimize any actions necessary to tackle the securitized topic by recognizing that if the topic is not addressed at the time of speaking and action is postponed, then the actor may not exist later to take this action (Buzan, Waever, & de Wilde, 1998, pp. 24, 26). The existential threat varies according to the sector affected (military, political, economic, societal, environmental) and the referent object (Buzan, Waever, & de Wilde, 1998, pp. 21-22). All this happens through an act (or acts) of speech (a security speech act) and is called *"securitizing move"* while the person who does this is called the *"securitizing actor"* (Buzan, Waever, & de Wilde, 1998, p. 40). The key to success in the process of securitization is not necessarily the real existence of a threat but rather the fact that an issue has been presented as a threat; after all, a securitizing actor *"can attempt to construct anything as a referent object"* (Buzan, Waever, & de Wilde, 1998, pp. 24, 36). Let us go back to 2003, when the US accused Saddam Hussein of possessing chemical weapons and invaded Iraq but then, it was proved that this was not the case. In this case, the rhetoric of chemical weapons in Iraq is the securitization move that legitimized the invasion of Iraq. The existence of chemical weapons in Iraq was successfully presented as an existential threat to the US and their interests and therefore provided the necessary legitimization to deploy "boots on the ground".

Of course, any issue can be at any stage of the procedure; for example, even personal/private issues can become political and when this happens we are talking about a

"politicizing move" and "*politicization"* (Buzan, Waever, & de Wilde, 1998, p. 23). For that reason, Buzan, Waever & de Wilde argue that securitization can be thought of as *"an extreme version of politicization"* (1998, p. 23).

Buzan, Waever and de Wilde (1998, p. vii) use a constructivist approach to distinguish securitization from politicization. To achieve this, they examine security in five sectors, namely the military, the political, the economic, the environmental and the societal sector. Their purpose is to analyze security in the post-Cold War era, during which they feel that the international system will be more regionalized (Buzan, Waever, & de Wilde, 1998, p. vii). Their research question is *"How could security complex theory be blended with the wider agenda of security studies, which covered not only the traditional military and political sectors but also the economic, societal and environmental ones?"* (Buzan, Waever, & de Wilde, 1998, p. vii).

They place themselves on the wideners' side of the debate, they disagree that the central point of security studies is war and force, and they explore both military and non-military threats but try to do this in a coherent way (Buzan, Waever, & de Wilde, 1998, p. 4). They dive into *"the logic of security"* and discover the differentiating factor between security/securitization and the political process (Buzan, Waever, & de Wilde, 1998, p. 5).

With regards to threat, securitization theory accepts that both vulnerabilities and threats can exist in many fields, but they become security issues under certain circumstances:

> *"They have to be staged as existential threats to a referent object by a securitizing actor who thereby generates endorsement of emergency measures beyond rules that would otherwise bind."* (Buzan, Waever, & de Wilde, 1998, p. 5)

Therefore, the authors try to explain and identify when, how and why an issue becomes a matter of security and what issues become security issues after all (Buzan, Waever, & de Wilde, 1998, p. 1).

During this process they use five levels of analysis, where events take place, defined by their spatial size (Buzan, Waever, & de Wilde, 1998, p. 5). These levels are:

a) ***International systems*** (currently the whole planet; no other level above them)
b) ***International subsystems*** (systems contained in the International System, regional subsystems such as ASEAN or organizations, such as OECD)
c) ***Units*** (actors in the form of groups, such as states, companies, etc.)

d) ***Subunits*** (groups within units that attempt or have the ability to have an effect on the unit's behavior, such as lobbies)
e) ***Individuals*** (bottom level)

It is not necessary though for actors to belong only to one of the levels. Under different circumstances they may belong to different levels (Buzan, Waever, & de Wilde, 1998, p. 6).

Furthermore, they distinguish three different units in the security analysis:

a) **Referent objects:** things or concepts whose survival is presented to be threatened
b) **Securitizing actors:** actors who use the security speech act to create a referent object (i.e. to claim that the existence of a thing or concept is under threat)
c) **Functional actors:** actors that do not fall in the previous two categories; they have an impact on the *"dynamics of a sector"* and they *"significantly influence decisions in the field of security"* (Buzan, Waever, & de Wilde, 1998, p. 36)

Having outlined the main points of the theory used in this dissertation, what becomes obvious is that the 'key' concept in the securitization process is *"for whom security becomes a consideration in relation to whom"* (Buzan, Waever, & de Wilde, 1998, p. 18). Furthermore, there is a serious question arising here. Given that securitization is a process of constructing a threat and (at least in theory) it can be used by anyone to present anything as an existential threat, it is also likely that it may become a tool in the hands of any person or any theory attempting to disguise their real desires and intentions. This is a question that we discuss in the conclusions of this research.

What is more, since securitization is a process with certain steps towards a specific direction, what do we call the situation when these steps are taken towards the opposite direction? Does it exist? Is it the opposite of securitization? The answer is "Yes. It is called *desecuritization*".

Desecuritization

Desecuritization is the opposite process. In other words, desecuritization means to pull a topic out of the security – threat discussion back into the politicization of the public sphere (Waever, 1995). When compared to securitization,

> *"Security should not be thought of too easily as always a good thing. It is better, as Waever argues, to aim for desecuritization: the shifting of issues out of emergency mode and into the normal bargaining processes of the political sphere."* (Buzan, Waever, & de Wilde, 1998, p. 4).

It seems to be better to aim at desecuritization. This is because, although securitization's target is balance and stability, the conflict that drove to it still exists; however, if the topic is desecuritized, then it means that the threat has been eliminated or it does not exist anymore and therefore, the underlying conflict does not either (Buzan, Waever, & de Wilde, 1998, p. 4). Paradoxical as it might be, desecuritization seems to be more desirable.

1.3 Energy Security

Energy is a noun of Greek origin, as it stems from the Greek word *'energeia'. Energeia*, which in English means *'action'*, is what makes the world move, advance, develop and grow. In other words, energy is what sets everything into motion. Furthermore, it facilitates the production of new products. According to the OECD, energy or energy sources are *"all solid, liquid and gaseous fuels; electricity; uranium; steam and hot water; and the traditional fuels such as fuelwood, charcoal, vegetal and animal wastes"* (OECD, n.d.). There are also new and renewable energy sources which, *"are energy sources including solar energy, geothermal energy, wind power, hydropower, ocean energy (thermal gradient, wave power and tidal power), biomass, draught animal power, fuelwood, peat, oil shale and tar sands"* (OECD). Apparently, energy can take several forms many of which, such as uranium, water in all its forms, sun and wind, are natural resources.

Natural resources are natural assets (raw materials) occurring in nature that can be used for economic production or consumption (OECD). The challenge occurring is that natural resources, especially energy, may not always be available or accessible due to various factors such as geomorphology or very high prices. This implies that, there are internal as well as external threats likely to halt energy related activities such as production, transport and use, either temporarily or even permanently (Blazev, 2015, p. 49). It is exactly this need - the need to maintain an uninterrupted flow of energy - that leads people to "*anticipating, planning and preventing any interruptions in the energy sector"* (Blazev, 2015, p. 49). Under such circumstances, we can start discussing about *energy security*.

What does the term *'energy security'* imply? There are numerous definitions in the bibliography concerning this term. According to the Asia Pacific Research Centre's (APERC) large definition,

> *"…the ability of an economy to guarantee the availability of energy resource supply in a sustainable and timely manner with the energy price being at a level that will not adversely affect the economic performance of the economy. Thus, there are several factors that can influence the 'security' of energy supply, such as: (1) the availability of fuel reserves, both domestically and by external suppliers; (2) the ability of an economy to acquire supply to meet projected energy demand; (3) the level of an economy's energy resource diversification and energy supplier diversification; (4) accessibility to fuel resources, in terms of the availability of related energy infrastructure and energy transportation infrastructure; and (5) geopolitical concerns surrounding resource acquisition. In terms of energy demand elasticity, an economy that is able to decouple economic growth with energy use – through energy efficiency and conservation– will have an advantage in terms of its energy security."* (Asia Pacific Energy Research Centre (APERC), 2007, p. 6)

As the definition demonstrates, APERC focuses on what is called "the 4 A's of Energy Security". It argues that these are the four main factors affecting energy security, namely (physical) availability, (geopolitical) accessibility, (price and cost of infrastructure) affordability and (environmental) acceptability (Asia Pacific Energy Research Centre (APERC), 2007, pp. 1-2).

However, apart from the 4 As of energy security, there are also the 4 Rs of energy security, a methodology aiming to make the concept of energy security more easily understandable to the public and politicians, proposed by Hughes (2009). The four Rs are: review, which refers to *"understanding the problem"*; reduce, which refers to *"using less energy"*; replace, which refers to *"shifting to secure sources"* or diversification and restrict, which refers to *"limiting new demand to secure sources"* (Hughes, 2009).

Diving into the literature of energy security, there are more definitions of the concept. For example, building upon a) Baldwin's argument that security is *"a low probability of damage to acquired values"* (1997, p. 13), and b) the definition of energy security as *"low vulnerability of vital energy systems"* (Jewell, Cherp, & Riahi, 2014, p. 744), Cherp and Jewell (2014) argue

that there are several questions around that subject that have not been answered yet, such as the risks that could make a vital energy system vulnerable as well as inefficient to provide for *"critical social functions"*.

Bahgat (2009, pp. 23 – 25), argues that the term energy security is used in order to describe the existence and availability of adequate and affordable amounts of energy.

According to the definition provided by the International Energy Agency (IEA, n.d.),

> *"The IEA defines energy security as the uninterrupted availability of energy resources at an affordable price. Energy security has many aspects: long-term energy security mainly deals with timely investments to supply energy in line with economic developments and environmental needs. On the other hand, short-term energy security focuses on the ability of the energy system to react promptly to sudden changes in the supply-demand balance."*[8]

Although IEA's definition seems to be similar to that of APERC's, it is shorter and it puts it more simply. IEA's definition is also the one that is used in this work because it covers all the aspects of the energy security in the simplest possible way.

There are two key phrases in this definition. The first one is *uninterrupted availability*. The stress in this phrase falls on the word 'uninterrupted'. This word indicates that availability alone cannot provide energy security; it also has to be constant (Pan20p. 244). The other phrase that has to be stressed is 'affordable price'. If uninterrupted availability of energy sources is sufficient to energy security, then affordable price is necessary. The reason is that even if the flow of energy supply is continuous, with no unexpected interruption, consumers will still be far from access to it if it is unaffordable (very expensive) for them (Panagopoulou, 2020, p. 244). This drives us to the conclusion that both conditions have to be valid in order for energy security to materialize.

Someone could wonder if the other way round is possible. To illustrate that point, someone could argue that even if the energy price is affordable, energy security cannot exist if there is no continuous access or no access at all to the supplies. The answer to such an argument would be that this situation simply cannot exist. The reason for this is provided by economics. If supplies of any good are restricted, discontinued or rare, then the price for that good is far

[8] For more on the different definitions given for energy security see Narula (2014), pp.1055-1056.

from affordable due to its limited supply and the sense that its scarce supply is exactly what makes it precious and expensive.

With regards to the interruption of energy supplies, advocates of a realist approach argue that it can only be the outcome of political reasons, which can either be *internal*, such as a conflict within an exporting state, or *external*, such as the use of this interruption as a tool of diplomacy towards a third state or actor (Τσακίρης, 2018, pp. 112-113). By analogy, we argue that this is a situation that is possible to occur with regards to the supplies of any resource, not just of energy.

However, it should not be overlooked that supply of any resource can also be disturbed or even interrupted due to natural occurring phenomena. To illustrate that point, back in 2011, when Japan was hit by an earthquake followed by tsunami, Apple had to take immediate action due to the impact this natural disaster had on its minerals supply chain (Kaye, 2011).

The different definitions of energy security demonstrate that it has multiple aspects and therefore it can be perceived in a different way by different actors. As Luft and Korin (2009, pp. 5-6) mention,

> *[…] energy security means different things to different countries based on their geographical location, their geological endowment, their international relations, their political system and their economic disposition.*

As Tsakiris (2018, p. 38) mentions in his book, a universal definition for energy security does not exist simply because it means different things to different actors. However, what remains stable are the factors that make its concept vary, namely its content (energy resource), its strategic importance to the military and economic security of the actors and the changing balance between importer states and exporter states in the international system (Τσακίρης, 2018, p. 38).

Based on these criteria, he further argues that the developments in defining energy security can be classified into four different time periods (2018, pp. 38-39), as shown in Table 1 that follows:

Table 1: Classification of the events defining energy security

Time Period	Main features
1905 – 1945	Energy security coincides with security of oil imports; necessary for military power
1945 – 1971	Oil's importance to global economy; low prices necessary to help US allies with the rebuilding process after the war
1971 – 1974	Collapse of previous system; OPEC's rise as an oil power – especially Saudi Arabia
1980 -	OPEC's hegemonic role both doubted and reassured; China and the US become the two greatest energy consumers; US as a stabilizing force in the Middle East

Source: (Τσακίρης, 2018, pp. 38-39)

There are two main views from which to look at energy security. When examined from the suppliers' (producers') point of view, it is called *security of demand*, whereas when examined from the consumers' point of view, it is called *security of supply* (Bahgat, 2009, pp. 23-25). The former is strongly related to the security of exports, since producers need to make sure there available markets for their energy production, whereas the latter is strongly associated with the security of imports, since consumers need to secure the availability of the resources and accessibility to them (Τσακίρης, 2018, p. 22). Both viewpoints serve the purpose to *"ensure a healthy and undamaged energy sector as a precursor of energy independence, which in turn contributes to a healthy national security"* (Blazev, 2015, p. 49).

However, there is one more viewpoint with regards to energy security. That is the viewpoint of the transit states. These states can view energy security as both security of demand and supply. For them, it can be security of demand when considering the markets which have bought the amounts of energy transiting their territory but at the same time it can also be security of supply, since they also have to make sure there are accessible and affordable supplies to fend for themselves.

What is essential to mention at this point is the existing interdependence between suppliers and consumers which is revealed by the fact that the stability and predictability of the market lies within the sphere of interests of both groups (Bahgat, 2009, pp. 23-25). As Keohane and Nye described it,

> *"Interdependence, most simply defined, means mutual dependence. Interdependence in world politics refers to situations characterized by reciprocal effects among countries or among actors in different countries."* (2012, p. 7)

To make a long story short, one cannot exist without the other and each is directly affected by the behavior of the other.

Other important parameters included in the concept of energy security are adequate and secure investments together with the need to tackle environmental challenges.[9]

There are more aspects of the *energy security* highlighted by Cambridge Energy Research Associates (CERA), namely diversification, the margin of security, in-time intelligence of high quality, cooperation between producers and consumers and technological advance (cited in Bahgat, 2009, p. 24).

Apart from the numerous aspects under which energy security can be approached, it is also true that it arose as a policy problem at the beginning of the 20th century (Cherp & Jewell, 2014, p. 415). For example, when World War I was about to break out, Churchill decided that the British fleet should no more use coal as a fuel; it should use oil if it were to move faster than their German rivals. Therefore, he turned the energy factor into a factor of national strategy, a rather crucial one (Yergin, 1991, pp. 11-12) (Yergin, 2006). However, it was not until the '70s, in the aftermath of the 1973 oil crisis, that energy security entered the field of International Relations (Παπασωτηρίου, 2018, p. 17). Although energy security might be quite 'new' as a concept, this does not by any way mean that it did not exist during the previous years as a reality.

Energy security seems to be as old as mankind. The more we go back historically, the more it becomes obvious that at the time it was not just energy security but it was something greater than that. We could call it resource security. To illustrate that point, according to Toynbee (1976, pp. 87-88 in Τσακίρης, 2018, p. 23), gold and silver were considered of strategic importance in Ancient Egypt, because they were the resources that could secure a state's economic power and consequently its military power. In other words, they could secure the existence, the survival of the state.

[9] For an analysis of the concept of security of demand and the term 'Sustainable Energy' see Narula (2014), pp. 1055-1056.

What is more, water has also become the stake of several conflicts since antiquity. For example, during the 7th century B.C., both king Ashurbanipal of Assyria and king Sennacherib of Assyria used water as a strategic tool in order to succeed in their military pursues and conquer new land (Τσακίρης, 2018, p. 23).

With regards to ancient Greece, Thucydides was the first ever to examine the importance of strategic resources to war and he did this in his work *The Peloponnesian War* (431-404 B.C.) (Τσακίρης, 2018, p. 23). As Thucydides himself stated in his work, he aspired that his history would become *"ktima es aei"*, which means a permanent possession, a good that mankind will possess to the end of time. It is true that he managed to do this really successfully. In his work, he describes what the Athenians needed in order to maintain their naval supremacy in the North Aegean Sea. What he mentions is that the two strategic resources were i) wood from Chalkidiki and Eastern Macedonia, because this was used in the making of new vessels and ii) wheat coming from Ukraine, which was necessary to feed 75% of the Athenian population (Τσακίρης, 2018, p. 24).

Given also the fact that it still remains part of the national security strategy of countries such as the U.S. (U.S. National Security Strategy, 2015), we can undeniably state that energy has been securitized. This shows that energy security has become a matter of utmost importance for states and it is part of their national interest. Of course, whether it ignites a conflict or leads to cooperation lies with the states' priorities (Bilgin in Krishna-Hensel [ed.], 2012, p. 31).

One crucial factor that makes energy maintain a high priority position is the political condition of the supplier countries. Apparently, instability raises concerns to consumer countries over the continuation as well as the security of the supply chain (Hensel in Krishna-Hensel [ed.], 2012, p. 113). It is for that reason that consumer states try to develop certain strategies (mainly diversification) in order to be able to address such a possibility, for example:

- diversification of suppliers
- diversification through developing domestic production
- *substitution or use of alternative resources* (ibid).

We have already defined what energy security is[10], and we have paid special attention to the various aspects it consists of. Furthermore, we have highlighted the fact that it has been securitized since states consider it part of their national interests and thus of their national strategy priorities and we have also illustrated some ways they use in their attempt to maximize their energy security.

As with energy, rare earths are also critical to the global (technological) development, therefore countries need to secure their supplies, mainly coming from China. What is more, after the Senkaku/Diaoyu related incident back in 2010, they have also been securitized[11] although to a lower level than energy. Finally, it is since then that states have started an attempt over diversifying their rare earth supplies and reducing their dependence on China.

Given that part of this project concerns natural gas, the theoretical framework (mini-theory) of *energy security* is applied, combined with the theory of securitization presented earlier in this chapter. This concept which describes a term used in the field of energy, can also be used for the case of the rare earths (and for any other natural resource) as well. Although critical raw materials like rare earths are not energy sources, this theoretical tool can be applied in their case too, based on Waltz's (1979, p. 89) argument that:

> "*Reasoning by analogy is helpful where one can move from a domain of which theory is well developed to one where it is not. Reasoning by analogy is permissible where different domains are structurally similar*."

To check if that is valid in this case, it is necessary to mention that there is large literature with regards to natural gas as a source of conflict, while there is really little literature on rare earths as a source of conflict. Furthermore, the natural gas sector and the rare earths sector can be considered structurally similar. The reason for this is that, first of all, both belong to the umbrella group of natural resources. Secondly, although natural gas belongs to the sub-group of energy and rare earths belong to the sub-group of metals, both include similar

[10] For more on that, Blazev (2015) is a really detailed, in-depth analysis of energy security for all those who want to 'dive' in the field. Also, Correljé and van der Linde (2006), present extensively the energy security instruments a state can use (see pp. 539-541). For a comprehensive literature review on energy security definitions and parameters, see (Azzuni & Breyer, 2017, pp. 23-24) as well as Appendix A in the supplementary material for the same paper. Also, see (Ang, Choong, & Ng, 2015, pp. 1079-1080).

[11] See HM Government (2010), p. 18 point 1.31, p. 27 the last point in the table and p. 28 points 3.15 and 3.16.

parameters, namely availability and location of reserves, accessible deposits, extraction, further processing and supply to the market in adequate and affordable quantities. Thirdly, both can be viewed under the prism of security of supplies and under the prism of security of demand. Fourthly, there are similar ways to overcome possible disruption in their supply chains. The main ways to tackle such a challenge are: diversification of suppliers, so that the level of dependence on a certain supplier is low; reduced use in order to lower the demand; domestic production, in order to lessen the dependence on external suppliers and the relevant vulnerability that comes with it; and recycling, which will limit the need for new reserves and provide more economical ways to enhance supplies by enjoying the fruit of circular economy. Therefore, by analogy, as Waltz suggests, the theoretical framework of energy security can be applied on rare earths as well. For that reason, this mini-theory combined again with securitization is also applied to rare earths, the critical raw material which is the other resource under discussion in this work.

1.4 Critical Raw Materials (CRM)

Both rare earths and natural gas belong to the wide group of raw materials. But what are raw materials?

According to dictionaries, a raw material is *"crude or processed material that can be converted by manufacture, processing, or combination into a new and useful product"* (Merriam-Webster, n.d.), *"any material, such as oil, cotton, or sugar in its natural condition, before it has been processed for use"* (Cambridge Dictionary, n.d.), or in business terms *"a substance in its natural state that will be used to make something else in an industrial process"* (Cambridge Dictionary, n.d.), or *"basic substance in its natural, modified, or semi-processed state, used as an input to a production process for subsequent modification or transformation into a finished good"* (Business Dictionary, 2019). An additional suggestion could be that,

> *"Raw materials are materials or substances used in the primary production or manufacturing of goods. Raw materials are commodities that are bought and sold on commodities exchanges worldwide. Traders buy and sell raw materials in*

what is called the factor market because raw materials are factors of production as are labor and capital." (Investopedia, 2019)[12]

China is considered the country with the largest quantities of raw materials and the largest natural resources supplies (Investopedia, 2019). In fact, there are specific groups of raw materials for which China does not only hold a dominant position, but it almost holds a monopoly in the respective market. A typical example of this are rare earths which have also been used as a tool of political pressure during the Senkaku/Diaoyu islands crisis in 2010 (Silver, 2019). This means that the rest of the world is quite justified to be upset at the prospect of China manipulating its dominant position in this sector. The reason is that should China decide to take advantage of its monopoly and reduce, let's say its REEs export quotas (which it has already done once, back in 2010), the consumers will experience a severe challenge to their supply chain. For this reason, rare earths are considered *critical raw materials (CRM)*.

Critical materials *"provide essential and specialized properties to advanced products or systems, have no easy substitutes and are subject to supply risk"* (Critical Materials Institute). Both the EU and the USA have conducted certain studies on CRM, the effects of a possible lack and possible solutions. According to the European Union for example, critical are considered *"those raw materials of high importance to the economy in the Union as a whole and whose supply is associated with a high risk"* (Pavel & Tzimas, 2016, p. 9, Box 1.2). To measure this, the EU's import dependence level is calculated (Pavel & Tzimas, 2016, p. 50). For example, there are at least 5 REEs which the EU considers critical and that is because it is almost 100% dependent on imports of these materials mainly from China (Pavel & Tzimas, 2016, pp. 3-4). Rare earths are among the most important of the CRM, especially for the United States (U.S.), which, despite the availability of REEs in its soil, is not a producer due to the high costs of extraction and separation and the health and environmental risks these procedures set (Critical Materials Institute).

It is also interesting to mention at this point the Critical Materials Assessment Program (CMAP), a methodology developed by Battelle and published in a 1984 research paper by Smith and Watts. According to this methodology, which uses the photovoltaic cells as a case study, shortages of critical materials can be specified before full-scale commercialization and

[12] For a detailed description of raw materials, their groups and how companies should list them, see Investopedia, https://www.investopedia.com/terms/r/rawmaterials.asp (15/8/2019).

this will contribute towards restricting the impact of materials shortages (Smith & Watts, 1984, p. 41). Here are the nine steps of the methodology as described in the study. First of all, the material requirements of the final products are identified followed by the specification of the production process of every cell; then, the next step includes scenarios with regards to installing the product; then, the materials requirements are measured followed by an analysis of the materials production processes; the next step is to proceed with characterizing the industry(-ies) relevant to the materials and after that, the effects of the technology applied are assessed; afterwards, an analysis of the results produced takes place and the last step is to study any possible alternatives or mitigating strategies (Smith & Watts, 1984, pp. 42-45). The alternatives examined for the materials considered critical are substitution, redesigning certain components, thorough research aiming at limiting the materials' criticality and research on new resources and providing motivation for the expansion of the materials manufacturing capacity (Smith & Watts, 1984, p. 45). Finally, they recommend mitigating strategies. Firstly, they suggest that production facilities of the materials be placed in close proximity to the production facilities of the final products, in order to secure the efficiency of the supplies available; secondly, they mention that the industry is willing to augment the production of a specific critical material if there is a market for it and thirdly, they recommend decrease in the usage or complete elimination of any critical materials produced mainly by non-US companies, such as gold and indium (Smith & Watts, 1984, p. 49).

Sometimes critical materials are referred to as strategic materials (Clark & Reddy, 1986, p. 173). However, critical are materials that can cause "*severe damage to a nation"* if their supply is disrupted whereas strategic are materials necessary in the military (Clark & Reddy, 1986, p. 173). Nevertheless, materials which belong in one of these categories do not necessarily need to belong to the other category too (Clark & Reddy, 1986, p. 173). The REEs for example, belong to the group of *critical and/or strategic minerals* (Kamenopoulos & Agioutantis, 2014, p. 140).

It is a fact though, that different actors provide different definitions to these terms. To illustrate that point, the USA defines critical and strategic materials as those which *"a) would be needed to supply the military, industrial, and essential civilian needs of the U.S.A. during a national emergency, and b) are not found or produced in [the] U.S.A. in sufficient quantities to meet such a need"* (Clark & Reddy, 1986, p. 173). This is a definition that stresses mostly the parameter of availability of resources and the dependence of the US on external actors, a fact that can make it vulnerable.

The criteria for evaluating criticality according to Clark and Reddy are three: a) availability of foreign supplies, for which they stress the factors of likelihood, severity and duration of a disruption, the diversification and location of supplies, as well as the speed with which the system can adapt to an emergency situation; b) availability of domestic supplies, for which they stress the factors of the availability of domestic supplies, the *availability of domestic processing capacity* and the speed of adaptation; and c) means for reducing domestic production, for which they underline the factors of *substitution, conservation, recycling possibilities, the normal business cycle and the effects of new technologies* (1986, pp. 173-174).

More than anything else, what is obvious so far by the theoretical concepts presented, is the fact that the actors tend to consider critical, strategic and securitize these resources that they *fear* will not be available to them at the amount or at the price that could grant them access to them. Therefore, it is fear that drives the behavior of the actors and dictates the attitude they will keep and the actions and measures they will take in order to avoid and prevent such scenarios from materializing. It is exactly this fear-driven behavior which, many times, leads the actors to conflict.

Having presented the theoretical tools used in this dissertation, namely securitization and energy security, the theoretical framework within which my research takes place has been set. Therefore, we can now get a closer look at natural gas and rare earths. Like the bubbles of natural gas, the next chapter pops up providing the opportunity to mine all the relevant information concerning both materials.

CHAPTER II

Introduction to Natural Gas and Rare Earths

This Chapter serves as an introduction to natural gas and rare earths. It presents information that is key to illustrating the background for both of these resources and understanding better and deeper the case studies presented and analyzed in the following chapters. For that reason, Chapter II has been divided into two sections – natural gas and rare earths – and it provides insight on what natural gas and rare earths are, how they are formed, how they are produced, what their properties are, what kind of applications they are used in and what the picture of their respective markets is. In order to illustrate each of the markets, the reserves, supply / producers, demand / consumers, prices and trade (both imports and exports) are considered. Finally, the markets' overviews also incorporate some information with regards to the projections made for the respective market and the challenges they might have faced or still face.

2.1 Natural Gas

Natural gas together with oil is included in what we call 'hydrocarbons'. Both of them are forms of energy and both of them have shaped the modern world since they are global motivators as far as energy is concerned. As already mentioned in Chapter I, in this dissertation we will focus on natural gas, which is *"the fastest growing fossil fuel, accounting today for 23% of global primary energy demand and nearly a quarter of electricity generation."* (IEA, 2020). But what exactly is natural gas?

According to the U.S. Energy Information Administration (EIA),

> *"Natural gas is a fossil energy source that formed deep beneath the earth's surface. Natural gas contains many different compounds. The largest component of natural gas is methane, a compound with one carbon atom and four hydrogen atoms (CH4). Natural gas also contains smaller amounts of natural gas liquids (NGL, which are also hydrocarbon gas liquids), and nonhydrocarbon gases, such as carbon dioxide and water vapor. We use gas as a fuel and to make materials and chemicals."* (EIA, 2019)

Or to put it a bit differently,

> *"Natural gas is a mixture of gases which are rich in hydrocarbons. All these gases (methane, nitrogen, carbon dioxide, etc) are naturally found in atmosphere. Natural gas reserves are deep inside the earth near other solid & liquid hydrocarbons beds like coal and crude oil."* (The Economic Times)

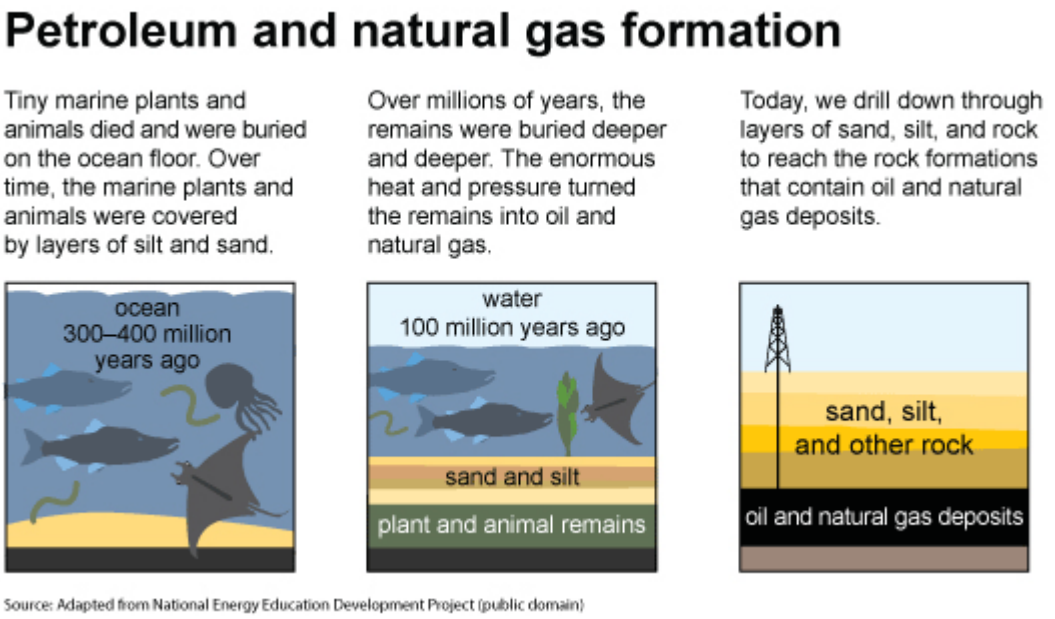
Additionally, it is the *"cleanest burning fossil fuel"* which implies that it is more environmentally friendly, offering better air quality and contributing less to the greenhouse gas emissions (IEA, 2020). It is colorless, odorless and tasteless, that is why a chemical substance called mercaptan is added in order to make natural gas detectable in case of leakage (EIA, 2019).

Natural gas has been intriguing mankind since the ancient times, when people would see flames, which had been probably ignited from a combination of lightning strikes and seeping natural gas, coming from the ground and they believed they were divine and sent from the gods (NaturalGas.org, 2013). That is why in about 1000 B.C. the Oracle of Delphi on Mount Parnassus in Greece was built (American Public Gas Association) (NaturalGas.org, 2013). Furthermore, in around 500 B.C., the Chinese being willing to use the natural gas in their everyday life, they used pipelines made of bamboo to transport gas and use it to boil water and make it drinkable (American Public Gas Association) (NaturalGas.org, 2013).

The first country ever to commercialize natural gas and its use was Britain, in around 1785, with US reaching that point in 1816 (American Public Gas Association) (NaturalGas.org, 2013). In Canada, natural gas was discovered in 1859 in New Brunswick (CAPP).

It is a fact that natural gas as well as oil took millions of years to be formed in the form we know them today, through complex geological processes. The following graph by the EIA, explains how oil and natural gas were formed, in a very comprehensive way.

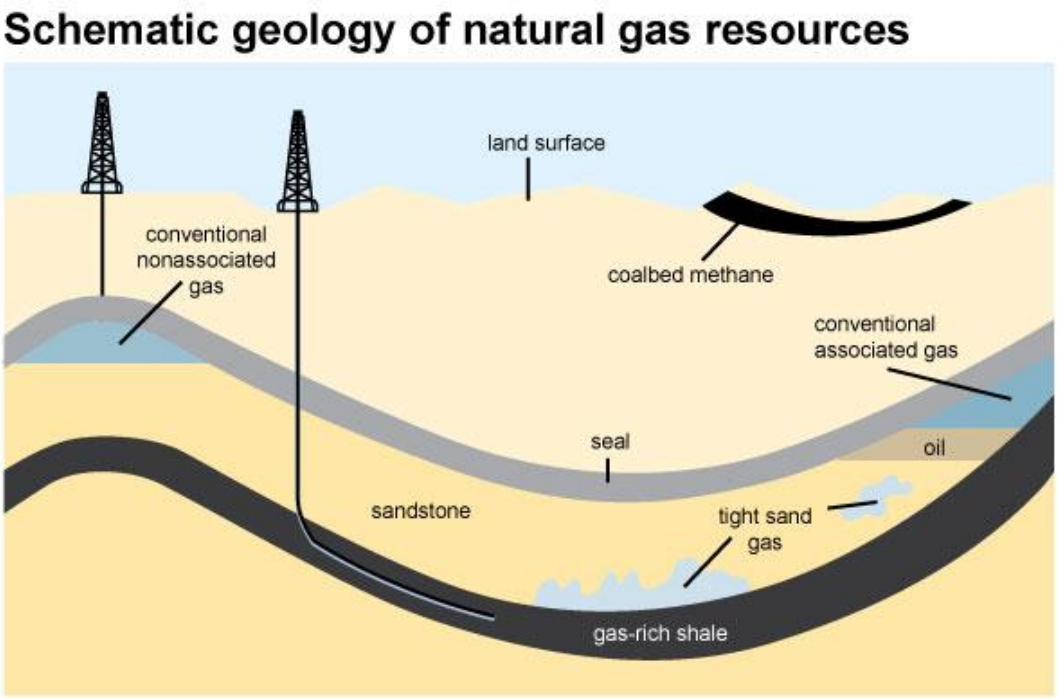
Figure 2: **Oil and Natural gas formation in a nutshell**



Source: (EIA, 2019)

Sometimes natural gas is found into large cracks between rock layers, this is called conventional natural gas; sometimes it can be found within shale, sandstone or other sedimentary rocks, this is called shale gas, tight gas (contained in sands) or unconventional natural gas. It can also occur with crude oil deposits and then it is called associated natural gas. Finally, it can also be found in coal deposits and then it is called coalbed methane (EIA, 2019). Natural gas' deposits are located either on land or *"offshore and deep under the ocean floor"* (EIA, 2019).

Figure 3: **The different types of natural gas**



Source: Adapted from *United States Geological Survey factsheet 0113-01* (public domain)

Source: (EIA, 2019)

Production methods – Shale Gas

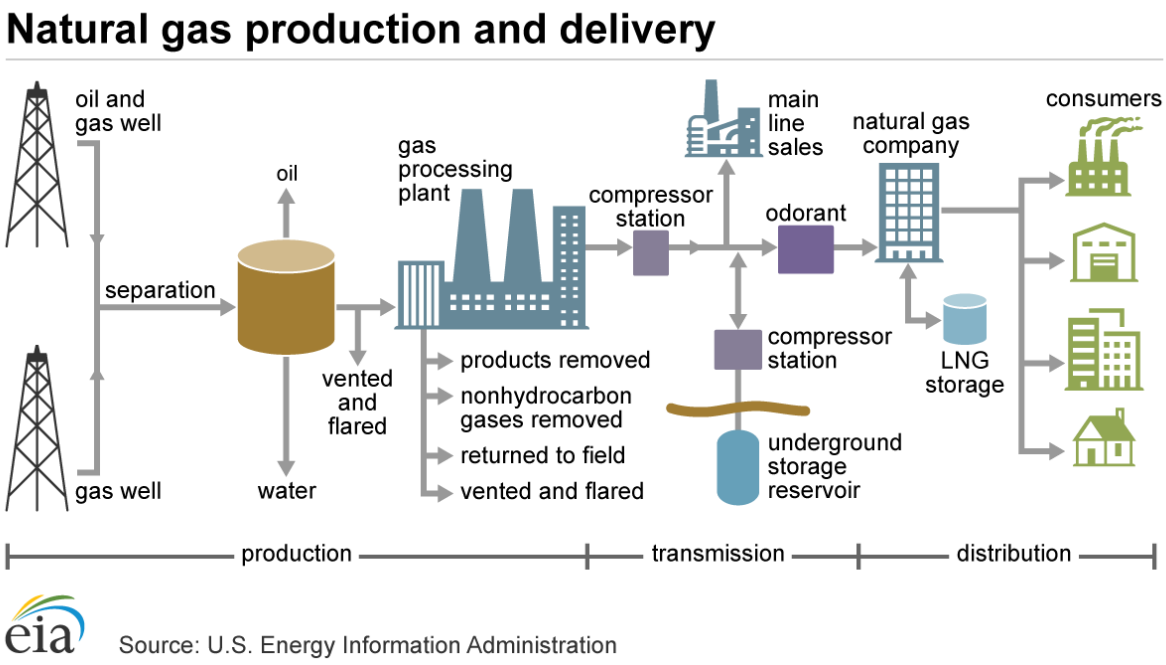
In order to locate natural gas deposits, seismic surveys have to be conducted and if a possible deposit is indicated, then an exploratory well is drilled to check the quality and quantity of the deposit (EIA, 2019). If the results of the test show that the deposit is economically viable, then a production or development well is drilled (EIA, 2019)[13].

Apart from the 'traditional' way, natural gas can also be produced by other methods, too. One of the most popular nowadays, is *hydraulic fracturing or fracking*. This method is also called *'unconventional production'* and is used to produce natural gas from shale (shale gas) or other sedimentary rocks (Zhiltsov & Semenov, 2017, p. 11) "*by forcing water, chemicals, and sand down a well under high pressure"* in order to break the rock formation, release the natural gas contained in the rock and allow it to flow up to the wells, where it is gathered into

[13] Concerning conventional natural gas deposits, the natural gas flows easily to the surface through the wells drilled (EIA, 2019).

pipelines and dispatched to natural gas processing plants (EIA, 2019). During the processing stage, natural gas becomes a cleaner fuel and many by-products are extracted, such as propane, ethane, butane, carbon dioxide and nitrogen (The Economic Times)[14]. After it is processed in the plants, it is either stored in underground fields or delivered to distribution companies which provide it to consumers as Figure 4 shows. Although methods of producing shale gas were developed in both the US and the former USSR (Zhiltsov & Semenov, 2017, p. 11), the technological breakthrough of the current millennium, together with horizontal drilling, ignited the so called *"shale revolution"* which has given ground to the US to outpace and outgrow both Russia and Iran, becoming world's largest producer of both oil and natural gas (CLNG) (DOE, 2013, pp. 11-13).

Figure 4:



Source: (EIA, 2019)

[14] Coalbed methane, extracted before or during coal mining can be placed into natural gas pipelines without special treatment (EIA, 2019).

Applications

Natural gas has a wide range of applications in our everyday lives. It is used for electricity and heating, it is used in boilers and air conditioners, it is used in the fertilizing industry and in its compressed form, which is CNG – Compressed Natural Gas[15], it can also be used as fuel for vehicles (The Economic Times). Furthermore, it can easily adapt to any seasonal or short-term fluctuations in demand in order to improve electricity supply security *"in power systems with a growing share of variable renewables"* (IEA, 2020).

Liquefied Natural Gas (LNG)

Liquefied Natural Gas or LNG is natural gas in liquid form that has been frozen at approximately -162°C (-260°F)[16] for shipping and storage and can be transported by huge quantities ($1m^3$ LNG = $600m^3$ natural gas) easily to places more than 100 km away from the network thanks to the liquefaction process that was developed in the 19th century, unlocking more markets for natural gas (ΔΕΠΑ) (EIA, 2019) (EIA, 2020) (Adriatic LNG) (CLNG). The first LNG plant was built in West Virginia, US, in 1912 (CLNG).

Being 600 times smaller than its gaseous form, LNG is transported in cryogenic tanks on special ships (LNG carriers or tankers) to and from a large number of markets, for example, to and from the U.S. as well as to the Asian countries which are the largest LNG importers (EIA, 2019) (Adriatic LNG). After it reaches its destination (import terminal) it may be stored in cryogenic tanks and after that, it is *regasified*, returning again to its gaseous state (EIA, 2019) (DOE). This type of facility is called a 'peak shaving plant' and is sometimes used to address high demand periods. For example, such facilities in the US are located near areas experiencing high natural gas demand, liquefying and storing LNG in times when the demand is low and regasifying it when demand peaks again, maintaining the system's capability and security (CLNG) (DOE).

[15] CNG ($1m^3$ CNG = $200m^3$ natural gas) gives the ability of natural gas transportation up to 100 km away from the network (ΔΕΠΑ).

[16] At this temperature natural gas becomes a liquid (EIA, 2019).

The Natural Gas market

Natural gas is a natural resource used as a commodity to power our everyday lives as well as entire states. It has also fuelled conflict and border reshaping, as happened, for example, in the Russian-Ukrainian Gas Crises back in 2006, in 2009 and in 2014 – disputes that led to a 'frozen' Europe and ended up to Russia annexing Crimea[17]. Therefore, we believe it is of utmost importance to illustrate and give a clear picture of the current situation of the natural gas market together with some insight concerning its historical evolution, by presenting the reserves and deposits, the suppliers (producers), the consumers (demand), the prices and the trade dynamics (both imports and exports). Apart from that, some projections for the future are also incorporated. This market overview will assist us to understand better the dynamics of the market, the trends, the key players and the role and power they have in shaping it and determining developments around natural gas.

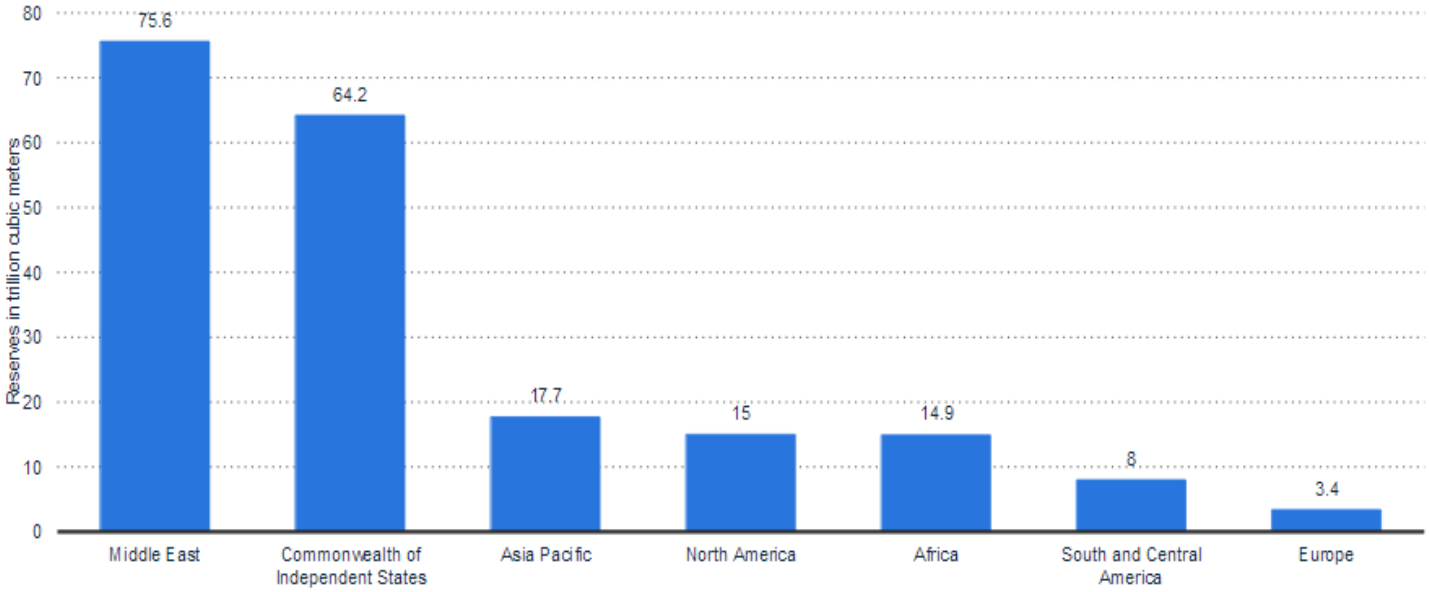
Supply

Reserves / Deposits

As we can see in Figure 5, it was the Middle East which held most of the natural gas proven reserves in 2019 (75,6 tcm), followed by the Commonwealth of Independent States (CIS) with 64,2 tcm. The rest of the world's regions demonstrated a lot smaller amounts of natural gas reserves.

[17] These case studies are thoroughly discussed in Chapter III.

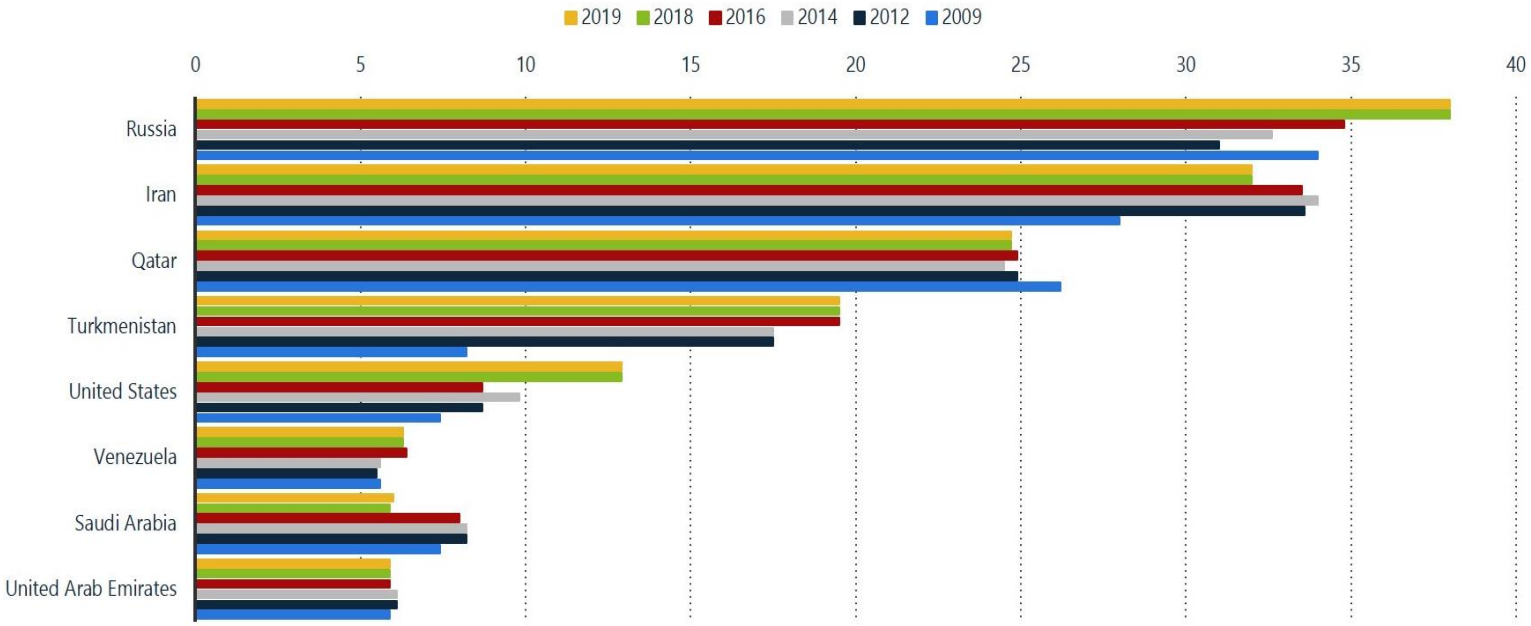
Figure 5: Natural gas proved global reserves per region, 2019 (in trillion cubic meters – tcm)



Source: (Statista, 2020, p. 7)

On a country level though, it is Russia that has been the top reserve holder for 2009, 2016 2018 and 2019, followed by Iran, Qatar and Turkmenistan (Figure 6). In 2012 and 2014 it was Iran that held this position with Russia following. It is also interesting to see that among the top 7 countries in natural gas reserves, the USA holds the fifth position leaving behind Venezuela and Saudi Arabia (same Figure 6).

Figure 6: Major countries by proved natural gas reserves, 2009 – 2019 (in trillion cubic meters – tcm)

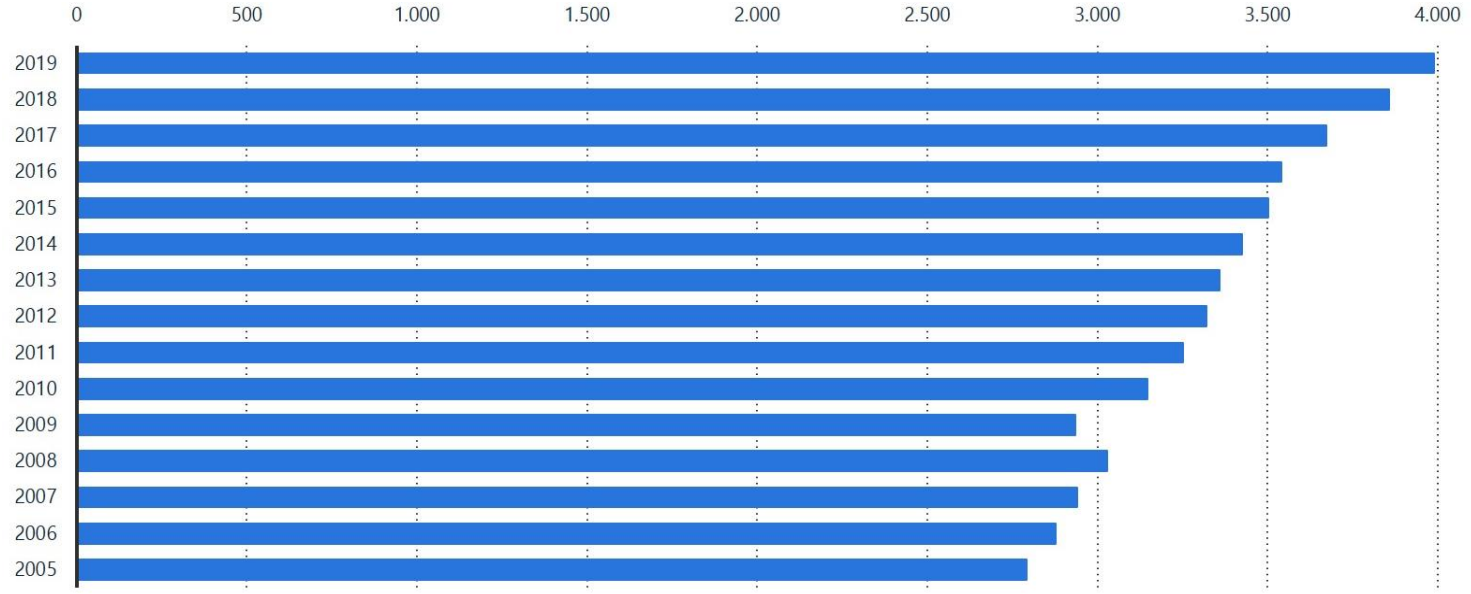


Source: (Statista, 2020, p. 8)

Suppliers (Producers)

As far as production is concerned, it has shown constant increase at least for the last 10 years (Figure 7). Consumption presents the same pattern as well (see Figure 11 in the "Demand" section).

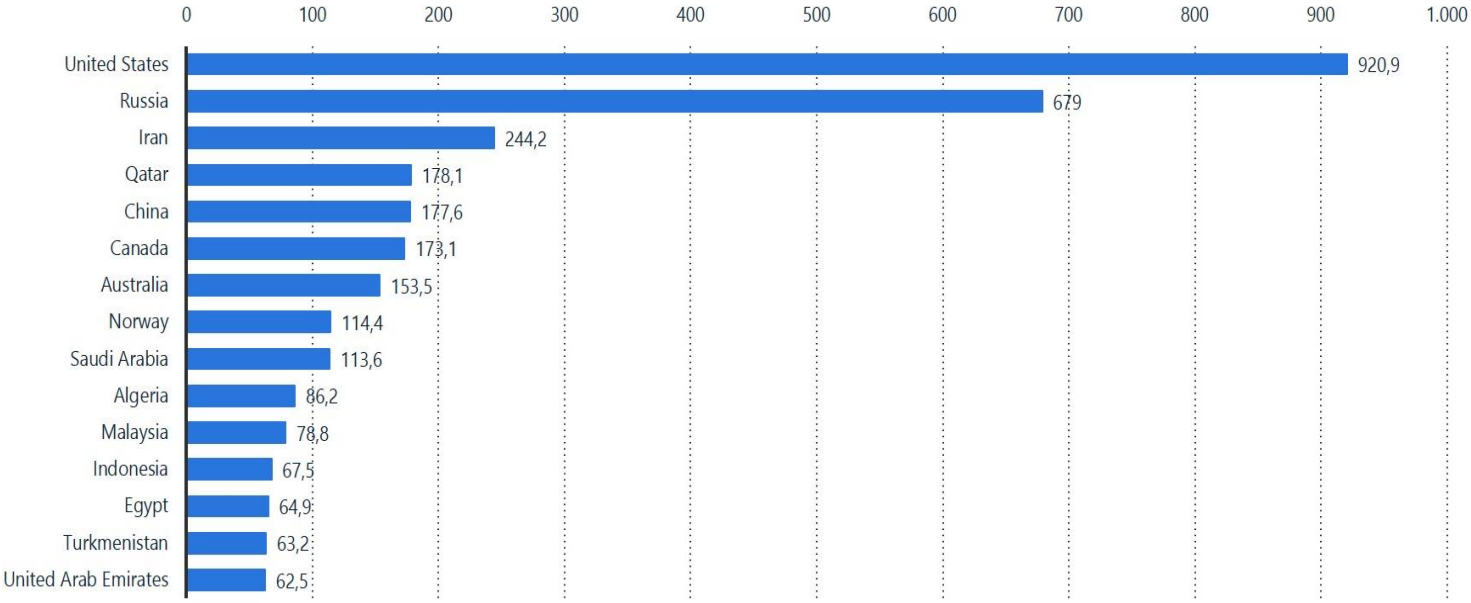
Figure 7: Natural gas production globally, 2005 – 2019 (in billion cubic meters – bcm)



Source: (Statista, 2020, p. 3)

In 2019, the United States was the country with the largest natural gas production (920,9 bcm), followed by Russia, which produced about 2/3 of the US amount and Iran, which produced a little less than 1/3 of the US production (Figure 8).

Figure 8: Global natural gas production by country, 2019, (in billion cubic meters – bcm)



Source: (Statista, 2020, p. 4)

Furthermore, as Table 2 presents, the ranking of the largest natural gas producers for 2014 and 2018 was pretty much the same, with Russia, the country that holds the largest natural gas reserves for 2019, being number two again for both years, only second to the US. It is also interesting to note here, that the Russian production in 2018 almost equaled the US production of 2014. The rest of the first five positions are covered by Iran, Qatar and China.

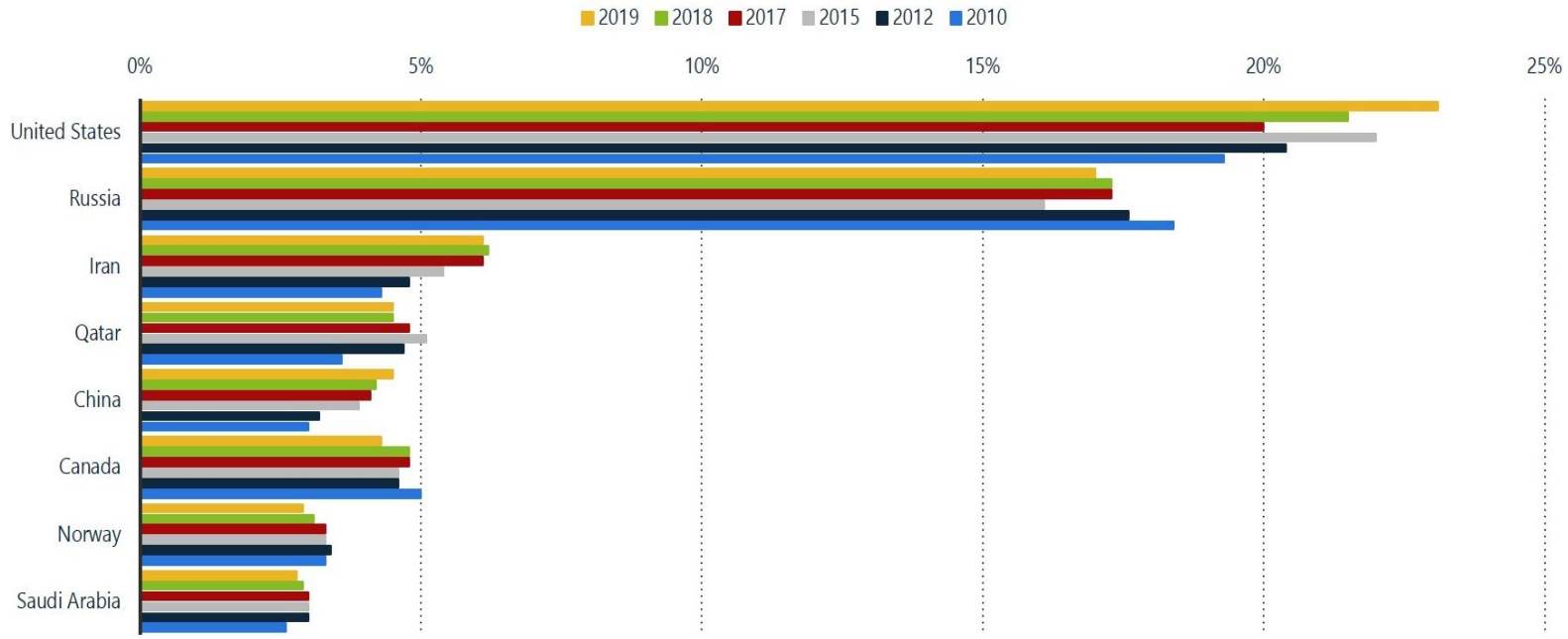
Table 2: The 10 largest natural gas producers, 2014 and 2018 (in billion cubic meters – bcm)

Country	2014	2018
United States	729,1	863
Russia	610,1	725,5
Iran	172,6	248,5
Qatar	160	181,6
China	132,8	176
Canada	161,3	172,7
Australia	55,3	131,1
Norway	108,8	119,2
Saudi Arabia	108,2	112,1
Algeria	79,7	95,9

Source: (Statista, 2020, p. 13)

More specifically, the US' share in the global production was about 23% in 2019, while Russia's was about 17% in the same year and at the same time, Iran's, Qatar's and China's shares stood on single-digit numbers (Figure 9).

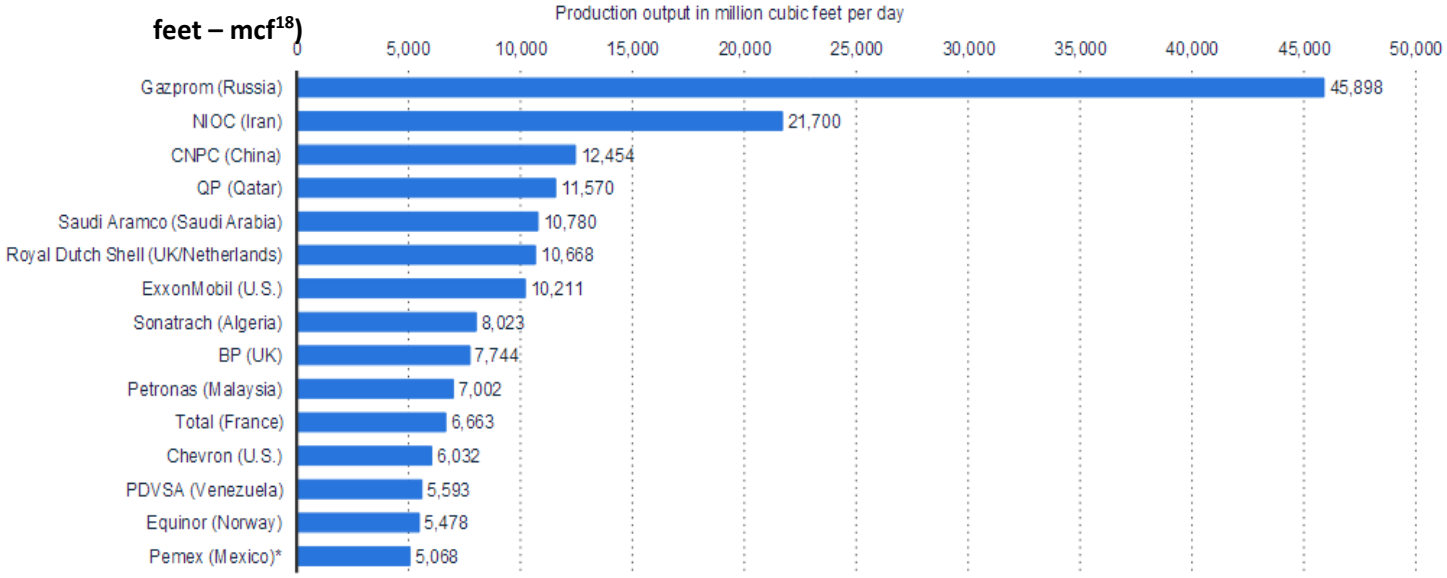
Figure 9: Production share of major natural gas producers, 2010 – 2019



Source: (Statista, 2020, p. 14)

Talking about companies however, it is the Russian Gazprom with 45.898 million cubic feet of natural gas that tops the list with the largest companies in terms of production for 2017, followed by Iran's NIOC (21.700 million cubic feet) and China's CNPC (12.454 million cubic feet). The US presence appears in the 7th place with ExxonMobil (10.211 million cubic feet) and in the 12th place with Chevron (6.032 million cubic feet).

Figure 10: Largest natural gas producing companies (output per day in 2017, in million cubic feet – mcf[18])

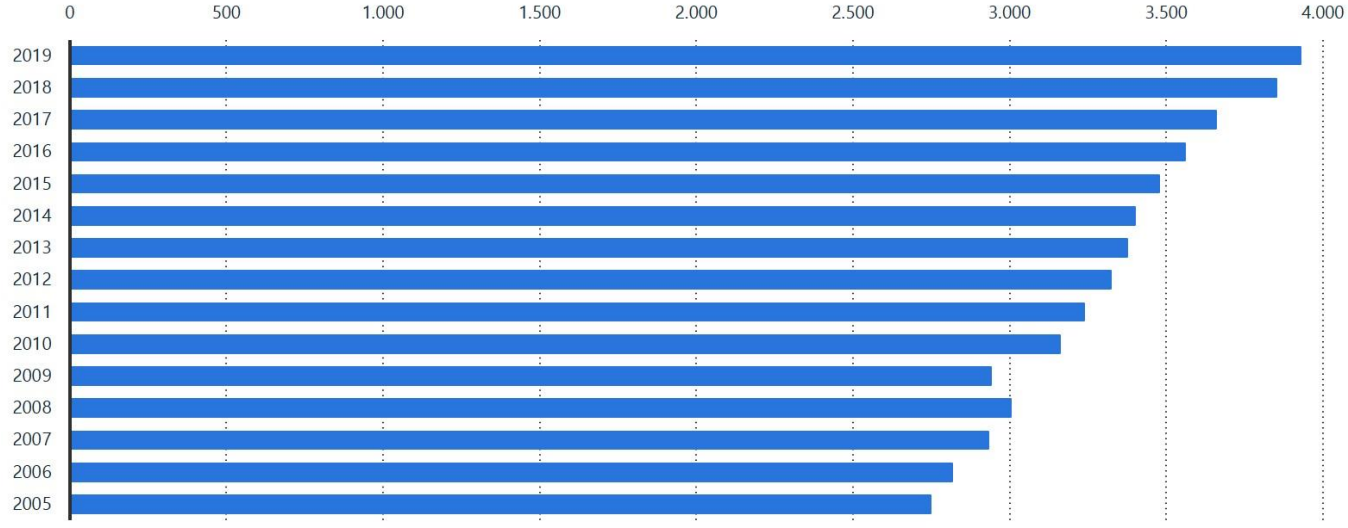


Source: (Statista, 2020, p. 26)

Demand – Consumers

Concerning demand, as Figure 11 shows, since 2009 it has been increasing year after year reaching approximately 4000 bcm in 2019. This illustrates the growing popularity of natural gas among fuels, given its 'greener' nature compared to oil.

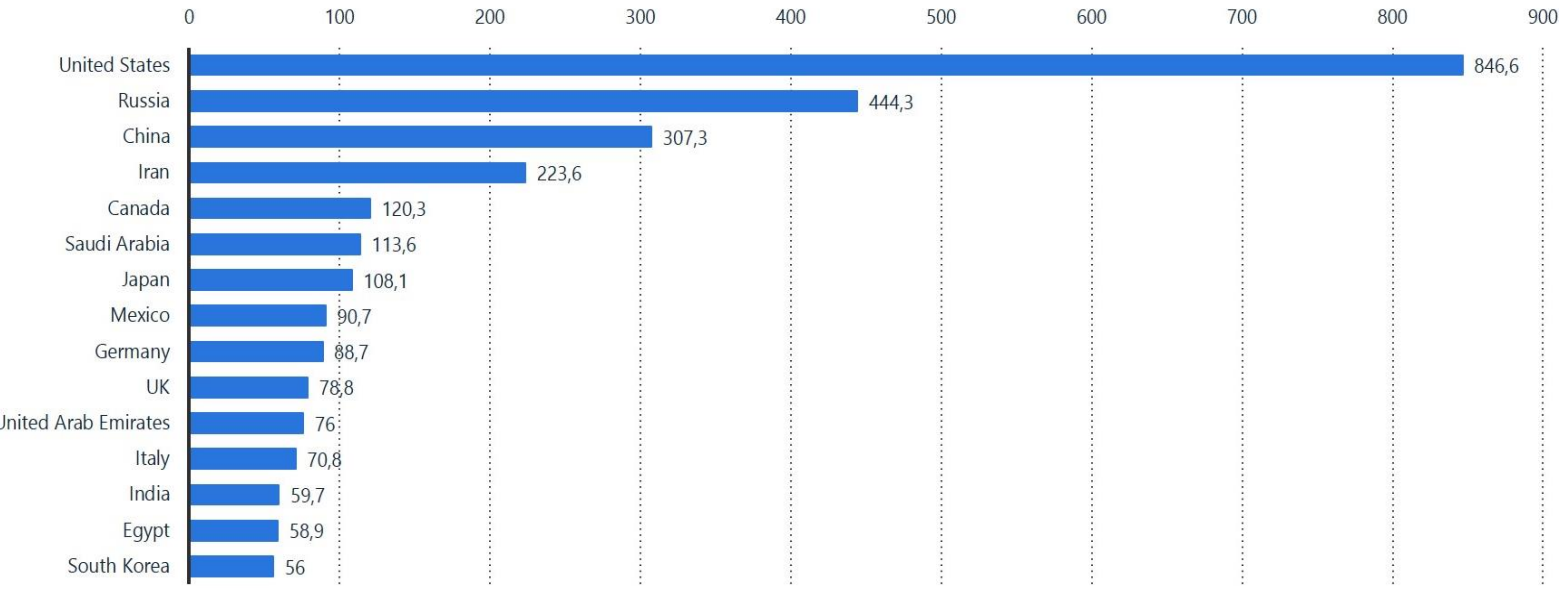
Figure 11: Natural gas consumption globally, 2005 – 2019 (in billion cubic meters – bcm)



Source: (Statista, 2020, p. 31)

[18] Cubic feet (cf): 1 cf = 283 x 10^{-4} m^3 (or 0,0283m^3)

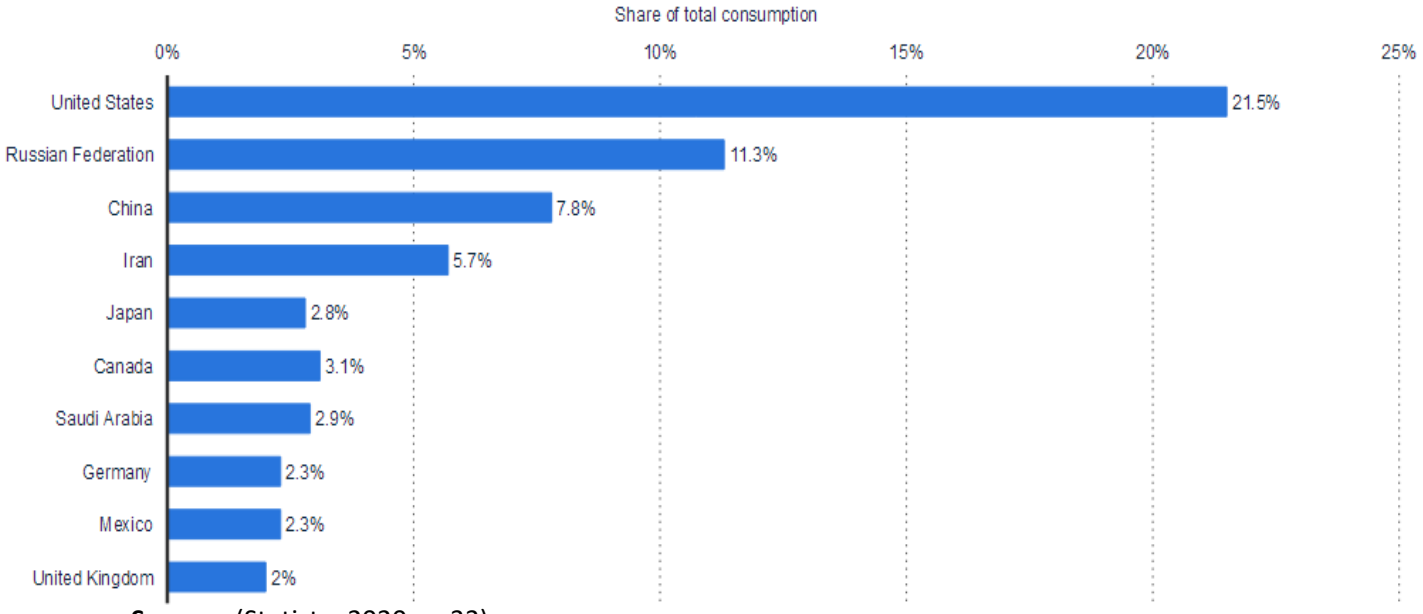
Figure 12: Global natural gas consumption by country, 2019 (in billion cubic meters – bcm)



Source: (Statista, 2020, p. 6)

As far as the top consumers are concerned, on a country level, the US, which has been the world's top producer of natural gas for more than a decade, is also the largest consumer of natural gas with a share of 21,5% (846,6 bcm) in the global consumption, with Russia and China following with 11,3% (444,3 bcm) and 7,8% (307,3 bcm) respectively (Figures 12 and 13).

Figure 13: Major natural gas consuming countries' share globally, 2019

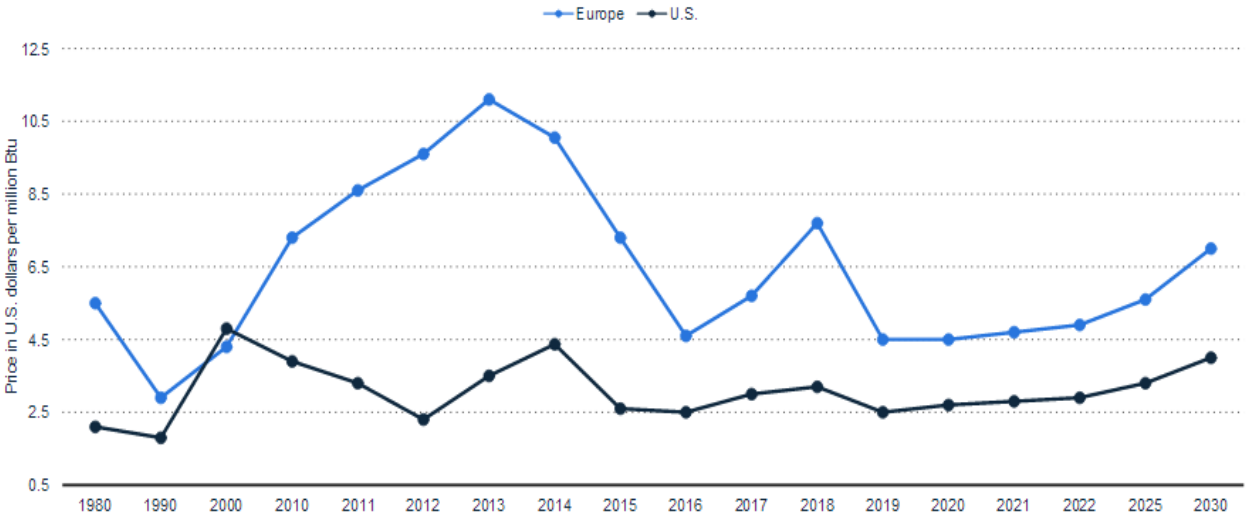


Source: (Statista, 2020, p. 33)

Prices

Natural gas prices, which are usually measured 'per million British Thermal Units (MMBtu)' but in some countries they are measured 'per Gigajoule (GJ)', are heavily determined by the US demand and they are strongly related to the crude oil prices (The Economic Times). With regards to natural gas prices in Europe and the US, between 1980 and 2000, they seem to follow the same pattern, although the US curve is more acute. Between 2000 and 2012, they follow diametrically different directions, with prices in the US constantly falling whereas prices in the EU were constantly increasing. Then, since 2012 up to 2020, prices seem to follow the same pattern presenting peaks and falls in the same years. However, variations in Europe's prices curve are more acute compared to the ones of the US curve (Figure 14).

Figure 14: Natural gas prices in the US and Europe, 1980 – 2030 (in US dollars per million Btu[19])



Source: (Statista, 2020, p. 23)

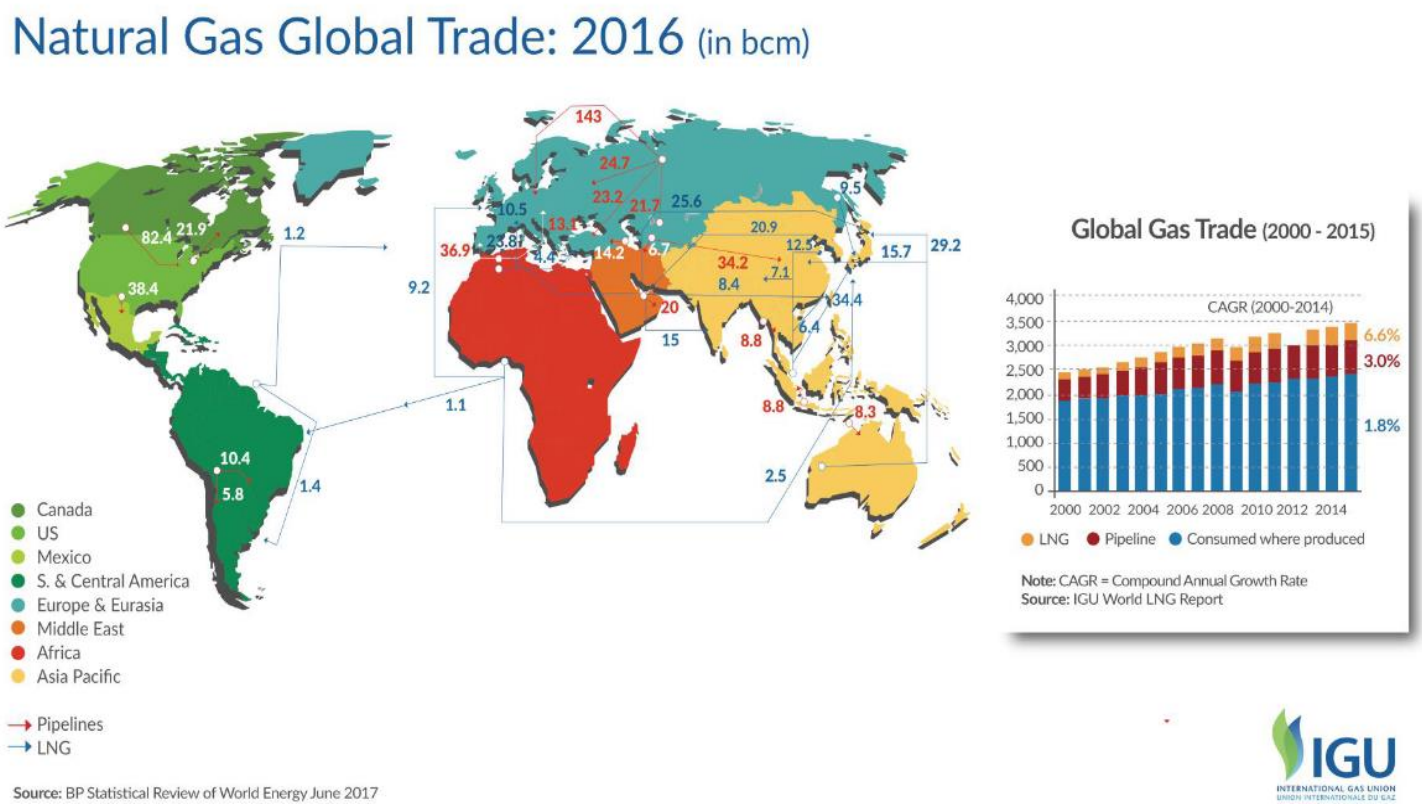
Finally, projecting the price trends for the next decade, it seems that prices both in Europe and in the US will move upwards reaching about $7 and $4 per million Btu respectively in 2030.

[19] Btu = British Thermal Unit

Trade

As far as trade is concerned, the map that follows (Map 1 – Figure 15) gives us a general overview of the intensity and the volume of natural gas global trade in 2016 for both pipelines and LNG (in bcm).

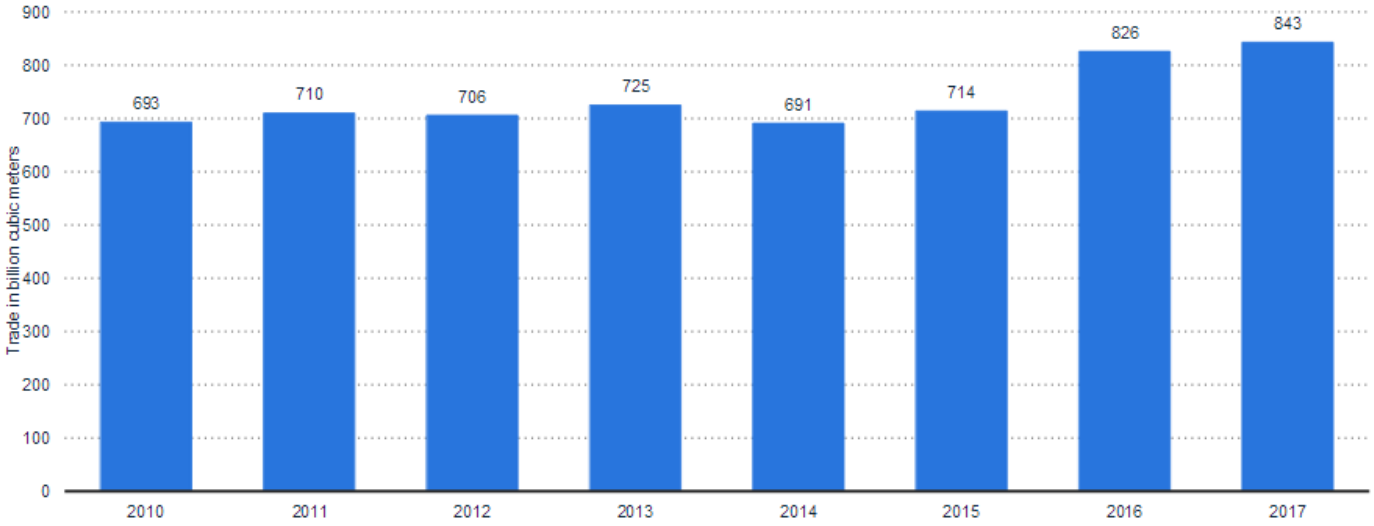
Map 1 – Figure 15: Global Trade of Natural Gas, 2016 (in billion cubic meters – bcm)



Source: (IGU)

Furthermore, as Figure 16 suggests, the natural gas global trade had been growing constantly between 2010 and 2013 – only with a small fluctuation in 2012. After that, in 2014 there was a severe fall, which can be attributed to the Natural Gas dispute between Ukraine and Russia, during which Russia significantly reduced and even stopped the quantity of natural gas sent to Ukraine or sent to Europe via Ukraine. From 2015 on, it seems that the trade volume via pipelines continues increasing year by year.

Figure 16: Global trade volume of natural gas via pipelines, 2010 – 2017 (in billion cubic meters – bcm)



Source: (Statista, 2020, p. 17)

Nevertheless, the question is: Who are the largest exporters and importers? To provide the answer, we need to look carefully at the data presented below (Tables 3 and 4):

Table 3: Largest natural gas exporters, 2016 (pipeline, in billion cubic meters)

Country	Quantity (bcm)
Russia	190,8
Norway	109,8
Canada	82,4
US	60,3
Netherlands	52,3
Turkmenistan	37,3
Algeria	37,1
Qatar	20

Kazakhstan	16,6
Bolivia	16,1

Source: (IGU)

In 2016, Russia, the country with the most proven natural gas reserves, was also the largest natural gas exporter via pipelines (190,8 bcm), followed by Norway (109,8 bcm) and Canada (82,4 bcm). The US, the world's largest natural gas producer, held the 4th position with 60,3 bcm, followed by the Netherlands (52,3 bcm).

With regards to imports (Table 4), Germany tops the list, importing 99,3 bcm of natural gas in 2016, verifying its high level of dependence (mainly on Russia) in the natural gas sector. It is then followed by the US, which is not only among the 10 largest natural gas exporters but it is also among the 10 largest importers. The US imported 82,5 bcm of natural gas via pipeline that year. The top five is concluded with Italy (59,4 bcm), Mexico (38,4 bcm), China (38 bcm) and the Netherlands (38 bcm).

Table 4: Largest natural gas importers, 2016 (pipeline, in billion cubic meters)

Country	Quantity (bcm)
Germany	99,3
US	82,5
Italy	59,4
Mexico	38,4
China	38
Netherlands	38
Turkey	37,4
UK	34,1

France	32,3
Belgium	22,2

Source: (IGU)

At this point, it would also be really interesting to take a look at the LNG trade statistics as well, since it holds a significant part of the global natural gas trade. For example, in 2016, 32% of the global natural gas trade was done through LNG whereas 68% was conducted through pipelines Table 5.

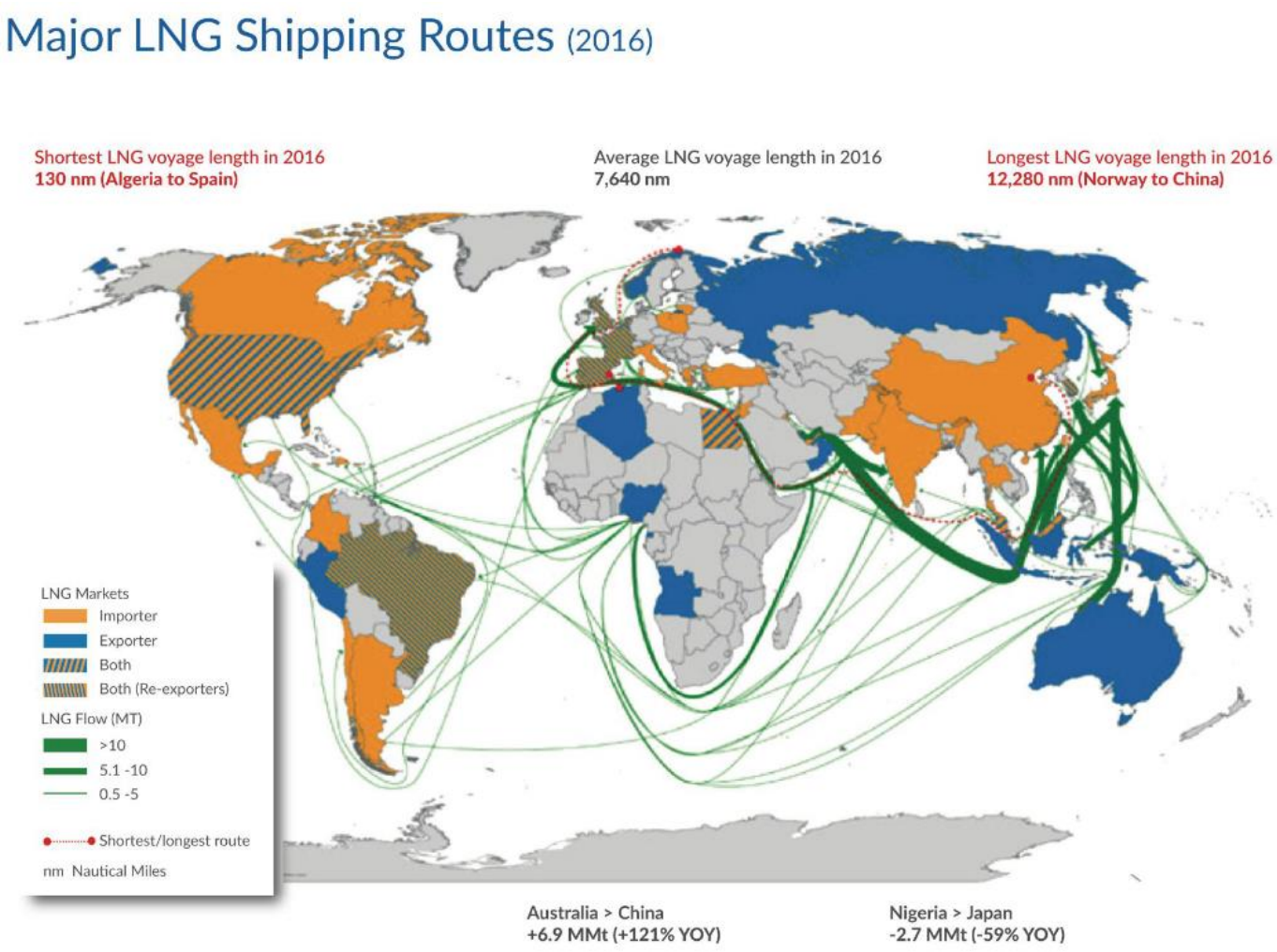
Table 5: Global natural gas trade by transit mode, 2016 (share and billion cubic meters)

LNG	Pipelines
32%	**68%**
346,6 bcm	737,5 bcm

Source: (IGU)

The following Map (Map 2) is very indicative of the LNG trade routes and it also summarizes the LNG exporters, importers as well as the volume of the LNG traded in 2016.

Map 2: **Most important LNG routes, 2016**

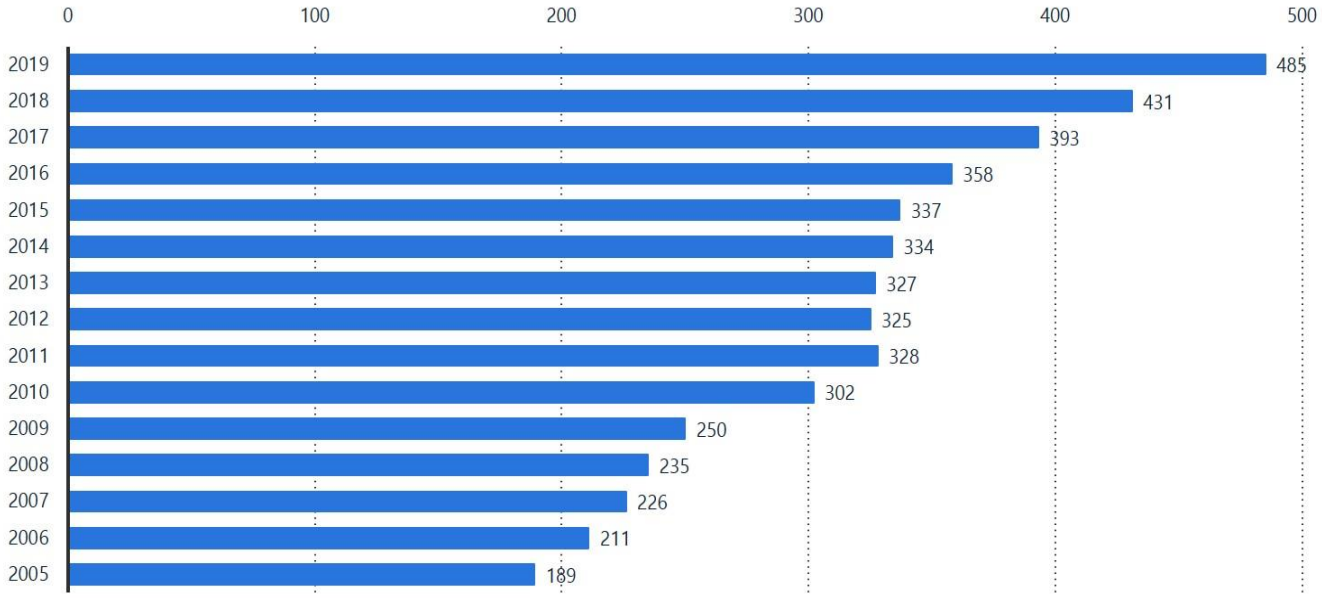


Source: (IGU)

It becomes really obvious that the Mediterranean Sea as well as the Hormuz Straits are of great significance to the LNG trade (and for the global trade in general, too), as they are the routes connecting the rest of the world with the Asia-Pacific countries. The Asia-Pacific region is the area which gathers the largest LNG flows.

With regards to the historical trend of the LNG trade, as Figure 17 shows, overall, it has been increasing year after year, revealing also the growing level of interdependence among markets and states.

Figure 17: LNG trade globally, 2005 – 2019 (billion cubic meters – bcm)



Source: (Statista, 2020, p. 13)

As far as the LNG exports and imports are concerned, the following two Tables (Tables 6 and 7) reveal the major players for 2019. With regards to LNG exports, Qatar is the largest exporter holding 22% of the global LNG exports, followed closely by Australia with 21%. The US is in the 3rd position with nearly half Qatar's share (10%) and Russia follows with a single-digit share of 8%.

Table 6: LNG exports market share, 2019

Country	LNG export share
Qatar	22%
Australia	21%
United States	10%
Russia	8%
Malaysia	7%

Nigeria	6%
Indonesia	4%
Trinidad & Tobago	4%
Algeria	3%
Oman	3%
Other	12%

Source: (Statista, 2020, p. 14)

Concerning LNG imports, Japan is the leader with 22% followed by China with 17% and South Korea with 11%. Such data reveal the great need of these countries and economies for energy, so that they can keep running the way they do. Following South Korea is India with 7% and Taiwan with 5%. Turkey and Greece also appear in the list with 3% and 1% respectively.

Table 7: LNG imports market share, 2019

Country	LNG import share
Japan	22%
China	17%
South Korea	11%
India	7%
Taiwan	5%
Spain	4%
France	4%
United Kingdom	4%

Italy	3%
Turkey	3%
Greece	1%
Other	19%

Source: (Statista, 2020, p. 16)

To conclude, all the data presented so far lead us to the conclusion that,

> *"The natural gas market is becoming increasingly globalised, driven by the availability of shale gas and the rising supplies of flexible liquefied natural gas. As gas trade increases, so does the interconnectivity of gas markets, creating new facets and dimensions of natural gas security, as a demand or supply shock in one region may now have repercussions in others."* (IEA, 2020)

Therefore, we can imply that the increased interconnectivity stated by the IEA has also increased the interdependence among the states and their vulnerability as well. This means that any differentiation in the behavior of one state – deliberately or not – can have a great impact on the energy security and prosperity of another state or even group of states. This shows that security has been and is still being reshaped, since nowadays security issues can arise not only due to lack of cooperation but also due to the presence of extensive cooperation.

That said, we will now turn to the other natural resource discussed in this dissertation, which is rare earths and we will present some key facts and figures about them as well.

2.2 Rare Earths

Nowadays millions of people around the globe use their smartphones to stay in touch or go online; use computers at work, for educational purposes or even entertainment; drive 'green' vehicles to contribute towards environmental sustainability; take the existence of light bulbs or LEDs and TVs for granted; undergo medical operations for which laser is used and are impressed by military as well as space equipment. All these examples illustrate the really high level of human dependence on technology. However, most of the people are unaware of the fact that all these devices do have something in common without which they would have never become a reality the way we know them. What could that be?

The answer is: **Rare Earth Elements (REEs)**.

The Rare Earths are 15 elements of the periodical table which belong to the group of lanthanides. These are: *Lanthanum* (La), *Cerium* (Ce), *Praseodymium* (Pr), *Neodymium* (Nd), *Promethium* (Pm), *Samarium* (Sm), *Europium* (Eu), *Gadolinium* (Gd), *Terbium* (Tb), *Dysprosium* (Dy), *Holmium* (Ho), *Erbium* (Er), *Thulium* (Tm), *Ytterbium* (Yb) and *Lutetium* (Lu).[20]

Why are they called *rare earths*? What makes them *rare*? – "What's in a name?"

Rare earths are not rare at all. In fact, they are more abundant than other elements in nature. For example, cerium, the most abundant rare earth (Voncken, 2016, p. 4), is more abundant than cobalt, tin and uranium, whereas thulium, the least abundant rare earth, is more abundant than gold, mercury, platinum and silver (Gschneidner, Jr., 1964, p. 6). The problem regarding rare earths is not how often they can be found in nature but how often they can be found in such a concentration that allows an economically viable extraction to take place (Van Gosen, Verplanck, Long, Gambogi, & Seal, 2014); (Haxel, Hedrick, & Orris, 2002). The geological processes under which a rare earth deposit was formed play a catalytical role to its economic performance (British Geological Survey (BGS), 2011, p. 3). To put it simply, they were called *rare* because the minerals containing them are rare to find (Gschneidner, Jr., 1964, p. 5). In other words, they are really common elements in nature,

[20] For the Greek names of the REEs see (ΗΜΕΡΗΣΙΑ.gr, 2014) «Ποια είναι τα σπάνια μέταλλα αξίας 40 δις ευρώ που κρύβονται στο ελληνικό υπέδαφος», as well as (Τσιραμπίδης, 2013), «Οι Προοπτικές Αξιοποίησης των Σπανίων Γαιών της Ελλάδος», *Επίκαιρα*, pp. 22 – 23, see. p. 22.

they can be found even more often than gold, but it is really rare to come across a deposit suitable for extraction (Van Gosen, Verplanck, Long, Gambogi, & Seal, 2014); (Haxel, Hedrick, & Orris, 2002); (Lele & Bhardwaj, 2014, pp. 152 - 153); (Powell-Turner & Antill, 2015, p. 218).

They were also called *earths* because they were first isolated as oxides, for which the old, French (as well as German), chemical term used at the time ('terre' and 'Erde') means "earth" (Gschneidner, Jr., 1964, p. 5) (Voncken, 2016, p. 4). They are also named *lanthanides* or *lanthanons* after lanthanum, which is the first element of their group in the periodic table (Gschneidner, Jr., 1964, pp. 5 - 6). However, the truth is that they are not *earths*; they are metals (Gschneidner, Jr., 1964, p. 6) or as Voncken puts it, they are not Alkaline-Earth Metals; they are Transition Metals (Voncken, 2016, p. 4).

Table 8 that follows, provides some general information on the atomic numbers of the rare earths, when they were discovered, by whom and how they got their interesting names.

Table 8: Rare earths' Atomic numbers, Year of discovery, Discoverer(s), Naming process

Rare Earth Name	Atomic Number	Discovered in/by	Named after
Yttrium	39	1794/Johan Gadolin	Swedish town and deposit of Ytterby
Lanthanum	57	1839/C.G.Mosander	Greek infinitive *lanthanein* (= to hide) because for 36 years it was hiding in a mixture of oxides mistaken for pure cerium
Cerium	58	1803/M. H. Klaproth, J. J. Berzelius and Wilhelm Hisinger independently	Then recently observed asteroid Ceres
Praseodymium	59	1885/C. A. von Welsbach	Greek words *prasios* (= green) and *didymos* (= twin)

(part of *didymium*[21])			
Neodymium (part of *didymium*[2])	60	1885/C. A. von Welsbach	Greek words neos (= new) and didymos (= twin)
Promethium (discovered as by-product of uranium fission)	61	1947[22]/J. A. Marinsky, L. E. Glendenin, C. D. Coryell	Prometheus (Greek mythology), who stole fire from the gods and gave it to humans
Samarium	62	1879/Lecoq de Boisbaudran	Russian mine official Colonel M. Samarski
Europium	63	1889/Sir William Crookes	The European continent
Gadolinium	64	1880/J. C. G. Marignac	Finnish chemist Johan Gadolin
Terbium	65	1843/C. G. Mosander	Swedish town and deposit of Ytterby
Dysprosium	66	1886/Lecoq de Boisbaudran	Greek word *dysprositos* (= difficult to access)
Holmium	67	1879/P. T. Cleve and J. L. Soret independently	*Holmia*, Latin word for Stockholm
Erbium	68	1843/C. G. Mosander	Swedish town and deposit of Ytterby
Thulium	69	1879/P. T. Cleve	*Thule*, Scandinavia's ancient name
Ytterbium	70	1878/J. C. G. Marignac	Swedish town and deposit of Ytterby
Lutetium	71	1908/G. Urban and C. A. von Welsbach independently	*Lutetia*, Paris' ancient name

Source: (Gschneidner, Jr., 1964, pp. 11 - 12); (Voncken, 2016, pp. 2, 4, 6, 10)

[21] Didymium: Initially thought to be a separate element by C. G. Mosander. It was called didymium *(Greek: didymos = twin)* because it was discovered together with lanthanum. Today, didymium refers to alloys whose main elements are praseodymium and neodymium (Gschneidner, Jr., 1964, p. 11).

[22] Voncken (2016, p. 4) mentions that Promethium and Lutetium were discovered in 1943 and 1907 respectively.

At this point, we should point out that promethium is radioactive, with a half-life of maximum 18 years and it cannot be found in nature (Gschneidner, Jr., 1964, p. 10). Adding to that, it is an unstable element and for all these reasons exempted from the discussions on rare earth reserves.

Contrary to promethium which is excluded from the debate on rare earth reserves, two other extra-lanthanides elements are included. These are Yttrium (Y) and Scandium (Sc). These two elements are usually included in the term rare earths because their chemical and physical properties are similar to the ones rare earths carry (Van Gosen, Verplanck, Long, Gambogi, & Seal, 2014); (Long, Van Gosen, Foley, & Cordier, 2010). Therefore, rare earths amount up to 17 elements and they can be divided into two groups – *Light Rare Earth Element*s (LREEs) and *Heavy Rare Earth Elements* (HREEs) – as Table 9 shows:

Table 9: Light and Heavy REEs

Light REEs		**Heavy REEs**	
Lanthanum (La)	Promethium (Pm)	Terbium (Tb)	Thulium (Tm)
Cerium(Ce)	Samarium (Sm)	Dysprosium (Dy)	Ytterbium (Yb)
Praseodymium (Pr)	Europium (Eu)	Holmium (Ho)	Lutetium (Lu)
Neodymium (Nd)	Gadolinium (Gd)	Erbium (Er)	Scandium (Sc)
			Yttrium (Y)

Source: (Van Gosen, Verplanck, Long, Gambogi, & Seal, 2014); (Long, Van Gosen, Foley, & Cordier, 2010)

It should be noted here that rare earths are really often found mixed with other elements (Van Gosen, Verplanck, Long, Gambogi, & Seal, 2014); (British Geological Survey (BGS), 2011).[23]

What are their properties?

Rare earths or Rare Earth Elements (REEs) are silver or grey-shaded metals with high electrical conductivity that naturally occur in minerals (Voncken, 2016, p. 54). They have very similar chemical properties, which makes it difficult for scientists to distinguish them, whereas at the same time they have rather different behavior. This paradox is due to the variation of their 4*f* electrons[24] and makes them distinguishable; they also represent nearly 1/6 of all elements occurring in nature, however their group has one position in the Periodic Table; they are not of radioactive nature, nevertheless they can often be found mixed with thorium or uranium which are radioactive; or they can be born as by-products of a nuclear fission (Gschneidner, Jr., 1964, pp. 1, 4, 10); (Voncken, 2016, p. 3).

Due to their 4*f* electrons number, rare earths have different properties compared to each other (Gschneidner, Jr., 1964, p. 5). For example, gadolinium becomes ferromagnetic[25] at and below room temperature (i.e. 15^{o}C), but the other rare earths do not (Gschneidner, Jr., 1964, pp. 5 - 6). Furthermore, lanthanum is the only rare earth that becomes a superconductor at low temperatures (Gschneidner, Jr., 1964, pp. 5, 32 - 38).

In what kind of applications are they used?

Rare earths are used in a wide range of applications such as cell phones, TVs, computers and superconducting magnets (Mancheri, 2015, p. 262). They are also used for the production of strong magnets and other equipment essential to the defence industry, such as aircraft magnets and surveillance equipment; they are vital to 'green' technology which is related to

[23] In British Geological Survey (BGS) (2011), pp. 3 – 17, one can also find out a detailed analysis on how rare earths are separated from the other elements as well as on the different methods of extraction and processing.

[24] The electrons of the 4*f* level shell of the rare earths' atoms.

[25] *Ferromagnetism* is the ability of a material to function as a magnet (Gschneidner, Jr., 1964, p. 36).

renewable energy resources as well as environmental protection, for example, they are found in wind turbines, in energy-saving lamps, in catalysts of vehicles and batteries of hybrid cars; they are also used for the production process of high-tech products such as flat screens, hard disks, rechargeable batteries and smartphones as well as medical equipment, such as Magnetic Resonance Imaging machines and lasers; they are also used as fertilizers; they are used by the glass polishing, ceramics and phosphors industries; they are used in oil refining and in many other cases (Van Gosen, Verplanck, Long, Gambogi, & Seal, 2014); (Haxel, Hedrick, & Orris, 2002); (British Geological Survey (BGS), 2011, pp. 18 - 23); (Lele & Bhardwaj, 2014, p. 152); (Voncken, 2016, pp. 1, 89-106). A typical example or rare earths significant applications is the use of europium in 1964 to enhance red color in TV screens and give it a level of brightness similar to that of blue and green (Gschneidner, Jr., 1964, p. 41). They are highly important for the sectors they are used by due to their physical and chemical properties which are unique (Du & Graedel, 2013, p. 781).

Furthermore, they have significant features which are important to the atomic energy sector. For example, gadolinium has the ability to absorb neutrons and therefore, it is used as a controller of the uranium fission in nuclear reactors (British Geological Survey (BGS), 2011, p. 22); (Gschneidner, Jr., 1964, p. 39). Other rare earths with similar capabilities are samarium, europium and dysprosium (Gschneidner, Jr., 1964, p. 39). What is more, rare earths were used during WWII by American scientists *"in developing techniques for preparing plutonium"* (Gschneidner, Jr., 1964, p. 40).

Despite the numerous applications of REEs, it was only in 2013 that the first quantitative end use information on them was published (Du & Graedel, 2013) – and this is only one of the paradoxes rare earths are involved in. The researchers focused on the end uses of REEs by certain countries (China, Japan and the US) for a certain time period (1995-2007). What they found was that the amount of rare earths used (end uses) in the selected countries in 2007 had doubled compared to 1995 (Du & Graedel, 2013).

Figure 18: Rare Earths applications

Figure 15 *Different uses of the REE. Size of the box is proportional to market share using data from Machacek and Kalvig (2016). ©NERC.*

Source: (Deady, Shaw, & Goodenough, 2017, p. 30).

The 'Nuclear Paradox'

The naturally beautiful paradox to be noticed here is that, while some rare earths can absorb the neutrons of a nuclear reaction, at the same time, one of them, promethium, is a by-product of the fission (Voncken, 2016, p. 3). Another interesting fact is that rare earths are one of the 'unconventional resources' of uranium. This means that uranium occurs as a by-product of rare earths deposits (World Nuclear Association, 2019). What is more, it has been reported that should uranium be replaced by thorium, nuclear power would be safer, because thorium's waste has a life of *"a few hundred years"* compared to the thousands or millions of years life uranium's waste has (Halper, 2011). But this is not the only noticeable fact here. The thing to catch our attention is that thorium is usually derived from monazite, which is a mineral that is home to many rare earths (Halper, 2011). In the light of this evidence, it becomes obvious that rare earths can give solutions to the threats that nuclear energy poses.

The REEs market

Given that rare earths are a commodity, we deemed necessary to provide a few 'key' elements of their market. In other words, we will illustrate the most important factors that shape the market; therefore we will present in brief the supply, the demand, the prices, the trade, the market's future prospects as well as a couple of key challenges it faces. This will contribute to our better understanding of the market conditions and will also assist our effort in shedding light and explaining the selected case study in Chapter IV.

Ores and Production Process

Just like every mineral, rare earths occur in ores. The principal REEs ores are monazite, bastnaesite, xenotime and eudialyte.

Monazite [$CePO_4$] occurs in placers and heavy mineral sands and it was the first ore ever from which REEs were extracted for industrial purposes (Voncken, 2016, pp. 15-16). Its name stems from the Greek word "monazein" (μονάζειν), which means "being alone" and it was given that name because monazite comes in isolated crystals. The REEs occurring in monazite are the LREEs Ce (Cerium), La (Lanthanum), Pr (Praseodymium), Nd (Neodymium) and Sm (Samarium) (Voncken, 2016, p. 15).

Bastnaesite (also bastnäsite and bastnasite) [$Ce(CO_3)F$], named after the Bastnäs area in Sweden and being the primary REE ore nowadays, is mainly "home" to the LREEs Ce (cerium), La (Lanthanum), Pr (Praseodymium) and Nd (Neodymium) and to the HREE Y (Yttrium) (Voncken, 2016, p. 16). Bastnaesite occurs really often but always in small quantities and it is usually found in carbonatites (Voncken, 2016, p. 17). In the bastnaesite deposits of both the US and China occur the largest REE concentrations, confirming that most REEs around the world are found in deposits of monazite and bastnaesite (Humphries, 2013, p. 9).

Xenotime [YPO_4] – from the Greek words "xenos" (ξένος), meaning *foreign* and "time" (τιμή), meaning *honor*, is "home" mainly to HREEs such as Y (Yttrium) (mainly) as well as to large quantities of Dy (Dysprosium), Yb (Ytterbium), Er (Erbium) and Gd (Gadolinium) and lower quantities of Tb (Terbium)Tm (Thulium), Ho (Holmium) and Lu (Lutetium) (Voncken, 2016, p. 17). Xenotime, similar to monazite, sometimes occurs in placers, heavy mineral sands as well as in pegmatites, in igneous rocks and in metamorphic rocks (Voncken, 2016, p. 18).

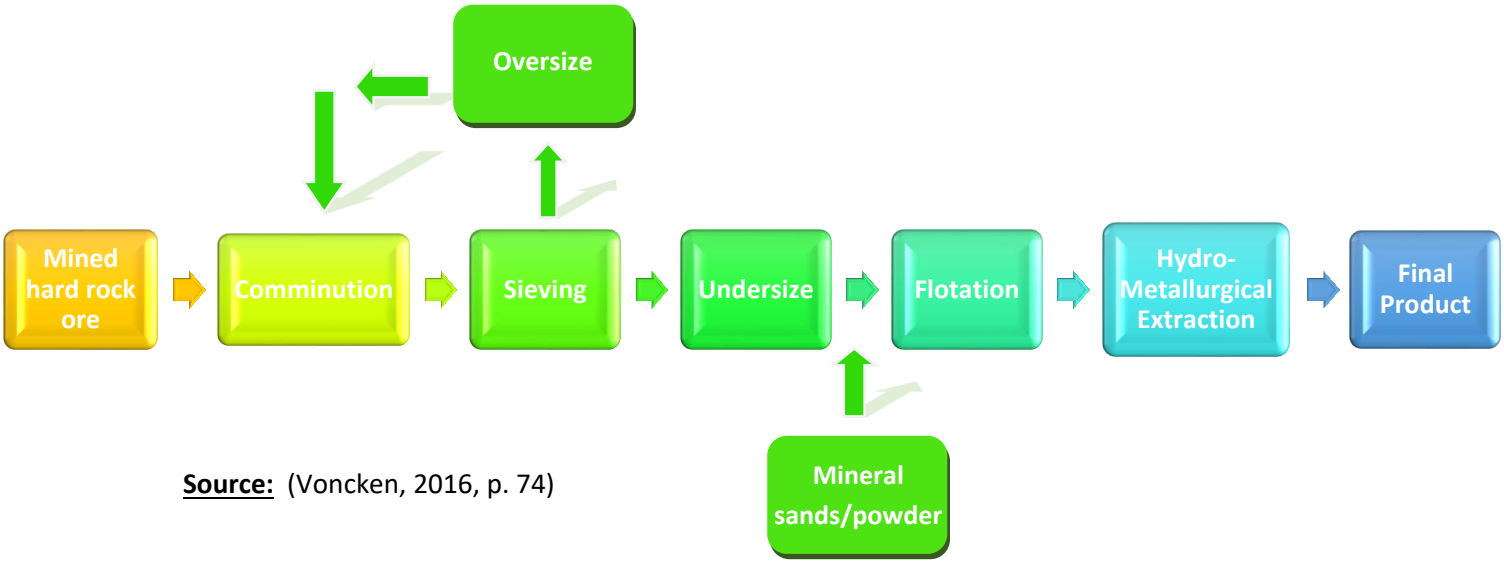
Both monazite and xenotime may contain Th (Thorium) and / or U (Uranium), which are radioactive and usually occur as by-products (Voncken, 2016, p. 17).

Eudialyte [$Na_4(Ca, Ce)_2(Fe^{2+}, Mn^{2+})ZrSi_8O_{22}(OH, Cl)_2$], meaning easily decomposable – from the Greek words "eu" (ευ) meaning *easy* and "dialytos" (διαλυτός) meaning *composable* – dissolves easily in acids and occurs in alkaline intrusions and nearby pegmatites (Voncken, 2016, pp. 18, 20). Eudialyte can contain Y (Yttrium), Ce (Cerium), La (Lanthanum), Nd (Neodymium), Pr (Praseodymium), Sm (Samarium), Gd (Gadolinium), Dy (Dysprosium), Er (Erbium), Yb (Ytterbium) [See Table 2.3 in (Voncken, 2016, p. 20)].

Apart from these four ores, there is also a great number of other minerals containing REEs but these are considered minor and insignificant from an industrial point of view (Voncken, 2016, p. 21).

With regards to production, the majority of the REEs that are extracted come from Light REEs (LREEs) ores after a complex and expensive production process (Powell-Turner & Antill, 2015, p. 218). More specifically, every ore that is extracted out of the mine needs to be processed in order to produce mineral concentrates out of which the metals under discussion will be extracted; these two procedures are called *mineral processing* and *extractive metallurgy* respectively (Voncken, 2016, p. 73). After that, it undergoes a grinding process until it reaches the size of grain which is necessary before it goes through the separation techniques with which the valuable parts are separated from the rest (Voncken, 2016, p. 73). However, there are several other smaller steps involved in the process of mineral processing and extractive metallurgy, depicted in the following graph (Figure 19):

Figure 19: Rare earths processing



Source: (Voncken, 2016, p. 74)

It is worth mentioning at that point that Figure 19 above presents a general overview of the process because in practice, the exact steps of the process followed may vary from ore to ore depending on the geomorphology of the mine's location; for example, the process followed for Mountain Pass (USA) ores is different from the one followed for Bayan Obo (China) or Mount Weld (Australia) (Voncken, 2016, pp. 75-77). Furthermore, the mining, extraction and separation process also differs for ion-adsorption deposits found only in China or placer deposits that are found in wet environments, such as alluvial deposits or sands (Voncken, 2016, pp. 44-45, 77-78).

To analyze every single step and present the technical details of this process is considered out of the scope of the present dissertation. However, readers interested in technical details may find all the relevant information in Chapter 4 in (Voncken, 2016).

Adding to that, Figure 20 presents an inclusive picture of both the rare earths' production process as well as their value chain.

Figure 20: **The production process and value chain of the REE**

Source: (Mancheri, 2015, p. 265)

Therefore, the global supply chain for rare earths can be summarized in the following five stages:

i) *Mining*

ii) *Separation*

iii) *Refining oxides into metal*

iv) *Fabrication of alloys*

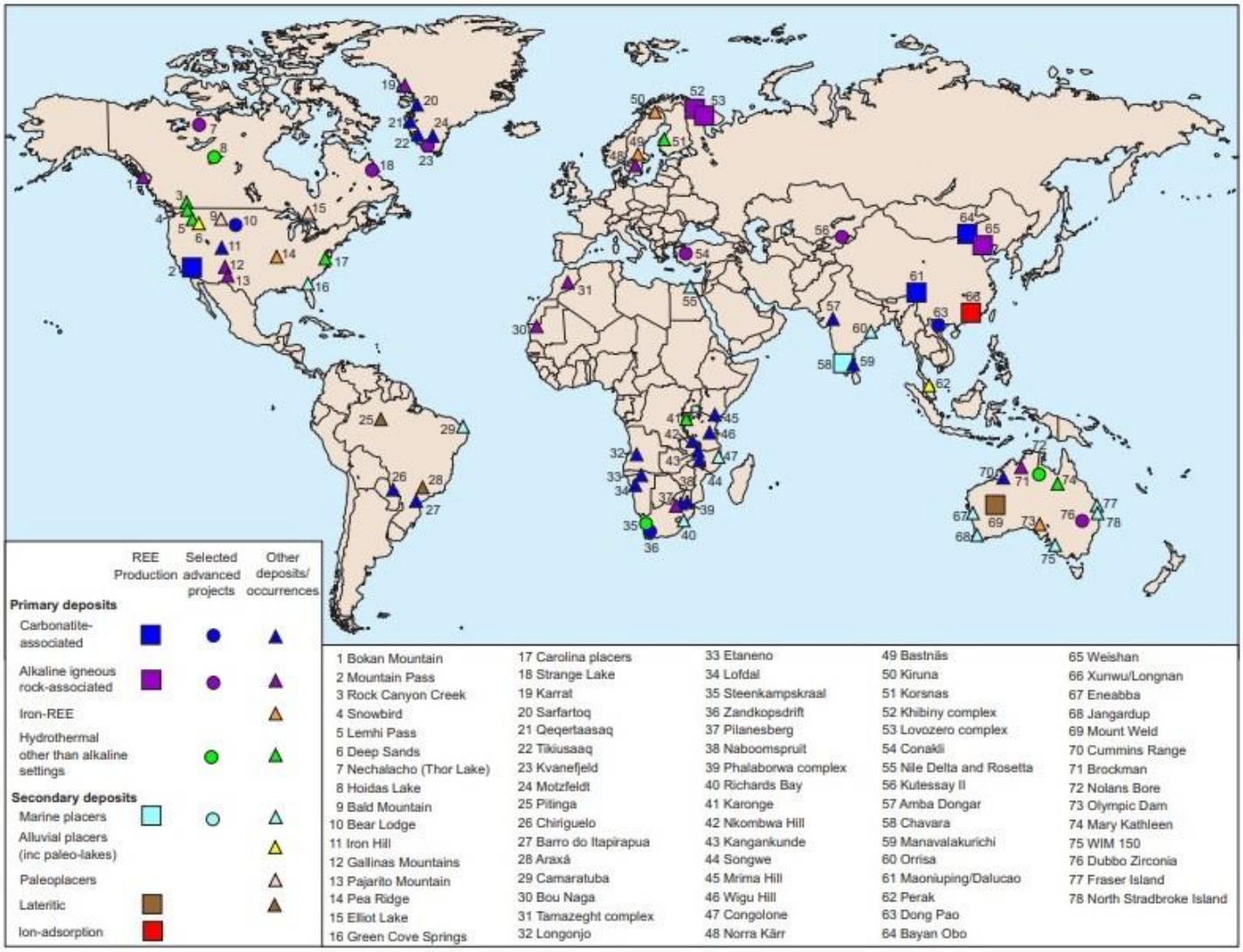
v) *Manufacturing of magnets and other components* (Grasso, 2013, pp. 14-15)

Supply

Reserves - Deposits

As far as deposits are concerned, only some of the countries that produce rare earths or have rare earth deposits are China (Bayan Obo, Inner Mongolia), the USA (Mountain Pass, California), Russia, Kyrgyzstan, Kazakhstan, India, Australia (Mount Weld), Denmark (Kvanefjeld in Greenland) and several other countries (Van Gosen, Verplanck, Long, Gambogi, & Seal, 2014); (British Geological Survey (BGS), 2011, pp. 24 - 30). The global distribution of REE deposits is depicted in the following map (Map 3).

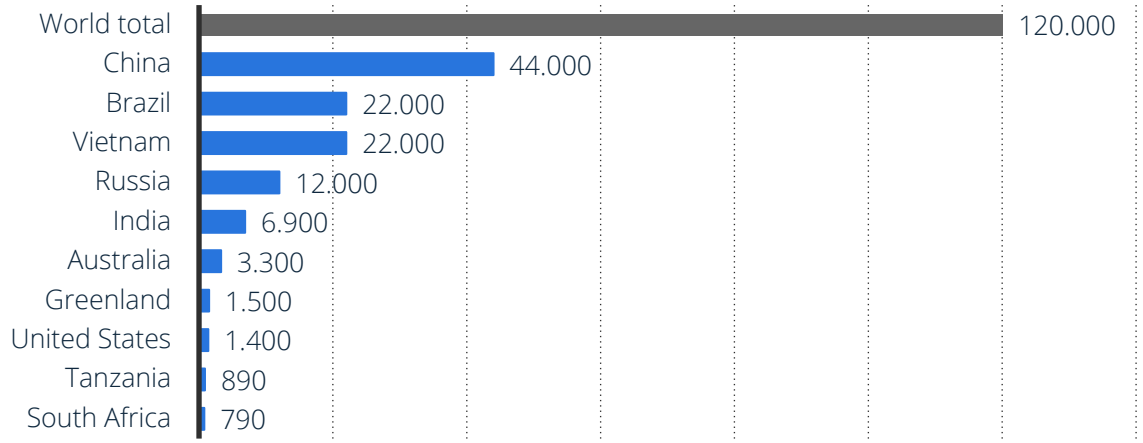
<u>Map 3:</u> Global REE deposits distribution, rare earth production points and developed mining plans



<u>Source:</u> (British Geological Survey (BGS), 2011, p. 5)

Furthermore, Figure 21 presents the "Top 10" countries and regions in terms of reserves as well as the global amount of rare earths reserves for 2019. According to the graph, China, Brazil, Vietnam, Russia and India are the five countries with the biggest rare earth oxide (REO) reserves ranging between 6.900 and 44.000 thousand metric tons. China alone holds more than a third of the global reserves.

Figure 21: **Rare earth reserves by country, 2019 (in thousand metric tons REO)**

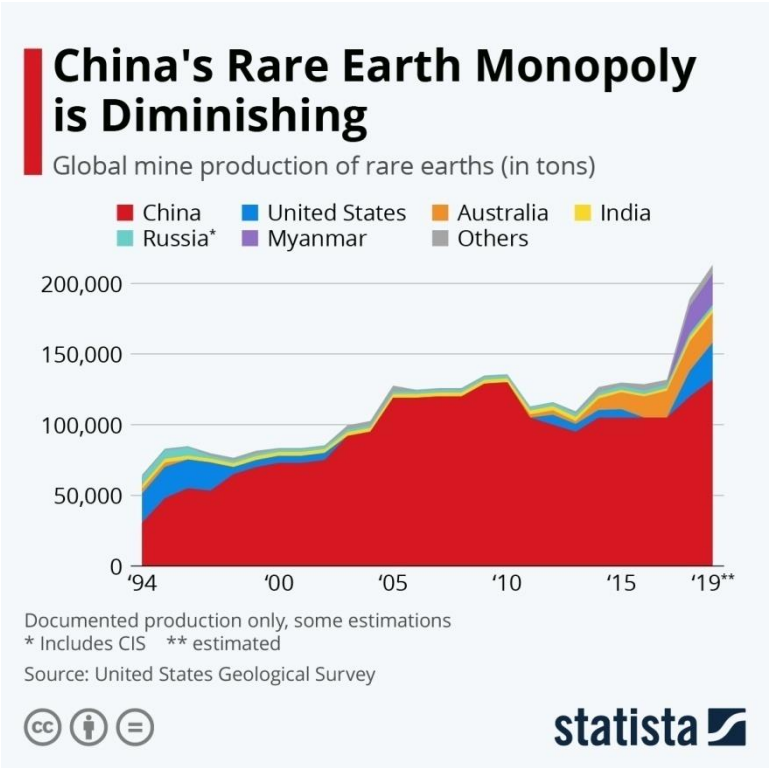


Source: (Statista, 2019, p. 4)

Suppliers

With regards to production, starting in 2000, REEs production comes mainly from China (Voncken, 2016, p. 107). China's share in the global rare earth production amounted to 97% in the 2010s (British Geological Survey (BGS), 2011, p. 27); (Dadwal, 2011, p. 181) but it seems that it has started to drop (Figure 22).

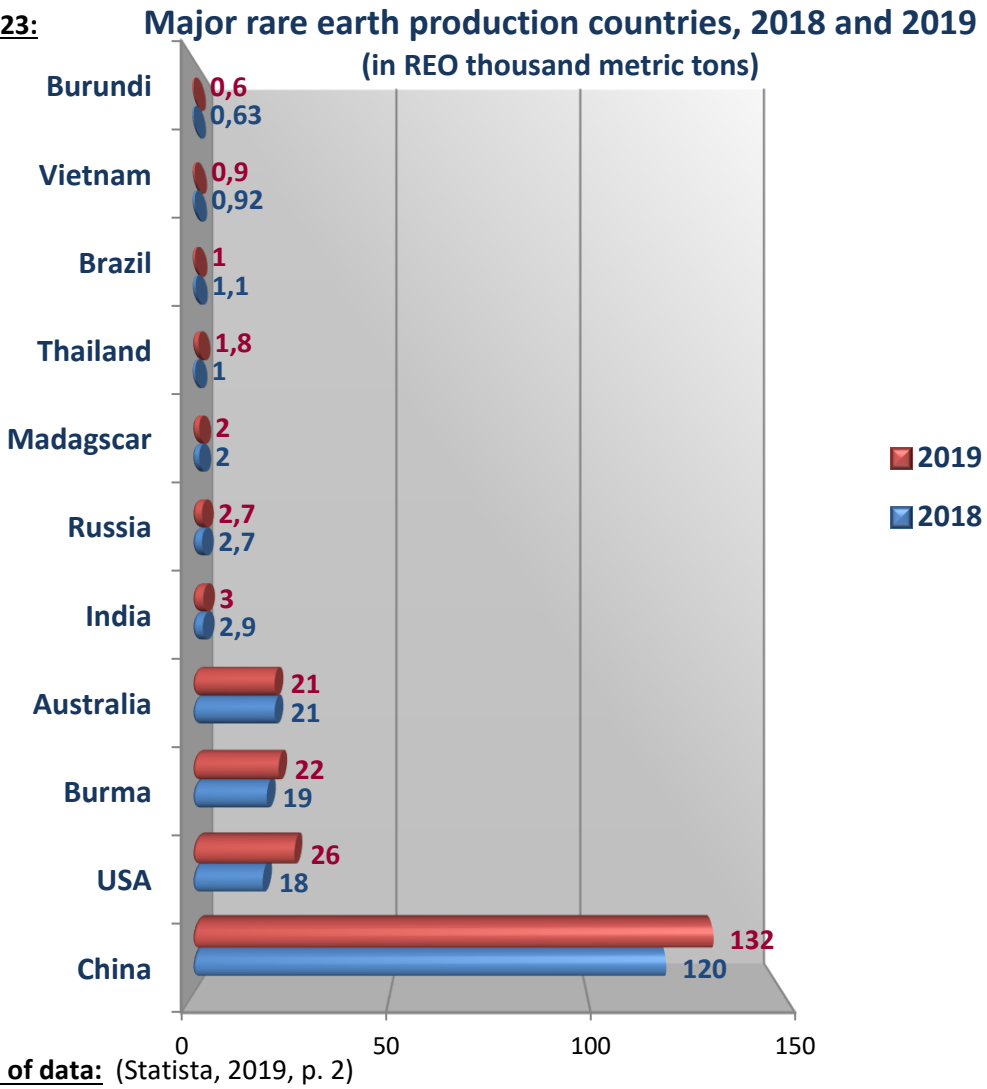
Figure 22:



Source: (Buchholz, 2020)

Nevertheless, China still holds the position of the dominant producer, although it holds only 37% of the global rare earth reserves, with the USA (13% – 15%), Russia (19%), Australia (5,5%) and India (3,1%) following behind (Dadwal, 2011, p. 183).[26] While Beijing's monopoly in the market is undeniable, it is also true that until recently markets of other countries had also been enjoying sufficient supplies (Mancheri, 2015, p. 262). However, the fact that rare earths reserves are located only in a few places around the world is something that makes companies of the relevant industry afraid because this means that cost will be increasing (Kaye, 2011). Figure 23 maps the production landscape of rare earths for 2018 and 2019.

Figure 23:



Source of data: (Statista, 2019, p. 2)

[26] The author also mentions that China accuses other countries (namely companies of Japanese, American and European origin) of taking advantage of the cheap Chinese rare earth imports in order to maintain and increase their reserves, avoiding the environmental impact and research costs.

Recycling, New projects and Substitution

Apparently, China is the dominant player in the market. However, mining of ores and extraction of placer deposits containing rare earths are ways to acquire rare earths from primary sources. Nevertheless, rare earths can also be retrieved from secondary resources through recycling. In other words, some possible solutions to reduce the level of dependency on China include recycling and reusing of the REE contained in devices whose life cycle has come to an end, research and redesigning with the purpose of replacing them with efficient and same-performance substitutes and diversification of suppliers which could be achieved if a new mining facility opened (Du & Graedel, 2013, p. 784). However, literature doubts whether rare earths adequacy can be achieved, especially for heavy rare earths[27], since industry will use them more and more in the following years (Du & Graedel, 2013, p. 784).

Other ways to alleviate the dependence on the Chinese supplies are diversification of suppliers, substitution and employing new projects which will create new input in the supply chain. As Table 10 shows, there is a large number of companies outside China engaging in rare earth-related activities. However, there is still a long way to go before we can talk about the end of the Chinese rare earth hegemony.

Table 10: Non-Chinese REE companies by capitalization, 2019 (million USD)

Company	Country	Capitalization
Iluka Resources Ltd.	Australia	2.620,02
Lynas Corporation Ltd.	Australia	761,19
Avonlea Minerals Ltd.	Australia	66,16
Hudson Resources Inc.	Canada	61,79
Midland Exploration Inc.	Canada	55,75
Artemis Resources Ltd.	Australia	39,38
Astron Ltd.	Australia	17,5

[27] Heavy rare earths (HREEs) are less abundant (Du & Graedel, 2013, p. 784).

Commerce Resources Corp.	Canada	16,37
Mkango Resources Ltd.	Canada	12,75
Avalon Rare Metals Inc.	Canada	10,71
Canada Rare Earths Inc.	Canada	8,68

Source: (Statista, 2019, p. 25)

However, China has not always been the world's hegemon in the REEs' production and exports. In fact, up to 1990 Mountain Pass in California was the place where most of the REE mining used to take place with China being a rather small player and as already stated, it was only in 2000 that it started taking over and building its monopoly (Mancheri, 2015, pp. 263-264). What is more, China's dominant (near monopoly) position extends throughout the whole REEs supply chain, meaning R&D, production and processing as well as consumption (Voncken, 2016, p. 108). Of course, being dominant in every part of the supply chain cannot happen overnight and takes years to build it up. This is exactly why it is hard for other countries to build their own supply chains that will help them become independent from China concerning rare earths.

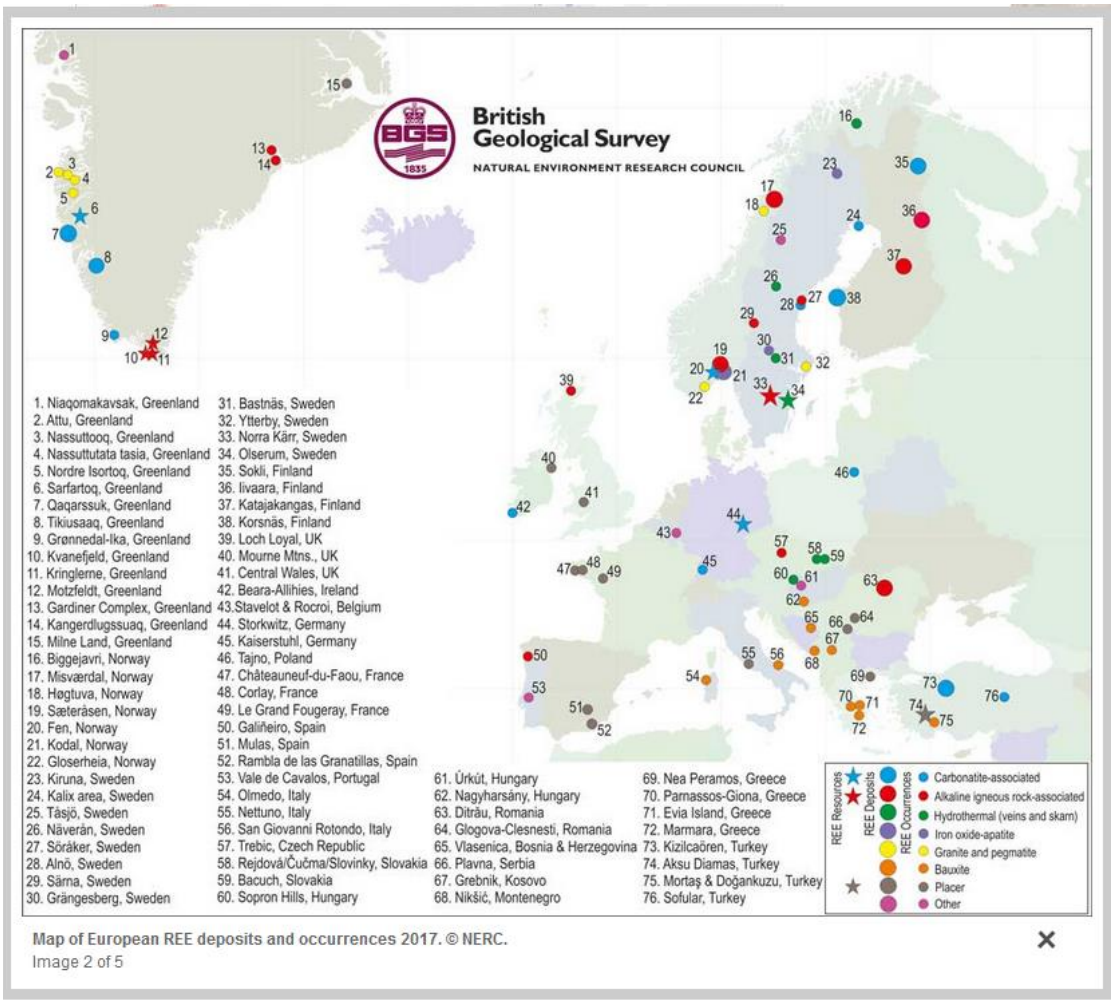
The EURARE project

It's worth mentioning here that moving towards that direction the EU launched a project called "EURARE"[28], funded by the European Commission's 7th Framework Programme, whose purpose was to research, locate and map possible primary REE resources within the EU and its partner countries and *"set the basis for the development of a European Rare Earth Element (REE) industry"* (Goodenough, 2015); (About EURARE). The project that started in 2013 and ended in 2017 was initiated based on the assessment of the REEs as critical by the European Commission, as already mentioned in Chapter I (Goodenough, 2015); (About EURARE). The reason they are considered critical is that there are several challenges related to their supply

[28] For the project's website, you may visit www.eurare.eu or http://www.eurare.org/ where one can also find the EURARE brochure, which contains all the details on REEs and the EURARE project http://eurare.eu/docs/EURAREbrochure_vfinal.pdf

chain, such as a) *economic challenges* concerning the opening of REE mines in countries other than China, b) *complexity of ore mineralogy and textures*, c) *limited number* of extraction and separation facilities *outside China* and d) environmental challenges stemming from the connection of the rare earths with the radioactive elements U (uranium) and Th (thorium) (Goodenough, 2015). As far as the results of the project are concerned, there are both primary deposits, which are more challenging when it comes to processing, as well as secondary deposits, whose processing is simpler and they may come out as by-products of other minerals, such as bauxite (Goodenough, 2015). Furthermore, *"Europe has a significant number of REE deposits and undoubtedly has the potential to be self-sufficient in the REE, including the most critical heavy REE"* but *"it is essential […] to develop a vertically integrated supply chain for Europe."* (Goodenough, 2015). Map 4 shows the distribution of REE deposits and occurrences across Europe (About EURARE).

Map 4: Distribution of REE deposits and occurrences across Europe

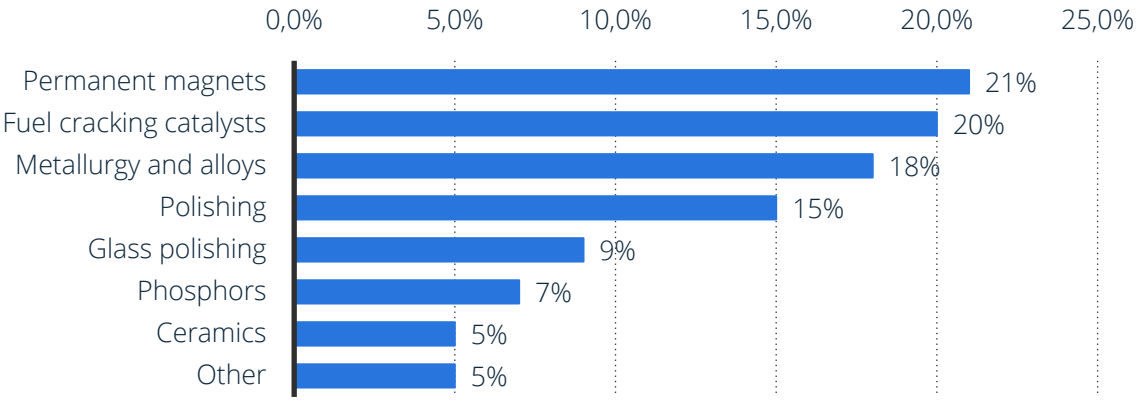


Source: (About EURARE)

Demand – Consumers

Rare earths demand is constantly increasing owing to a large extent to the groundbreaking development of the high-tech, the green energy and the automotive sectors. To illustrate that point, in 2014 demand was 118,000 tons with projections made in 2015 expecting it to reach to 170,000 tons in 2020 (circa 6% per year) (Rollat, Guyonnet, Planchon, & Tuduri, 2016). Figure 24 presents the global REE demand in 2018 by end use. The most REE-demanding sectors are permanent magnets (21%), fuel cracking catalysts (20%), metallurgy and alloys (18%) and polishing (15%).

Figure 24: Global rare earth element consumption, 2018 (% by end use)



Source: (Statista, 2019, p. 9)

With regards to demand in 2020, rare earths seem to be recovering during the 2nd half of the year, after the coronavirus pandemic, although Roskill expects annual demand to fall across all market fields (Barrera, 2020). The highest demand in the early 2020s is expected to evolve around magnets containing Neodymium (Nd), Praseodymium (Pr), Dysprosium (Dy) and maybe Terbium (Tb) according to David Merriman, manager of Roskill (Barrera, 2020).

All in all, the REE demand is expected to increase hand in hand with the rise of the 'green' sector. Furthermore, China's rare earths consumption is and will continue to be constantly growing in accordance with the country's economic growth and in order to meet its military expansion, causing its exports to go lower – a fact that raises the REEs level of criticality (Mancheri, 2015, pp. 262, 265). That seems to be the reason why Beijing does not seem willing

to export rare earths (see 'Trade' section) and it encourages domestic companies *"to add value by making more technologically advanced products"* (Mancheri, 2015, p. 263).

Prices

For decades, the high-tech industry, which relies heavily on rare earths, had falsely assumed that it enjoyed 'price security', mainly due to the abundance of supply (Mancheri, 2015, p. 264). However, prices can be affected by a number of factors, such as supply and demand, possible export restrictions or quotas that will reduce the amount of supplied rare earths, new technological developments that may increase the demand for a certain rare earth and unpredictable incidents, such as the Covid-19 pandemic or anything that could upset or interrupt the supplies. To illustrate that point, in 2007, China reduced exports by nearly 70%, inflicting a price surge of as much as 850%, shaking the industry that up to that day had accepted that it just could not compete with the Chinese rare earth prices (Mancheri, 2015, p. 264) (Voncken, 2016, p. 107). Following this development, the trade value in 2009 hit its lowest, which, combined with the change in China's behavior, the imposed quotas on production and exports as well as export taxes, explains why 2009 is considered a key-year for the REEs market and this time period was called the "Rare Earth Crisis" (Voncken, 2016, p. 1).

The mapping of the REO prices as presented in Figure 25, shows exactly that, with prices between 2009 and 2012 climbing, reaching top points and then going down again, illustrating clearly the REE Crisis.

Figure 25: Development of Rare Earth Oxides Prices, 2007 – 2014

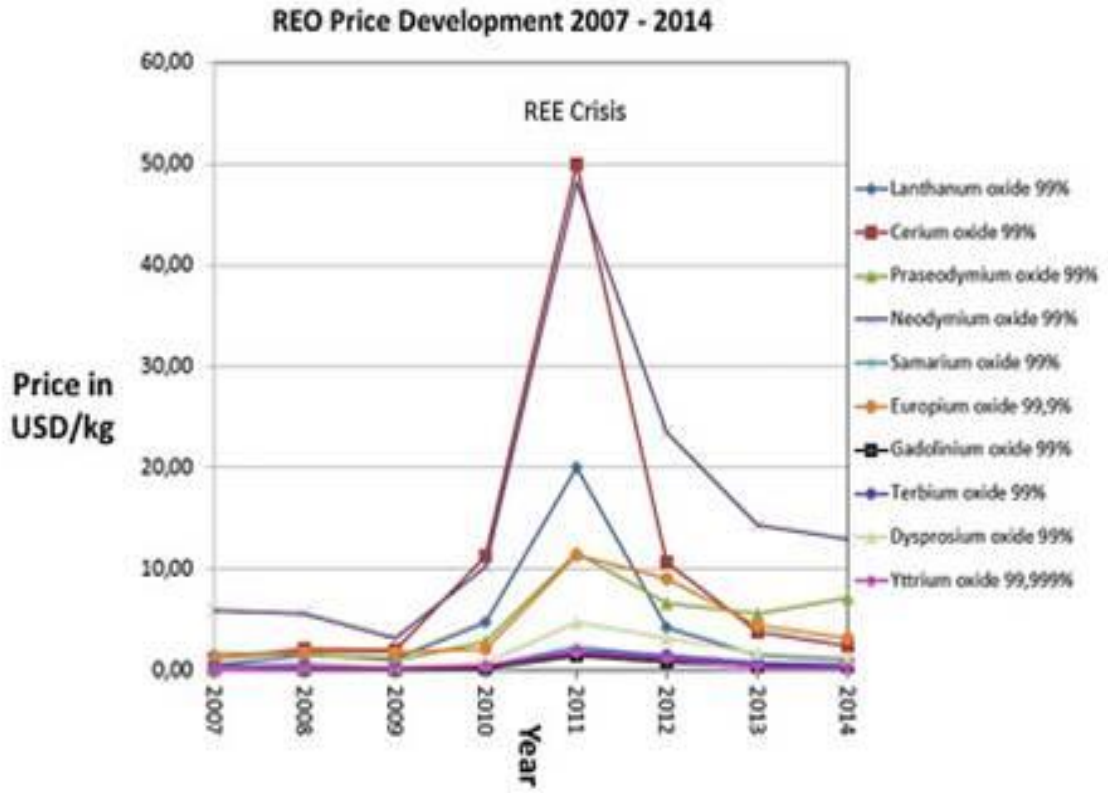


Fig. 6.2 REO price development 2007–2014. Based on data published by Metals Pages, and Lynas Corporation. NB: these are prices for REE-oxides (REO). Prices for the pure metals were much higher

Source: (Voncken, 2016, p. 112)

With regards to the present situation of the market, the rare earth oxides prices for 2019 are presented in the following Table (Table 11). As we can see, Heavy Rare Earths (HREEs), such as Terbium (Tb) and Dysprosium (Dy), are much more expensive than the Light ones (LREEs).

Table 11: Average prices of selected REOs (USD/kg, 2019)

Rare Earth Oxides (REOs)	Average price, 2019 (USD/kg)
Terbium [99,99% minimum purity]	510
Dysprosium [99,5% minimum purity]	240
Neodymium [99,5% minimum purity]	45
Europium [99,9% minimum purity]	35
Mischmetal [65% cerium, 35% lanthanum]	6
Lanthanum [99,5% minimum purity]	2
Cerium [99,5% minimum purity]	2

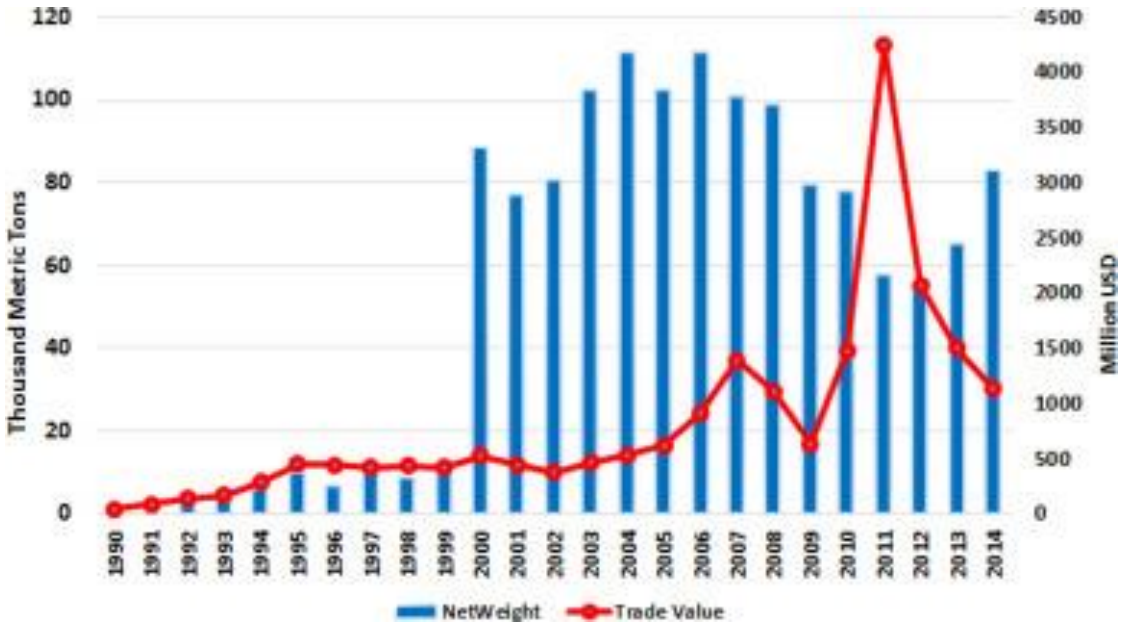
Source: (Statista, 2019, p. 7)

Neodymium (Nd) and Dysprosium (Dy) are very likely to face supply challenges in the future due to their applications in the rapidly growing automotive industry, according to David Merriman, manager at Roskill (Barrera, 2020). This is verified when we take into consideration for example, the fact that NdFeB (Neodymium-Iron-Boron) permanent magnets are a) 'key' to green energy and the transition to an economy less based on carbon and b) are driving the global rare earths demand (Rollat, Guyonnet, Planchon, & Tuduri, 2016).

Trade

As far as the REEs global trade is concerned, Figure 26 suggests that exports can be segmented into the following four main periods: a) 1990 – 2007: "Period of Growth", b) 2007 – 2009: "Sudden Fall" , c) 2009 – 2011: "The Rare Earth Crisis" (low quantity but maximum trade value) and d) 2011 – 2014: "In the Crisis Aftermath". The "Sudden Fall" period in 2007 – 2009 is attributed to the global financial crisis which caused lower demand from major consumers such as the US, the EU and Japan (Mancheri, 2015, p. 263).

Figure 26: **Global REE exports 1990 – 2014**



Source: (Mancheri, 2015, p. 263)

Looking at the exporters breakdown for 2013 and 2014 (Table 12), we can easily notice that China's share of the world exports almost doubled within a year holding more than half of the global export activity. Nevertheless, up to 2010 it was the US and Germany the ones leading the refined REE exports (Mancheri, 2015, p. 264).

Table 12: **Major 10 REE exporters by volume for 2013 and 2014**

Country	% of world exports (volume) 2013	Country	% of world exports (volume) 2014
China (+ Hong Kong)	26,43	**China (+ Hong Kong)**	51,16
Austria	8,54	**Malaysia**	12,79
United States	8,36	**United States**	11,59
Japan	6,99	**Japan**	7,23

Russia	6,24	**Estonia**	4,19
Estonia	4,18	**Sri Lanka**	3,25
Netherlands	3,46	**Kazakhstan**	2,05
France	2,22	**France**	1,27
Korea	1,52	**Philippines**	0,89
Kazakhstan	1,12	**Germany**	0,85

Source: (Mancheri, 2015, p. 264)

Table 13: Major 10 REE importers by volume for 2013 and 2014

Country	% of world exports (volume) 2013	Country	% of world exports (volume) 2014
Japan	22,38	**Malaysia**	42,93
United States	21,81	**Japan**	18,49
Germany	10,62	**United States**	12,99
Estonia	7,30	**Germany**	6,21
China	5,58	**Estonia**	5,21
Austria	4,88	**China**	3,05
Korea	3,39	**Brazil**	1,26
Kazakhstan	2,68	**Netherlands**	1,21
France	2,64	**India**	1,20
United Kingdom	2,15	**United Kingdom**	1,09

Source: (Mancheri, 2015, p. 265)

As Table 13 presents, in 2013 Japan and the US were at the top 2 positions of rare earth importers with Germany following. In 2014, Malaysia (42,93%) became the top REE importer followed by Japan, the US and Germany. What is remarkable here, is the fact that both the US and Germany reduced their rare earth imports to almost half of their 2013 shares. What is more, Japan reduced its imports to a relatively smaller extent compared to the US and Germany, reflecting a relative weakness in reducing its rare earth import dependence more.

The Balance Problem

A worth mentioning problem in the REEs market is the Balance (or Balancing) Problem. This refers to the balance between the supply and the demand of REEs. The problem is that REE ores do not contain just one pure rare earth but they are a mixture of rare earths which has to be processed in order to have the different REEs it contains isolated. This implies that when ores are processed in order to get a specific REE, there are also other REEs which come out of it and have to be dealt with. As a consequence, there is a high surplus of certain REEs that have to be stockpiled because there is not such a high demand for them (Binnemans, 2014, p. 37).[29]

According to Falconnet (1985, p. 9), the *ideal situation* of the balance of the rare earth market, when REEs' price is the lowest possible, is one of the three most challenging problems for rare earth producers. Since balance is not the actual situation of the rare earth market, there are two options for the industry:

> a) *Adjusting its overall capacity to match the total demand in order to optimize the production costs. Obviously, this attitude creates shortages and surpluses of some elements.*
> b) *Treating more ores to obtain, for instance, more yttrics, and stockpiling huge quantities of cerics.* (Falconnet, 1985, p. 12)

However, the second choice inevitably leads to a significant increase in the prices of all REEs to cover the costs of stockpiling as well as the damage caused by the devaluation of the stockpiled elements (Falconnet, 1985, p. 12). This also implies that the competition among

[29] Binnemans (2014) gives a detailed description of the problem as well as its history and provides some possible solutions.

mining companies dictates that they compete not only over markets and prices, but mostly over keeping and maintaining their production costs as low as possible (Tanzer, 1980, p. 41).

The other two problems Falconnet presents are the rapid technological development and the difference in the life cycle of certain applications. This implies that during a certain period there might be a certain rare earth which is dominant – critical due to a certain application for which it is used. Still, this does not guarantee that this will be the case forever, since after some years some other rare earth will be driving the market just because there will be a different application at the spotlight this time. To put it briefly, technology is probably the most crucial determinant of the REEs demand.

This is exactly what the history of the balance problem shows. It is true that during different periods of time, different rare earths have driven the market owing to the fact that the demand for them was higher than the demand for other REEs at the time, which is explained by the technological evolution which made different REEs become critical over time (Binnemans, 2014, pp. 38-39). Table 14 shows the different REEs that have become critical over the years due to certain technological advances at the specific time.

Table 14: Most critical REEs through the years

Decade/Year	REE	Use
Mid-1960s – early 1970s	Europium	Red phosphors in colour TV screens
1970s – 1980s	Samarium	Samarium-cobalt permanent magnets (SmCo magnets) – military technology (e.g. precision-guided missiles, smart bombs, aircraft)[30]
Circa 2015	Neodymium; Dysprosium	Neodymium-iron-boron magnets (NdFeB magnets) – military/defence weapon systems[31]

Source of data: (Binnemans, 2014, pp. 38-39)

[30] See (Grasso, 2013, p. 10).

[31] See (Grasso, 2013, p. 10).

What is more, since different groups of rare earths are derived from different ores, it is obvious that the importance of ores will also vary according to the dominant REE of the period (Binnemans, 2014, p. 39). Therefore, as Table 15 presents, different ores become important always in connection with the REE that technology demands at a specific time.

Table 15: History of REE ores

Decades	**Ore**	**Era**
Until 1960s	Monazite	Monazite era
1960s	Bastnäsite (lanthanum, cerium, europium) (But gradually higher demand for monazite due to demand for HREEs and yttrium)	Mountain Pass era
End of 1980s till now	HREE rich ion-adsorption ores (laterite clays from southern China – yttrium and HREEs)	China era

Source of data: (Binnemans, 2014, p. 39)

Both Falconnet and Binnemans provide some possible solutions to the balance problem. The former argues that ores should be better evaluated by extensively separating all the elements and that it is necessary to know exactly which rare earth is the important one in an application (Falconnet, 1985). The latter advocates that what will solve the problem is a) diversification of the type of ores used to produce REEs, b) recycling, c) substitution of certain critical rare earths with other less critical and d) reduced consumption of critical rare earths (Binnemans, 2014). Nevertheless, both authors agree that research and development of new high-volume applications for the elements that come out in excess together with the REEs, but are not in demand, is vital; for example, radioactive thorium could be used instead of uranium as a nuclear fuel in nuclear reactors - that way, it would also stop being regarded as waste of REEs mining (Falconnet, 1985, p. 15; Binnemans, et al., 2013; Binnemans, 2014, p. 44).

Illegal Mining and Smuggling

Illegal mining and smuggling is an important parameter in the REE market which we could not afford not to mention. To illustrate that, Table 16 shows the global imports of rare earths in 2013 and 2014 in metric tons. As (Mancheri, 2015, p. 264) points out, imports in 2014 were almost double the size of the exports, a fact that raises questions on the reasons behind it. A possible reason for that could be illegal mining and smuggling of rare earths from China or India, mixed with iron ore (Mancheri, 2015, p. 264). There are further allegations that large quantities of rare earths are also smuggled to Japan, Vietnam, Philippines and South Korea (Mancheri, 2015, p. 268).

Table 16: Global rare earth exports and imports (metric tons) in 2014

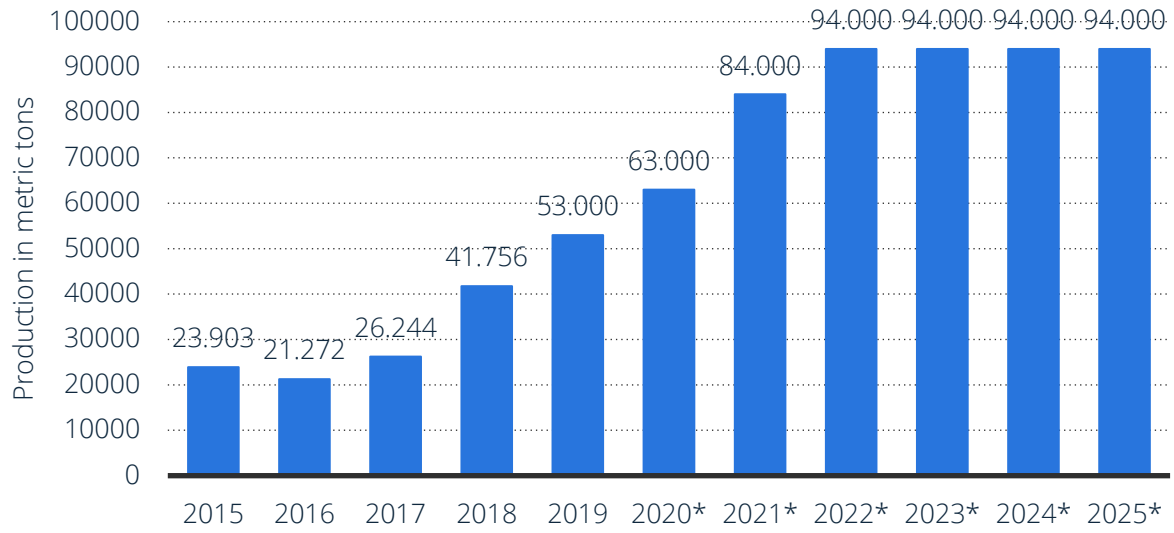
Global Rare Earth Exports (metric tons)	Global Rare Earth Imports (metric tons)
66.774,14	**120.638,01**

Source: (Mancheri, 2015, p. 265)

Prospects

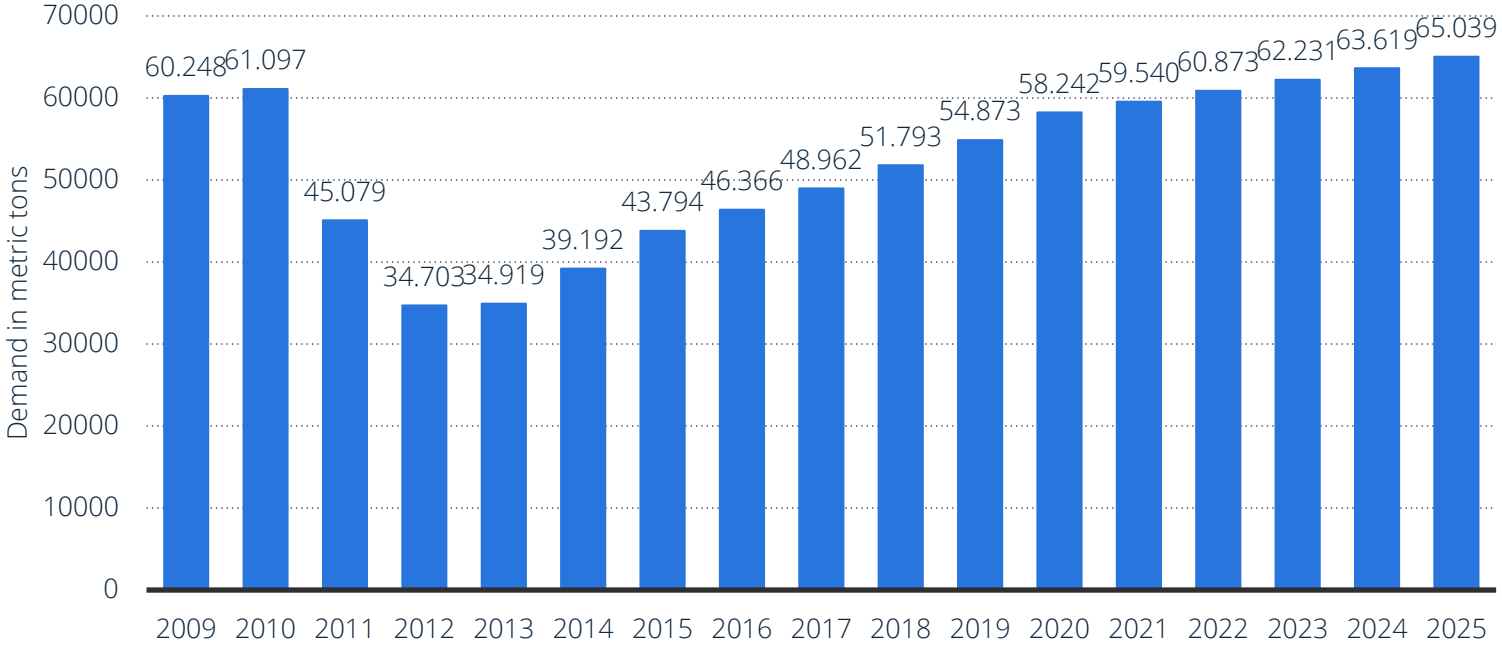
As far as the future is concerned, the global REOs production is expected to continue growing (China not included) and the same will happen with the demand, too (Figures 27 and 28). What is more, it seems that the supplies outside China will be sufficient to cover the demand outside China.

Figure 27: Global rare earth oxides production, 2015 – 2025 (China not included)



Source: (Statista, 2019, p. 28)

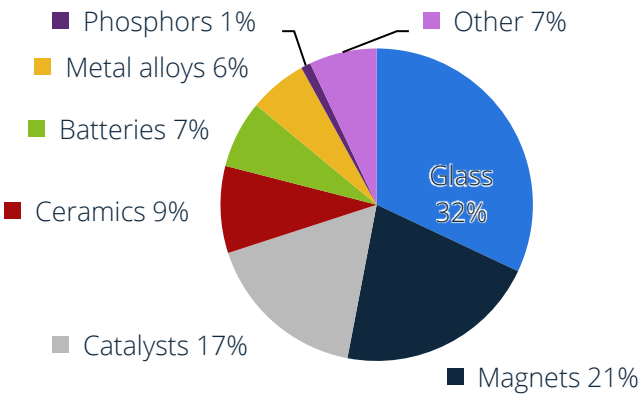
Figure 28: Global rare earth oxides demand, 2009 – 2025 (China not included)



Source: (Statista, 2019, p. 29)

It is also interesting to see the projections for the rare earths consumption by application. For example, by 2028, glass will remain among the industries demanding most of the REEs (32%) while magnets follow closely with 21%.

Figure 29: Rare Earth consumption by volume of application, 2028



Source: (Statista, 2019, p. 32)

As for the prices outlook, it has been predicted that Neodymium's price along with the price of Praseodymium will surge reaching six-digit numbers by 2025, around 150.000 and 120.000 USD/metric ton respectively. After them comes Gadolinium with about 24.000 USD/metric ton (Table 17).

Table 17: Global rare earth oxides prices, 2014 – 2025

	2014	2018	2022	2025
Lanthanum oxide (US$/metric ton)	5,955	7,904	6,558	6,932
Cerium oxide (US$/metric ton)	8,847	5,516	3,248	3,308
Praseodymium oxide (US$/metric ton)	121,257	122,931	113	119,093
Neodymium oxide (US$/metric ton)	71,180	107,729	105	148,444
Samarium oxide (US$/metric ton)	7,601	6,884	4,519	4,887
Europium oxide (US$/kilogram)	918	721	418	372
Gadolinium oxide (US$/metric ton)	25,485	28,473	19,982	23,437
Terbium oxide (US$/kilogram)	788	868	556	577
Dysprosium oxide (US$/kilogram)	456	454	367	378
Holmium oxide (US$/kilogram)	63	46	20	22
Erbium oxide (US$/kilogram)	71	155	128	143
Ytterbium oxide (US$/kilogram)	51	76	45	48
Lutetium oxide (US$/kilogram)	1,258	1,258	1,258	1,258
Yttrium oxide (US$/kilogram)	21	54	35	38

Source: (Statista, 2019, p. 30)

All in all, the REE market is an imperfect, near-monopoly market facing two major problems: i) low prices (even below cost) and ii) oversupply created by illegal sources in China (Mancheri, 2015, p. 269).

Rare earths can be of critical importance to states. This is also why they are among the list of critical raw materials, as already discussed in Chapter I. For example, the UK's military capability can be affected if availability of rare earths is affected by certain factors, as described in Powell-Turner and Antill (2015). These factors or *"drivers"* as the authors refer to them in their work, are

> *"…resource concentration, tighter regulatory policy and its enforcement, export policies, their use in economic statecraft, increases in domestic demand, promoting greater efficiency in resource use, efforts to mitigate resource depletion and more efficient resource extraction while reducing its associated environmental impact."* (Powell-Turner & Antill, 2015, p. 217)

Adding to that,

> *"…China wants (and has achieved) domestic control of the entire supply chain, from mining to end products. Under the current situation, any high-end REE products must originate or pass through China's vast value chain. Even US defense industries are dependent on China for some advanced materials and components, including magnets used in F-35 fighter jets."* (Mancheri, 2015, p. 270)

Such a situation in the market creates uncertainty, nervousness and apprehension to both the rest of the countries and the industry's companies outside China. Feelings like these that are linked to insecurity can certainly lead towards tensions of any kind and of any intense. One could argue that since the rare earths market is a domain that has caught attention relatively recently, tensions and even conflicts around rare earths can only be both unpredictable and unprecedented.

Is this the case? Are tensions and conflicts around rare earths something new and unpredictable? Or can they be addressed just like any other conflict around natural resource commodities, such as oil or natural gas?

To find out, we shall proceed to the case studies of natural gas and rare earths, starting with the former one.

CHAPTER III

Natural Gas Case Studies

In Chapter I we set out the framework and the tools this dissertation will employ as well as the research questions and hypothesis. In Chapter II we provided a 'natural gas and rare earths 101' offering insight on the fundamental information one needs to gain about these two natural resources in order to be able to understand the concepts explained later.

In this chapter, Chapter III, we present the two case studies we have chosen to explore in relation to natural gas. These are a) The Case of Russia – Ukraine and b) The Case of the Eastern Mediterranean (Israel – Cyprus – Greece and Turkey). The Chapter has been structured as follows: it has been divided into two subsections, one for each of the case studies. For each of the case studies, first, we provide the outline of the events relevant to it and then we apply the theoretical tools discussed in Chapter I, namely the securitization theory and the concept of energy security. At the end of the Chapter, we provide general conclusions for both of the natural gas cases. The first case study to be presented is the one of the Russian – Ukrainian disputes.

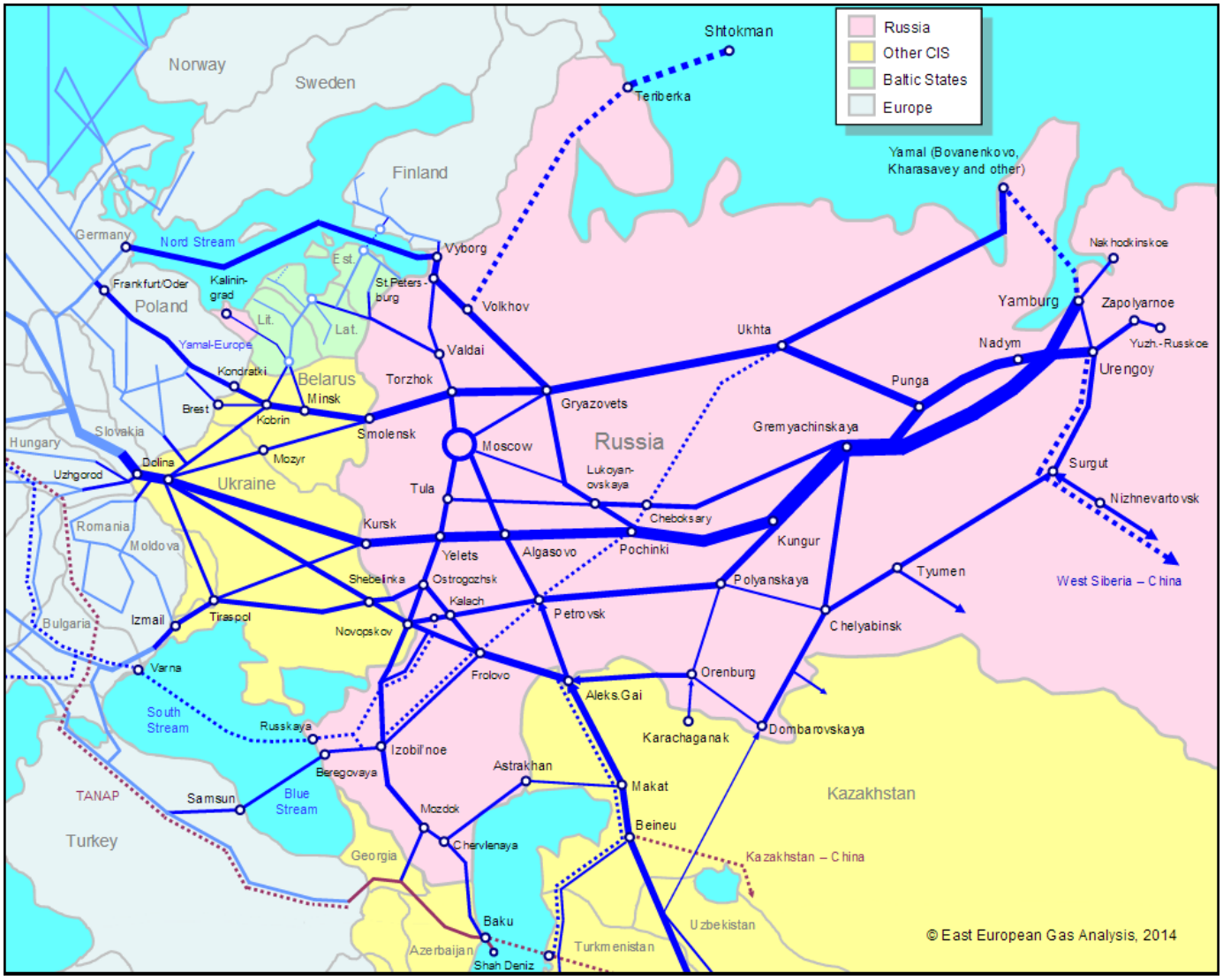
3.1 The Case of Russia – Ukraine[32]

Introduction

Russia is the country holding the largest natural gas reserves globally and is second only to the US in natural gas production (see Chapter II). Russia's Gross Domestic Product (GDP) today consists of about 25% of hydrocarbons, which also represent 2/3 of its earnings from exports (Novikau, 2020, p. 1). During the 1980's, natural gas exports were important for the USSR, too, because they provided it with foreign currency (Τσακίρης, 2018, p. 522).

[32] A few parts in this section have also been used for (Panagopoulou, 2018, pp. 15-17) and have been adapted appropriately.

Map 5: Major Gas Pipelines of the Former Soviet Union in 2013/2014



Source: (East European Gas Analysis, 2013)

Ukraine and Russia or Russia and Ukraine are connected not only in terms of borders but also throughout history. Ukraine, a member of the former USSR, gained its independence in 1991, after the dissolution of the Soviet Union and started re-appearing in the European political map and re-identifying itself as "Europe" or even better as "Eastern Europe" (Velychenko, 2007, pp. 1, 3). However, *"political independence from Russia is not matched by economic, cultural or psychological independence"* (Velychenko, 2007, p. 1).

Russia and Ukraine have a strong relationship of interdependence, especially in the energy field. On the one hand, Ukraine depends on Gazprom for gas supplies and transit fees for the pipelines transiting its territory before they reach Russia's customers and it is a country that

has energy security issues at the top of its agenda as its "Energy Strategy of Ukraine to 2030" reveals (World Bank, 2010, pp. 13, 20, 34, 35). On the other hand, Gazprom depends on Ukraine – as well as on Belarus and Moldova – because its gas cannot be transited to Europe without them (Stern, 2006, p. 34). As a transit state, Ukraine holds a significant position in transiting the Russian gas to the European customers. For example, in 2004, more than 80% of the Russian gas destined to Europe transited Ukraine (Stern, 2006, pp. 33-34; Reuters, 2009). Furthermore, so large is gas trade in terms of volumes and money between the two countries, that Presidents and Prime Ministers both in Russia and in Ukraine get involved in all the great decisions with regards to it (Stern, 2006, p. 34). However, the events of the disputes to be presented here highlight Russia's and Ukraine's high level of interdependence (Council on Foreign Relations) which can also turn to vulnerability under certain circumstances.

Map 6: Existing and planned pipelines transiting Ukraine and gas storage

Source: (Pirani, 2007, p. 75)

The Events of 2006, 2009 and 2014

2005 – 2006

In May 2005, 7,8 bcm of gas deposited by Gazprom in the Ukrainian storage units were not available to the company and there were allegations that they had been missing, they had disappeared or they were stolen by unknown third parties (Stern, 2006, p. 41; Pirani, 2007, p. 24). The incident was resolved later by an agreement between Gazprom and Ukraine but it had already raised serious concerns with regards to the security level of the gas stored in Ukraine and how the European supplies could be affected (Stern, 2006, p. 41). What is more, it is a fact that during that period, Gazprom was trying to move the prices up towards the European (market based) levels, which is why it really welcomed the Ukrainian proposal to do so for the transit tariffs in March – April 2005. (Stern, 2006, p. 41) Additionally, in August 2005, the Energy Minister of Ukraine confirmed that proposal noting that *"trade will move to a cash basis in 2006-07 'if this is in Ukrainian interests'"* (Stern, 2006, p. 41).

However, July 2005 found the two parts trying to reach an agreement again due to the objections raised by the new Ukrainian administration to an agreement reached back in 2004 and the criminal investigation that the authorities had began in relation to one of the elements of that agreement (Stern, 2006, pp. 41-42). Adding to the already deteriorating climate in their bilateral relations came the following two events a) an agreement between Gazprom and Turkmenistan that would literally leave the Turkmen-gas supplied Ukraine with no gas supplies at all, at least for the first quarter of 2006 and b) Gazprom's insisting on higher prices to be paid by Ukraine, which could even be given a loan to be able to afford it, together with the offer that the new prices would come into force three months later (Stern, 2006, p. 43; Pirani, 2007, p. 24). December 2005 was generally a period during which Russia was undertaking efforts to dwindle costs of oil and gas export subsidies towards the post-Soviet states (Tsygankov, 2015, pp. 4 - 5)[33]. Nevertheless, Ukraine did not accept these proposals, leading to the cut – off of Gazprom's gas supplies to Ukraine on January 1, 2006 (Stern, 2006, p. 43; Pirani, 2007, p. 24; Gazprom, 2006).

Europe was affected directly and heavily by this conflict, revealing the critical level of its energy security as well as the high level of supply insecurity and vulnerability the European states were experiencing [(Stern, 2006, pp. 43-45) in which one can find more details on the

[33] In (Tsygankov, 2015, pp. 4-5) one can read "*Putin explained that 'over the last 15 years Russia subsidized the Ukrainian economy by a sum that amounted to $3 to 5 billion each year'*".

story].[34] Ukraine was accused of stealing transit gas by Gazprom, however Kiev denied that allegations (Reuters, 2009). Apart from the supply shock that Europe had to face at the moment, it also had to cope with the prices that were soaring (Blazev, 2015, p. 70). Finally, the two states negotiated and concluded on a contract lasting for one year, during which Russia would continue to subsidize gas supplies towards Ukraine in exchange for a cost-effective transition fee for Gazprom for the pipelines crossing the Ukrainian soil (Tsygankov, 2015, pp. 4 - 5)[35]. However, there was an energy dispute between Russia and Ukraine again that reached its peak on January 6, 2009 (Kovacevic, 2009, p. 10) due to Gazprom's decision to halt gas supplies destined for Ukraine.

2008 – 2009

On December 31, 2008 Gazprom announces that talks with Kiev concerning a new agreement over natural gas prices have not been fruitful, that the company has not received any payment from Ukraine for the Russian gas, that they believe Ukraine uses the talks over natural gas for political bargaining and that if an agreement is not reached before January 1, Gazprom will have to stop providing gas supplies to Ukraine (Gazprom, 2008). In a later statement on the same day similar to the first one, it is added that the company *"will continue supplying gas to its European customers in full, we have a transit contract in force"* repeating the warning that supplies destined for Ukraine will be suspended without a new contract and accusing Ukraine of this situation (Gazprom, 2008).

On January 1, 2009 according to Gazprom, the supplies of Russian gas towards Ukraine were suspended by 100% but transit quantities were still pumped into the system (Gazprom, 2009)[36]. This happened due to extreme debts to the company and the absence of a new agreement on the prices (Reuters, 2009). However, it was this action that resulted in a 'frozen' Ukraine and a 'frozen' Eastern Europe (Kramer, 2009; Khrennikova, Shiryaevskaya, &

[34] For a detailed analysis on the effects of the Russia-Ukraine natural gas crisis on the Southeast European countries, see also (Kovacevic, 2009).

[35] See also (Stulberg, 2015, pp. 116-121) for a detailed presentation and analysis of the incidents between Russia and Ukraine concerning natural gas during the period 2006 – 2014.

[36] On a later announcement on the same day, the company announced that from January 2009 on, Ukraine would pay gas supplies at a European market price, because it had rejected the favorable offer made by Gazrpom (Gazprom, 2009).

Krasnolutska, 2019). Gazprom announced that Kiev had stated that it extracted quantities of the transit natural gas supplies for its domestic use and as a result the EU and the Balkan states were faced with severe lack of supplies during winter (Gazprom, 2009). On January 3, Gazprom reiterated its status as a reliable partner that continues to provide gas to the European countries, accusing at the same time Ukraine of rejecting the company's 'compromise proposals' and not honoring its obligations as a transit country, a behavior having an impact on Europe (Gazprom, 2009). On January 4, the company openly accused Kiev of stealing natural gas destined for Europe (Reuters, 2009) and announced that it would dispatch extra volumes through Belarus transit and the Blue Stream pipeline (Gazprom, 2009). On January 7, the Russian Prime Minister, Vladimir Putin, *"ordered a halt in gas transit via Ukraine as well, saying it was pointless pumping the gas if it was being stolen by Ukraine. Kiev said Russia's actions amounted to blackmail to extract an unjustifiably high price for the gas it sells to Ukraine"* (Reuters, 2009).

However, manipulating the political disunion that Ukraine was experiencing at the moment, Russia achieved an agreement in its favor (Tsygankov, 2015, p. 5). The Russian Prime Minister, Vladimir Putin and the Ukrainian Prime Minister, Yulia Tymoshenko, reached an agreement which was to last for a decade (Pirani, Stern, & Yafimava, 2009, p. 26). The duration of the agreement was not unanticipated given the significant position that Russia holds in the market: it has the largest natural gas reserves in the world and it is the 2nd largest natural gas producer following the US, as presented in Chapter II. Given its significant position, Moscow is wide aware that natural gas is a natural resource and a commodity that contributes to its budget in a significant way (Blazev, 2015, pp. 227, 266).

2011 – 2014

A few years later (in 2011), according to Kommersant, Ukraine received an invitation – deal proposal from Russia to participate in a Customs Union and it would enjoy a remarkable reduction concerning natural gas prices in return [cited in (Tsygankov, 2015, p. 6)].[37] Nevertheless, Ukraine's President Yanukovych responded in a negative way and the reason lying under that was Kiev's desire for a special relationship with the Customs Union so that it

[37] As Tsygankov (2015, p. 6) advocates, this was an action expressing the broader Russian attempts for a closer relationship with its neighbors and also an effort to secure the continuation of the Russian economic influence over Ukraine.

could maintain the path towards its European Union integration (Tsygankov, 2015, p. 6)[38]. But Putin wanted to change that, so in October – December 2013, not only did he offer a new discount in energy prices but he moved a step further by offering financial aid amounting to $15 billion (Tsygankov, 2015, p. 6). Consequently, the Association Agreement between Ukraine and the EU was postponed at the Vilnius summit in November 2013 (Spiegel Staff, 2013). However, this decision proved to be rather unwelcome among the Ukrainian people (BBC News, 2013).

These political developments ignited severe dissatisfaction by the people, who were already rather unhappy with the country's performance on both the political and the economic field and such strong people's feelings led to great protests across the country (BBC News, 2013; Tsygankov, 2015, p. 7; Stulberg, 2015, p. 112; Council on Foreign Relations, n.d.). As a result, violence spread and the country disintegrated since President Yanukovych did not secure law and order nor did he apply any of the proposals made by the opposition, which was strongly advocating against his domestic policy and in favor of the country's path towards the European Union (Tsygankov, 2015, p. 7; Council on Foreign Relations). Meanwhile, Germany, France and Poland made an attempt to bring both the Ukrainian President and the opposition to a compromise and while they initially managed to do it, in February 2014, it turned out that it could not stabilize the situation and subsequently, it collapsed (Tsygankov, 2015, p. 7). At that moment, the Ukrainian President left office and fled to Russia (Council on Foreign Relations).

During this turbulent period, forces attached to Russia mixed with Russian soldiers in uniforms that did not carry the identifying insignia[39], take control of the Crimean peninsula, whose population is mainly ethnically Russian, whose position on the Black Sea entitles it to large reserves of oil and natural gas and easier access to the Aegean and the Mediterranean Seas and whose Sevastopol harbor already hosts the Russian Black Sea Fleet (Council on Foreign Relations; Klare, 2014; Wiener-Bronner, 2014; Umbach, 2014; Broad, 2014; Cohen, 2019). Following this incident, the local authorities hold a controversial referendum[40] concerning Crimea's status and whether it would become independent of Ukraine and join

[38] BBC (2013) reports that Putin and Yanukovych denied having discussed the prospective participation of Ukraine into a Russian-led Customs Union.

[39] The notoriously famous "little green men".

[40] Brussels described the referendum as "illegal and illegitimate" and the US stated that "it will never be accepted" (Council on Foreign Relations).

Russia and the result was in favor of secession (Council on Foreign Relations). Taking advantage of that, Russia took control of Crimea in two steps: first, by recognizing the Crimean independence in the aftermath of the referendum and then, by annexing it to the Russian Federation in March 2014 (Tsygankov, 2015, p. 7; Stulberg, 2015, p. 112; Council on Foreign Relations). Adding to that, Russia took more action by demanding that the Russian-speaking population in Ukraine should be protected and for that reason it gathered around 30,000 troops on the Ukrainian border; and it also withdrew the energy discount and the assistance it had offered Ukraine – two actions that led to the deterioration of Kiev's already rather gloomy economic situation, since it was not able to pay the large debt it had towards Gazprom (Tsygankov, 2015, p. 7; Stulberg, 2015, p. 112; Council on Foreign Relations).

In the light of these developments, with turmoil in Ukraine at its highest, the US, the EU, Canada and other Western states decided to impose strict economic sanctions against Russia in July 2014 (Borger, Lewis, & Mason, 2014; Council on Foreign Relations). In response to such a move, Russia also proceeded with imposing sanctions on the food imports from the West (Christie, 2015) causing the political temperature to rise and making the political situation even more tense.

However, it is worth mentioning here that although both parties were getting prepared to become engaged in an energy war, no such war broke out, thanks to the October 2014 temporary deal between Kiev and Moscow that served as a bridge between the two, preventing such a conflict and at the same time making sure that a) the Ukrainian debt would be settled, b) the Russian gas would be safely transferred during the following winter and c) Kiev would enjoy temporary discounts on energy and '*advanced payments of transit fees through 2015'* (Stulberg, 2015, pp. 112-113). Stulberg (2015) further points out that there was no action taken by either state actors (Ukraine) or non-state actors that would prevent normal Russian gas transition through the Ukrainian territory (p. 113) and he also analyses thoroughly the *restraint* revealed by the actors' behavior at the time[41].

[41] The author also mentions that, "*Ironically, the parties not only avoided uncontrolled energy brinkmanship that marred earlier stand-offs, but deepened mutual energy ties as the crisis unfolded from fall 2013 through spring 2014.*" (p. 113).

Analysis, Application of Theory and Conclusion: Securitizing Natural Gas?

On January 15, 2009, during a meeting with ENI's Chief Executive Officer Paolo Scaroni, Alexey Miller, Chairman of the Company's Management Committee of Gazprom, spoke of *"conditions of crisis in gas transit through Ukraine"* and *"the current critical situation in the relations with Ukraine"* which urges that *"high priority should be given to the diversification of the gas export routes, particularly to the implementation of the South Stream project, which would enable to directly link Russia and Europe and to reinforce the energy security of the continent"* (Gazprom, 2009).

Meanwhile, on December 13, 2010, the then President of the Russian Federation, Dmitry Medvedev, asked the government to draft an *Energy Security Doctrine* and set the priorities that needed to be included and addressed. As we can read on the website of the President of Russia, "*Mr Medvedev stressed that energy security is an essential condition for Russia's sovereign development and has a direct impact on the country's ability to achieve its social and economic goals, stay competitive on global markets, and increase its global standing"* (The Kremlin, 2010). He said,

> *"One of the items on our agenda today is a key issue in the economic sphere and one we return to on a regular basis: national energy security.*
>
> *Energy security in any state is a guarantee of the nation's sovereign development. The same is true for our country, even though we seem to have more energy resources than any other state. Energy security has a direct impact on the country's ability to achieve its social and economic goals, and stay competitive on global markets.*
>
> *Today the Russian fuel and energy sector amounts to about 12% of global supply of oil and coal, nearly 25% of global gas supply, and is the fourth largest producer of electricity in the world. These are very impressive figures.*
>
> *The energy sector's share of Russia's gross domestic product is above 30%. It is a guarantee of our development and at the same time a challenge to our progress.*

We realise that the situation in the energy market is unstable, as was proved once again by the events of late 2008 and early 2009, that it often changes and not necessarily to the benefit of energy-producing states, such as Russia. Incidentally, this is caused not only by sharp fluctuations in oil prices, especially during the crisis, but also by a growing shortage of energy resources.

[…]

Once again I would like to emphasise that energy security for us does not just mean compliance with relevant standards but is a way to achieve critical social goals and to address the tasks facing our state: it means heating and electricity in homes, schools and hospitals, and a better life in our communities. It is these issues we must focus on." (The Kremlin, 2010)

To sum up the Russian President's statements, he linked energy security with a 'nation's sovereign development' and with a state's ability to achieve its goals on a social and an economic level. He also recognized the lack of stability in the energy market, using as examples the incidents in 2008 and 2009 and he attributed this instability to the fluctuations in oil prices as well as to the shortage of energy resources.

Bearing all these events and statements in mind, it is time to apply our theoretical tools – energy security and securitization – to the case study, to check if and how natural gas has been securitized. We will apply the theoretical framework on the three main players, namely Russia, Ukraine and Gazprom, as well as on the EU since it was the actor most directly affected by the events, after Ukraine. However, our focus will be on the state actors because a) they were directly involved whereas the EU was not and b) Gazprom's interests most of the times identify with Russia's due to the high link between the company and the state.

From an energy security point of view, for Russia, energy security – an issue of central importance to its leadership as presented in the National Security Strategy to 2020 (Dimitrakopoulou & Liaropoulos, 2010, p. 39) – can be defined as both security of supply and as security of demand, since it is a state that both consumes large amounts of energy and at the same time it is the 2nd largest natural gas producer in the world. However, the stress should be put on the second dimension because security of demand is what contributes to the country's exports revenue and GDP. Furthermore, in order to transport its gas quantities and address the market's demand, it needs safe routes for the pipelines, which implies that

they must traverse transit countries that both the producer (Russia) and the consumer (in this case: the EU) perceive as trustworthy. After all, it is a fact that natural gas is traded through pipelines to a large extent, which can raise concerns concerning the transit states and whether they will take advantage of their geopolitically significant position in order to cause problems between exporters and importers (Τσακίρης, 2018, p. 521).

Indeed, if the transit state is not trustworthy, then the danger looming is that the producer might appear untrustworthy, too, in which case its reputation as a supplier can be ruined. Of course, the opposite case can happen, too; for example, if the producer does not honor its contract, the transit state might be accused of unreliability too. So, Russia faced a situation of insecurity, because of the fact that Ukraine allegedly kept transit gas quantities for itself, which would damage Russia's reputation as a reliable supplier to the European market and there was also a threat towards its economy, which is heavily based on natural gas exports.

At the same time, it becomes more than obvious that producers, transit states as well consumers are all interlinked and interdependent. They are bind together in a relationship in which each of the actors is heavily dependent on the behavior of the other two actors or at least one of them. Such high level of reliance dictates the diversification of the suppliers and the transits as well, in other words the diversification of the supply routes as a whole.

We should not forget though the strategy Moscow followed with regards to oil and we should draw a useful comparison in relation to gas. As Tsakiris (2018, p. 525) aptly notices, during the 1990's Russia did not pursue to prevent Azerbaijan and Kazakhstan from exporting oil towards Europe but it rather opted for controlling the relevant routes in order to gain on a political, diplomatic, military and (geo)strategic level. He further notices that it was the same concept that was applied during the suspension of gas exports during 1993-1994, 2006 and 2006 despite the fact that until 2011, when Nord Stream 1 became a reality, Russia's 80% of its global natural gas exports was transiting Ukraine (Τσακίρης, 2018, p. 525). Therefore, it becomes obvious that Russia values its geostrategic aspirations and its influence on its Near Abroad more than the possible economic loss that follows gas exports suspension. Adding to that view, Pirani suggests that the 2006 gas crisis due to Russia's desire for a price rise was in fact politically motivated because it was the culmination of the tense that already existed between Kiev and Moscow since the Orange Revolution in 2004 (2007, pp. 9, 101). The researcher further notes that,

> *"Moscow sought to reduce its dependence on Ukraine and other former Soviet states for gas transit to Europe, and to raise import prices, while giving away as little as possible on transit and storage fees. It also sought, using the price negotiations as a lever, to gain control of transit infrastructure. […] For several years before January 2006 in Putin's Russia, the ground was being prepared in gas sector policy for the conflict that erupted. […] …no progress was made in reducing Ukraine's dependence on cheap imported gas."* (Pirani, 2007, p. 99)

From a Ukrainian point of view, energy security is defined mainly as security of supplies. This means that it seeks uninterrupted availability of energy resources and accessibility to them at an affordable price. In the case described above, Ukraine had to face a situation of energy insecurity at all levels, since the supplies towards it were interrupted, thus they became unavailable and inaccessible and Gazprom pushed for a price rise, which implies that the natural gas flows for Ukraine would become unaffordable, given the already huge debt it had. On the security of demand field though, it faced a case of insecurity because the halt of the gas exports by Gazprom would also signify a halt to the transit gas destined for Europe, something that would harm Ukraine's reputation as a transit state within the European circles.

Furthermore, the annexation of Crimea by the Russian Federation in 2014 had a strong impact on the Ukrainian reserves. As First Vice Prime Minister – Economic Development and Trade Minister of Ukraine, Stepan Kubiv said during a Cabinet meeting,

> *"Ukraine has lost 80% of oil and gas deposits in the Black Sea and a significant part of the port infrastructure due to the annexation of Crimea. The negative impact caused by the loss of ports is now being aggravated by Russia's obstruction of the vessels in the Sea of Azov and the Black Sea. Up to now, 115 out of 150 coal mines are located in the temporarily occupied territories. The defense industry suffered nearly the biggest losses. We lost 13 state-owned enterprises in the annexed Crimea and ten enterprises in the temporarily occupied areas of Donetsk and Luhansk regions"* (UKRINFORM, 2019)

This implies that Ukraine's security of supplies challenge becomes stronger while at the same time Russia's oil and gas reserves have increased. It is a zero-sum game since one part loses what the other one wins. Still, it shows the great importance of oil and gas reserves for both countries.

With regards to Gazprom, it had to face a security of supply case. The reason is that during the events described above, there were times when it could not access the supplies stored in the Ukrainian territory to provide them to its customers. Adding to that there were also times when the quantities expected to reach the European markets did not actually reach their destination due to the fact that, most probably, Ukraine extracted them in order to make up for its own supplies that had been halted. Therefore, even this giant company faced a situation of unavailability of supplies and inaccessibility to them, showing that the concept of energy security can apply not only to states but also other actors, such as companies.

With regards to the EU, it certainly had to face a serious insecurity of supplies (supply shock) which became threatening to the EU's industry and economy and to the citizens' lives, too. The natural gas halt and the annexation of Crimea in 2006, 2009 and 2011 – 2014 revealed the unpredictable behavior of Europe's largest supplier (Jürgens, 2019, p. 14). It was a 'wake-up call' for the EU to take action in the field of diversification of suppliers in order to lower its dependence on the Russian supplies[42] and decrease its vulnerability stemming from its energy relationship with Moscow (Commission of the European Communities, 2009).

From a securitization perspective, in the case of Russia, as we said earlier, hydrocarbons exports account for almost a quarter of its GPD. In other words, nearly a quarter of its economy is based on hydrocarbons which also contain natural gas. This shows that one of the main economic pillars supporting the country's existence is natural gas. What is more, we should always remember that economy and politics are the two sides of the same coin, constantly transforming into each other, so every conflict always has two sides: the political one and the economic one (Πλατιάς, 2012, p. 598). Given that the elements a state consists of are always securitized, we can assume that energy/ hydrocarbons/ natural gas are securitized by default. Moving a step further, we can argue that this principle applies to all states and not just to them; it applies to all the actors of the international system. Supporting this argument is the fact that since ancient times, any actor, state and non-state ones, needs energy to move, trade and fuel their activities. This means that *"The need for drama in establishing securitization falls away, because it is implicitly assumed that when we talk of this issue we are by definition in the area of urgency"* (Buzan, Waever, & de Wilde, Security: A New Framework of Analysis, 1998, p. 28).

[42] For more information on the EU's dependence on energy imports, especially from Russia, see (Panagopoulou G. , 2020, pp. 242, 253).

This is also exactly what President Medvedev said during his 2010 statement, that energy security can guarantee a nation's sovereign development. Additionally, the fact that he asked the government to prepare an Energy Security Doctrine stresses even more the significance that the Russians give to energy security and natural gas as well. Such moves (securitizing moves) clearly declare that it is included in their national interests, meaning that any threat or attack towards that interest (referent object) equals to an existential threat and therefore it must be tackled. Since energy is among the country's national interests, natural gas as an energy source has been securitized because its lack or even absence poses a threat to the Russian sovereignty. It was in this context that they halted the gas supplies towards Ukraine. They wanted to protect their economy from losing more income, given that Ukraine had already accumulated a large debt towards Gazprom. With regards to Gazprom, as a company, it also wanted to protect itself given that companies need to make profit from transactions in order to continue them; however, the transaction with Ukraine had had tremendous damage and loss. Adding to that, the 2009 accusations of gas stealing (energy theft) made by both the company and the government, further increased the level of securitization of the natural gas. This was also illustrated in the words of Gazprom's CEO, Alexey Miller, that the situation with Ukraine was critical and that there were conditions of crisis. Taking into account Russia's need for reserves in order to maintain its position in the energy market, especially in the European one, it is no surprise that Russia proceeded with the annexation of the oil and gas rich Crimea back in 2014. That was a move that gave it access to more reserves and it could also have served as an answer to the concern over possible future shortfalls in its supplies due to *"under-investment in the exploration and development of new oil and gas fields and by a potential redirection of energy flows away from Europe"* (Perovic, 2009, p. 3). Combined with Crimea's strategic position in the Black Sea and the presence of the Black Sea Fleet in the port of Sevastopol, Crimea gives Russia opportunities to transport the gas from the new reserves more easily, to have easier and better access to the sea routes towards the Mediterranean and to develop the LNG part of the natural gas market and trade. In addition, that was a move planned to make Ukraine even more reliable on the Russian supplies as it was deprived of 80% of its Black Sea reserves. Therefore, Russia secures further demand for its natural gas and lowers the level of the existential threat towards its exports.

Regarding Ukraine, it is one more example of a country that has securitized energy, for example, through its Energy Strategy. Therefore, natural gas has also been securitized. This is also illustrated by the fact that during the 2006 crisis *"the de-linking of transit tariffs and gas prices, led to accusations of the national interest being sacrificed"* among the people

(Pirani, 2007, p. 101). Furthermore, in 2009, after Russia ordered to halt transit gas supplies amidst allegations that Kiev had been stealing it, Ukraine answered that such actions seemed as if it were blackmailed to accept Gazprom's unreasonably high prices for the gas it sold to Ukraine (Reuters, 2009). This kind of behavior was perceived by Kiev as an existential threat towards its gas supplies, its economy and its domestic market, so this justified any extracting of transit gas from the pipelines in order to use it domestically and cover the people's needs. This means that Ukraine experienced an existential threat, as well as its realization, towards its natural gas supplies, which are the referent object. Therefore, it had to take emergency measures to protect the natural gas supplies needed for the existence of its people and industry.

With regards to Gazprom, as any company seeking to maximize its profit, it wanted to secure that it is being paid. Therefore, it had to securitize natural gas (referent object), so that it would be entitled to move on to any urgent measures, such as halting natural gas exports. Securitization of natural gas took place through the statements of the company's CEO, who spoke about *crisis* and a *critical situation*, as well as through the state's statements, given the strong relationship between the company and the Kremlin. The company presented the extracting of transit gas from the pipelines by Kiev as an act of theft, meaning that the supplies the company provided were under attack (existential threat) and therefore, had to be protected.

Finally, concerning the EU, it started securitizing energy by discussing the energy security issue (referent object) more and more after these events, trying to find a solution that fits all interested parts. For the EU, the unexpected interruptions in the gas supplies implied a serious energy (existential) threat to its industries, to the markets' of the member – states and to its citizens as well. However, given Europe's tradition to move forward after big crises, it was this energy crisis that gave it the necessary boost towards forming the Energy Union (European Commission, 2017).

To conclude, the (regional) security complex formed by Russia, Ukraine and the EU concerning the energy sector have brought certain issues to the forefront.

First of all, there is the significant umbrella – matter of the energy security (or natural gas security) which takes different forms for different actors. For Ukraine as well as for the EU, it is a matter of security of supplies, whereas on the Russian side, this is transcribed as security of demand and also as security of stored gas supplies in the transit country's territory. The

second issue that arose was the diversification of the energy providers for both Ukraine and the EU, because both are rather dependent on the Russian gas to address their energy needs (Tziampiris, 2015, p. 13). From a Russian perspective, this is transliterated as diversification of transit routes. Nevertheless, the same issue affects the EU as well and that is why several different projects have been discussed and developed since then in order to bypass the Ukrainian territory. Thirdly, the price of natural gas (as well as the transit fees) proved rather significant as a factor determining not only the quantities supplied, but also the security (read: availability) of them. Furthermore, it became clear that Russia, Ukraine and the EU are highly interdependent, which signifies that they are also highly vulnerable under certain circumstances. For example, Ukraine and the EU were highly vulnerable with regards to Russian natural gas supplies, while Russia was highly vulnerable with regards to natural gas transit routes and reaching its customers and also with regards to the income from gas exports, which contributes to the GDP at a significant level. What is more, it seems that international organizations did not play any significant role in the dispute.

In addition to this, there has been clear evidence that Russia is still interested in its 'Near Abroad' (NA) area and it desires to exercise influence at least over the former Soviet states and be respected as a major player. To achieve this, it seems that it securitizes and uses its advantageous position in the energy field to exercise influence over other states and even annex new territories. It is for that reason that Cohen (2009, p. 91) argues that Russia "*has already proved that it is willing to […] use energy as a foreign policy tool."* This perception has further increased suspicion and lack of trust among the parties involved.

Finally, the overtaking of Crimea was the outcome of Russia's desire to keep Ukraine out of the Western institutions, in its sphere of influence, confirming its status as a former imperial power, as one of the two powers of the bipolar system and as a post-Cold War great power. However, given the gas deposits in the Crimean peninsula and offshore it, it can be concluded that Moscow's ultimate purpose was to gain control over these resources, not only to feed itself, but also a) to enrich its available supplies for its customers and further secure an enduring demand, b) to be able to control critical sea routes, c) to extend its already existing borders with the EU and be closer to the Middle East and d) to have better access as far as LNG is concerned.

Given the concerns and issues raised by the events presented and analyzed in our first natural gas case study, everybody welcomed the discovery of natural gas reserves in the Eastern Mediterranean back in 2009 – 2010. This is exactly the topic we will get engaged with in our second case study that follows promptly.

3.2 The Case of the Eastern Mediterranean (Israel-Cyprus-Greece and Turkey)

Introduction

In this section we will present the case study of the Eastern Mediterranean, specifically covering key events during the period 2009 – 2011, when the discoveries of natural gas by Israel and Cyprus took place, triggering their collaboration with Greece on energy matters as well as Turkey's reaction. After presenting the crucial energy events of this period, we will apply the theoretical framework and make interpretations of the actors' behavior.

The Events

Israel. A state that has historically been *'energy-poor'*, addressing its energy needs almost entirely through imports of fossil fuels, is in fact *'an isolated energy island'* since it has no connections to energy grids of neighboring states (apart from the gas pipeline from Egypt), meaning that it faces a real challenge to address the demand every time a usage spike or other emergency (or conflict) situations arise (Shaffer, 2011, p. 5379; Michaels & Tal, 2015, p. 482). Just a couple of years before the first decade of the millennium was over, Israel started importing gas from Egypt through the El Arish-Ashkelon pipeline, although there was apprehension with regards to the pipeline's security (Michaels & Tal, 2015, p. 482). This apprehension was not without ground though, given that the Israeli state had to be dependent on Arab states energywise (Cohen E. , 2018, p. 139) but the bilateral relations with them were rather hostile and certainly far from friendly[43]. In the aftermath of the Arab Spring, the pipeline suffered sabotage several times until March 2012, when the bilateral agreement between the two countries was terminated by Egypt, leaving consumer prices in Israel rising

[43] While these lines are being written, a historical moment is taking place. Israel and the United Arab Emirates (UAE) signed "The Abraham Accords" on August 13, 2020, signifying a significant attempt to normalize and improve the Arab-Israeli relations (Kalman, 2020; Collins, 2020; Waxman, 2020).

and forcing the country to increase gas extraction from the reserves of Yam Tethys[44], which were already diminishing (Michaels & Tal, 2015, p. 482). That is the reason why the 2009 and 2010 gas reserves discovery – Tamar, Dalit and Leviathan fields, 318, 14 and 605 Bcm respectively (Shaffer, 2011, pp. 5380-5381; Delek Drilling) – in the Israeli Exclusive Economic Zone (EEZ) near the port city of Haifa and the city of Hadera was big news for the state, which now had the opportunity to move towards its energy independence and become a gas exporter state (Michaels & Tal, 2015, p. 482; Siddig & Grethe, 2014, p. 312)[45]. As Cohen puts it,

> *"Israel's transformation into an independent producer of natural gas will enable it to reduce or even forego its dependency on foreign countries for its energy needs, and at the same time create and preserve dependency by foreign countries on Israel as a direct and exclusive supplier of natural gas or as an attractive alternative to their current gas suppliers."* (Cohen E. , 2018, p. 141)

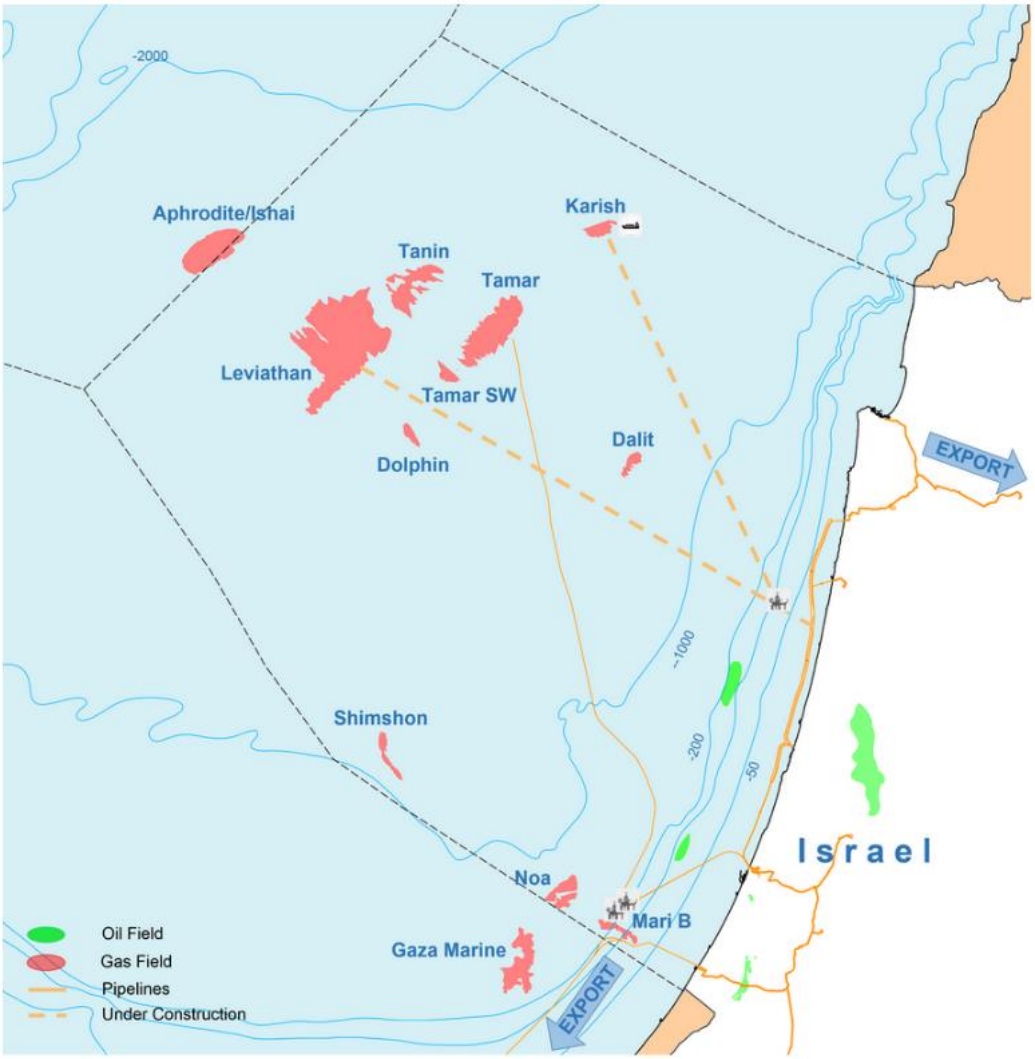
Furthermore, the gas reserves in the Aphrodite gas field, that were also discovered in the EEZ of the Republic of Cyprus (ROC) by Noble Energy in December 2011, according to the timeline of Aydıntaşbaş et al. (2020), triggered a domino of collaboration as well as disagreements in the region, mainly among Israel, Greece, Cyprus, Egypt and Turkey. To illustrate that, it is a fact that Israel considered Greece *"a potential European center from which Israeli gas can be conveyed to various countries in the region, and it is already possible to identify progress in its relationship with this country"* (Cohen E. , 2018). It is true that a very promising cooperative relationship was developed between the two countries and initiative for cooperation was taken in various fields, including the military (Tziampiris, 2015)[46]. With regards to Cyprus, it started being an important partner for Israel on an economic as well as on a political level, although this partnership could affect the Israeli-Turkish relations due to the still unsolved Cyprus Question (Cohen E. , 2018, p. 141).

[44] Yam Tethys is an umbrella name for the fields Noa and Mari-B, which were discovered in 1999 (Shaffer, 2011, p. 5380).

[45] Nowadays, in 2020, Israel exports gas from the Leviathan field to Egypt; the exports started on January 15, 2020 (Delek Drilling, 2020).

[46] For the emergence of the cooperation between Greece and Israel, see (Tziampiris, 2015) where he gives a very insightful and eloquent description and analysis concerning the bilateral relations.

Map 7: **Hydrocarbon reserves in the Israeli EEZ (oil and gas)**

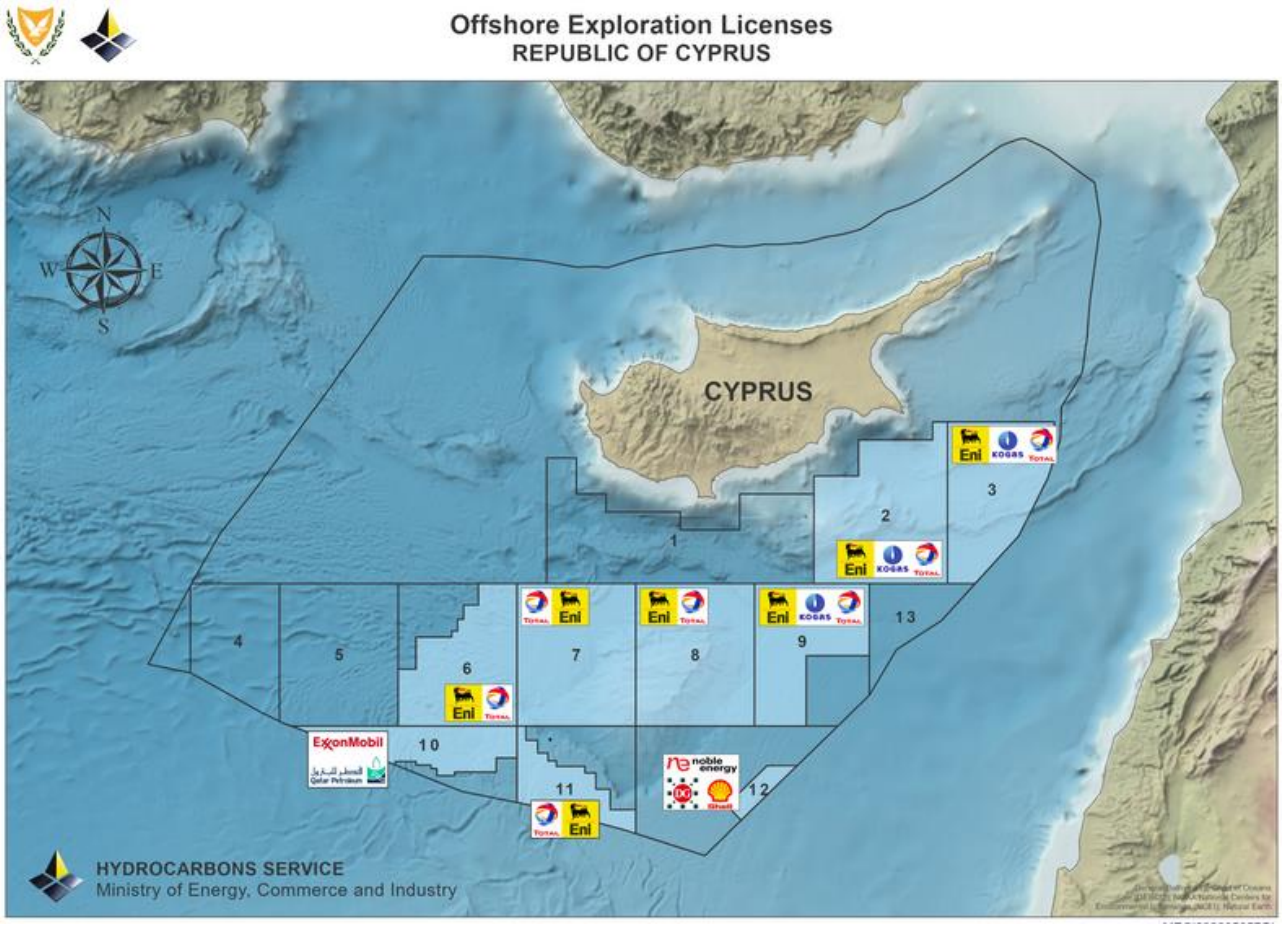


Source: (Ministry of Energy)

Cyprus' efforts to discover natural gas in its EEZ can be traced back to 2006. In this framework, it proceeded with delimitating its maritime borders with Egypt, Lebanon and Israel (in 2010); it designated 13 separate Blocks (see Map 8) for exploration and production into its EEZ, it also auctioned drilling rights and that is how an American company based in Houston, Texas, Noble Energy, obtained the rights to drill in Block 12, proven to be a rather lucrative one, which was later called 'Aphrodite' (Tziampiris, 2015, pp. 14, 139-140; Gordon, 2011). An energy development agreement between Nicosia and Noble Energy was signed on November 2, 2011 and it was also announced that an LNG facility was to be built in Vasiliko in order to connect Israel's Leviathan-stemming gas (Gordon, 2011). Block 12's reserves were said to be capable of addressing Cyprus' energy needs for a century if not for even longer. However, when Nicosia was about to start drilling in 2011, Ankara expressed its objections to

such actions claiming that they are against the interests of the Turkish-Cypriots and that they are a violation of the international law (Republic of Turkey: Ministry of Foreign Affairs, 2011).

Map 8: The hydrocarbons' lots in the Cypriot EEZ and the companies that have gained the exploration licenses



Source: (Hydrocarbons Service - Ministry of Energy, Commerce and Industry)

Russia and the US were supportive of Cyprus' efforts, as was Israel, which developed close cooperation with Nicosia on energy matters as far as the exploitation of the resources was concerned – a scheme that would most likely include Greece for that matter (Tziampiris, 2015, pp. 14, 145).

Greece became part of the energy equation as well, forming *"an "energy triangle" between Athens, Jerusalem, and Nicosia"* and taking part in the discussions regarding the construction of a) an electricity cable that would link the three countries and b) a natural gas pipeline that would provide Europe with energy it so much needs (Tziampiris, 2015, p. 14) from a source

that would be rather welcome given its non-Russian origin (Luft, 2010). According to Tziampiris (2015), who conducted several interviews with decision makers and people serving at 'key' positions at the time, the energy affair was also a really strong factor that made relations between Greece and Israel become closer (Tziampiris, 2015, p. 142). Furthermore, the fact that *"the Greek government is convinced that Western Greece holds as much as 4.7 trillion cubic meters of natural gas"* (Tziampiris, 2015, p. 139) made the prospects of the energy cooperation seem even more beneficial for all the parties involved.

As far as Turkey is concerned, it showed (and is still showing) a really big interest in the natural gas discoveries in the region, since it is rather dependent on Iranian and Russian gas imports to cover its needs (Cohen E. , 2018, p. 141). This interest is illustrated by the following actions of Ankara – for example, on September 9, 2011, the Turkish Prime Minister was reported saying that *"Turkey will be firm in exercising its right of controlling the territorial waters in the Eastern Mediterranean and it has taken measures to prevent Israel from unilaterally exploiting the natural resources of this area"*[47] (Πολλάτος, 2011). On top of that, later in September 2011, it was reported that the Turkish exploratory vessel, Piri Reis, was heading towards Block 12 of the Cypriot EEZ (Chasapopoulos, 2011). After that, in November 2011, the Turkish Minister of Energy at the time, Taner Yıldız, characterized the Israeli-Cypriot energy exploration in the Mediterranean as illegal, adding that *"agreement should first be reached with all relevant parties, and resources should be equally shared"* (Gordon, 2011). Furthermore, in December 2011, the Turkish Minister of Energy at the time, announced that within two-months time his country was about to start exploration in the region near Famagusta in cooperation with Shell and one more company that would join later (Το Βήμα, 2011; Sigmalive/ΚΥΠΕ, 2011).

Analysis – Application of Theory and Conclusion: Securitizing Natural Gas in the Eastern Mediterranean?

All the events speak for themselves. It becomes evident that natural gas was (and is still) securitized in the Eastern Mediterranean. Israel, Cyprus and Turkey were the most active in making securitizing moves through which the referent object, natural gas, was securitized.

[47] Original source in Greek; translated in English by the author.

During the securitization process, they presented any moves regarding this matter taken by the other side as existential threats aiming to compromise their energy security.

From an energy security perspective, it becomes obvious that Israel's top goal has been to guarantee its natural gas security of supplies. In order to achieve this, it wanted to become less dependent on gas imports, which were of Arab origin, thus not very trustworthy from the Israeli state's point of view, due to the hostile bilateral relations. To that end, it attempted to diversify its resources by having its EEZ explored for gas and oil. The hydrocarbons discovered in its EEZ have given it a sense of security concerning energy and they have also provided the country with the advantage of the natural gas exporter.

Energy security for the state of Israel is really important. Its energy policies are considered issues of national security (Shaffer, 2011, p. 5380). This means that Israel has securitized energy affairs and made it one of the state's top priorities. The Prime Minister's Office, the Ministry of Foreign Affairs, the National Security Council, the Ministry of Finance, the National Economic Council and the Ministry of National infrastructures are all state institutions of Israel that play important roles in shaping its energy policy (Shaffer, 2011, p. 5380). Furthermore, it regards its energy consumption data as classified, so it releases the relevant statistics after four years and it never discloses information considering its strategic reserves (Shaffer, 2011, p. 5380)[48]. This shows clearly that the threat towards energy is perceived as *"persistent or recurrent"*, which explains why *"the response and sense of urgency* [have] *become institutionalized"* (Buzan, Waever, & de Wilde, Security: A New Framework of Analysis, 1998, p. 27). This should not be unexpected though. Energy security for Israel is not just the lack of resources and the absence of connection to neighboring states' grids. It is also the efficiency of energy supplies for the army, especially during conflict, as well as the security and the protection of the energy infrastructure itself from any possible attack, coming either from state or non-state actors (Shaffer, 2011, p. 5379).

The reserves discovered in 2009 and 2010 gave the state of Israel the advantage of increasing its level of energy security and at the same time, *"Israel may advance technology in the sphere of energy infrastructure security that could contribute to global knowledge in this field and create a new technological niche for Israeli companies."* (Shaffer, 2011, p. 5385). However, upon the discovery of these reserves, there was heated debate on whether Israel

[48] Also, Israel uses huge amounts of energy for the desalination of the sea water coming from the Mediterranean, in order to meet its water needs. See (Shaffer, 2011, p. 5380).

should export gas to the region, advancing the economic and security relationships with the neighboring states, or whether it should keep some of the newly discovered gas as 'strategic reserves' to *"ensure energy security for many years"* (Cohen E. , 2018, pp. 138, 141).

The importance of energy resources for Israel is also clearly depicted in the following statement made in 2011 by President Shimon Peres during his visit in Cyprus. His words are yet another proof that natural gas, which is an energy resource, is included in the Israeli national interests, thus has been securitized:

> *"We waited for a long time to discover natural resources in the region," Peres told his host, "and now that natural gas has been discovered within the jurisdiction of both our countries, we will deal with the matter in accordance with international law, not taking anything that belongs to someone else, on the understanding that they will not take from us that which is ours."* (Cashman, 2011)

This is an example of a securitizing move made by the Israeli President. In this move he acts as a securitizing actor and through his securitization speech, he presents natural gas as something that is at stake, something that is threatened, something that someone else threatens to seize and for that reason it has to be protected. The existence of the Israeli natural gas, which has become the referent object, is presented to be in danger. The existential threat is anyone who aspires to seize it and take it away from the Israeli hands.

The Israeli President's words should not come as a surprise though. The uneven distribution of natural resources and especially energy resources around the globe has always been at the epicenter of the causes of conflict in international relations as already discussed in Chapter I. That explains why,

> *"The natural gas discoveries and planned exploration efforts in Cyprus and Lebanon have spurred a number of maritime border delimitation conflicts in the Eastern Mediterranean. The two most acute conflicts to emerge thus far are between Turkey and Cyprus and Israel and Lebanon. In light of the past militarization of these two conflicts, the emerging discrepancies on border delimitation could have negative consequences. In contrast, Israel and Cyprus*

quickly delimitated their maritime border, realizing the win-win potential for both states to discover more significant volumes." (Shaffer, 2011, p. 5385)

In the light of that, Turkey's actions showed that it was afraid that if Israel and Cyprus pursue their natural gas plans to transfer gas to Europe, it may lose the transit role it holds concerning the Russian gas (Deutsche Welle, 2012; Energia.gr, 2011). Therefore, it had to address its 'transit security'. To avert this possibility from materializing, it securitized natural gas in the Eastern Mediterranean, so that it would continue being an important transit state. Ankara's insecurity is also confirmed by the fact that in the aftermath of the incident with Mavi Marmara, when the Israeli – Turkish relations were aggravated and when the drilling offshore Cyprus started, Turkey claimed that the Republic of Cyprus did not have any rights to do so and it also implied that it would even employ its military forces to prevent energy – related actions from happening (Tziampiris, 2015, pp. 14, 144). According to the Press Release of the Turkish Ministry of Foreign Affairs issued on August 5, 2011,

"International law dictates that the delimitation of the continental shelf or the exclusive economic zone in the Eastern Mediterranean, which is indeed a semi-enclosed sea, should be effected between the relevant states in an equitable manner, taking into account the rights and interests of all parties.

Yet the Greek Cypriot Administration, contrary to international law and in violation of the rights of the third parties, carries on its attempts, since 2003, in concluding bilateral agreements, delimiting maritime jurisdiction zones with the neighbouring countries and in conducting oil/natural gas exploration activities in the Eastern Mediterranean.

These agreements and exploration activities of the Greek Cypriots negatively affect the settlement of the Cyprus question and lead to new conflicts among the countries in the region. Turkey's views and objections on this matter, as well as those of the Turkish Republic of Northern Cyprus have already been expressed to the countries in the region and registered with the United Nations in the past. In this respect, the countries and the companies having an interest in oil/natural gas exploration and exploitation in the south of the island of Cyprus based on invalid permits were called to act in a responsible manner.

We still maintain our stance and views regarding the issue.

In light of the recent news and official statements that offshore drilling activity in the south of the Island will start as of October 2011 it is deemed necessary to draw attention to some points once more:

The Greek Cypriot Administration does not represent in law or in fact the Turkish Cypriots and Cyprus as a whole. As such, the Greek Cypriot Administration is not entitled to unilaterally negotiate and conclude international agreements as well as adopt laws and conduct activities regarding the exploitation of natural resources on behalf of the entire island. These unlawful acts create tension in the region, compromise and prejudge the Turkish Cypriots' existing and inherent equal rights over the natural resources of the island and the sea areas of the Island of Cyprus as well as have a direct bearing on the ongoing settlement negotiations."
(Republic of Turkey: Ministry of Foreign Affairs, 2011)

This statement is an example of a securitizing move made by the Turkish Ministry of Foreign Affairs. The Ministry as a securitizing actor presented the natural gas as a referent object threatened by the actions taken by Cyprus concerning the natural gas exploration and drilling. The delimitation agreements signed by Nicosia and the exploitation of natural gas on behalf of the island as a whole are actions constituting an existential threat according to Ankara, which also raised legal issues. Furthermore, Turkey pointed out that such actions create tension; it implied that the rights of the Turkish Cypriots are threatened and it implied that the negotiation process was threatened as well. Reading between the lines used by Ankara, it is apparent that the term 'security' is implied. The word 'tension' implies that the stability and the state of security of the region are challenged; with regards to the Turkish Cypriots' rights, the connotation of the words 'compromise' and 'prejudge' is that these people's rights are not secure and need to be protected; and the phrase 'direct bearing', which is used to describe the impact on the negotiation process, again reveals Ankara's feeling of fear that the process is being challenged and is therefore not guaranteed and secured. Under the same scope it was that Turkey sent its vessel Piri Reis to conduct research in the Aphrodite lot of the Cypriot EEZ. Of course, this was an action that triggered Cyprus' severe protest (Chasapopoulos, 2011).

However, it is a fact that both President Peres and his Cypriot counterpart, Demetris Christofias, extended a hand of cooperation to Ankara – when the former visited Cyprus – expressing their willingness to cooperate with Turkey on natural gas *"exploration and projects"* provided that *"it act within the bounds of international law"*, as the Israeli President mentioned (Cashman, 2011).

As far as Cyprus is concerned, the following statement made by the President of the Cypriot Parliament, Yiannakis Omirou, in early 2012, reveals the importance of energy matters to the Republic of Cyprus.

> *"The President of the Cypriot Republic pointed out that with these discoveries the drastic geopolitical upgrade of the Republic of Cyprus is achieved, which, both on strategy as well as on an energy level, will reinforce Cyprus' struggle for liberty and justice. […] According to Sigma Live, Mr. Omirou highlighted that the energy sector constitutes a matter of utmost importance for Cyprus, since, as he explained, due to its geographical position and the challenges as far as its connection to the EU's and neighboring states' energy networks are concerned, the country is almost entirely reliant on energy imports for the purpose of electricity and transport."* (Institute of Energy for South-East Europe, 2012)[49]

The characterization of the energy sector as of 'utmost importance' signifies that energy is among the top priorities of the Cypriot state. Furthermore, the fact that it is 'almost entirely reliant on energy imports', indicates a red alert concerning its security of supplies and the need for divesification. It also implies that the state is vulnerable to any possible energy supply disruption that would leave it in a complete state of energy insecurity.

In addition, Mr. Omirou continued by adding that Turkey pursues co-sovereignty rights upon the natural gas reserves, in violation of the International Law and he pointed that such behavior *"destabilizes the region even more and constitutes a threat against the EU's energy security and interests"* (Institute of Energy for South-East Europe, 2012). Through his words, the President of the Cypriot Parliament does not only want to raise awareness on the EU's energy security; he also wants to illustrate that the situation and the incidents regarding Cyprus' energy security have a direct impact on the EU, too, since Cyprus is one of its member

[49] Original source in Greek translated by the author.

– states. Establishing this connection also allows him to speak of the EU's energy security while implying his country's energy security.

All this narrative aims at presenting energy, especially the newly – found natural gas, as one of the ROC's national interests being under threat. This suggests a securitizing move. What is more, he clearly makes a securitizing move when he refers to Ankara's behavior concerning natural gas as a region destabilizer and a threat against the EU's – and consequently Cyprus' – energy security. The President of the ROC's Parliament acted as a securitizing actor presenting natural gas as the referent object and Ankara's behavior as the existential threat against natural gas, which is able to lead to the referent object's annihilation from Nicosia's hands if let to act upon its will. This example of securitizing speech reinforces the argument that natural gas was securitized.

To conclude, in this Chapter we argued that natural gas has been securitized. In order to do that, we have used two case studies: a) the Russo-Ukrainian gas disputes of 2006, 2009 and 2014 and b) the case of the Eastern Mediterranean, namely the natural gas – related relations among Israel, Cyprus, Greece and Turkey. For each case study, we applied the theoretical tool of energy security and we also examined it under the scope of the theory of securitization.

What we have noticed is that almost all actors involved in the case studies have used an apt narrative in order to point at the issue of energy security and securitize natural gas, which is an energy resource. Furthermore, we have presented the great importance that energy security carries for all the actors of the cases, which also implies that the newly discovered gas reserves hold one of the top places in the states' priorities list.

Having discussed the natural gas case studies in Chapter III, we will now turn to the rare earths case study in Chapter IV and we will try to apply the same theoretical framework – energy security and securitization theory – to them although they are not an energy resource. What are the conclusions drawn from this application of theory? To find out, please follow our journey to the next chapter.

CHAPTER IV

RARE EARTHS CASE STUDY

"The only way you can avoid the rare earths is to grab your sleeping bag and go into the deep forests or caves in the desert far from civilization without your cell phone or even lighter flints (which are made of iron and cerium-rich rare earths)". (Gschneidner, 2011)

This Chapter has been dedicated to a rare earths case study under the prism of securitization and energy security. For that reason, in the first part of Chapter IV, I will present the events that took place in connection with the Senkaku/Diaoyu islands' conflict between China and Japan in 2010 and I will also illustrate the REEs' role in this conflict. After that, we will use extracts of documents and statements by the UK and the USA and the application of the theoretical framework will follow, namely the application of the securitization theory as well as the application of the theoretical tool of energy security. The application of the latter in such a case that is not directly related to energy will eloquently reveal that at the end of the day, we should not speak that much of an "energy security" theoretical tool but rather of a "supply chain security" or even better a "natural resources security" one.

4.1 The Case of the Senkaku/Diaoyu Islands and the Rare Earth Crisis[50]

Rare earths are widely used in the high – tech and defence industry (see Chapter II, 2.2, "In what kind of applications are they used?", p. 70). High – tech products are vital for the Japanese economy, which is highly specialized on them, especially since 1979 (Cheng, 2009, p. 57). However, the manufacturing process of these high – tech products requires[51] large quantities of rare earths whose production takes place largely in China (it was about 95% –

[50] A few parts in this section as well as Table 19 have been also used for (Panagopoulou, 2018, pp. 17-20) and have been adapted appropriately.

[51] See Table 1 in (Mazza, Blumenthal, & Schmitt, 2013, p. 5) for only some of the rare – earth using Japanese companies.

97% in 2010)[52] (Dadwal, 2011, p. 181) as already discussed in Chapter II). Therefore, it becomes obvious that Japan is highly dependent on the Chinese rare earth exports; for example, in 2008 it was dependent on the Chinese rare earths by 90,58% while in 2010 it was dependent by 81,61%. (Ting & Seaman, 2013, p. 244; Shen, 2014). Moreover, China is Japan's largest trading partner (BBC News, 2011).

The following table (Shen, 2014) depicts the extremely high level of Japanese dependence on Chinese rare earths. Despite the Japanese attempts for a gradual reduction of this rate, in 2014, Japan still remained dependent on China by approximately 60%. Today, only 53% of Japan's rare earth imports are of Chinese origin, whereas the US relies on Chinese imports of rare earths for over 90% (Funabashi, 2019).

Table 18: Japan's REEs Imports by country of origin, 2008 – 2014

Japan's Rare Earths Import Statistics (2008 - 2014)							
COUNTRY	QUANTITY (ton)						
	2008	2009	2010	2011	2012	2013	2014
CHINA	31,097	15,613	23,311	15,378	8,013	9,084	13,303
VIETNAM	0	334	605	1,282	1,451	2,122	2,758
KAZAKHSTAN	528	108	449	798	61	190	445
FRANCE	1,712	1,373	2,758	2,604	1,784	1,828	3,352
MALAYSIA					0	9	1,218
USA	63	220	454	1,107	242	13.9	14
ESTONIA				377	998.5	343	880
OTHERS	930	614	987	944	1,279	1,103	337
TOTAL	**34,330**	**18,262**	**28,564**	**22,490**	**13,829**	**14,693**	**22,307**
CHINA'S SHARE	**90.58%**	**85.49%**	**81.61%**	**68.37%**	**57.94%**	**61.83%**	**59.64%**
Source : Ministry of Finance Japan							

Source: (Shen, 2014)

[52] Today, in 2020, this percentage is a bit lower, around 85% – 90% but China still remains the number one producer of rare earths.

In 2007, the government in Beijing started setting export duties in order to have a better control over the range of rare earth products exported (Morrison & Tang, 2012, p. 16). It started by imposing a 10% in 2007 and moved to 15% – 25% in 2012 (Morrison & Tang, 2012, p. 16). Furthermore, in 2008 and 2009, Beijing started setting regulations over the rare earth industry in order to be able to control it more and that is why China's Ministry of Land and Resources (MLR) published the "Guidelines for Development of National Mineral Resources 2008 – 2015 directive in 2008, with which it declared Beijing's goal to protect and use rationally the country's natural resources for the stated period (Morrison & Tang, 2012, p. 12). After that, in 2009/2010, China decided to impose production and export quotas as well as export taxes, it also implemented environmental legislation, it did not grant any new licenses concerning rare earth mining and it announced that it would stop exports of rare earth finished products due to the fast – paced growth of its domestic market (Gschneidner, 2011). According to Mancheri (2015, p. 262), export restrictions seem to have been a way of a) securing adequate domestic supplies of resources and b) environmental protection for many countries including China.

As expected, this news caused great apprehension to markets, especially the high – tech ones which are more dependent on rare earths. *"This period, starting in 2009 and known as the "Rare Earth Crisis", made many people around the world aware of this peculiar group of elements."* (Voncken, 2016, p. 1; Bourzac, 2011).

The Incident at the Senkaku/Diaoyu Islands

In September 2010, amidst a situation resembling to a "global currency war", Beijing decided to disrupt rare earth exports towards Tokyo's high-tech industry, a move characterized as a "surprise attack[53]" by the Japanese Minister of State, Banri Kaieda (The Monitor's Editorial Board, 2010; Dickie, 2010), who also called upon China to *"stop this extremely abnormal action at the earliest possible time"* (Dickie, 2010). But it was not as simple. It seems that this halt of the exports towards Japan happened in the aftermath of an incident that occurred

[53] This is a phrase often referring to the bombing of Pearl Harbor in 1941 (The Monitor's Editorial Board, 2010).

between Beijing and Tokyo over the contested Senkaku/Diaoyu (or Diaoyu/Senkaku) Islands[54], the timeline of which has been created mainly drawing on information gathered by (Hagström, 2012) and (BBC News, 2011; Bradsher, 2010; Haruki, 2010; Amako, 2010) and we will present it in the next few paragraphs.

September 7, 2010: A Chinese trawler operating within the disputed area near the Senkaku/Diaoyu Islands was asked to leave by a Japanese Coastguard patrol vessel. However, not only did it not leave, but it also collided with the Coastguard patrol vessel and when it was asked to stop for inspection, the captain refused. During the chase that followed, the trawler collided with one more Japanese Coastguard patrol vessel (BBC News, 2011; Haruki, 2010) but finally, the Japanese authorities managed to arrest the captain (Amako, 2010) and the 14 crew members of the Chinese boat, who were accused of hindering the duties of the authorities and illegal fishing. The same evening, the Japanese Ministry of Foreign Affairs lodged a protest to the Chinese Ambassador and the following day, the Chinese captain was charged and put in custody, which was extended the day after. The Japanese authorities claimed to be acting according to their domestic law (Hagström, 2012, p. 272; Haruki, 2010).

September 8 – 19, 2010: The Japanese ambassador to China was called at least 6 times, even at 2 a.m., to receive Beijing's demand to release the captain and crew members immediately (Haruki, 2010) or it would proceed to unspecified actions (Bradsher, 2010). What is more, Beijing stated its *"historical claim"* regarding the islands while Tokyo repeated its argument that Japan exercises *"valid control"* on the islands, that these islands *"are the inherent territory of our country"* and that there is no territorial issue concerning the sovereignty of these islands. On September 13, the crew members were released and on September 19 it was decided that the captain would remain in custody for 10 more days (Hagström, 2012, p. 272; Haruki, 2010; Amako, 2010).

September 20, 2010: Four employees of a Japanese firm named Fujita Corporation, who were in China to prepare a bid for a WWII Japanese chemical weapons destruction site, were arrested by the Chinese authorities and accused of entering military zone unauthorized and videotaping military targets (Hagström, 2012, p. 274; Haruki, 2010; Amako, 2010).

[54] These islands, sometimes called "Pinnacle Islands" in the West, are claimed by Japan (calling them "Senkaku"), China (calling them "Diaoyu") and Taiwan (calling them "Diaoyutai"). At the moment, they are under Japanese control (Haruki, 2010).

September 21, 2010: The Chinese Premier Wen Jiabao stated that *"the Diaoyu Islands are part of China's sacred territory"* and the arrest of the captain was *"completely illegal and unjustifiable"* (Haruki, 2010).

September 22, 2010: During a UN conference in New York, the Chinese Premier Wen Jiabao refuses to meet his Japanese counterpart Prime Minister Kan (Hagström, 2012, p. 273).

September 23 – November 19, 2010: Chinese REEs exports to Japan are suspended (Hagström, 2012, p. 274; Bradsher, 2010; Haruki, 2010; Amako, 2010). However, a Chinese Commerce Ministry spokesman denied that Beijing had imposed any embargo on Tokyo (Bradsher, 2010; Hagström, 2012, p. 282; Bradsher, 2010).

September 24, 2010: The captain of the trawler was released earlier than what had initially been decided (Amako, 2010). The decision was justified by the Vice-Prosecutor as serving the future of Japan – China relations, taking into consideration the impact on the Japanese people and the fact that the investigation should not proceed while the captain was in custody (BBC News, 2011; Hagström, 2012, p. 273).

September 25, 2010: China, claiming that the captain's detention had been "illegal and invalid", (BBC News, 2011) demanded an apology and compensation from the Japanese part. However, Tokyo rejected it (Hagström, 2012, p. 273; Amako, 2010).

September 27, 2010: Japan demands an estimated ¥14,29 million for the damage caused to its patrol vessels (Hagström, 2012, p. 273).

September 30, 2010: Three of Fujita Corporation's employees are set free (Hagström, 2012, p. 274; Amako, 2010).

October 4, 2010: The Chinese Premier Wen Jiabao meets the Japanese Prime Minister Kan during an ASEM meeting in Brussels (Hagström, 2012, p. 274).

October 9, 2010: The fourth employee of Fujita Corporation is also released (Hagström, 2012, p. 274; Amako, 2010).

October 29, 2010: On the margins of an ASEAN+3 meeting, the Chinese Premier Wen Jiabao refuses again to meet his Japanese counterpart Prime Minister Kan (Hagström, 2012, pp. 273-274).

October 30, 2010: The Chinese Premier and the Japanese Prime Minister meet in Hanoi for about 10 minutes (Hagström, 2012, p. 274).

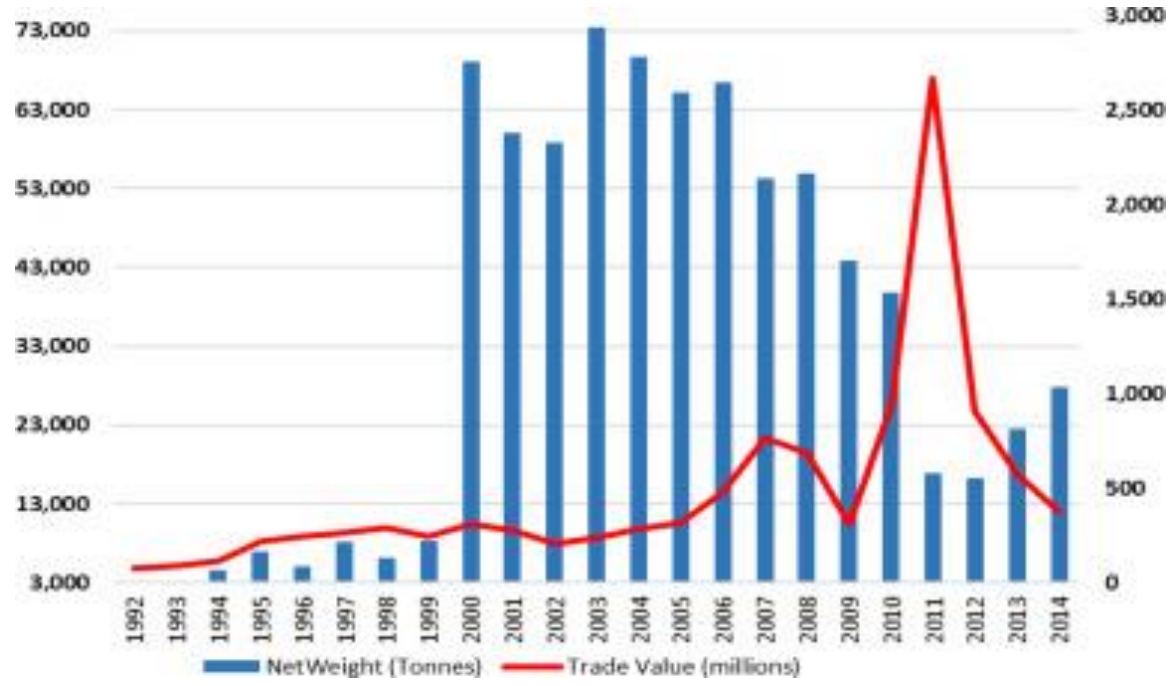
November 13, 2010: The Chinese President and the Japanese Prime Minister meet on the sidelines of an APEC summit (Hagström, 2012, p. 274).

21 January 2011: The BBC reports that the Japanese side is about to drop the allegations against the Chinese captain (BBC News, 2011; Hagström, 2012, p. 273).

As illustrated by the events, there was great tension between the two countries and talks were suspended on a wide range of issues; even contacts on a ministerial level were discontinued and public protests were witnessed in China as well as in Japan (Hagström, 2012, p. 274; BBC News, 2011; Amako, 2010)[55].

Focusing on the suspension of the REE exports, the rare earth market was affected inevitably, causing the prices of the rare earths oxides to soar (see Chapter II, Figure 25 "Development of Rare Earth Oxides prices, 2007 – 2014, p. 85) and the trade value as well (Dadwal, 2011, p. 182). The decrease in the Chinese REEs exports is clearly seen in the following figure (Figure 30).

Figure 30: China's REEs exports, 1992 – 2014



Source: (Mancheri, 2015, p. 265)

[55] For more details on the dispute see (Hagström, 2012; Haruki, 2010; Amako, 2010).

This measure put a lot of pressure on Japan. The impact of the suspending rare earth exports to Japan was choking for the Japanese economy and in the end, Tokyo could do nothing but accept and satisfy Beijing's demands so that the diplomatic dispute over the islands could be ended.[56]

Furthermore, there was a 'gap' left by China's move, so Japan needed to secure its vulnerable rare earths supply chain and it wanted to fill it in quickly (Humphries, 2013, p. 19).

Table 19: Agreements between Japanese companies and partners of non-Chinese origin

Japanese company	Partner	Purpose
Sumitomo Corp.	Kazakhstan National Mining Co. (Kazatomprom)	Light Rare Earths (LREEs) production
Toyota Tsusho and Sojitz	Dong Pao project (Vietnam)	Light Rare Earths (LREEs) production
JOGMEC	India	REEs exploration; establishment of processing facility
JOGMEC	Lynas Corporation (Australia)	JOGMEC seeking investments in the Australian company
Hitachi Metals		Plans to build rare earth permanent magnet facility in China Grove, NC
Note: Regarding the Japanese government: 1) Interest in investing in the USA (Sumitomo investment in Molycorp's Mountain Pass – deal not reached) 2) Reduction of exploration risk by joining potential mining projects globally as exploration partner 3) Increased R&D investments; finding substitutes for Heavy Rare Earths (HREEs) in magnets 5) Establishment of 'recycling-based society'		

Source: (Humphries, 2013, p. 19)

[56] The official Chinese position over the halt of the rare earth exports towards Japan is that this action was an effort to provide for the Chinese REE domestic demand and it is also pointed out that it had nothing to do with the dispute about the contested islands. See (Hagström, 2012, pp. 282, 284).

Moving towards that goal, both the Japanese government and Japan-based firms were in need of effective solutions; thus, many of them tried to secure their rare earths supply chain by concluding several agreements with non-Chinese partners as shown in Table 19 (Humphries, 2013, p. 19).

With regards to third countries, this 'export vacuum' did not go unnoticed, so India is reported to have concluded an agreement with Japan with the purpose of providing it with rare earths (Dadwal, 2011, p. 184). Adding to that, in mid-October 2010, as the New York Times reports, China *"halted some shipments of those materials to the United States and Europe, three industry officials said this week"* (Bradsher, 2010). What is more, the further reduction in rare earths export quotas that Beijing imposed in 2012 caused great concern to the U.S. as well as to the European Union (EU), both of which acted accordingly (Nekuda Malik, 2015, p. 207; Lele & Bhardwaj, 2014, p. 156).

As a result, in March 2012, the U.S., the EU and Japan filed a case to the Dispute Settlement Body (DSB) of the World Trade Organization (WTO), which was also supported by many other states such as Argentina, Australia, Brazil, Canada, Colombia, India, Indonesia, the Republic of Korea, Norway, Oman, Peru, the Russian Federation, the Kingdom of Saudi Arabia, Chinese Taipei, Turkey and Vietnam (Nekuda Malik, 2015, p. 207). However, as the New York Times reports, it was challenging to do so because:

> *"Any publication of government regulations or other official pronouncements barring exports would allow Japan to file an immediate complaint with the World Trade Organization, alleging a violation of free trade rules. But an administrative halt to exports, by preventing the loading of rare earths on ships bound for Japan, is much harder to challenge at the W.T.O."* (Bradsher, 2010)

Furthermore, the New York Times reports that:

> *"Industry executives and analysts have interpreted that official denial as a way to wield an undeclared trade weapon without creating a policy trail that could make it easier for other countries to bring a case against China at the World Trade Organization."* (Bradsher, 2010)

Adding to that, Mancheri (2015, p. 262) finds out that there is no article in the General Agreement on Tariffs and Trade (GATT) referring exclusively to and regulating export

restrictions but admits that Article XI of GATT is key on that topic[57]. The researcher also argues that what caused China to impose export restrictions on REEs may have been the rise of the world price and the amelioration of the trade terms as well as the lower price the REEs would have domestically both as an input for other industries and as a final product (Mancheri, 2015, pp. 262-263).

In August 2014, the WTO ruled that China should bring to an end exercising this policy and that the export quotas should return to their previous levels (Nekuda Malik, 2015, p. 207; Lele & Bhardwaj, 2014, p. 156). Then, in September 2014, Beijing announced that it would act accordingly and it has started doing so since early 2015 (Nekuda Malik, 2015, p. 207; Lele & Bhardwaj, 2014, p. 156).

It is worth mentioning here that meanwhile, the apprehension caused to many countries and actors by the halt of rare earth exports to Japan led them to take action in an attempt to combat the insecurity, the uncertainty and the fear ultimately that this measure taken by Beijing caused. Such actions involved mainly methods of diversification of supplies, such as initiating, reopening or developing new sources of supplies as well as launching or intensifying recycling programs aiming to retrieve rare earths from end-of-life products (Nekuda Malik, 2015, p. 206). In the Table that follows, we have collected only a few examples of such countries or actors and their initiatives.

Table 20: Examples of action taken by states and actors amidst apprehension caused by China's halt of rare earth exports to Japan

Country / Actor	Action or initiative taken
The United States	a) Defense Department's review examining the necessity for the US to develop their own rare earths supply sources b) Several bills concerning the restoration of a domestic REEs and other critical materials supply

[57] For an updated clarification on the provisions of Article XI or the GATT, please see https://www.wto.org/english/res_e/publications_e/ai17_e/gatt1994_art11_oth.pdf

	c) Funded initiatives and research programs such as "The Materials Genome Initiative" and "The Critical Materials Institute" concerning i) domestic supply chain, ii) recycling of critical materials, iii) development of substitutes
The United Kingdom	a) Natural Environment Research Council investment in SoS Minerals (Security of Supply of Mineral Resources) – focus on critical elements for production and efficient energy use b) Research programs between academia and industry concerning supply issues
The EU	a) List of 20 critical materials b) EURARE project (duration of 5 years; co-funded by the European Commission and the EU 7th Framework program) c) Raw Materials Initiative
Japan and Vietnam (partnered)	The Rare Earth Research and Technology Transfer Center – focus on finding substitutes for critical materials and recycling
South Korea	The Korea Institute for Rare Metals – focus on the development of REEs technology and resources
Molycorp Inc.	Reopening of Mountain Pass mine (California, the US) and upgrading of the processing facility
Lynas Corp.[58]	a) Opening of mine in Australia (Mount Weld) b) Opening of processing facility in Malaysia

Source: (Nekuda Malik, 2015, pp. 206-207; Bradsher, 2010)

[58] Today, Lynas covers 1/3 of the Japanese needs in rare earth magnet imports (Funabashi, 2019).

Analysis, Application of Theory and Conclusion: Securitizing Rare Earths?

It is true that all the states and Japan at a larger extent have been interdependent with China in this economic sector. The reason why the states acted like that is mainly the fact that they realized how alarmingly dependent they were on China for rare earths and how vulnerable their supply chains were due to their dependence. As Alan Hurd said *"…depending on foreign sources for rare earths and other commodity metals can produce vulnerability that would be very difficult to address quickly due to the long lead times necessary to mine and produce some of these critical materials."* And he also added that,

> *"While I view the elimination of quotas on China's rare-earths exports as a positive step in international diplomacy, it should not in any way halt efforts to diversify critical materials sources, find substitutes for these materials, and institute a recycling program to capture more value from the supplies we already have."* (Nekuda Malik, 2015, p. 207).

The fear and uncertainty that overwhelmed the other states has also been recorded in the several government documents and analyses that were published at the time as well as public speeches with regards to this topic. A striking example of that is the United Kingdom's National Security Strategy, which was published in October 2010. This document was divided into four main parts, namely *Part One: The Strategic Context, Part Two: Britain's Distinctive Role, Part Three: Risks to Our Security* and *Part Four: Our Response* (HM Government, 2010). In *Part One* of the document, it is stated that,

> *"Greater demand for scarce natural resources is attracting interest in countries which control those resources. Action by them to restrict exports and stockpiling by other countries in response could undermine certain strategic industrial sectors in the UK (for example restrictions on exports of rare earth metals, a key component of various low carbon and military technologies). Competition for resources may also increase the prospect of global conflicts over access to them."* (HM Government, 2010, p. 18)

Then, in Part Three, the National Security Risk Assessment (NSRA) is presented. It is divided into three tiers, with Tier One including the risks that are of top priority. In Tier Three, we read,

"Tier Three: The National Security Council considered the following groups of risks to be the next highest priority after taking account of both likelihood and impact.

- *A large scale conventional military attack on the UK by another state (not involving the use of CBRN weapons) resulting in fatalities and damage to infrastructure within the UK.*
- *A significant increase in the level of terrorists, organized criminals, illegal immigrants and illicit goods trying to cross the UK border to enter the UK.*
- *Disruption to oil or gas supplies to the UK, or price instability, as a result of war, accident, major political upheaval or deliberate manipulation of supply by producers.*
- *A major release of radioactive material from a civil nuclear site within the UK which affects one or more regions.*
- *A conventional attack by a state on another NATO or EU member to which the UK would have to respond.*
- *An attack on a UK overseas territory as the result of a sovereignty dispute or a wider regional conflict.*
- *Short to medium term disruption to international supplies of resources (e.g. food, minerals) essential to the UK."* (HM Government, 2010, p. 27)

It becomes crystal clear that in the UK's perception concerning its national strategy, natural resources (as well as energy) hold a significant position. There are also concerns that in a possible restriction of their exports towards the UK or in a possible situation of stockpiling by third countries, certain strategic industrial sectors, such as the 'green' energy sector or even the military technologies sector, would be under threat. Additionally, one more thing noteworthy is the fact that rare earths are specially mentioned, even though they are used as an example – this can be no coincidence. The UK is also aware of the possibility of conflict over access to such natural resources. For all these reasons, they have included short to medium term disruption of resource supplies in the third tier of risks the UK faces.

With regards to the United States, the then US Secretary of State Hillary Clinton made some remarkable comments, following a statement by Zhu Hongren, a China's Ministry of Industry and Information Technology spokesman, that China had no intention of using its dominance over rare earths supplies as a *"bargaining tool"* or *"as an instrument for bargaining"* with other economies expressing also China's hope for co-operation with other

countries on the goal of *"jointly protecting this unrenewable resource"* (Cooney, 2010; Dombey, 2010). According to Reuters and the Financial Times, in a joint news conference with the Japanese foreign minister, in October 2010, Hillary Clinton said,

> *"I hadn't heard about the Chinese statement of today but I would welcome any clarification of their policy and hope that it means trade and commerce around these important materials will continue unabated and without any interference. […] At the same time, because of the importance of these rare earth minerals, I think both the minister and I are aware that our countries and others will have to look for additional sources of supply. […] This served as a wake-up call. […] So we welcome the Chinese statement that it will resume normal trading in these materials but I think the entire world has to seek additional supplies."* (Cooney, 2010)

> *"The entire world has to seek additional supplies in order to protect the important production needs that these materials serve. […] These are elements that are critical to industrial production, not only in Japan and the US."* (Dombey, 2010)

She also added that such great a level of dependency on only one supplier set a high risk for supply disruption during natural disasters or *"other kinds of events"* (Dombey, 2010).

Through her statements, Hillary Clinton clearly addresses the need to secure the supplies of rare earths and she suggests that every country do so by attempting diversification of supplies. Furthermore, she speaks about the need to protect the production sectors related to rare earths. Speaking of 'protection' signifies the existence of a threat. Therefore, we can assume that she views a possible disruption in the rare earths supply chain as a threat to the industries that are dependent on them.

A further example is the following. On March 13, 2012, the President of the United States at the time, Barack Obama, stated,

> *" […] This morning, we're taking an additional step forward. We're bringing a new trade case against China – and we're being joined by Japan and some of our European allies. This case involves something called rare earth materials, which are used by American manufacturers to make high – tech products like advanced batteries that power everything from hybrid cars to cell phones.*

We want our companies building those products right here in America. But to do that, American manufacturers need to have access to rare earth materials -- which China supplies. Now, if China would simply let the market work on its own, we'd have no objections. But their policies currently are preventing that from happening. And they go against the very rules that China agreed to follow.

Being able to manufacture advanced batteries and hybrid cars in America is too important for us to stand by and do nothing. We've got to take control of our energy future, and we can't let that energy industry take root in some other country because they were allowed to break the rules. So our administration will bring this case against China today, and we will keep working every single day to give American workers and American businesses a fair shot in the global economy. […]" (The White House - Office of the Press Secretary, 2012)

His remarks refer to the filing of the case to the WTO against China and they reveal the President's wide awareness that a disruption in the REEs supply chain would also have a heavy impact on and even pose a threat to the country's energy future since they are used in batteries for hybrid cars as well as in many other applications directly related to 'green' technology[59].

Additionally, at the beginning of the rare earths crisis, the China director of the United States Chamber of Commerce, Jeremie Waterman, had told the New York Times that: *"If it's true, it's disturbing news to say the least."* (Bradsher, 2010) and according to the newspaper, he had further added that:

"[…] rare earths were so important to advanced manufacturing that restrictions on their trade might need to be put on the agenda of the Group of 20 meeting of heads of state, scheduled next month in Seoul, South Korea." (Bradsher, 2010)

It is undeniable that such comments are revealing of how rare earths are viewed by countries and actors dependent on the Chinese imports. They carry a remarkable level of significance

[59] For example, Toyota Prius' motor needs about 1kg of rare earths (Bourzac, 2011). For more applications of the rare earths, see Chapter II.

for the industry and that is why even the possibility of their suspension or discontinuation – let alone the realization of it – raises wide concern.

We strongly believe that this Sino-Japanese incident proved the validity of the argument posed by Platias (Γεωπολιτική, Γεωοικονομία και Διεθνής Ανταγωνισμός, 2012, p. 596) that there is danger looming in economic interdependence if the interdependence is not balanced, meaning that the actor that is in more need of the relationship is always more willing and motivated to continue it, therefore, this actor acts accordingly or even surrenders to any kind of pressure placed on it. In our case, it was Japan which was more dependent on China (than China on Japan) and this was because China was Japan's main REEs supplier whereas China had a lot more export destinations for its rare earths. Therefore, it was almost inevitable for Japan to accept the Chinese demands after the latter had caused choking to the bulkily high-tech based Japanese economy by halting rare earth exports towards it. This reveals that rare earths were used as a means of political or diplomatic pressure from China against Japan. What is more, it was not only Japan that was pressed; it was the global market as well. It seemed that the only solutions available to rare earth consumers were a) to move their facilities to China so that they could have secure and stable access to supplies, b) find alternatives of non – Chinese origin, c) find substitutions through innovation, research and development in order to be independent of rare earths and d) disappear (Seaman, 2019, p. 14).

However, someone could argue here that there were two different conflicts taking place, a political one over the Islands and an economic one over rare earths but as Platias (2012, p. 598) points out (in Greek), *"every conflict is economic and political at the same time"* and as he argues, that is because "*power and wealth are the two sides of the same coin*", meaning that politics and economy always go hand in hand as the one transforms into the other continuously. The conclusion we could draw then is that, instead of demonstrating its military capabilities, China opted for stretching its muscles in the economic chessboard. In other words, economy is the continuation of war by other means[60].

From an energy security theory point of view, the question ailing all three importing countries presented here, namely Japan, the UK and the US, is certainly the security of

[60] Based on Carl von Clausewitz' famous quote.

supplies of rare earths since they are consumers. They all need the rare earths; Japan needs them because it has an economy that is high – tech oriented and as discussed in Chapter II, rare earths are indispensible parts of this industry; the UK, as described in its National Security Strategy, needs REEs especially for its low carbon and military industries and the US also needs them to sustain its 'energy future' (or even better, its 'green' energy future) which is related to rare earths through the manufacturing of advanced batteries and hybrid cars, all of which contain them.

To be more specific, Japan, the UK and the US all set among their priorities securing the existence and availability of rare earths as well as accessibility to them. In this case, available and accessible rare earths supplies are the ones that are neither export–restricted nor stockpiled. At the same time, they want to reduce the supply chain's vulnerability as much as possible and make sure the availability of the resources under discussion is uninterrupted. If these conditions are fulfilled, then the states will feel secure since they will not be afraid that their industries will face a lack of supply. Should this not be the case, fear will be the top driver of the states, which will behave and act accordingly in order to protect their interests. And in such a case, their interest is the supplies of their industries. This feeling of insecurity shapes and brings the states face-to-face with an economic security dilemma.

Applying the securitization theory, when states face security dilemmas or economic security dilemmas in our case, they are obliged to take action in order to protect what is under threat. Therefore, they have to present the threat to the public, through a / some securitizing move(s), which consist(s) of (one or more) security speech act that is about an existential threat to a referent object which must be tackled right away or it might not be possible to tackle it later. We have presented a few examples of security speech acts.

In the case of Japan, the halt of the Chinese exports towards Japan was resembled to a 'surprise attack' which is an expression usually referring to the attack in Pearl Harbor in 1941. By using this expression, the Japanese official left no doubt that Japan viewed China's behavior as, first of all, unexpected and threatening Japan's existence or at least the existence of its high-tech industry and its economy. China's decision to suspend REE exports to Japan made even stronger the already historically existing security dilemma of Japan because it was targeting exactly Japan's 'Achilles' heel': resource scarcity (Dickie, 2010). Therefore, the securitizing actor (Japan) made a securitizing move by presenting the discontinuation of the rare earths supplies as an existential threat to its high-tech industry and economy (which is the referent object).

With regards to the UK, its National Security Strategy (HM Government, 2010) serves as a security speech act. The security speech act is part of the broader concept of the 'securitizing move' that the securitizing actor does. The securitizing actor here is the UK. By adding rare earths and natural resources in its National Security Strategy, the UK points them out and presents them as possible existential threats. However, we should be careful here. Could a suspension of the rare earths supplies manage to eliminate the existence of the UK? Certainly not immediately, but for sure it sets at risk the existence of those industrial and technological sectors that rely on REEs. Therefore, it poses an existential threat to 'key' economic sectors which are also characterized as 'strategic' in the Strategy. So, a disruption of rare earths supplies, by any means, poses an existential threat to the UK's strategic economic sectors, which are the referent object here.

As with Japan, the UK also views the 'green' as well as the military industry sectors as directly connected to its interests. Since a state's ultimate purpose in the international system is to safeguard its survival through safeguarding its national interests, the UK undoubtedly attempts to do so by projecting its concerns on rare earths, stating clearly that it will take the necessary action in case it cannot access them sufficiently. Adding them in such a document as its National Security Strategy, signifies the importance it gives to them as something that is necessary for its national security. What is more, the UK's National Security Strategy recognizes that the threats after the Cold War are unpredictable, unconventional and changing constantly, including "gathering hostile intelligence, cyber attack, the disruption of critical services, and the exercise of malign influence over citizens or governments" (HM Government, 2010, p. 18). In that context, they have included natural resources and rare earths in that kind of threats.

As far as the United States are concerned, the Secretary of State highlights the importance of rare earths in her statements and she also 'rings the bell' with regards to the need of diversifying suppliers. Furthermore, she raises the issue of (inter)dependence, recognizing that the higher the level of dependence of a resources supply chain on a certain supplier is, the higher the level of that chain's vulnerability becomes. This implies that the US (and practically any state) should aim not to be reliant only or mostly on China concerning rare earths but seek alternatives as well.

Adding to that, she picked two words carrying special connotation, *'protect'* and *'critical'*. Protect what / whom from whom / what? And if something needs to be protected, then it is implied that it is not safe and there is threat and danger looming. By mentioning, *"The entire*

world has to seek additional supplies in order to protect the important production needs that these materials serve" (Dombey, 2010), she made clear that it is the REEs related industry that is under threat and needs protection from mainly relying on imports from China for its supplies. Therefore, Hillary Clinton voiced the necessity to keep the rare earth reliant industries safe, away from threats and risks and she also implied that being reliant almost exclusively on China, suggests a threat.

That is also why she refers to rare earths as *"elements that are critical to industrial production, not only in Japan and the US"* (Dombey, 2010). Using the word *'critical'* implies the significance of the rare earths. It is a word revealing that rare earths are of vital importance to certain industries, without which they will not be able to continue functioning. Just like it is vital for a human body to have blood provided by heart circulating within it, rare earths are also considered as the 'blood' of certain industry sectors. Additionally, the US Secretary of State made clear that rare earths are critical for many countries around the world, not only for the US and Japan, in an attempt to raise awareness to other states as well, create possible alliances and gain ground in order to have the legitimacy to act accordingly if needed.

Looking at President Obama's statement announcing the case brought to the WTO, we notice that at the beginning of it, he stresses the fact that rare earths are used by the high-tech industry for products *"like advanced batteries that power everything from hybrid cars to cell phones"* (The White House - Office of the Press Secretary, 2012). In these words, he attempts to bring the importance and the criticality of rare earths at the spotlight by implying that they are used in sectors critical not only to everyday life, but also critical to a state's energy and communication fields.

Then, he moves on to highlight the desire for rare earth based products to be manufactured in America and he notes that an obstacle to that is China's behavior. Therefore, he implies that China's behavior over rare earths supplies, threatens the domestic US production of REEs related products. In that way, through his security speech act, the US President (the securitizing actor) presents an existential threat (China's behavior regarding rare earth supplies) to a referent object, which is the domestic rare earth industry. Furthermore, he raises the issue of accessibility of American manufacturers to rare earths supplies and he points out the need for China to obey the rules set for the market and trade. In that way, he draws an underlying contrast between the US, which is in favor of rule compliance and China, which breaks the rules it has agreed upon itself. This contrast is useful as it prepares the ground among the audience in order to legitimize any further action taken. It shows that any

action taken will be within a legal framework and will be legitimized, since the US is the one abiding to the rules and desiring everybody to comply, whereas China is the one violating the rules. And it is this violation of the rules that creates the threat posed to the American manufacturers: the disruption of supplies.

In the last part of his statement, President Obama referred to America's energy future and the need to maintain this energy future within the country. That is why he says that the ability of manufacturing both advanced batteries as well as hybrid cars in the US *"is too important for us to stand by and do nothing"* (The White House - Office of the Press Secretary, 2012). That is a 'key' phrase in his speech, signifying that i) having rare earths to produce the aforementioned products domestically is among the US national interests, ii) the situation described above poses a threat to the US national interests and iii) the US will take the necessary action to protect its national interests. That is how the US President illustrated the security dilemma his country was facing with regards to rare earths.

The statements of both the US President and the US Secretary of State are indicative of the fact that the American government and the American diplomacy perceive inaccessibility to rare earths as a threat to the US economy and the US national interests. They also express the United States' readiness to take any necessary action required by the circumstances.

To sum up, rare earths are a strategic resource gathering attention not only on an economic level but also on a political level, since it is a field that has faced state intervention (Mancheri, 2015, p. 263). In September 2010, when the Sino-Japanese dispute over the islands broke out, rare earths played a major role as a means of pressure. China reduced its production quotas significantly (Mazza, Blumenthal, & Schmitt, 2013, p. 4), and that also had an impact on the export quotas. It advocated that the reason justifying this action was the dire need to assure environmental protection from the detrimental effects that the rare earths mining procedure causes (Dadwal, 2011, pp. 181-182). Also, following the 2010 incident there was *"a number of scientific articles and policy reports from both governmental and private organizations […] published on these minerals"* which have presented research around different aspects of the REEs such as ways of measuring their criticality (Mancheri, 2015, p. 263).

The incident at the Senkaku/Diaoyu Islands and the Rare Earth Crisis brought a wide variety of issues to the front. The first issue that arose was using a natural resource as a diplomatic tool, by taking advantage of the production monopoly of that natural resource, in order to exercise pressure upon third parties (Lele & Bhardwaj, 2014, p. 163). Secondly, the incident raised the issue of *security of supplies as* well as the need for the diversification of suppliers concerning rare earths (Ting & Seaman, 2013, pp. 244-245). Thirdly, as Ravenhill notices, this dispute put in the spotlight another important issue: the lack of collective organizations, cooperative schemes and institutional framework regarding rare earths – these are structures which would have a consultative or arbitrary role (2013, pp. 6-7). It is true that there is not any institution having as its exclusive duty and responsibility the regulation and the supervision of the rare earths market and trade.

Adding to these issues, the question of the unequal distribution of resources in the international system was raised, pointing out that some states have plenty of certain resources and some do not. That is why the actors of the international system become interdependent, since one has to rely upon another to have access to resources.

Apparently, the 2010 dispute and the issues that it brought to the spotlight have won rare earths a position among the strategic materials. This is because they are of paramount importance to the defence industry, to the 'green' technology sector, to the production of oil products and to the production of a great variety of products that millions of people worldwide use in their everyday lives; such products include television, computers, and even electric bulbs.[61] This comes as a further confirmation of Waltz's 1979 argument that technology's importance would rise significantly in international politics (Waltz, 1979, p. 179).

Furthermore, we saw that the suspension of rare earths exports posed a real security dilemma to Japan since it challenged its economy. In addition, other states were also apprehended, such as the UK and the US. Owing to their growing concern on the future of the rare earth supplies and how this would impact their economic interests, they took action to make sure their national interests are safeguarded. First and foremost, they securitized the issue, in order to raise global awareness on the matter and in order to guarantee the necessary legitimization of any further actions that they might need to take. Then, the US together with the EU, Japan and other states also proceeded to filing a case with the DSB of the WTO, which

[61] For more uses of the REEs, see Chapter II and also see the table in (Nekuda Malik, 2015, p. 206) as well as (Livergood, 2010, p. 1).

in 2014 ruled in their favor. After all, according to Platias' argument presented earlier, which argues that economics and politics are the other side of the same coin, any threat to a state's economy is also a political threat, and thus it should be deemed and addressed as such. Unless that happens, the state risks its very own existence and survival in the international system.

In the aftermath of the WTO ruling and China's compliance with it, the rare earths issue seems to have been desecuritized and returned to the politicized sphere of affairs. However, in 2020, when these lines are being written, amidst the first phase of the Covid-19 pandemic which started in China, one can read in the news that there are certain efforts made by the US Pentagon to reduce the American military industry's dependence on Chinese rare earth supplies since the two countries are already engaged in a trade dispute[62] (Cammarata, 2020; Scheyder, 2020; Scheyder, 2020; Smyth, 2020; Gross, 2020). Therefore, we can argue that at the moment, the issue is not completely desecuritized but it remains in a low level of securitization.

Finally, even if rare earths are not securitized at the moment, the 1987 statement made by Deng Xiaoping reveals it all: as Funabashi reports in The Japan Times, Deng Xiaoping visited the rare earth production area of Baotou, in Inner Mongolia, where he voiced an insightful prediction: *"The Middle East has its oil, China has rare earths."* (Funabashi, 2019). And indeed, it is true that if oil is responsible for running the world, rare earths are even responsible for running oil.

That said, it is true that issues similar to those analyzed in this Chapter usually come up when discussing energy security, oil and natural gas. Therefore, it seems worthwhile to provide a comparison between the cases of natural gas and rare earths – which some call "the new oil" (Mamula, 2019) – by outlining their most important similarities and differences and drawing conclusions with regards to natural resources. To find out about this comparison, onward to the next Chapter!

[62] It is also true that the pandemic is really likely to have a heavy impact on rare earth supplies, just as it had on the natural gas supplies.

CHAPTER V

Comparison

In Chapters III and IV, we presented the three case studies of this research. Starting in Chapter III, with regards to natural gas, we outlined the main incidents concerning Russia, Ukraine and natural gas during 2006, 2009 and 2011 – 2014. We showed how natural gas became the stake of a strong negotiation which later developed into a 'gas conflict' and we presented the key points in the behavior of the actors involved – Russia, Ukraine, Gazprom and the EU. By finding examples of securitization in the discourse of the main actors, we proved that natural gas had been securitized in that case. Then, we turned to the second natural gas case study of the Eastern Mediterranean, where we presented the events related to the 2009 natural gas discoveries in the Levantine Basin up to 2011. We outlined the key points in the behavior of each of the actors directly involved, namely Israel, Cyprus, Greece and Turkey, and we found instances of discourse revealing securitization. These instances became the proof that natural gas had been securitized in that case, too.

Concerning rare earths, in Chapter IV, we examined the dispute between China and Japan over the Senkaku / Diaoyu islands in 2010, which developed to a rare earths dispute and resulted in the US, the EU and Japan filing a case to the WTO the ruling for which was issued in 2015. As in the natural gas cases, we presented the most important events during this period and highlighted key aspects of their behavior. These aspects provided the necessary evidence to prove that REEs were securitized back then.

Now in Chapter V, given that both of the selected natural resources were securitized, we will draw comparisons and distinguish contrasts among the three case studies. These points of convergence and divergence will serve as a means to draw conclusions on the level of securitization in each case and how it was achieved, the reasons that led to it and what was aimed to be protected by each of the parts in every case. Adding to that, we will also draw conclusions concerning natural resources and their relationship with conflict in general.

To that end, we have created a separate table for each case study. These matrices consist of the following columns: a) case study actors; presenting the main actors involved in each case, b) reasons leading to securitization; presenting the causes that led to securitization in each case, c) stake(s) to be protected; where the real referent objects are presented, d) how

securitization was achieved in the discourse; presenting the main arguments that were used in discourse in order to achieve securitization, e) extreme measures taken; presenting measures taken by the actors, which would have not become a reality were the defined threat not to exist and f) level of securitization; where we distinguish between 'heavy' and 'light' securitization using as a criterion the existence or the absence of extreme measures taken.

5.1 The cases of Russia – Ukraine and China – Japan

In the case of Russia – Ukraine, the natural resource that was securitized was natural gas, while in the case of China – Japan it was rare earths that were securitized. Although different, can the reasons leading to their securitization – and consequently the stakes to be protected in each case – be alike? How was securitization achieved in each case?

First of all, with regards to the actors involved in the natural gas case study, we observe that both state as well as non-state actors were engaged. Specifically, apart from Russia and Ukraine, Gazprom was also a key player and the EU, a supranational legal entity, was also significantly affected. However, it could be argued that Gazprom expresses the willingness of the Russian Federation, since it is rather connected to the state, thus it should not be considered as a separate, non-state actor. Despite that, we preferred to refer to it as such due to the fact that it is a company, not a state and the fact that its interests coincide with that of the Russian Federation's should not be considered as an efficient criterion to consider it as a 'state actor'.

In the rare earths case study, we observe states as the main actors, namely China, Japan, the US and we have also included the UK, which, although did not have any immediate involvement in the case, serves to the purpose of consolidating the argument that the REEs had been securitized. Furthermore, the WTO is not among the main actors listed, because its actions were not related to the securitization process.

Therefore, it becomes obvious that both state and non-state actors such as companies can have interests in natural resources and get involved in a conflict over them. This is not unexpected though, given that companies need access to and availability of raw materials to manufacture their products such as in the rare earths case or need access to and availability of the commodities they sell such as in the natural gas case study.

Table 21: The Russia – Ukraine natural gas case study

Case study actors	Reasons leading to securitization	Stake(s) to be protected	How securitization was achieved in the discourse	Extreme measures taken	Level of securitization
Russia and Gazprom (supplier)	Dependence on Ukraine for gas transition; Ukrainian debt; Hydrocarbons amount to almost ¼ of country's GDP and 2/3 of its exports revenue; Energy included in national and company interests	Energy security (security of demand); Pipeline security; Supplier reliability; National economy; Energy security (security of supply) → Access to stored reserves; Gazprom's profit	Energy security linked to sovereign development, social and economic goals; Lack of stability in the energy market due to oil prices and shortage of energy resources; Energy Security Doctrine; Critical situation – conditions of crisis; Gas theft by Ukraine	Halt of gas exports towards Ukraine; Halt of gas exports transiting Ukraine; Annexation of Crimea	Heavy
Ukraine (consumer and transit)	Dependence on Russia; Dependence on Gazprom; Transit fees; Energy issues toping country's agenda	Energy security (security of supplies and affordability); Energy security (security of demand) → Transit reliability; Connection between transit tariffs and gas prices; Economy and domestic market	Energy Strategy; Sacrifice of national interest; Ukraine blackmailed to accept Gazprom's prices	(Accusations of) Extraction of transiting gas	Heavy (If accusations true; otherwise, light)

The EU (consumer)	Energy dependent on Russia / Gazprom	Energy security (security of supplies); EU industry, economy and citizens	A 'wake-up call' for the EU towards diversification of suppliers		Light

Table 22: The rare earths case study

Case study actors	Reasons leading to securitization	Stake(s) to be protected	How securitization was achieved in the discourse	Extreme measures taken	Level of securitization
China (supplier)	Control over REEs products exported; Control over REEs industry;	Country's natural resources; Fast – paced growth of the Chinese market; Domestic supply; Environment;	Guidelines for Development of National Mineral Resources 2008 – 2015;	Export duties imposed; Regulations to the REEs industry; Production and export quotas, export taxes; Environmental legislation; No new REEs mining licenses granted; Halt of REEs finished products exports;	Heavy

				Disruption of REEs exports to Japan (administrative halt);	
Japan (and Japanese companies) (consumer)	High specialization of the Japanese economy on high – tech products; REEs production mostly in China; Relatively inelastic supply in the short term; High level of dependence on Chinese REEs exports; China: Japan's largest trading partner; Already existing controversies between China and Japan; Resource scarcity; Interdependence	National economy and high-tech industry; Vulnerable REEs supply chain → security of supply; Accessibility to REEs; Uninterrupted availability of REEs;	"Surprise attack", "extremely abnormal action";		Light
The US	REEs production mostly in China; Relatively inelastic supply in the short term; High level of dependence on REEs imports from China;	Security of supply / Supply chain; Accessibility to REEs; Uninterrupted availability of REEs; Sustain the country's (green) energy future – advanced	REEs characterized as "important materials" and "critical to industrial production"; Wake-up call; Call for diversification of supplies to all countries "in order to protect important production needs";		Light

		batteries and hybrid cars industries;	High level of dependence → high risk of supply disruption; Building rare earth based products in the US is "too important" → need access to REEs; "Control of our energy future"; Violation of rules; China hindering the REEs market self-regulation; REEs restrictions should be in the agenda of the G20;		
The UK	REEs production mostly in China; Relatively inelastic supply in the short term; High level of dependence on REEs imports from China;	Security of supply / Supply chain; Accessibility to REEs; Uninterrupted availability of REEs; Low carbon and military industries	The UK's National Security Strategy (2010): - export restrictions and stockpiling of scarce natural resources *"could undermine strategic industrial sectors in the UK (for example restrictions on exports of rare earth metals…)"*; - possibility of increase in global conflicts due to competition over resources; - short or medium term disruption of resource supplies, such as minerals, considered *"essential to the UK"* is		Light

			included in Tier Three of the National Security Risk Assessment (NSRA);		

Secondly, let us compare the reasons that led to securitization and the stakes that had to be protected in every case. Starting with the natural gas case, we can argue that all the main actors, Russia and Gazprom, Ukraine and the EU, securitized natural gas. Russia and Gazprom had several reasons to do that. First and foremost, energy is included among the Russian Federation's national interests as well as in Gazprom's company interests. A quarter of the Russian GDP and 2/3 of the country's revenues from its export activities are attributed to hydrocarbons. This makes natural gas a really important economic asset for the country and the Russian national economy. This also implies that the country has to protect its national economy and to do that it needs to guarantee its energy security and more specifically its security of supply, the uninterrupted availability and access to natural gas together with its security of demand, the availability of existing markets who are willing to buy the gas it sells at a specific price. By analogy, Gazprom has to guarantee its profits, given that companies seek profit in order to be viable and survive. To that end, both the state and the company also have to guarantee that the natural gas they offer, which in most of the cases transits another country such as Ukraine, reaches its destination (the consumers) safely. Consequently, the suppliers (Russia and Gazprom) have to make sure that the pipelines are safe and that the transit state is reliable and will provide the quantities of gas stored when asked. However, the Russian state and Gazprom were largely dependent on Ukraine as a transit country, which made the Federation and the company rather vulnerable if we also add to that the huge Ukrainian debt towards the company. These financial vulnerabilities were also among the most serious reasons that led to the securitization of natural gas in that case.

In the REEs case, from the supplier's perspective, China wanted to gain control over the REEs products that were exported and it also desired to have greater control on the rare earths industry. Stemming from these reasons, China was in an attempt to protect its natural resources – the rare earths in our case – in order to be able to address the domestic needs of the fast growing Chinese market. This means that it had to protect its domestic supply and secure availability and access to the supplies. Furthermore, Beijing expressed its willingness to protect the environment that was harmed by the REEs mining and extraction procedure.

Although the reasons for securitization and the stakes to be protected in each case seem to be different, in fact they lie at the core of a state's survival. In the natural gas case study, the Russian Federation wanted to guarantee the survival of its national economy by controlling the flows of the resource (control over resources). In the rare earths case study, China, the world's largest resource consumer, wanted to secure the needs of its domestic industry, which

indicates again the critical role national economy plays for a state's policy. In both cases, the utmost stake was to control the respective resource and the best way to achieve this and 'legalize' any actions taken towards that direction, was through securitizing it. By analogy, Gazprom, a non-state actor, wanted to secure its survival through securing its profits (a company's *raison d'être*), which were also profits of the Russian state, and its brand name's reputation and trustworthiness, which were also the brand name and the reputation of the Russian state.

But how did the suppliers in both cases achieved securitization through discourse? In the natural gas case study, the Russian Federation linked energy security not only to social and economic goals but also to sovereign development, which signified that it lies at the heart of the country's national interest, as also proven by the existence of the Energy Security Doctrine. Furthermore, both Gazprom and Russia presented Ukraine as a 'thief', indicating that it threatens the security of the gas flows supplied to the European consumers. They spoke of 'crisis conditions' and characterized the situation as critical. Additionally, the energy market was presented as unstable owing to the oil prices and the scarcity of energy resources, which was adding to the feeling of insecurity for the suppliers' side of the story.

In the REEs case study though, the People's Republic of China proceeded to securitizing rare earths by issuing the Guidelines for Development of National Mineral Resources for 2008 – 2015. With this move it declared this resource as of national interest, legitimizing any extraordinary measures to be taken towards protecting the quantities necessary for the Chinese state.

What we notice here is that discourse, which is the tool, the means or the method through which something becomes securitized, differs when it comes to different actors. The reason is that they have to adapt the discourse according to the circumstances, their interests and their goals and they also have to form and transform it in such a way, as to be conceivable but most importantly, convincing for the audience they target.

As already said, the securitization speech prepares the ground for extreme measures to be taken by the securitizing actors. However, for securitization to exist it is not necessary to have extreme measures taken. Did the suppliers in these two cases take extreme measures? Using this criterion, we propose two levels of securitization. We make a distinction between heavy securitization – when extreme measures were taken – and light securitization – when extreme

measures were not taken. As described in Chapters III and IV and also presented in the tables of this Chapter, the suppliers in both cases took measures considered extreme based on the effect they had. In the natural gas case study, Russia halted the gas exports destined for Ukraine and later it also halted the exports transiting Ukraine destined for Europe. This resulted to great impact on both Ukraine and Europe, which literally froze. Furthermore, the annexation of Crimea, an action seemingly not directly related to the events, at the end of the day was a move aiming not only to secure the Russian Federation's natural gas supplies but also to control the source and the route. In other words, the proven reserves of the Crimean peninsula, would guarantee Russia's (and Gazprom's) natural gas supply independence in times of crisis.

In the REEs case, the People's Republic of China imposed export duties, production as well as export quotas, decided on several regulations and issued environmental legislation concerning the relevant industry, stopped granting new mining licenses and ultimately, put a halt to the exports of REEs towards Japan.

All these are considered measures that would not have been taken had it not been for securitization. We can therefore talk about heavy securitization by the suppliers' side in both cases.

Turning to the consumers' side, we will first compare and contrast Ukraine and Japan, which were the consumers primarily and most heavily affected by the disruption of the natural resource supply in each case. After that, we will turn to other consumers that were also affected in each case, such as the EU, the US and the UK.

Ukraine has a lot of reasons for securitizing natural gas. First of all, energy issues are a matter lying at the top of the state's agenda. Adding to that is the dependence on the Russian Federation and Gazprom for natural gas supplies that will be used domestically. Furthermore, the revenue earned by the transit fees paid by Gazprom for the pipelines transiting Ukraine and transferring natural gas to European consumers, is also another strong reason leading to securitization of natural gas by Ukraine. Respectively, the stakes to be protected for the Ukrainian side were its national economy and the state's domestic market, which could only take place through safeguarding its multi-layered energy security. This means it had to secure both the availability and affordability of supplies as well as to secure the demand for its transit gas and its reliability as a transit state. On top of that, Kiev had to make sure that a beneficial

deal between Naftogaz and Gazprom connecting transit tariffs with gas prices comes into effect.

As for the REEs case study, Japan and the Japanese companies, which were the consumers primarily affected by the conflict, had also many reasons to proceed with securitizing the natural resource under discussion, namely rare earths. The high specialization of the state's economy on high-tech products which are based on rare earths; the high level of dependence on the Chinese REEs exports; China's role as the largest REEs producer and the largest trading partner for Japan and the already existing disputes between Tokyo and Beijing, all made it clear that securitization of REEs was inevitable for Japan. Adding to that was also the scarcity of economically viable and exploitable REEs reserves hence the inelastic supply of this resource in the short term, parameters that made the impact of interdependence for the Japanese economy even heavier. All these factors dictated that Tokyo had to provide for its national economy and its high-tech industry. Therefore, it had to secure uninterrupted access and availability to rare earths immediately in order to reduce the vulnerability of its REEs supply chain and guarantee security of rare earths supplies.

What we observe is that there are certain common points between Ukraine and Japan. First of all, both economies heavily rely on the respective natural resource – Ukraine on natural gas and Japan on rare earths. Secondly, both faced a situation during which they had to find and implement rigorous alternatives in order to secure their resource supplies and protect their economies. Thirdly, both were heavily relying on a certain provider, which produced a high level of vulnerability to the supply chain of the resource. Fourth, it was not only the state that was affected but also the respective company / companies. The difference, however, between the two countries was that Ukraine also had to secure its transit supplies, its income from the transit fees and its reputation as a transit country.

But how did these countries achieve securitization through discourse? With regards to Ukraine, it had made clear how important energy matters are for it through releasing its Energy Strategy. What is more, Kiev characterized the halt of gas supplies as blackmailing from Gazprom and there were also voices that a delinking of the transit tariffs from the natural gas prices, would suggest a 'sacrifice of the national interest'.

Concerning Japan, the halt of the REEs supplies was characterized as an "extremely abnormal action" and a "surprise attack". Given that this last expression was used to describe

the Pearl Harbor attack in 1941, it becomes apparent how shocking such an action was for Tokyo and how important at the same time. This resemblance also reveals the strategic character of the REEs for Japan and intensifies the resource's security nature for the state and its position as part of the Japanese national interest.

It is true that not many statements were available during our research. However, this does not make the case of less importance neither lessens the level of securitization from the Japanese side. On the contrary, it proves that even a short statement or even a comment can become the necessary discourse tool to achieve securitization.

As far as extreme measures are concerned, there are allegations that Ukraine withheld quantities of natural gas in order to provide for itself, its domestic market and needs, and that is why it was accused of theft from the Russian side. If these accusations are considered true, then we can say that Ukraine did take extreme measures to address the gas crisis and therefore we can claim heavy securitization. Nonetheless, if the allegations are false, then it was light securitization that took place, given the absence of extreme measures taken by Kiev.

As for Japan, it is clear that no extreme measures were taken, so we can talk of light securitization in this case. However surprising it might be, the absence of extreme measures taken by Tokyo is not without ground. Japan being in a rather difficult position, highly dependent on only one supplier and with no better alternative – at least in the short term – was not in a position to take extreme measures against China. What is more, the Japanese side might also have been afraid that upon taking of (extreme) measures, the rather weak position Tokyo found itself in, could become even more deteriorated. Therefore, Japan being aware of its disadvantaged position opposite Beijing at the time, it decided not to escalate and challenge China but rather attempt de-escalation[63] while trying not to give up its positions.

Turning now to the main third parties involved in both case studies, we will begin with the EU, which was also a consumer heavily affected by the gas crisis between the Russian Federation and Ukraine. Why did the EU securitize natural gas? The main reason for doing so was the absence of diversification concerning the natural gas suppliers that had left the EU highly dependent on the Russian Federation and Gazprom with regards to energy supplies. Therefore, the European Union had two main stakes to protect: a) its energy security and b)

[63] De-escalation does not necessarily mean desecuritization.

its economy. To be more specific, it had to safeguard the security of the supplies destined for the member states and guarantee the uninterrupted availability and flow of them, especially during the difficult period of winter. Furthermore, the EU needed to protect its domestic industry that is fueled by natural gas as well as make sure there is enough natural gas for household use by the EU citizens. Given that at the time period selected for the case study, the EU was primarily dependent on the Russian gas supplies, it was rather expected for the EU to securitize its energy sources.

In order to achieve this, it referred to the situation as a 'wake-up call' towards the diversification of suppliers. This phrase shows that the European states admitted they had been resting more than accepted on the fact that Russia would constantly address their needs, uninterruptedly. For that reason, they realized that they had to try to fend for themselves by guaranteeing diversification of suppliers / supplies and uninterrupted flow to the member states. Apart from that, the EU did not take any measures of extreme character to answer to this crisis, therefore, we can speak of light securitization from the side of the EU.

With regards to the REEs case, the US was the third party most actively involved and it had several reasons to do so. First of all, just like most of the states, the US is highly dependent on the REEs imports coming from China. Apart from that, the relatively inelastic short term supply of this natural resource and the fact that the production takes place mostly in China, contribute towards securitizing rare earths. As a consequence, the stakes for the US are high. The most important of them is safeguarding the supply chain by securing uninterrupted accessibility and uninterrupted availability of rare earths for the industry, hence contributing to the growth of the US battery and hybrid cars industries and sustaining the US (green) energy future in general.

To achieve securitization, there were several instances in the discourse of high ranking US officials, such as the Secretary of State as well as the US President himself. Through the discourse, the rare earths were characterized as both "important" and "critical" to production. The halt towards Japan was perceived as a "wake-up call" for diversification of suppliers aiming at the protection of "important production needs". Furthermore, the high level of dependence was interpreted as a high risk of supply disruption. Additionally, China was accused of violating the WTO rules and setting obstacles to the self-regulation of the rare earths' market. It was also proposed that the restrictions posed on rare earths should be included in the G20 agenda. Above all, it is rather striking to notice that the US considers "too

important" building rare earth based products within its territory and it also linked rare earths to controlling the country's energy future.

As we described, there were several and rather striking examples in the US officials' discourse securitizing rare earths. However, there were no extreme measures taken, so the securitization in this case will be categorized as light. The filing of the case with the WTO dispute settlement body cannot be considered as extreme measure, since it an action complying with the international process and the rules agreed in the framework of international organizations. In other words, it is not something that a country would not be able to do if rare earths had not been securitized.

As far as the UK is concerned, it was a third party that made clear its position on the topic and that is why we picked it as an example. The UK clearly securitized rare earths and it also had a lot of reasons for that. Just like most states all around the world, it is heavily dependent on rare earths' imports from China, whose production largely takes place there, too. Furthermore, the inelastic supply of the resource in the short term makes dependence of any country on China even greater. There are several stakes stemming from this dependence. First and foremost, the UK needs to protect its supply chain. In order to achieve the security of rare earths' supplies, it needs to guarantee accessibility to them as well as uninterrupted availability of the resource. Adding to that is the fact that rare earths are used by the low carbon and military industries. Therefore, the UK has to make sure these industries, which are the industries mainly using rare earths, can continue their activities with no obstruction. Especially when it comes to the military industry, it is obvious that protecting its production and eliminating any obstacles that might hinder its functionality is of utmost importance to a state due to the security implications it entails.

Let us take a look now at how the UK achieved securitization in the discourse by issuing its National Security Strategy in 2010. There are three main points in it. First of all, the document clearly states that restrictions and stockpiling of rare earths (and any natural resource – especially those considered scarce) may pose at risk some sectors of the UK industry. Secondly, there is a general prediction made that competition over (natural) resources will trigger an augmentation in conflicts around the world in the coming years. Finally, in the National Security Risk Assessment (NSRA) categorization of threats to the UK, rare earths are included in Tier Three, where the disruption of resource supplies "essential to the UK" in the short or medium term are included.

As was the case with the US, the UK did not take any extreme measures despite the concrete securitization through its National Security Strategy. This means that the UK's securitization can be categorized as light without this of course diminishing the importance of the United Kingdom's securitization process or the importance of the rare earths for the UK.

With regards to all third parties examined, namely the EU, the US and the UK, what we notice is that all three found themselves in a critical condition where they had to secure supplies of either natural gas in the case of the EU or rare earths in the case of the US and the UK. They were also faced with the harsh necessity of diversifying their suppliers and finding alternatives to reduce the vulnerability caused by the great level of reliance on a single provider. What is more, all three had to work towards keeping the domestic production uninterrupted and the economy not harmed.

To conclude, it becomes obvious that regardless of the natural resource, there were common points as well as differences that occurred in these two case studies. All actors had to protect their resource security which provides for their development and growth. Some of them viewed it under the prism of the supplier and some of them under the prism of consumer or even transit. At the end of the day, all of them had to find ways to serve their interests. And it was among their interests to combat the fear stemming from a possible disruption of the natural resource at stake. It was among their interests to fend for themselves and make sure they can survive in the international system. It was among their interests to provide for and protect their existence.

Was this also the case in the Eastern Mediterranean case study? To find out, we will proceed with comparing and contrasting this case study with the rare earths' one.

5.2 The cases of the Eastern Mediterranean (Israel-Cyprus-Greece and Turkey) and China – Japan

Turning now to the comparison of the Eastern Mediterranean and the China – Japan case studies, where the resources at stake are also natural gas and rare earths, we will follow the same procedure as in the previous section. First and foremost, what we notice in the Eastern Mediterranean case study is the fact that states are the dominant actors again. To be more specific, Israel, Cyprus, Greece and Turkey are the states most directly involved. Companies, which are non-state actors, are also involved, but their role is not as much determinant as Gazprom's role was. As far as the REEs case study is concerned, as we have already noticed,

the actors involved were primarily states. Furthermore, the WTO is not considered an actor directly affected by the case, for reasons explained in section 5.1. Therefore, the dominant players involved again are state actors, proving the state's yet dominant position in the international system.

Let us now examine the reasons leading the key actors in the Eastern Mediterranean case to securitize natural gas and the stakes each of them had to protect. First of all, with regards to Israel, it is a state that is 'energy poor' and for that reason, it had to cover its energy needs mainly through imports. Adding to that, the hostile bilateral relations with the neighboring states leading to a solidified lack of trust between them and the State of Israel had resulted in the absence of the latter's connection to the energy grids of its neighbors. What is more, despite the existence of the El Arish-Ashkelon pipeline during the recent years, there were serious questions posed around the pipeline's security, questions that could not just be overlooked, especially after the attacks on it and the termination of the agreement by Egypt. In the aftermath of that, the rising consumer prices and the rather diminishing deposits of Yam Tethys posed serious energy security questions for the State of Israel. There were several stakes Israel had to protect. It had to protect its energy infrastructure and it also had to guarantee energy supplies for the Israel Defense Forces (IDF). Apart from that, Israel also had to protect the newly discovered gas reserves, namely Tamar, Dalit and Leviathan. Above all, it was its energy security that it had to safeguard, especially the security of supplies.

Table 23: The Eastern Mediterranean natural gas case study

Case study actors	Reasons leading to securitization	Stake(s) to be protected	How securitization was achieved in the discourse	Extreme measures taken	Level of securitization
Israel	'Energy-poor' state; Energy needs covered mostly through imports; No connection to energy grids of neighboring states; El Arish-Ashkelon pipeline security; Hostile relations with neighboring states – lack of trust; Consumer prices rising; Existing deposits diminishing;	Energy security (security of supply); Newly discovered gas reserves (Tamar, Dalit, Leviathan); Energy supplies for the army; Protection of energy infrastructure;	Energy policies are national security issues; Highly institutionalized; Energy consumption data are classified – released after 4 years; (lack of discourse) Disclosure of strategic reserves relevant information → never; (lack of discourse) Compliance with international law on condition that no one will ever take away from Israel what is proven to be its own; (securitizing desecuritization?)		Light
Cyprus	The still unresolved Cyprus Question; Geographical position and difficulties connecting to the EU's and its neighboring states' energy networks; Almost totally energy import dependent (electricity and transport) → vulnerable;	Newly discovered gas reserves (Aphrodite field – Lot 12);	Geopolitical upgrade; Reinforcement of the Cypriot struggle for "liberty and justice"; Energy is of utmost importance to Cyprus; Violation of the international law by Turkey – Ankara aims at "co-sovereignty rights" concerning natural gas reserves;		Light

Greece	Improvement of its geopolitical position; Increase its significance for the EU;	Energy security (energy supplies);			
Turkey	The still unresolved Cyprus Question; Iranian and Russian gas import – dependent; Fears it may lose its transit role for Russian gas;	Energy security (security of supplies); Transit security;	Nicosia's drilling activities were against Turkish-Cypriots' interests and violation of international law; Declaring right to control territorial waters in the Eastern Mediterranean and measures to prevent Israeli unilateral exploitation of regional natural resources; Israeli – Cypriot energy exploration characterized illegal; agreement including all parties involved and equal distribution of the resources; Announcement for drilling activity near Famagusta; Threat for military forces deployment to prevent energy – related actions; Delimitation according to the international law and the rights and interests of all parties; Violation of rights of third parties by "the Greek Cypriot Administration"; Agreements and exploration of the Greek Cypriots lead to new regional conflicts;	Piri Reis heading to Lot 12 of Cyprus' EEZ;	Heavy

			Permits for exploitation and exploration issued by Nicosia characterized as invalid and the companies having them were asked to act responsibly; Rejection of Nicosia's representing the Turkish Cypriots or the island as a whole → Nicosia not entitled to act on behalf of the island as a whole concerning agreements and natural gas exploitation; Nicosia's acts characterized as unlawful, creating regional tension, "compromising and prejudging" the Turkish Cypriots' rights over the island's resources and deteriorating the negotiations on the Cypriot Question;		

Table 24: The rare earths case study

Case study actors	Reasons leading to securitization	Stake(s) to be protected	How securitization was achieved in the discourse	Extreme measures taken	Level of securitization
China (supplier)	Control over REEs products exported; Control over REEs industry;	Country's natural resources; Fast – paced growth of the Chinese market; Domestic supply; Environment;	Guidelines for Development of National Mineral Resources 2008 – 2015;	Export duties imposed; Regulations to REEs industry; Production and export quotas, export taxes;	Heavy

				Environmental legislation; No new REEs mining licenses granted; Halt of REEs finished products exports; Disruption of REEs exports to Japan (administrative halt);	
Japan and Japanese companies (consumer)	High specialization of the Japanese economy on high – tech products; REEs production mostly in China; Relatively inelastic supply in the short term; High level of dependence on Chinese REEs exports; China: Japan's largest trading partner; Already existing controversies between China and Japan; Resource scarcity; Interdependence	National economy and high-tech industry; Vulnerable REEs supply chain → security of supply; Accessibility to REEs; Uninterrupted availability of REEs;	"Surprise attack", "extremely abnormal action";		Light

The US	REEs production mostly in China; Relatively inelastic supply in the short term; High level of dependence on REEs imports from China;	Security of supply / Supply chain; Accessibility to REEs; Uninterrupted availability of REEs; Sustain the country's (green) energy future – advanced batteries and hybrid cars industries;	REEs characterized as "important materials" and "critical to industrial production"; Wake-up call; Call for diversification of supplies to all countries "in order to protect important production needs"; High level of dependence → high risk of supply disruption; Building rare earth based products in the US is "too important" → need access to REEs; "Control of our energy future"; Violation of rules; China hindering the REEs market self-regulation; REEs restrictions should be in the agenda of the G20;		Light
The UK	REEs production mostly in China; Relatively inelastic supply in the short term; High level of dependence on REEs imports from China;	Security of supply / Supply chain; Accessibility to REEs; Uninterrupted availability of REEs;	The UK's National Security Strategy (2010): - export restrictions and stockpiling of scarce natural resources *"could undermine strategic industrial sectors in the UK (for example*		Light

		Low carbon and military industries	*restrictions on exports of rare earth metals…)"*; - possibility of increase in global conflicts due to competition over resources; - short or medium term disruption of resource supplies, such as minerals, considered *"essential to the UK"* is included in Tier Three of the National Security Risk Assessment (NSRA);		

With regards to Cyprus, it is an island state that faces serious security dilemmas stemming from the still unresolved Cyprus Question. What is more, it is a state whose geographical position poses great difficulty in connecting Cyprus to the EU's energy networks or even to the grids of its neighboring states. As a consequence, it is almost completely dependent on imports to cover its energy related needs, such as in the electricity and transport sectors.

Unfortunately, such energy conditions make the level of vulnerability for Cyprus rise and have led it to securitize energy. Additionally, the gas reserves that were discovered recently, such as the large Aphrodite field or Lot 12, however promising and prosperous they might be, they are also a stake which the Republic of Cyprus has to protect in order to protect its energy security.

With regards to Greece, we can interpret that first of all, energy holds an important position in the country's agenda because, as most of the states, Greece aims at covering (part of) its needs. However, we cannot argue that energy was securitized during the period under examination since there is lack of the required discourse. Nevertheless, such a move would result in upgrading its geopolitical position and its significance for the EU as it would become a transit state of the pipeline destined for the EU[64].

As far as Turkey is concerned, the reasons behind securitizing natural gas in the Eastern Mediterranean include the still unresolved Cyprus Question but most importantly they include the country's dependence on natural gas imports from both Tehran and Moscow and on top of that, the fear that Ankara may lose its role as a transit state for the Russian natural gas, should the Eastern Mediterranean gas findings start flowing towards the EU. As illustrated, Turkey's main stakes were two: a) its energy security, meaning the security of natural gas supplies and the need for available quantities and uninterrupted flow towards it and b) its transit security, which translates into maintaining its geopolitical position in the energy game by securing that it will keep its role as a transit state for the Russian gas.

Talking about the REEs case study[65], as already discussed in the previous section, China's aim was to control the exports of the REEs products and industry in order to protect the national natural resources and the environment, its domestic supply and the fast growth of the Chinese

[64] At the time when these lines are written, Greece also has securitized energy.

[65] The points referring to the REEs case will be presented very briefly in section 5.2 since they have already been presented in section 5.1.

market. With regards to Japan, the high specialization of its economy on REEs-requiring products and Tokyo's high dependence for this raw material on China, made it extremely vulnerable to any supply disruptions by its largest trading partner.

Concerning the third parties involved in the dispute, the US being highly dependent on the Chinese imports of REEs had to take care of the accessibility of its supply chain to them, in order to sustain its green energy future. As for the UK, it also had to face a high level of dependence on the Chinese rare earths which translated into having to safeguard accessibility to the REEs and their availability for its supply chain in order to provide for its military and low carbon industries.

What we have to notice here is that, even though different actors seem to have different interests, different reasons leading them to securitize energy and different stakes to protect, at the end of the day all the actors try to secure their access to natural gas and energy and to maximize their gains from controlling them. Towards that goal it is that they perceive securitization.

Next we will present the way securitization was achieved through the discourse. Starting with the Eastern Mediterranean case study, Israel makes an example that could not go unnoticed. The State of Israel perceives its energy policy as a national security issue and this becomes obvious by the fact that energy in the Israeli state has been highly institutionalized, as presented in Chapter III, too. Apart from that, the data concerning energy consumption are classified and they are released only once every four years. What is more, Israel never discloses information in relation to its strategic reserves. The impressive to notice here, is that securitization is achieved through the absolute absence of (verbal) discourse but it becomes rather apparent through the actions and the organization of the State of Israel. Therefore, it is an instance where the actions are actually statements. However, in 2011, when the developments around the discovered natural gas reserves were at their peak, the Israeli President made clear that his state would completely follow the international law on condition that nobody pursues to take Israel's possession. With such a statement, he openly securitized the new natural gas reserves and at the same time we can argue that he securitized de-securitization by explaining that Israel will behave according to the norms but it will not do so – and will therefore take extreme measures – if anyone tries to steal its possession.

Concerning Cyprus, the discovery of the gas reserves was characterized as a 'geopolitical upgrade' and it was also viewed as reinforcing the struggle of the island for 'liberty and

justice'. Furthermore, the energy sector was characterized as of 'utmost importance' to Cyprus signifying that it is included among the state's vital interests. In addition to that, the Cypriot discourse accused Turkey of violating the international law and aiming at 'co-sovereignty rights' over the Eastern Mediterranean gas reserves.

Greece was also part of the energy equation but it can be argued that it was not directly involved in the conflict over the newly discovered reserves, since the discoveries took place mainly in the waters of Cyprus and Israel. This explains the absence of securitization discourse for the time period given.

As far as Turkey is concerned, it seems to have had the longest discourse at the time. Ankara accused Nicosia of violating the international law and it also stated that Nicosia's drilling activities were against the interests of Turkish-Cypriots. What is more, Turkey declared that it has rights to control territorial waters in the Eastern Mediterranean region and it also announced it had taken measures to hinder Israel from unilaterally exploiting the region's natural resources. On top of that, Ankara characterized the Israeli-Cypriot energy exploration as illegal and expressed its desire for a) an agreement that would include all parties involved and b) equal distribution of the resources. To balance the Cypriot-Israeli activities and reach a climax in its discourse, Turkey also announced initiative for drilling activity near Famagusta and it also threatened to deploy its military forces in order to prevent actions related to energy developments. With regards to delimitation, Turkey expressed its view that it should be done according to the international law, the rights and the interests of all parties, while it also accused 'the Greek Cypriot Administration' of violating the rights of third parties. It further characterized the agreements and the exploration activities of the Greek Cypriots as leading to new regional conflicts and it moved on to state that it considers the exploitation and exploration permits issued by Nicosia as invalid. On that ground, Ankara also called the companies which already have them to act responsibly, meaning that in Turkey's point of view, they should not proceed in any activities because they would further fuel regional conflicts. Finally, Turkey rejected that Nicosia represents the island as a whole – meaning the Turkish Cypriots as well – and it reiterated that the ROC is not entitled to act as a representative of the whole island when it comes to natural gas agreements and exploitation. Based on that, Nicosia's actions were characterized as unlawful, creating tension in the region, 'compromising and prejudging' the rights of the Turkish Cypriots over the resources of the island and finally, causing deterioration to the negotiation process over the Cypriot Question.

In the REEs case study, China showed that it securitized not only rare earths but natural resources in general, through issuing the guidelines for Development of National Mineral Resources 2008 – 2015. As for Japan, it viewed the halt of the rare earths supplies from China as a 'surprise attack' and an extremely abnormal action. With regards to third parties, it was labeled as 'too important' and a 'wake-up call' by the US, which also called for the diversification of the supplies. Additionally, the UK also expressed its concern that competition over resources might result to an increase in conflicts.

Comparing the securitization discourse of all parties, we can distinguish between more passive – such as China's – and more active ones – such as Turkey's. Furthermore, we can distinguish between those attempting to change the status quo – such as Turkey's – and those trying to maintain it and protect what they own – such as Israel, Cyprus and Japan. Nevertheless, whatever the type of the discourse of every actor is, at the very heart of it, it reflects the interests, the plans, the fears and the aspirations of each actor.

Some of them appeared apprehended with regards to the uninterrupted flow of natural resource supplies – such as Japan – and some others engaged into a battle over controlling the resources, hence the supplies towards their supply chain. Finally, some actors were also apprehended over maintaining or gaining a geopolitical role as transit states – such as Cyprus, Greece and Turkey or even as suppliers – such as Cyprus and Israel. Above all, the truth is that different actors have different goals and different securitization discourses in their attempt to achieve these goals.

What about after the discourse? Were there any extreme measures taken? In the Eastern Mediterranean case, what we see is that Israel did not take any extreme measures and therefore can be grouped as light securitization. With regards to Cyprus, it did not take any extreme measures, neither did Greece, so securitization was light again in both cases. However, Turkey proceeded with heavy securitization, by sending its vessel, Piri Reis, to Lot 12 of Cyprus' EEZ. A conclusion to be drawn at this point is that the extreme measures were taken by the actor that wanted to push for a change in the status quo of the region.

In the rare earths case, China was the one that acted by taking extreme measures when it halted the REEs exports to Japan. Contrary to Beijing's heavy form of securitization, Japan kept it light, without taking any extreme measures. After all, it was not in a very advantageous position that would allow it to take such measures.

All in all, actors seem to opt for heavy securitization when they want to change the status quo or when they want to put pressure on other actors in order to get the desired outcome.

5.3 Final Comparison – Conclusion

In this Chapter we have tried to compare and contrast our case studies by breaking up the securitization components, namely the actors, the reasons and the stakes leading to securitization, as well as the ways securitization was expressed and achieved in the discourse of the actors, the extreme measures taken (where applicable) and whether securitization is considered light or heavy. Light securitization signifies the absence of extreme measures whereas heavy securitization implies their presence.

In the first part, we have presented all the necessary details in order to compare and contrast the natural gas dispute between Russia and Ukraine and the rare earths case study. In the first natural gas case study we distinguished between suppliers and consumers because the conflict was taking place between them. We also followed the same organization when examining the rare earths case study.

However, in the second natural gas case study, where we compared and contrasted the Eastern Mediterranean case study with that of the rare earths, we could not keep the same typology, since the conflict taking place is not on a supplier – consumer basis but it is rather over who the new supplier(s) is going to be. In other words, it is a dispute over who dominates or controls the deposits and the flows of the natural resource.

With regards to similarities and differences, let us look at the similarities first. What we noticed is that all of the actors tried in different ways to secure, safeguard and maintain their flow of supplies for either natural gas or for rare earths. This means that the supply chain of the natural resources under discussion bears great significance to the actors' core policy and more significantly, to their national interests. Some of them also tried to maintain their positions as transit states but all of them understand the geopolitical implications of energy and resource games. What is more, the actors discussed in this research securitized the respective natural resource.

Concerning differences, the main difference was the resource under discussion in each case. Furthermore, the different point of view – supplier, consumer, transit – from which they perceived and interpreted everything, provided a variety of arguments in the securitization

discourse of the actors. Of course, the different points of view stem from the actors' different interests. Therefore, we can argue that the different interests caused the wide range of arguments in the securitization speech. This is also what triggered the existence or the absence of extreme measures.

All in all, we have observed the procedure through which a natural resource becomes a source of conflict. First of all, it needs to be among the actor's / state's survival or national interests. Secondly, it starts being securitized through the appropriate discourse. Thirdly but not necessarily, the actor / state takes extreme measures according to its survival / national interests. Above all, at the core of this procedure lie the interests of the actor and of course fear, that pushes the actor towards the process of securitization in order to secure its survival and protect its existence in the international (self-help) system.

In the light of these facts, we deemed useful the existence of an index that could help identify and recognize early enough the possibility of a conflict outbreak. To find out more about that, please move on quickly to Chapter VI!

Chapter VI

THE NATURAL RESOURCES INDEX OF CONFLICT (NRIC)

"Trying to predict the future is always a perilous endeavor for social scientists"

(Tziampiris, 2015, p. 170)

Through this research we have tried to determine to the best possible extent, the factors, the parameters, the causes and the reasons of a conflict. Natural resources are among the conflict – triggers; a UN (United Nations) study published in 2012 is depicting this truth saying that,

> *"Over the past 60 years, 40% of civil wars can be associated with natural resources; since 1990 there have been at least 18 violent conflicts fuelled by the exploitation of natural resources. […] …natural resources actually inhibit the establishment of conditions that nurture peace…"* (The United Nations Interagency Framework Team for Preventive Action, 2012, pp. 9, 12)

However, a natural resource cannot become a cause of conflict by itself. There are always other reasons underlying that prepare the ground and trigger a conflict over a natural resource. As stated in the 2012 UN study,

> *"Natural resources and other environmental factors are linked to violent conflict in a variety of ways that are often obscured by more visible drivers such as ethnic tensions. Specifically, competition to control or gain access to natural resources can contribute to the outbreak of violent conflict. Natural resources can be exploited by rebel groups to fund war. During conflict, individuals and groups may be able to exploit natural resources in ways that create an incentive for them to obstruct or undermine efforts to build peace."* (The United Nations Interagency Framework Team for Preventive Action, 2012, p. 9)

Such underlying parameters also include the geographical features of natural resources and the country's political economic and social features (Varisco, 2009, p. 42). For example, natural resources that are distant, whose reserves are not concentrated in one region and upon which a given government does not have the total control are highly likely to become linked to an armed conflict (Varisco, 2009, p. 42). Research by Nie (2003) lists *scarcity, policy surrogate, the importance of a place, the policy design, policy frames, scientific disagreement and uncertainty, electoral politics and the use of conflicts as a wedge to win, political and interest group strategy, media framing, adversarial governance, constitutional, statutory and administrative language and distrust* among the drivers of conflict over natural resources (Nie, 2003, pp. 311-312). Diving further into the literature, we have also come across the attempt by researchers to categorize drivers. According to research by GOXI and Extractives Hub, drivers have been grouped as *a) drivers of social conflict, comprising reduced access of communities to resource and livelihoods, inadequate benefit sharing, unmet expectations, forced relocation, unplanned migration and impact on local values, crime, labour rights issues, gender-based impacts and human rights; b) environmental drivers of conflict, comprising impacts of pollution, degradation, deforestation, water issues and climate change; c) governance drivers of conflict, comprising lack of transparency, deficient planning, lack of adequate consultation, corruption and mismanagement of resource revenues, lack of local content, inadequate institutional and legal frameworks and inadequate dispute resolution and grievance mechanisms; d) economic drivers of conflict, comprising unjust revenue sharing and government not providing promised infrastructure or services; e) drivers of violent conflict emergence, comprising high value resources and war funding, border and boundary disputes, climate stress and illegal extraction* (GOXI and Extractives Hub).

It becomes obvious that literature has tried to identify the factors that contribute and lead to conflicts over natural resources in order to understand better this phenomenon and act accordingly. Therefore, it is the need to define the circumstances under which a natural resource becomes the source of conflict, be it armed or non-armed, that has led to the creation and hereby presentation of the *Natural Resources' Index of Conflict* (NRIC).

6.1 Presentation of the NRIC

The NRIC comprises of 12 factors covering a wide range of parameters that we deemed necessary to be taken into account after conducting bibliography research and assessing the conflict-leading parameters that are presented in the literature. NRIC aspires to help predict the following 4 types of conflict:

i. inter-state (IeSC)
ii. intra-state (IaSC)
iii. state – non-state (SNSC)
iv. non-state – non-state (NSNSC)

*C stands for "conflict"

These 4 types are based on the actors[66] involved in a conflict and try to cover all possible cases.

[66] *"The actors in these conflicts usually include local communities, national governments, private sector companies, private and national security forces, civil society organizations, and, in some cases, political independence movements, warlords and rebel armies."* (The United Nations Interagency Framework Team for Preventive Action, 2012, pp. 12 - 13)

THE NATURAL RESOURCES INDEX OF CONFLICT (NRIC)

Factors/Parameters:

1. Scarcity of the resource/Frequency of reserves/Distribution of the resource (deposits)
2. Ready-to-use level (or further process needed/required; Lootability)
3. Applications (Level of/Range of applications)
4. Price/price elasticity/fluctuation (volatility)/vulnerability/sensitivity
5. Cost of extraction/mining/logistics/the management of the deposit (geology)
6. Side-effects of extraction (geological, natural disasters, etc.), friction, unpredictable/unforeseeable
7. Geographical position (location) of reserves (the closer to a conflict area, the more prone the resource is to become the stake of a conflict) (other non-state actors; terrorist groups, etc.) and climate change
8. Political and economic state of the owner/supplier (state/actor)
9. Political and economic state of the transit state/actor
10. (Level of) Dependence of consumer states/actors
11. Profile of private (non-state) actors involved in the (specific) natural resource market (MNCs, companies, etc.) (black market/illegal mining/smuggling)
12. Institutions and International Organizations

Types of conflict that can be defined:

i. inter-state (IeSC)
ii. intra-state (IaSC)
iii. state – non-state (SNSC)
iv. non-state – non-state (NSNSC)

*C stands for “conflict”

Scale range: 1 – 10 (1: impossible/low; 10: certain/high)

6.2 How the NRIC works

So far we have proven that a natural resource becomes the source of conflict when it has been securitized and we have also claimed that something becomes securitized when it is among the interests of a state or of an actor in general and contributes towards its survival in the international system. The question now is "When does a natural resource contribute to an actor's survival?" The purpose of the NRIC is to measure how a natural resource scores across the 12 parameters on a scale of 1 to 10, where 1 signifies the lowest point or the lack of possibility and 10 represents the highest point or the certainty. How the scores are awarded to each of the parameters (Quantification of the Index) is not within the purpose of this chapter or this research and remains a field of further study.

After scores have been attributed to the parameters, they have to be added up and divided by 12 in order to reach the average score for a specific natural resource. Here is the formula to be used:

$$NRIC\ score = \frac{\sum_{i=1}^{12} p_i}{12}$$

where p represents the score of a parameter i of the Index from 1 up to 12 and $\sum$ represents the sum of the scores of the 12 parameters. Since the scores of the parameters p are scaled between 1 and 10, it is reasonable that the $NRIC\ score$ will also be within that range:

$$1 \leq NRIC\ score\ \leq 10$$

where 1 illustrates the least possibility and 10 represents the certainty that a natural resource will become a source of conflict.

6.3 About the parameters of the NRIC

In this section we will present the twelve parameters of the Index and we will showcase all the rationale based on which we chose them to compose the NRIC. One thing that should be well noted here is that the literature presented in this section is by no means exhaustive and one can find large quantities of research items related to the parameters. Furthermore, the order in which the parameters are listed is not representative of their importance or of anything else. They were just recorded in the order that they arose throughout research.

1. Scarcity of the resource/Frequency of reserves/Distribution of the resource (deposits)

The first of the parameters refers to the abundance of a resource or the frequency with which it occurs. The point behind that is the fact that scarcity of a natural resource can lead to conflict.

For example, Homer-Dixon relates environmental scarcity with violent conflict. As he puts it,

> *"Environmental scarcity has insidious and cumulative social impacts such as population movement, economic decline, and the weakening of states. These can contribute to diffuse and persistent sub-national violence. The rate and extent of such conflicts will increase as scarcities worsen."* (Homer-Dixon, 1994, p. 36)

Furthermore, he provides China as an example to prove that lack of adequate resources in one region will lead people to move to another region within their country and this is highly likely to lead to tensions and disputes among the regions (Homer-Dixon, 1994, p. 38). Lastly, he argues that such a situation is likely to put international security at risk by triggering conflict even among states and that will also be the case when countries will seek to draw attention away from domestic issues (Homer-Dixon, 1994, p. 40).

As presented by Klem (2003), environmental resources have been a controversial issue for a very long time and there is a debate on whether it is scarcity or abundance that causes conflict (pp. 9, 16, 18) and whether actually they cause conflict or cooperation (p. 18). During the 18th century, Thomas Malthus argues that the limited lifetime of natural resources will trigger turbulence (Klem, 2003, p. 9). Klem also juxtaposes the Malthusian view with that of Homer-Dixon's concluding that "the primary cause of concern should be with violent intra-state conflicts" (Klem, 2003, p. 13).

However, the Peace and Research Institute in Oslo, challenging Homer-Dixon's arguments, draws the conclusion that *"economic and political variables are more significant contributors to conflict than are environmental variables"* (Klem, 2003, p. 14). Adding to that, NATO's view on the relationship between scarcity and conflict is that the former is a factor when it comes to intra-state conflicts (Klem, 2003, p. 15).

There is also some other point of view too, the view of Oregon State University. Researchers of the University conclude that water scarcity for example, is not a war trigger but rather a cooperation trigger (Klem, 2003, p. 15). At the same pitch, World Bank opposes the idea of resource scarcity as "an essential cause of violent conflict" (Klem, 2003, p. 16).

Another example is climate change, which contributes to resource scarcity and therefore, to conflicts over (renewable) resources (Safarzynska, 2018, p. 1022). Furthermore, Safarzynska concludes that while *"…random shocks encourage resource conservation within groups. The positive impact of resource uncertainty on resource conservation disappears in the presence of conflict."* (2018, p. 1001).

Ide (2015), who conducted research on "why some conflicts over scarce renewable resource escalate into violence, while others do not", concludes that

> *"no single condition could be identified as necessary or sufficient, but that the simultaneous presence of two structural conditions (negative othering and low power differences) and one triggering condition (recent political change) is sufficient for the violent escalation of renewable resource conflicts."* (Ide, 2015, pp. 68-69).

The researcher also distinguishes between factors causing the conflicts and factors causing the escalation of the conflicts. In the end, he reaches the conclusion that *"the factors causing conflicts over renewable resources are not identical to those causing a violent escalation of such conflicts."* (Ide, 2015).

Among the views expressed in the literature review is also the blunting effect humanitarian aid can have on the impact of resource scarcity – it can even eliminate conflict (Maxwell & Reuveny, 2000, p. 312). However, lack of it may lead to peace and conflict occurring cyclically owing to scarce renewable resources (Maxwell & Reuveny, 2000, p. 315).

Apart from these views, we should also note the fact that we can distinguish three different types of scarcity: a) demand-induced scarcity, *"when the demand for a specific renewable*

resource cannot be met by the existing supply"; b) supply-induced scarcity, *"when environmental degradation, pollution, natural variation or a breakdown in the delivery infrastructure constrains or reduces the total supply or local availability of a specific resource"*; and structural scarcity, *"when different groups in a society face unequal resource access"* (United Nations Interagency Framework Team for Preventive Action, 2012, p. 9). This typology classifies scarcity depending on which resource security criterion you look at it, namely demand of, supply of or access to the resource.

Additionally, the example of the Caspian Sea and the conflicts over how it should be shared among the littoral countries, stresses the importance of this parameter (Madani, Rouhani, Mirchi, & Gholizadeh, 2014). The same research also suggests a system based on utility shares in order to divide the area fairly (Madani, Rouhani, Mirchi, & Gholizadeh, 2014).

All in all, with regards to the first parameter, it can be argued that there is a consensus in the literature that resource scarcity is a challenge – creator, which can cause either direct challenges or indirect challenges by functioning as a multiplier of other problems, among which inter- or intrastate conflicts (Matthew, 2008, p. 15).

2. Ready-to-use level (or further process needed/required; Lootability)

The second parameter of the NRIC brings the resource's readiness-to-use as well as its lootability at the spotlight. Are there any differences between natural resources that need lots of processing before they can be used and natural resources that need less processing? And how does this affect conflict? What if a natural resource can be more easily looted than other natural resources? What is the impact of that factor on the conflict? These are the questions that led to the inclusion of this parameter into the NRIC.

The literature reflects a relationship between lootable resources and separatist or non-separatist conflicts. For example, according to research by Ballentine & Nitzschke, 2005,

> *"Lootable resources (such as alluvial gemstones, narcotic crops, timber, or coltan) are generally associated with non-separatist insurgencies such as in Sierra Leone, Colombia, and Afghanistan. They are easily exploitable and transportable by small groups of unskilled workers. As such, they provide easy benefits to whoever controls the resource-rich area but also to the local population whose labour is needed. Access to lootable resources may prolong conflict, as weaker parties can*

avoid 'hurting stalemates' by generating finances necessary to continue hostilities" (Ballentine & Nitzschke, 2005, pp. 5-6).

In the same paper, juxtaposed to lootable resources are the unlootable[67] ones – in which oil as well as natural gas are also included – resources which are argued to be having a link with separatist conflicts (Ballentine & Nitzschke, 2005, p. 6). The authors provide three reasons for that. The first reason they give is the fact that a variety of costs, directly stemming from the region that the exploitation of the specific resource is taking place, lead to conflict of interests among the several culturally and ethnically diverse communities living in that region (Ballentine & Nitzschke, 2005, p. 6). The second reason according to Ballentine & Nitzschke (2005) is the accumulation of "benefits" by "the central government and foreign companies" owing to the fact that "the exploitation of these resources" is "technology and skill intensive" (p. 6). This fact together with the unequal distribution of the resources and the benefits to the people, cultivate a high sentiment of exclusion, which leads to great dissatisfaction capable of leading to conflict (Ballentine & Nitzschke, 2005, p. 6). The third and last reason provided in this research is the temptation of creating a separate independent state, which will rely heavily in economic terms on that specific resource (Ballentine & Nitzschke, 2005, p. 6).

This evidence makes clear that the more accessible and easy to acquire a natural resource is, the more lootable it is and the more prone to ignite a conflict it is. This is also exemplified in the aforementioned research, where the authors justify the conflict over diamonds in Sierra Leone and the diamond mining in Botswana. In the first case, the diamond deposits were easily lootable (alluvial diamonds) whereas in the second case the diamond deposits were rather difficult to loot (deep-shaft kimberlite diamonds) (Ballentine & Nitzschke, 2005, p. 6).

3. Applications (Level of/Range of applications)

With regards to this parameter, it is true that research has not placed much focus on the impact of the range of the applications of a natural resource on the beginning, the duration or the development of a conflict. However, we believe that this is a field that requires further research. The reason is that we expect a natural resource which is used in a wide range of applications to be more likely to become the stake of a conflict than others. What is more, we should not merely focus on the variety of applications but we should also examine the criticality of the applications.

[67] Examples of unlootable resources provided in their research are "kimberlite diamonds, deep-shaft minerals, oil, and natural gas (Ballentine & Nitzschke, 2005, p. 6).

Criticality of course is something subject to an actor's needs and aims. A material that is critical to certain actors might not be as critical to others.

Criticality and the number of applications seem to be interdependent. We can easily understand this interdependence if we take into account the fact that the more a resource is used, the more indispensable it becomes and this is what makes it crucial. Even if it is used in a limited number of applications, if it is not easily replaceable or substitutable, then it automatically becomes critical. Therefore, criticality is not something to be measured separately, in absolute terms, but it is something that has to be examined under the prism of substitutability as well. Low levels or even worse lack of the latter could make the respective resource a possible source of conflict.

All in all, this parameter has to be further researched into and further justified before it is finally included in the NRIC.

4. Price/price elasticity/fluctuation (volatility)/vulnerability/sensitivity

Price. The price of a natural resource is also among the factors that can trigger a conflict over that specific resource. For example, a surge in food prices is highly likely to lead to violent uprisings, as happened in 2008 – an event that is interpreted as the result of poverty which raises security concerns over livelihood (Blondel, 2012, p. 28). As Raleigh et al also conclude, in cases where the food prices are high, then the rate of conflict is also high; and in cases demonstrating an increase in violence, the average prices for food and commodities also rise (Raleigh, Jin Choi, & Kniveton, 2015, p. 196). As just proven, security and survival exist and progress hand in hand, solidifying the argument that a natural resource becomes a source of conflict when it is among the vital interests of a certain actor.

However, talking about price does not imply only the economic access to the resource. It can also imply the fact that a specific natural resource is precious for an actor due to its potential of funding the survival of that specific actor and the violent action taken to defend this survival. Such a resource is "the conflict diamonds"[68] which were used for funding rebellion in Angola and Sierra Leone in 1990s (Le Billon, 2008, p. 345). Other examples of conflict resources include timber, precious stones or metals, water, etc. The researcher also cites Keen (1998) and Weinstein (2007) saying that *"These 'conflict commodities' are not only understood as financing*

[68] For a list of armed conflicts during 1946 – 2005 related to diamonds, see Le Billon, (2008), p. 353.

hostilities, but also as shaping the motives of violence and behavior of armed groups" (Le Billon, 2008, p. 345).

5. Cost of extraction/mining/logistics/the management of the deposit (geology)

The importance of the impact of extraction can be easily understood if we take a look at the definition used in the work of Hailu, Rendtorff-Smith, Gankhuyag, & Ochieng (2011) to describe resource dependence. The definition used in their work,

> *"…highlights the negative economic and social effects of extraction, mainly high unemployment, poverty, horizontal and vertical inequalities and inadequate provision of social services."* (Hailu, Rendtorff-Smith, Gankhuyag, & Ochieng, 2011, p. 7)

They also express the view that when natural resources are included in a country's national wealth, extraction of them should be considered *"equivalent to diminishing total national wealth – unless resource revenues are invested in building other forms of capital"* (Hailu, Rendtorff-Smith, Gankhuyag, & Ochieng, 2011, p. 14). One more interesting point raised in their work is that not only can resource dependence be a cause of violent conflict but it can also become a sign, a *"symptom"* of conflict and it is under these circumstances that,

> *"Conflict itself increases dependence on resource extraction by weakening markets as well as dislocating manufacturing, services and agricultural activities. […] The greater willingness of extractive companies to accept risk can be explained by the capital – intensity of extractive operations with high sunk investments."* (Hailu, Rendtorff-Smith, Gankhuyag, & Ochieng, 2011, p. 20).

Downey, Bonds, & Clark (2010) also conclude that *"armed violence is associated with the extraction of many critical and noncritical natural resources, suggesting quite strongly that the natural resource base upon which industrial societies stand is constructed in large part through the use and threatened use of armed violence"* (p. 437).

The United Nations Interagency Framework Team for Preventive Action study (2012), provides a focused insight on the potential of each of the extraction stages to trigger conflict. According to the study, among these stages are:

- *"Exploration and discovery;*
- *Definition and allocation of tenures or concessions;*
- *Construction of access and operational infrastructure;*
- *Operations and decommissioning;*
- *Revenue investment into development programmes and projects."* (The United Nations Interagency Framework Team for Preventive Action, 2012, p. 12)

What is more, the study presents the *"key causes for conflict during each of these development stages"* (The United Nations Interagency Framework Team for Preventive Action, 2012, p. 12). Namely,

- *"Inadequate engagement of communities and stakeholders in the development process;*
- *Unfair distribution of the benefits, costs, risks and responsibilities associated with the development;*
- *Impact of the development on the environment, communities, and the local and national economies;*
- *Corruption and diversion of funds to satisfy individual gains at the expense of national and community interests; and,*
- *Inadequate institutional and legal framework to govern the EI[69] development and management of funds."* (The United Nations Interagency Framework Team for Preventive Action, 2012, p. 12)

6. Side-effects of extraction (geological, natural disasters, etc.), friction, unpredictable/unforeseeable factors

However profitable extraction can be, it also produces side-effects. These side-effects are multi-layered, meaning that they can extend over many different sectors such as the environment, the health conditions of the inhabitants in the surrounding areas, the employment or unemployment levels in the area and the economic condition of the local communities, as well as the transformation of the geology and geomorphology of the region. That is why Hailu, Rendtorff-Smith, Gankhuyag, & Ochieng (2011) conclude that,

[69]EI = Extractive Industries

> *"While extractive resource exports such as oil, gas and minerals provide opportunities for growth and human development, an overreliance on such exports is also associated with the risks of slow growth, poverty and conflict."* (Hailu, Rendtorff-Smith, Gankhuyag, & Ochieng, 2011, p. 33)

Illustrating that point is the research produced by Klare, Levy, & Sidel (2011), in which they examine the impact of resource wars over public health. They also stress the fact that resource wars, especially wars over petroleum, are very likely to *"be an increasing source of conflict"* (p. 1617) mainly owing to declining reserves, *"population growth, increasing industrialization and modernization of societies, and other factors"* (p. 1619) and they propose that public health workers can help in various aspects from the documentation of the resource wars consequences over public health to contributing towards prevention of such violent conflicts (Klare, Levy, & Sidel, 2011, p. 1619).

Public health is not the only field that bears the burden of the resource extraction side effects. There are also many other fields, such as the environment. Research conducted by Zhao, et al. (2019) focuses on the impacts of resource extraction on the environment. The case study used in their research is the domestic resource extraction taking place in China and they have also picked specific materials[70] whose extraction impact they examine (Zhao, et al., 2019). Their results show that within a 23-year time period (1992 – 2015) China's domestic extraction grew by 372% (Zhao, et al., 2019, p. 67).

On the environmental level again, research by Bebbington, et al. (2018) uses Amazonia, Indonesia and Mesoamerica as case studies to examine the threat that resource extraction poses on forests, greenhouse gas emissions and forest communities and the increased feeling of insecurity among the forest inhabitants.

Another research (Cust & Poelhekke, 2015) suggests that natural resource projects can have a really positive impact on local economy; however, the researchers also conclude that *"there is evidence that resource projects can fuel internal conflict – both for petroleum and solid mineral production"* (Cust & Poelhekke, 2015, p. 264). They attribute this negative impact on the fact that natural resource extraction can function as a deteriorating factor for inequality as well as cause the expansion of it (Cust & Poelhekke, 2015, p. 264). Adding to that is the risk caused by strictly local activities *"such as artisanal mining, which in many rural areas may cause severe*

[70]Among which are the rare earths, too.

environmental and health risks, conflict and generally few economic benefits" (Cust & Poelhekke, 2015, p. 265).

Adding to that, extraction can lead to environmental problems, which are many times categorized as security problems, causing harsher and *"often violent responses by companies, governments and even environmental NGO's"* (Abukar, 2016). According to the United Nations Environment Programme (n.d.),

> *"Mining activities – whether artisanal or industrial in scale – result in two types of environmental and social impacts: primary impacts, which occur on or immediately adjacent to an extraction site, and secondary impacts, which occur because of infrastructure development, population movements, and changes in local economies."*

Among the secondary impacts of extraction and mining are deforestation and biodiversity loss, agricultural expansion into forests and logging in areas where it was not supposed to be taking place (United Nations Environment Programme, n.d.). The effect of such activities can be really detrimental and they can have an unimaginable "effect on ecosystems" (United Nations Environment Programme, n.d.).

7. *Geographical position (location) of reserves (the closer to a conflict area, the more prone the resource is to become the stake of a conflict) (other non-state actors; terrorist groups, etc.) and climate change*

Geography is a factor that has affected human activity since the early days of humanity on this planet. Ever since these days, geography has had probably the greatest impact than any other factor on what humanity eats and drinks, wears, how it moves, where it settles, the type of its political, social and economic structure as well as the human relationships. Inevitably, it has also had a strong as well as decisive impact on the ignition of a conflict, its form, its duration, its ending and its final result.

According to the literature,

> *"…after the start of the Cold War, the field of geography has focused on the physical, environmental and social influences on war. Conflict geography is a subfield concerned with understanding conflict in various regions. […] A lack of*

> *geographic understanding in post-World War I planners has often been cited as a reason why major conflicts persist in the Middle East today. […] …countries in defensive areas, where mountains are high and difficult to traverse, have had less conquest in their histories, limiting the impact war and its trauma has had on populations. Other regions, with their open, expansive plains, have had to develop and invest more on the military because of perceived vulnerability […].”* (Altaweel, 2016)

Therefore, it is also natural that conflicts over a natural resource are severely affected by the geographical position of that source.

The significant role of the geographical position of the resource is also illustrated by the United Nations Interagency Framework Team for Preventive Action (2012) Guidance Note, where 3 drivers leading to conflict over renewable natural resources are identified. One of these three drivers is the “Transboundary natural resource dynamics and pressures”, which refers mainly to the problems that might occur over resources that are unequally distributed among the national borders of states or to the movement of them across borders (United Nations Interagency Framework Team for Preventive Action, 2012, pp. 10-11). Illustrating this, is the example of the Caspian Sea, researched by Madani, Rouhani, Mirchi and Gholizadeh (2014).

Adding to that is the research undertaken by Yoffe, et al. (2004). The researchers conducted quantitative research in order to examine the relationship between conflict and freshwater. Among their conclusions, is that *“historically extreme events of conflict were more frequent in marginal climates with highly variable hydrologic conditions, while the riparians of rivers with less extreme natural conditions have been more moderate in their conflict/cooperation relationship.”* (Yoffe, et al., 2004, p. 10). This evidence highlights the significant role of the geographical and climate conditions in determining the presence or absence of conflict.

What is more, climate change, which is a topic that lies high on the current global agenda, is a phenomenon that has triggered and will continue to trigger conflict over natural resources (Blondel, 2012, p. 2). As the UN General Assembly and Secretary General have recognized, there are links between security and climate change (Blondel, 2012, p. 2). Illustrating this point are extreme weather events which become aggravated by climate change, such as flooding and drought (Blondel, 2012, p. 29). Adding to this, Raleigh, Jin Choi, & Kniveton (2015) have proven that *“anomalously dry conditions are associated with increased frequencies of conflict”* and

"decreased rainfall exerts an indirect effect on conflict through its impact on commodity prices." (p. 196). Such conclusions reinforce the fact that climate and geography go hand in hand with security and survival and they can have a significant effect – from detrimental to blunting – on the outbreak of a conflict.

Apart from unequal distribution, freshwater and climate change, there are more factors under the umbrella term "geography" that contribute significantly to the beginning of a conflict. One of them is proximity. Research has shown *"how easily war can spill over into neighbouring countries"* (Di John, 2007, p. 981), meaning that the closer a country is to a conflict-experiencing region, the more likely it is to become involved in the conflict or see the conflict spreading over and crossing its borders.

This is a fact valid for civil war, too. According to Bannon and Collier (2003), *"Civil wars also affect the country's neighbours and the global community"* (p. 1) and the authors also add that *"The costs suffered by other countries in the region may be as large as those suffered within the country, as the effects of the war spill across borders."* (Bannon & Collier, 2003, p. 1).

Reiterating the importance of geography and proximity as conflict factors is the research by Caselli, Morelli, & Rohner (2015), arguing that *"conflict is more likely when at least one country has natural resources; when the resources in the resource – endowed country are closer to the border; and, in the case where both countries have natural resources, when the resources are located asymmetrically vis-à-vis the border."* (p. 1). To examine the validity of their arguments, they use a dataset of the distances of oilfields from state – borders and they conclude that *"the presence and location of oil are significant and quantitatively important predictors of inter – state conflicts after WW2"* (Caselli, Morelli, & Rohner, 2015, p. 2).

All in all, the major significance of geography is also highlighted by Klare (2001), who suggests that prediction of conflict should start *"with a map showing all major deposits of oil and natural gas lying in contested or unstable areas*[71]*."* (p. 53). The same researcher also suggests that,

> *"The map would also trace the pipelines and tanker routes used to carry oil and natural gas from their points of supply to markets in the West; many of these routes pass through areas that are themselves subject to periodic violence*[72]*. […] A map of contested resource zones would also show all major water systems*

[71] For a list of such areas, see (Klare M. T., 2001, p. 53).

[72] For an example of such a route, see (Klare M. T., 2001, p. 54).

> *shared by two or more countries in arid or semi – arid areas*[73]*. […] Finally, this map would indicate major concentrations of gems, minerals, and old – growth timber in the developing world*[74]*. […] Such a map, if properly designed, would truly delineate the places where armed combat is most likely to erupt in the years ahead. The mere presence of valuable resources in a particular area does not, of course, mean that conflict is likely to break out there. Other factors – including the relative stability of the countries or regions involved, the history of relations between them, and the local military balance – must also be considered. Israel and Syria, for example, fight over the Golan heights because of a sovereignty dispute dating back to the 1967 war, in addition to the fact that some sources of the Jordan River lie there. Conflict over valuable materials is a significant feature in this and most other conflicts around the world today, so a map of contested resource zones is a more reliable indicator of potential violence than any other single factor."* (Klare M. T., 2001, pp. 53 - 54).

8. Political and economic state of the owner/supplier (state/actor)

We believe that the political and economic condition of the natural resources suppliers can function either as a trigger or as a preemptive force with regards to conflict. As Di John (2007) concludes, *"Very negative economic performance surely contributes to undermining regime and government legitimacy and therefore may increase widespread support for abrupt and even violent changes."* (p. 981). Furthermore, Collier and Hoeffler, who have conducted extensive research on the topic, conclude that *"primary commodity exports increase the likelihood of the onset of civil war"* (Di John, 2007, p. 961).

What is more, as Hailu, Rendtorff-Smith, Gankhuyag, & Ochieng (2011) put it, with regards to producers,

> *"Resource dependence, in its narrow economic definition (measured by the share of primary exports in GDP), is demonstrably negatively correlated with economic growth. This is the classic case of the resource curse (see the work by Sachs and Warner, 1995; Collier and Hoeffler, 2002)."* (p. 7)

[73] For a list of contested regions over water, see (Klare M. T., 2001, p. 54).

[74] For a list of countries with significant concentrations of gems see (Klare M. T., 2001, p. 54).

9. Political and economic state of the transit state/actor

It is true that this parameter resembles the previous one – and even the next one – and it could be argued that they should be merged into one parameter. However, we deem necessary to separate them for the following reason: suppliers/providers have a different political and/or economic approach to the natural resource they offer compared to the consumers. The consumers have a different approach towards the natural resource they consume compared to the suppliers. Finally, transit actors have a third, different approach to the natural resource transiting them simply because their approach incorporates both the suppliers' as well as the consumers' views. In fact, this is not unexpected, given that transit actors get in the consumers' position when they receive the natural resource expected to transit them, while they find themselves in the suppliers' position when it is time to provide some certain amount of that resource to others.

As already stated in the previous factor, states in a weak economic condition are more prone to suffering from weak political institutions and this can easily trigger *"abrupt and violent changes"* (Di John, 2007, p. 981).

10. (Level of) Dependence of consumer states/actors

Once again, just like in the previous two parameters, the worse the economic condition of a state is, the more likely this state is to experience weak political institutions and sudden, violent change (Di John, 2007, p. 981).

Furthermore, literature also suggests that,

> *"Where armed groups depend on easily accessible resources, there is a greater risk that conflict will be lengthened by the consequent fragmentation and fractionalization of combatant groups, as internal discipline and cohesion are undermined by economic motives"* (Ballentine & Nitzschke, 2005, p. 6).

This argument provides evidence that dependence on natural resources 'feeds' and sustains conflict. On top of that, it also becomes obvious that it affects heavily the conflict's duration.

11. Profile of private (non-state) actors involved in the (specific) natural resource market (MNCs, companies, etc.) (black market/illegal mining/smuggling)

Non-state actors are becoming more and more important in the international relations and politics arena. They can be part of the problem or part of the solution, they can be *"burdens"* or *"facilitators"*, they can be *"part of the causes as well as part of the victims of injustice"* (PRIF Research Department III, 2012, p. 14). Non-state actors may take several forms, from companies to paramilitary groups. That is also why there has been debate lately with regards to the power transition from the Westphalian state to the non-state actors (PRIF Research Department III, 2012, p. 3).

Adding to that, any activities taking place in the black market are also shaping the market of the respective natural resource. The black market is a space where any actor can be involved; state, non-state, private. The actors involved in this market are motivated by *"the business opportunities that open up in highly unregulated and chaotic war situations"* (Ballentine & Nitzschke, 2005, p. 8). However, this type of economy is not born only in times of war; it is often present even before a conflict begins and it can also facilitate a conflict outbreak. This is justified if we consider the fact that *"once conflict erupts, shadow economies are easily captured by combatants and, thus, often become the basis for the combat economy."* (Ballentine & Nitzschke, 2005, p. 8).

12. Institutions and International Organizations

It is really important to take into consideration the impact the action of Institutions and International Organizations (IO) can make on the ignition, the duration and the intense of a conflict. Mining the literature, what becomes obvious is *"the blunting effect humanitarian aid can have on the impact of resource scarcity – it can even eliminate conflict"* (Maxwell & Reuveny, 2000, p. 312). However, literature also observes that *"lack of it may lead to peace and conflict occurring cyclically owing to scarce renewable resources"* (Maxwell & Reuveny, 2000, p. 315).

Rather interesting is the research conducted by Shannon, Morey, & Boehmke (2010). They have used empirical analysis concerning *"militarized interstate dispute duration"* for events taking place over a time period of half a century, specifically since 1950 up to 2000 and they have found that a) *"increasing shared IO participation reduces the length of disputes, even after accounting for selection into international conflict"* and b) *"international organizations designed to mitigate commitment problems decrease dispute duration, while IOs capable of reducing asymmetries do not influence dispute length"* (Shannon, Morey, & Boehmke, 2010, p. 1123).

What is more, there is research focusing on the impact of international organizations on a specific type of conflict. To illustrate that point, Chervinka (2013) has conducted research on the role of the international organizations *"in the settlement of separatist ethnopolitical conflicts"* and on the *"mechanisms used by them in this process"* (Chervinka, 2013, p. 141).

Institutions and International Organizations like the United Nations (UN) and the European Union (EU) are among the most famous and popular ones when it comes to humanitarian aid affairs, conflict prevention, the post-conflict building process[75] and the peace process. A study published by the United Nations Interagency Framework Team for Preventive Action (2012) lists several *"Key roles the UN and EU can play"*:

- *"Partnering to support institutional development and capacity – building within host governments to: establish the necessary institutional, legal, policy and capacity to manage and allocate revenues from EI[76]; establish and maintain stable macroeconomic conditions to support sustainable growth in the economy; create a legal and regulatory framework that attracts investment and ensures local content and environmental impacts are adequately addressed.*
- *Supporting the development of partnerships between foreign companies and host governments to enhance the potential for the host country to benefit from the development while also building local capacity to manage the EI.*
- *Delivering programs and engagin in collaborative efforts to develop business linkages and clusters associated with EI development to enhace the potential for the host country to benefit directly from the development while building new industrial bases for long-term sustainable development."* (The United Nations Interagency Framework Team for Preventive Action, 2012, p. 30)

[75] For a list of programs and projects for extractive economies supported by UNDP, see (Hailu, Rendtorff-Smith, Gankhuyag, & Ochieng, 2011, pp. 34-40).

[76] EI = Extractive Industries

Literature has also observed the positive effect that conflict mediation can have on the international and regional organizations themselves. By getting involved in the conflict resolution process, *"they are also evolving into conflict management institutions"* (Slobodchikoff, 2012, p. 31).

However, there is also the argument that *"The United Nations and leading states have also chosen to ignore certain wars or failed states"* resulting in some states being at risk *"of getting exterminated from the political map of their regions"* (Chuka & Samuel, 2016, p. 28).

6.4 Other attempts (for models, trackers, databases etc.) and final thoughts

Several efforts to create tools, mechanisms, indicators, trackers and data sets have taken place in an effort to record, measure and create patterns with regards to conflict and its factors. One of these attempts is "The Correlates of War Project" founded in 1963 by J. David Singer (The Correlates of War Project). Other efforts include the Uppsala Conflict Database (O' Lear, 2005, p. 304), the Peace Research Institute Oslo (PRIO) (Peace Research Institute Oslo (PRIO)), the Stockholm International Peace Research Institute (SIPRI) (Stockholm International Peace and Research Institute (SIPRI)) and the "Crisis Watch" developed by the International Crisis Group (International Crisis Group). However, nowadays the Council on Foreign Relations' (CFR) "Global Conflict Tracker" is among the most popular and prestigious conflict trackers. This tracker is an interactive tool that maps and provides information on conflicts related to the US interests all around the world (Council on Foreign Relations). Another effort worth mentioning is the "Energy Policy Tracker" developed recently by the Center on Global Energy Policy of Columbia University. Although it is not tracking conflict, it still covers the significant task of creating a database of the energy policies and public finance of the energy sector globally (Energy Policy Tracker.org). The reason why it is mentioned here is because this research focuses on conflict, natural resources and energy matters.

With regards to factors, Collier and Hoeffler (2003) have concluded that there are three parameters affecting the relationship between natural resources and conflict significantly. These are *"the level of income per capita, rate of economic growth, and structure of the economy, namely, dependence on primary commodity exports."* (Bannon & Collier, 2003, p. 2).

There have also been attempts of trying to predict conflict. For example, through their research, Caselli, Morelli, & Rohner (2015) created a model for dispute prediction. More

specifically, it is a *"simple model that predicts the risk of inter – state disputes to be largest in the presence of natural resources asymmetry"* (p. 41).

However, the critique with regards to such databases and models is that they fail to understand thoroughly and take into consideration the role and the impact of geography and spatial factors on the conflicts they study (O' Lear, 2005, p. 302).

At this point, special mention should be made for the work of Weidmann & Ward (2010), which has provided the initial inspiration to the author to research this field since 2011 or 2012 when the author was first introduced to their work by a professor of her undergraduate studies. Therefore, it could be considered as being at the deepest foundation of this dissertation. In their work, they research whether *"geography can help us make our forecasts of political violence more accurate"* (Weidmann & Ward, Predicting Conflict in Space and Time, 2010, p. 883). In order to do that, they use a *"spatially and temporally autoregressive discrete regression model, following the framework of Geyer and Thompson"*, which they apply on the conflict in Bosnia during the period March 1992 – October 1995 and they conclude that this model, which takes space into consideration, can result in improved *"forecasts of future conflict"* (Weidmann & Ward, Predicting Conflict in Space and Time, 2010, p. 883). Therefore, we can argue that there are certain efforts to include space/geography into the conflict prediction models, although it is a field that still needs further research.

The NRIC introduced here for the first time fits in this landscape of conflict measurement and prediction efforts. The NRIC as presented here might seem simplistic and not all-inclusive. The factors and the parameters listed in the Index have been chosen after critical consideration of the literature and further careful brainstorming. However, the purpose of this dissertation was not to reach a conflict index. The NRIC arose as a product of the research on when a natural resource becomes the source of conflict. Therefore, it should be viewed as an aspiration to create a tool for conflict tracking and prediction but this tool should not be considered as fully completed since it still lacks the method based on which the parameters will be allocated the values of the scale. This is a great field for further research, study and scientific work in order to create a fully-fledged scientific tool.

Although many people may think that the term – phrase 'conflicts over natural resources' refers mainly to non-renewable natural resources, such as oil and gas, this is not true. As renewable

resources become more and more the trend in covering energy needs worldwide, conflicts are also going to follow that trend and evolve around them. The United Nations Interagency Framework Team for Preventive Action Guidance Note adds *"poor governance of renewable natural resources and the environment"* among the three drivers leading to conflict over renewable natural resources (2012, p. 9). This driver stresses the importance of rights, laws, policies and public participation to the ignition of conflict that has renewable resources as its stake (2012, pp. 9-10).

Overall, we believe that it is in the human nature to be worried or even afraid of the future – even if 'future' is only a few moments later – and therefore trying to predict the future. At the same time, conflict is an uncertain situation during which power is contested and change is brought at the threshold of tomorrow. It is for these reasons that humanity will continue to try to predict conflict in order to be able to be prepared for the changes it brings.

CHAPTER VII

CONCLUSIONS

They say that when you write an academic essay or dissertation, you usually start from the conclusion, then you proceed with the main body and finally, you write the introduction. This dissertation has followed that rule as well; one of the first parts to be written was the second part of the conclusion.

7.1 All in all

However, before reaching any conclusion, it is deemed necessary to make a summary of the previous chapters in order to get a full perspective of the topic and realize exactly where the pieces of this puzzle fall.

In Chapter I, the Introduction of the dissertation, we set the research purpose of this research, which was to study the conditions required for a natural resource to become the source of a conflict in the international system. Furthermore, we presented the paradoxes around which this research has been built and we set the main research question "When does a natural resource become the source of conflict?" as well as the secondary ones "Why is it that some natural resources have been securitized and have become sources of conflict whereas others have not? Why is it that some natural resources have become the source of a conflict more times than others? What are the determinants of a conflict? What are the determinants of a conflict over natural resources? Is it possible to predict a conflict?". After that, we set the research hypothesis awaiting for its rejection or verification.

Then, we explained the theoretical framework and the methodology that has been used as well as the structure that we would follow and we also defined the key terms such as security, conflict, threat and critical (raw) materials. We provided a detailed description of the securitization theory, which is the primary theory used in this analysis. We presented its main representatives and its key concepts that have been applied to the case studies in order to interpret the behavior of the several actors involved in them. What is more, we also provided a thorough presentation of the other analytical tool used in the dissertation, namely energy

security. We depicted the wide range of existing definitions in the literature and we distinguished the key concepts and perceptions around it.

Then, in Chapter II, we presented the two natural resources that were selected to be put down to the test in this dissertation. First of all, we provided facts and figures with regards to natural gas. We provided a definition for it as well as useful information on its composition and where its reserves are usually found geologically speaking. Furthermore, we presented its environmentally friendly character compared to oil and offered a brief historical illustration of natural gas' impact on human life. We made a special in-detail mention to its types and production methods – both the traditional way and fracking – in and attempt to give a clear picture of the extraction process of natural gas and the delivery to its market. What is more, we presented the various applications it has owing to its characteristics. We made special reference to LNG, its creation, transportation, storage and benefits.

After that, we engaged in an effort to depict the natural gas market as sufficiently as possible. Using figures, tables and charts, we provided insight on the supply (reserves /deposits), the suppliers (producers), the amounts produced, the demand and the consumers, the amounts consumed, the prices, the trade (both imports/importers and exports/exporters and the amounts traded), the LNG trade (exports, imports, trade by transit mode) and the issues originating from the unequal distribution of natural gas around the world such as interconnectivity and interdependence among the actors together with the repercussions on energy security.

Further down the path of Chapter II, we followed a similar process to present the rare earths. Just like in the part on natural gas, through charts, tables and figures we provided all the necessary details to offer a clear picture concerning the rare earths production and production process, the consumption levels, the REEs applications and the several other issues related to them and their market.

Since they are not a natural resource that many people are familiar with, we first provided all the necessary details concerning them, such as which metals this group consists of, the reason why they are called 'rare' and 'earths', how these metals got their interesting names and how they are grouped into Light and Heavy REEs. Following that, we presented their physical and chemical properties and the really wide variety of applications in which they are used from the glass and polishing sector to catalysts and magnets and from the ceramics sectors to batteries and nuclear reactions. Additionally, we also presented the 'Nuclear

Paradox' concluding that rare earths could provide solutions to the risks that the nuclear energy poses.

After that, we proceeded with illustrating the REEs market attempting to give a clear picture about it. First, we focused on the ores in which REEs can be found and their complex extraction, separation and production process. Then, we continued with illustrating the supply of the rare earths, both reserves and deposits, the suppliers, the recycling methods, the new projects and the possibilities for substitution which could increase the REEs supply. We also made a special mention to the EURARE project, a program funded by the European Commission with a target of researching, locating and mapping possible REE resources within the EU and its partner countries. Next, we turned to the demand and the consumers of rare earths, the prices of the rare earths oxides, which play a catalytic role and can trigger both economic as well as political developments, and the trade. Regarding the latter, we presented the exports and the major exporters as well as the importers. Furthermore, we highlighted 'The Balance Problem' – a problem that occurs when there are oversupplies of a specific rare earth that have to be stored due to the fact that they are extracted in the same ore as other REEs that are in greater demand at a given time in the market. After presenting the most important REEs ores and REEs throughout the years and some solutions to 'The Balance Problem' according to the literature, we proceeded to the topic of illegal mining and smuggling and to the prospects of the REEs production, demand, consumption and prices for the years to come.

Turning to Chapter III, we presented the selected natural gas case studies, namely a) The Case of Russia – Ukraine and b) The Case of the Eastern Mediterranean (Israel – Cyprus – Greece – Turkey).

Starting with the case of Russia – Ukraine, we provided an outline of the events related to it and then we applied the theoretical framework – the theory of securitization and the concept of energy security. First, we presented the major role of the Russian Federation in the natural gas industry and market and we also stressed the vital role the natural gas exports play for the state's economy. In addition, we provided the necessary background to understand the connection between Ukraine and Russia and the level of their interdependence, especially in the trade and energy sectors. We also showed the great importance that the natural gas sector carries for Ukraine on multiple levels – on the economy, political and security sectors. Furthermore, we presented a picture of the vast transit network Gazprom relies on to reach its customers.

Then, we turned to outlining a timeline of the events that took place during the years 2006, 2009 and 2014, events that led to large political, economic and social unrest in Ukraine – probably the largest unrest after the Orange Revolution. We also made special reference to the developments that led to the annexation of the Crimean peninsula by the Russian Federation and the sanctions imposed to the latter by the US, the EU, Canada and other Western states.

After that, we proceeded with the analysis of the events and the application of the theoretical framework. For that purpose, we also presented key moments of the discourse of the main stakeholders and actors from all sides involved in the situation during the given period in order to examine whether natural gas had been securitized. We concluded that natural gas was securitized and that energy security can take as many forms as the different actors involved in a given security complex have, for example, security of supplies, security of demand, security of stored gas supplies. Furthermore, we highlighted that diversification was something that had to be targeted by both the Russian and the Ukrainian sides as well as from the EU. Moscow should aim for diversification of transit routes while Kiev and Brussels should be aiming at diversification of supplies. Additionally, we emphasized the critical role of the price of natural gas and its transit fees in determining the security of supplies. Price is so important that, as Dagoumas argues, if it were detached from the international oil prices, then a decrease in the natural gas prices would be expected but at the same time, there would also be an increase in the possibility of mid- and long-term energy crises that would be created artificially (Δαγούμας, 2012, p. 233). We also drew attention to the high level of interdependence thus of vulnerability of the actors involved and unraveled the geopolitical pursuits of the Russian side, which were expressed through the annexation of Crimea.

In the light of the vulnerabilities that the reliance on Moscow created to its customers, we continued our journey by examining the case study of the Eastern Mediterranean. In the beginning, we portrayed the picture of each of the main actors, namely Israel and Cyprus, with regards to their energy security status. We also provided a timeline of the natural gas discoveries in the Israeli and in the Cypriot EEZs and we depicted their bilateral relations and the relations developed with Greece and Egypt as well in an attempt to present the multidimensional effect that the cooperation on the energy sector triggered. What is more, we presented Turkey's reaction to the rapid developments and the conflict of interests that inevitably occurred.

Having illustrated the key events of the case study, we continued with the analysis and the application of the theoretical framework on it. We concluded that natural gas has been securitized in the Eastern Mediterranean region, as the moves of the actors reveal; especially the moves made by Israel, Cyprus and Turkey. Furthermore, we stressed Israel's high level of energy security vulnerability in terms of security of supplies and we also mentioned the heated debate that was going on at that time. Having presented discourse examples of the securitizing actors during that period, we reached the conclusion that energy for Israel, Cyprus as well as for Turkey has been securitized. We further moved on to argue that it is the unequal distribution of (energy) resources around the globe that leads actors to certain behaviors and to the securitization of the energy supplies and the energy sector.

Then, our journey continued with proceeding to Chapter IV where we presented the case study related to rare earths – the Sino-Japanese dispute over the Senkaku/Diaoyu islands in 2010. At the beginning of the chapter, we offered a brief recap of the REEs applications and of the role the rare earths hold in the Japanese economy which is significantly dependent on China for REEs imports. In that way, we wanted to illustrate the bilateral relations of the two countries, their interdependence and the high level of vulnerability especially on Japan's side.

Following this introduction is the presentation of the events related to the rare earths crisis dating back to 2007 when Beijing started imposing export duties in an attempt to gain better control of the exported REEs quantities. Similar measures and actions on the Chinese part took place in the years following, culminating in 2009 when the "Rare Earth Crisis" is set to have been born (Voncken, 2016, p. 1; Bourzac, 2011). After that, we proceeded with the presentation of the incident at the Senkaku/Diaoyu Islands that took place in September 2010 and resulted in the disruption of the rare earths supply from China to Japan and the deterioration of the bilateral relations on both the diplomatic and institutional level. After providing a timeline of the events, we highlighted the great impact this move had on the prices of the REOs, causing them to soar and we stressed the 'choking' effect it had for the Japanese economy, leaving Tokyo with no choice but to surrender to Beijing's demands. Furthermore, we presented the actions Tokyo took in order to form agreements with third parties that would contribute to the diversification of the REEs supplies and the concerns raised to the West – mainly to the US and the EU – which led to the filing of a case against China to the Dispute Settlement Body of WTO in March 2012. Adding to that, we provided examples of the measures taken by several actors in order to tackle the rare earths challenge posed.

Having done so, we proceeded with the analysis and the application of the theoretical framework on this case study. We have argued that all actors had been alarmingly dependent on China thus becoming highly vulnerable to any disruption in the supplies offered. It became clear that fear and uncertainty dominated most of the actors dependent on China for REEs supplies and this is explained by the lack of trust and the presence of suspicion among the actors of the international system. What is more, we have included examples of government documents as well as statements from all the parties involved (such as the UK and the US) that show that rare earths had been securitized and they were seen as a material under threat that needed to be protected from the threat of the supply disruption. We concluded that the REEs were securitized in that case and that was a result of the great dependence of the parties on China and their imbalanced interdependence with it. Furthermore, we reiterated Professor Platias' argument that *"every conflict is economic and political at the same time"* and that "*power and wealth are the two sides of the same coin*" (Πλατιάς, 2012, p. 598). In addition, we applied the energy security theoretical tool but this time as "rare earth security" and pointed out the high risk for the security of supplies. When applying the securitization theory, we drew the conclusion that rare earths had become the referent object which had to face an existential threat. Finally, we concluded that REEs might not be securitized at the same level at the moment, but still they are of utmost importance to many sectors.

Moving forward, we reached Chapter V, which was destined to be devoted for comparing and contrasting the three case studies. Through this procedure we attempted to understand the level of securitization in each case study, the reasons behind it, the way it was achieved and the stake that was to be taken under protection in each situation. To succeed in doing so, we used some matrices as a tool to help us gather the data and evidence from the cases and then find common points and differences among them. These matrices were used to record the case study main actors, the drivers towards securitization, the stake(s) under threat, the means used to achieve securitization, the extreme measures taken by the actors and the level of securitization in each of the cases, where we distinguished between 'heavy' and 'light' securitization depending on the presence or the absence of extreme measures respectively.

First, we began with comparing and contrasting the cases of Russia – Ukraine (natural gas) and China – Japan (REEs) and then we proceeded with the comparison and contrast between the Eastern Mediterranean (Israel-Cyprus-Greece and Turkey) and the rare earths cases study. For the first comparison, we distinguished between suppliers and consumers for both case

studies because the conflict was taking place between these two sides. Nevertheless, we did not follow this pattern for the second comparison due to the fact that the conflict was not on a supplier vs. consumer basis but rather on a 'wannabe'-supplier competition and control-over-resources basis.

As for similarities, what we found is that in all the cases the actors were aiming at securing an uninterrupted flow for the natural resource demonstrating that it is part of their vital interests and securitizing it for that matter.

With regards to differences, not only was there the difference of the resource under examination in the cases – natural gas and rare earths – but there was also a ranging point of view and a variety of interests which formed different perceptions and interpretations of the events by the actors. What is more, it is exactly this variety that allowed for differentiation of the actors' securitization discourse and for the existence (heavy securitization) or absence (light securitization) of extreme measures.

What we concluded is that for a resource to become the source of a conflict it is essential that it is among the actor's interests. Additionally, it has to become securitized through discourse and sometimes the actor takes extreme measures as a result of the securitization process. Finally, we argued that it is fear about their survival and existence and it is the feeling of insecurity and threat that makes actors behave like that and take measures to protect themselves, together with mistrust between them and other actors for whose friendly behavior they have no valid guarantee or evidence.

Entering Chapter VI could be considered as a rather bold and brave step. It is the Chapter hosting our attempt to create and establish an index that could help predict future conflicts. The index created is "The Natural Resources Index of Conflict (NRIC)".

First of all, we presented the NRIC which consists of 12 factors/parameters and aspires to predict 4 types of conflict, namely i) inter-state (IeSC), ii) intra-state (IaSC), iii) state – non-state (SNSC) and iv) non-state – non-state (NSNSC) conflict. Then, we proceeded with presenting how the NRIC works. The NRIC measures the score of a natural resource for each of the 12 parameters. The 12 parameters can be assigned a score from 1 (lowest / least possibility) to 10 (highest / certainty). After that, the 12 scores are added up and divided by 12 so that we can get the average score for a specific natural resource. At that point, we also presented the NRIC's formula and its domain of definition.

Someone might wonder why 1 has been chosen as the least acceptable value for a parameter and zero is not included at all. The reason is that 0 represents the absence of possibility. Therefore, it would be representing the impossible. However, in international relations, just like in all human relations and human – affected sectors, you can never be sure when a parameter will become part of an actor's vital interests. The reason for this is the constant change, which Heracleitus summarized in his famous quote «τὰ *πάντα ῥεῖ*» ("ta panta rhei" – everything flows). In other words, the reason is that the human nature can be highly unpredictable and that the conditions in the anarchical international system which – to someone's eyes – may seem stable at a given time are always subject to change, adapting to the actor's (and actors') needs and behavior.

Having presented the NRIC and the way it should be calculated, we moved on with justifying the choice of the twelve parameters. For each of them we provided a short literature review to illustrate its importance and justify its inclusion in the parameters of the NRIC. Finally, we provided a picture of other attempts similar to the NRIC, such as models, trackers and databases in order to show that research is constantly in a pursuit of a pattern or a mechanism that will allow humanity to predict and anticipate conflict. However, we could argue that at the end of the day conflict is like an earthquake – you know where it is more likely to happen but you cannot predict when or what its intensity will be.

7.2 Personal conclusions

Over the course of the dissertation, we have tried to uncover the answer to the question "Why is it that natural gas has been securitized whereas rare earths haven't? Or is it just a lower level of securitization?". However, this is not a paradox that has only been noticed in the present research. For example, Mancheri aims to contribute towards that by studying *"the international trade aspects, how these minerals have emerged from obscurity to considerable relevance and how China articulated its policies in concurrent with developments in global trade"* (2015, p. 263). This demonstrates that this is a field that needs further research in order to explain this paradox. In our dissertation we have used the theory of securitization in an attempt to illuminate and examine this field. What we have concluded unravels in the following personal conclusions.

Although of a constructivist nature, I strongly believe that, at the end of the day, securitization is a tool of realism and I believe that the same happens with constructivism as

a whole too. We could argue that it is 'realism by other means' to paraphrase Clausewitz's famous quote about war[77].

We have illustrated that securitization is a rhetoric construction on a specific topic, which appears when a state (or actor) starts feeling insecure with regards to that topic. In other words, securitization starts taking place when fear comes to the front. But why does realism need securitization? Realism is often accused of 'amorality' and having no ethics. Therefore, securitization provides the 'great cover' since through this process realism can achieve moralization and legalization of its actions. Furthermore, two of the most important realist axioms are that a) the international system is a 'self-help' system due to its anarchy and b) states/actors struggle/fight for their survival in the international system because they are afraid of their annihilation. This means that an actor's interest (or national interest when talking about states), is to protect its survival in the international system. This is the key purpose and the primary goal of any actor. Therefore, the actors' behavior is definitely driven and determined by that purpose and actors take advantage of and use any means that serve this ultimate purpose.

Securitization, meaning the rhetoric process, is the trigger that ignites a conflict. Something, anything is not securitized by itself and it cannot become securitized unless someone has securitized it through talking in public about this thing's security implications[78]. This means that securitization is the sufficient condition that produces the outcome, whereas the security dilemma of the actor is the necessary condition. But that alone, cannot lead to conflict.

Of course, different actors have different interests. This means that it is rather likely for different interests of different actors to be mutually exclusive. In that case, these interests cannot be fulfilled at the same time. This is exactly the point when conflict among actors arises.

All things considered, when a topic arises, and it seems to threaten an actor's existence, then the actor has to tackle it by selecting the necessary means from a wide range of political and non-political tools. We have argued here that one of these tools is securitization or 'realism in disguise'.

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[77] Clausewitz argued that 'War is the continuation of politics by other means'.

[78] See also (Fischhendler & Nathan, 2014, p. 154) where they argue that *"Framing energy as a security issue is thus dependent on the dynamics of discourse."*

In our case studies, energy and rare earths have been securitized or to be more specific, their supply chains have been securitized. However, there is a difference in the level of securitization of each of the two cases. In the first case, energy has been securitized for centuries. Natural gas as a form of energy has also been strongly securitized ever since it came in the limelight and started threatening the primacy of oil. It still remains highly securitized if we take into consideration the two case studies in this dissertation, namely the Russo-Ukrainian dispute and the dispute in the Eastern Mediterranean. Contrary to natural gas' high level of securitization, rare earths have a low level of securitization. REEs were highly securitized back in 2010 in the immediate aftermath of the dispute over the Senkaku/Diaoyu islands. However, it seems that what followed was a procedure of de-securitization but not a complete one. In other words, rare earths have not been completely desecuritized – they just remain on a low level of securitization[79].

In the light of this evidence, what is proven is that not only have energy and natural gas been securitized for a long time but they have also been securitized more strongly than other natural resources. Furthermore, currently used energy resources are more strongly securitized than other energy resources, such as wind, sun and sea.

To conclude, we have proved the validity of our research hypothesis that a natural resource and practically anything can become a source of conflict when it has been securitized. This answers our primary research question which was "When does a natural resource become a source of conflict?". It also explains why some natural resources have become sources of conflict over the years but others have not. The answer is: simply because they have not been securitized yet or because they have not reached the level of securitization required to become a source of conflict.

In the light of this evidence, a wide field for research lies ahead concerning the levels or shades of securitization. Furthermore, the NRIC (Natural Resources Index of Conflict) proposed in this thesis aspires to provide a stepping stone for further study on other factors that affect the moment when a natural resource becomes securitized (and a [possible] source of conflict).

[79] At the time when these lines are written, there is an ongoing trade war between China and the U.S.. This brings to the front the possibility that rare earths can be used as a means of pressure by China against the U.S. Furthermore, if China uses rare earths in this trade war, it might not be in a direct way. For example, it could halt or significantly reduce quotas exported to significant U.S. allies, such as Japan, and not directly to the U.S.. In such a case, we will be talking of a trade war by proxy.

That said, what comes to my mind is Thucydides who, in his masterpiece *History of the Peloponnesian War*, which he aspired to become «*Κτῆμα ἐς ἀεί*» ("ktima es aei" – a possession for all time), narrated in the most eloquent way the causes that lead to the great tragedy of war. Through delineating the two great powers, Athens and Sparta, and as Professor Platias has said time and again in his speeches and books, Thucydides shows that great powers seek control over resources to maintain their power which they then project so that the other actors are aware of their capabilities and potential and they are deterred from entering a competition with them. Based on that, conflict over a resource arises when two or more actors aspire to gain control over it at the same time because gaining control over it will fulfill their vital interests. This means that according to their perception and agenda, this specific resource has been securitized. Therefore, it could be argued that Thucydides had already answered to the primary question of our research proving the validity of our research hypothesis thousands of years ago.

Sometimes I wonder, "Why are there so many texts and analyses on international relations still written, since Thucydides has said it all thousands of years ago?" The answer is simple – To prove him yet again true.

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