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The Gas Industry in Italy: liberalization process and new business models

Relatore

Prof. Dottore Luigi Benfratello

Candidato

Bernardo Antonio Raad Char

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1. Introduction

The current thesis will represent a mapping of the Gas industry in Italy, with a focus on the liberalization process of the industry that has changed the course of the internal market. It is fundamental to understand that the Gas industry is a part of a major Industry: “The Utilities Industry”.

The processes of liberalization of the industry began in May the 23rd of 2000 with the “Decreto Letta” (Enrico Letta: Ministro dell’industria, del commercio e dell’artigianato), the Law decree 164/2000 has established that the following activities are completely liberalized in the Gas industry in Italy:

- Gas Import;
- Transportation and dispatching;
- Storage;
- Distribution;
- Sale of Gas.

The Gas Industry in Italy has a special characteristic, more than 90% of the Gas in Italy comes from outside of the country (ARERA, 2019), this is a fundamental fact in the analysis of the industry, the Gas Import activity is the main input of the Business.

The gas imported needs to reach the customers, the transportation and dispatching activities scope is to move the gas from imports or national producers of gas along the country. The gas is transported until the different local distribution networks, and in some special cases to major consumers. The dispatching activity is considered and strategic activity that manages the domestic flows on the transportation network.

The main scope of the storage activity is to compensate for the fluctuations and guarantee a strategic reserve inside of the national gas system.

Two actors play a fundamental role in the Industry: the distributors and the sellers, these two players are in direct contact with the final customers. The distributors in Italy are “Regionalized”, this means that virtually a Distributor has a typology of exclusiveness in the local Markets, they are the ones, for example, that owns the Gas meter device in the PDR “Punto di Riconsegna” (see glossary), some of the responsibilities and duties for the Distributors in Italy are:

- Resolve any failures in the devices;
- Moving the devices from one point to another;
- Connection of a new point to the network;
- The detachment of the Gas Meter Device from the network (e.g. contractual termination).

In the Gas industry in Italy the final customer can decide who to buy from, and here is the “Crux of the matter”, since 2003 the final customers have been empowered by the government, Customers can analyze the offers in the market and can decide who to buy from.

The sellers differentiate each other with two special characteristics: Price of the cubic meter and Customer service. In recent times the market has evolved in so a notable way that many sellers are offering not only Gas but also Electricity (also liberalized, not objective of this thesis), bundling the two principal commodities in the market creates simplicity for the final customers.

In the process of achieving an actual mapping of the Gas industry in Italy and how the liberalization process has contributed to the creation of new business models, the following structure of the thesis has been defined:

1) Introduction
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3.2.3) Legal entities;

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2. Objectives

2.1 General

Assess the evolution of the Gas industry in Italy after the liberalization process of the industry, by analyzing the structure and the different players in the industry that have led in the creation of new business models.

2.2 Specific

Identify the characteristics of the main companies and the way in which they are positioned in the Utilities industry in Italy, by analyzing different factors such as geographic area, services offered, the legal constitution of the companies and main the main activities performed.

Introduce the main players in the utilities industry in Italy and introduce their capacity of action in the national and in the international markets.

Analyze the impact of the liberalization process of the Gas industry in Italy by considering the different players in the industry, and the way in which they have contributed to the stability and development of the market.

Analyze the National Authority ARERA entity that regulates the Gas Industry in Italy.

Assess the industry profitability by understanding the structure of the industry and the attractiveness of the industry to potential players, by using the Porters' Five forces analysis.

Analyze the composition of the final price of the Natural Gas paid by the consumers.

Assess the new business trends and how complementary services/goods have contributed to the development of the Gas Industry in Italy.

3. The utilities industry

3.1 Overview

The concept of Utilities Industry refers to a category of companies that provide and are committed, in the production and delivery of public services or goods to society, such as:

- Gas;
- Electricity;
- Water;
- Sewage services;
- Waste disposal;

These services are necessary for society and are considered as indicators of social development and wellness in a community. These are goods that are always demanded, and in the market, each of them can be acquired by the final customer from different sellers. The quality of the product that is offered by the different sellers is homogeneous, these characteristics make them a commodity (refer to the glossary).

3.2 The Utilities Industry in Italy

In the Utilities Industry in Italy different markets can be identified. To have a better comprehension of the way in which companies are positioned in the industry it is fundamental to identify the following four factors in some of the main Groups/Companies in the Industry:

- Geographic area;
- Goods offer;

- Legal entities;
- Main Activities.

3.2.1 Geographic area

The geographic area specifies the territorial area of scope in which the company operates, there are three main territorial divisions that will be considered:

1- Local scope: is a characteristic of most of the companies in the Italian Market, their operating activities are carried out usually in the place in which the company has its origins. An example of this category are the well-known municipality companies.
2- National Scope: Companies that have the capacity to operate in the country.
3- International Scope: refers to companies that have enlarged their capacity of action over the years, their territorial scope has turned on many countries. Usually, this capacity is motivated by political agreements of investment between Nations, creating opportunities for their Private or Public companies. An example of this case is the multinational company ENEL, in which even though it's a private company, the main shareholder is the Country throw the Ministry of Economy and Finance of Italy. This company has a presence in countries such as Colombia, Spain, Brazil, etc.

3.2.2 Services offer

The strategic choice of the organizations goes under the business perspective; the choices made by the companies are deeply correlated with the different services that can be offered to the different customers in the market.

The companies in the utilities industry have the following characteristics in their services portfolios:

- Mono Utility: addresses all their activities in the offer of only one good. Usually, small players are part of this category, it is almost impossible to find one of the main players in the Italian market in this typology.

- Bi-Utility companies: as the prefix states are companies that address all their portfolio activities in offering two goods. In the Italian Market, there are many sellers that offer in their portfolio services, two goods, usually, the combination is Gas and Electricity (two liberalized goods in the market).

- Multi-utility companies: are companies that address all their portfolio activities in offering more than two goods, in the Italian market, the main competitors in the industry are in this segment, their portfolio services include other offers such as waste disposal services, water services, Gas, Electricity, etc.

- Multi-services: this is an interesting categorization of the companies, many of them have initiated a different way of conceiving the business in the industry, they have started introducing complementary goods (see glossary) in their portfolio services.

3.2.3 Legal entities

The way in which companies in the utilities industry are legal constituted is an important factor that allows the organizations to act in a specific way in order to achieve results in the National and the International markets.

In Italy, the main players in the Industry are legally formed under the legal business entity of Limited Public Company mostly known in Italy as S.p.A “Società per azioni”. Even though this is the main legal business entity chosen by the

companies, what really guides the business inside of the company is the main or principal shareholders.

As an example, two companies: Eni that has as the main shareholder the State, throw the Ministry of Economy and Finance of Italy, and ACEA, that its main shareholder is not the central Government but a local government “Comune di Roma”. Each of these authorities has its own way of doing business in the industry, and many of the decisions taken by these companies depend on the governments in a determined moment.

3.2.4 Main activities

To understand the role that the main competitors have in the market it is important to consider the main activities they carried out, with the introduction of regulations by the authority in the Market (refer to 4.4 4.4Authority), the way in which the companies must act in the market has been strictly delineated and hence, must be analyzed carefully.

The following main activities are performed by the companies in the Utilities Industry:

- Import – Export (EE and GAS);
- Production (EE and GAS);
- Transportation and dispatching (EE and GAS);
- Distribution (EE and GAS);
- Sale (EE and GAS);
- Integrated Water System.

Even though companies can perform all the previous activities (vertical integration) at the same time by using a special legal entity known as “Gruppo societario”, they should be careful in the way they do it. Since the liberalization process began in Italy for the principal goods offer: Electricity and GAS, there have

been many resolutions dictated by the Authority. There are four resolutions that are strictly related to the way in which companies must act in the market.

After the first resolution named and as the market and politics evolved over the years, modifications have been introduced to the original resolutions by the Authority creating new resolutions:

The first resolution “TIU” (Testo Integrato “Unbundling – see glossary”) from 2007, was dictated by the authority for the Energy and Gas and stated: “The administrative and accounting separation obligations (Accountable Unbundling) for companies in the sectors of Electricity and Gas and related publication and communication obligations”. (ARERA, 2019)

The second Resolution “TIUC” (Testo Integrato Unbundling Contabile) from 2014, was dictated by the authority for the Energy, Networks and Environment and stated: “The accounting separation obligations (accountable unbundling) for companies operating in the sectors of Electricity and Gas and the related communication obligations”. (ARERA, 2019)

The third resolution “TIUF” (Testo Integrato di unbundling funzionale), from 2015, was dictated by the authority for the Energy, Networks and Environment and states: “The function separation obligations (Functional Unbundling) for companies operating in the sectors of Electricity and GAS”. (ARERA, 2019)

The fourth resolution “TIUC” (Testo Integrato Unbundling Contabile) from 2016, was dictated by the authority for the Energy, Networks and Environment and states: “The accounting separation obligations (Accountable Unbundling) for companies operating in the sectors of Electricity and Gas and for the administrators of the integrated Water services and the related communications obligations”. (ARERA, 2019)

The objective of the previous resolutions is mainly to avoid unfair competition in the market, dictating an Unbundling of the functional and accountability roles in the companies that are under a Company Group or perform two or more activities in

the industry at the same time. Having information about different activities in one company/system is not a proper way of having a liberalized industry, the introduction of the Unbundling regulations has improved the way market moves (Refer to paragraph Authority).

For example: The Group Company AENG (not and existing company) in Italy that has two companies operating in the market, one company is a distributor of Electricity in the region of Piedmont and the other is a Sales company of Electricity, the sale company has lost a significant piece of the internal market in the region of Piedmont. Before the introduction of the Unbundling regulations, the Sales company could take advantage of and use the information from the competitors in their systems (information in the distribution company) to construct new market trends.

Even though there are restrictions and the adoption of the unbundling regulations is a must in the Industry, important players are running many of the activities in the business with the well-known legal entity of “Gruppo societario”, that refers to a group of societies that are related to a “Holding” or Higher society that controls the others. After this description, many questions can be formulated (ethical questions), and this is the crucial scope of the Authority, reducing unfair competition in the market by creating and dictating new regulations on the market.

3.3 Main competitors

The following matrices represent the Main Competitors (multi-service companies) in the Italian Market, describe the way in which companies differentiate in terms of operational choices in Italy and outside of Italy. It is important to remark that the following main players in the Industry have also a presence in different countries, proving the capacity of the Italian companies in the International Market.

GRUPPO ACEA

Subsidiaries	Geographical area	Goods offer	Main activities
1)ACEA Ato2 2)ACEA Ato5 3)GORI 4) Crea gestioni 5) Acque 6) Publiacqua 7) Acquedotto del Fiora 8) Nuove acque 9) Geal 10) Umbra acque 11) ACEA International 12) Aguazul Bogota	National Lazio – Rome (79 municipalities) Frosinone (86 municipalities) Campania (22 municipalities) Campagnano di Roma and Termoli Pisa Florence Siena and Grosseto Arezzo Lucca Umbria International Honduras Dominican Republic Colombia Peru	Management of water services	Water systems
13) ARETI	Lazio	Electricity	Distribution
14) ACEA Energia	National	Electricity and GAS	Sale
15)ACEA Ambiente 16)AQUASER	Lazio Tuscany Umbria	Waste	Disposal

Table 1 - Gruppo ACEA

ACEA was founded in 1909 as a company to serve the city of Rome, the trademark at the begging was not so important for the company, the real change started in 1992 when the company felt the necessity to separate itself from the municipality of Rome and became a Public Limited Company. In this year also started the change in the Trademark. Three representative colors on their logo: green, for the environment, yellow, for the energy and blue for the water.

ACEA is a Multi-utility company that demonstrates with numbers, its constant progress and capacity of growth and action. ACEA has an EBITDA (see glossary) of 933 million euros, 77% of it comes from Regulated activities and 23% from unregulated activities. 45 % of the consolidated EBITDA comes from the Water services, 37 % of consolidated EBITDA from Distribution of electricity, public lighting, generation of electricity and Industrial energy efficiency, 8 % of the consolidated EBITDA in Commercial and Trading (sales), 7 % of the consolidated EBITDA in waste management, and the remaining 3% between Engineering and services and overseas activities.

GRUPPO ENEL

Subsidiaries	Geographical area	Goods offer	Main activities
Enel Energia	Italia	Electricity and GAS	Sale
E-Distribuzione	Italia	Electricity	Distribution
Enel Russia	Russia	Electricity	Sale
Enel Iberoamerica Endesa Endesa Lationamerica Enel Latinoamerica	Spain Brasil Colombia Argentina Chile	Electricity	Sale Distribution

	Peru		
Enel Romania	Romania	Electricity	Sale
Enel Slovakia	Slovakia	Electricity	Sale
Enel Portugal	Portugal	Electricity	Sale Distribution
Endesa Germany	Germany	Electricity	Sale
Endesa Netherlands Enel Finance International Enel Investment holding	Netherlands	Electricity Gas	Sale

Table 2 - Gruppo Enel

Enel is a Multinational Italian company founded in 1962, with a presence in 34 countries around the globe across the five continents, is a company that produces, transports, distributes and sales Gas and Electricity around the world. It has approximately 73 million end users around the world, one of Europe's leading energy companies by installed capacity (see glossary) and reported EBITDA. Enel reported 75.7 billion euros and an EBITDA of 16.2 billion euros. Enel sold more than 11 billion m3 of Gas in the Italian Market.

Enel is one of the most remarkable companies in the world in terms of value chain proposition, fulfilling all the value chain in the Gas and Electricity market. The major shareholder is the state of Italy throw the Ministry of Economy and finance.

GRUPPO ENI

Subsidiaries	Geographical area	Goods offer	Main activities
Eni Gas e Luce	Italy	Electricity Gas	Sale
Eni USA	United States	Gas	Production
Eni Australia	Australia	Gas	Production
Eni Spain	Spain	Gas	Sales
Eni Switzerland	Switzerland	Electricity Gas	Sales Distribution
Eni Algeria	Algeria	Gas	Sales Distribution
Eni Tunisia	Tunisia	Gas	Transportation
Eni Greece	Greece	Gas	Sales
Eni Egypt	Egypt	Gas	Production
Eni Turkey	Turkey	Gas	Sales
Eni Germany	Germany	Gas	Sales
Eni Russia	Russia	Gas	Transportation and Dispatching

Table 3 - Gruppo Eni

Eni was founded in 1953 is a multinational company, Eni operates in 67 countries across the five continents, it is fundamental to know that Eni carries out oil and gas exploration, development and extraction in 43 countries, and this is the crucial point, the economic power of Eni comes from these activities. Eni Trades in Oil, Gas, and Electricity in 28 countries, and sells fuels and lubricants in 33 countries. Eni reported on 2018 revenues of more than 75.8 billion euros and an EBITDA of more than 20 billion euros. The major shareholder is the state of Italy throw the Ministry of Economy and finance.

After this overview of the Utilities Industry in Italy the following paragraphs will focus on the Gas Industry in Italy.

4 The Gas Industry in Italy

4.1 Overview

Natural gas is fundamental in a country, and the use is diffuse for sectors such as health, education, businesses, companies, residential, etc. In Italy is directly correlated with the production of another fundamental commodity: Electricity. The thermoelectric plants in Italy produce more than 70% (Sorgenia, 2019) of the total production of Electricity in Italy. A thermoelectric plant needs as inputs to produce electricity the following goods: Natural Gas, Carbon, and petroleum derivates.

4.2 Liberalization process of the Gas Industry in Italy

The Gas industry in Italy is part of the Utilities Industry, as mentioned in the previous paragraph the use of Gas in Italy is not only related to traditional consumption (heat, cooking, etc.) but is also used to produce Electricity. This fact makes interesting the industry and the way the companies in the Market are producing revenues from it.

The 23rd of May of 2000 was dictated the legislative decree well known in Italy as “Decreto Letta”, introducing the Liberalization of the Gas Industry in Italy for the Industrial consumers, and, since the 1st of January of 2003 for the residential consumers. The Letta Decree was introduced by the former Minister Enrico Letta (Ministro dell’industria, del commercio e dell’artigianato), which converted EU directive 98/30 into an Italian Law.

The introduction of the Letta Decree in Italy brought a significant impact on the market:

- Import, production, and sale of Gas are regarded as competitive and liberalized activities. Storage, transmission, and distribution retain monopolistic characteristics, but they have been more strictly regulated by the Authority.
- The transportation activity is a national interest matter (art.8 Letta Decree), for this, the manager of the primary network (transportation network), is unique and must guarantee without discrimination, the access to the network to all the companies that request it.
- With the Letta Decree and the different resolutions (TIUF and TIUC) of the Authority, the following activities in the Gas industry in Italy have been Unbundled and regulated:
    - Import;
    - Transportation and Dispatching;
    - Storage;
    - Distribution;
    - Sale.
- Antitrust rules on import/production and sale were introduced, in order to foster supply-side competition;
- The “unblock” of the existent monopoly in the industry that had the Country owned company “Eni”.

Since 2000 the activities of Import, production, and sale have been totally liberalized.

The following scheme represents the different activities/players, and the way they interact in the Gas industry in Italy:

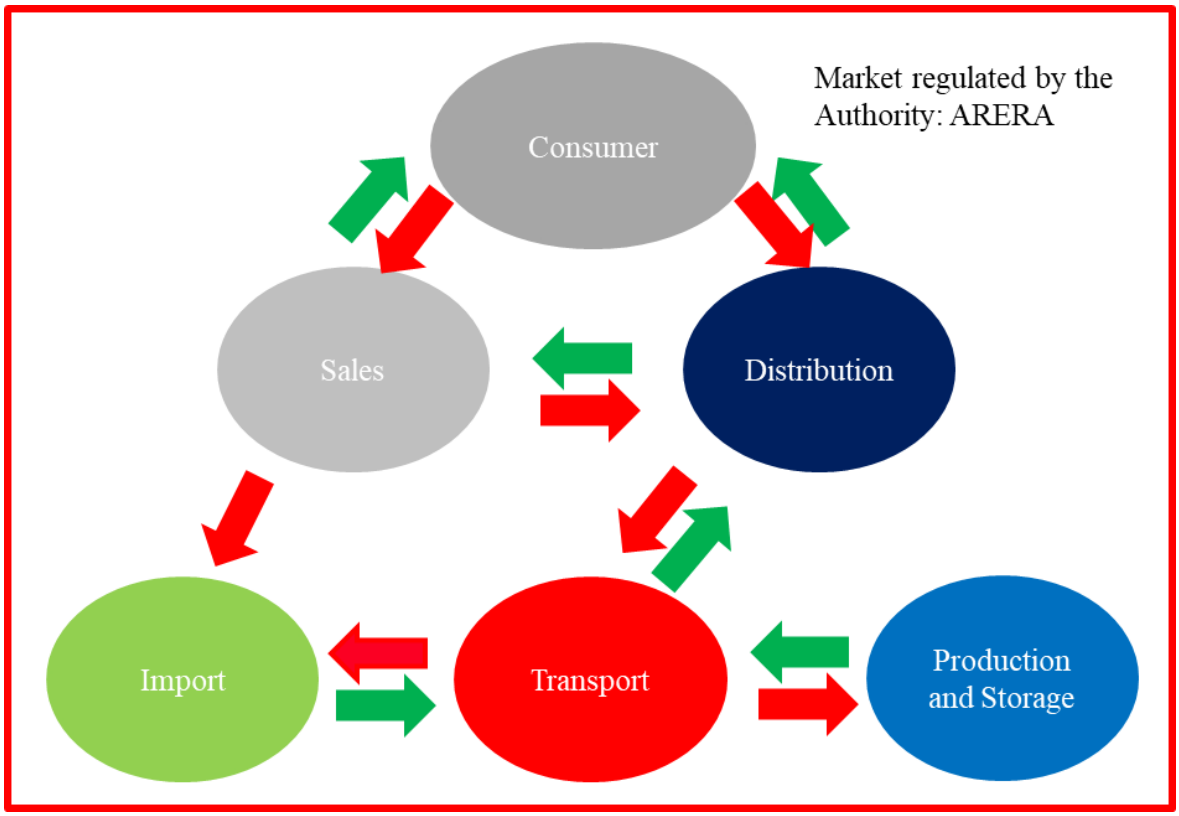

Figure 1 - The Gas Industry in Italy

The successive paragraphs will explain each of the players in the industry, the way in which each of the Players interact, following this an analysis of the Five forces of Porter of the Industry will allow the comprehension of the Industry, how does the Industry structure drives competition, which finally determines the level of Industry profitability. This contributes to the Industry attractiveness and helps in the identification of the key success factors (see Glossary).

4.3 Market composition: Import, Transportation and Dispatching, Storage, Distribution, Sales and Customers.

4.3.1 Import

4.3.1.1 Overview

The activity of Gas import is fundamental to the Industry, more than 90% of the Gas consumed in Italy comes from imports (Sorgenia, 2019). Import is fundamental not only for the households use but also for the rest of the Industry (productive companies, small businesses). The Natural gas in Italy contributes in a significant way in the production of another important commodity: Electricity. More than 70% of the internal production of electricity is obtained in Thermoelectric plants, this reflects the necessity of planning the correct quantity of Gas that should be imported, based on the consumption of another good (electricity). In the following paragraphs, it will be described the Long-term existing contracts and the “Take or Pay” clause included in the contracts, frequently used in the commercial agreements between exporters and importers in the Gas industry.

4.3.1.2 Amount of Gas Imported

The following chart represents the total amount of imported gas per year in Italy since 2010 until 2017, in the graph are listed the principal countries from which Italy imports the Gas, the data was obtained in the Ministry of Economic Development of The Italian Republic.

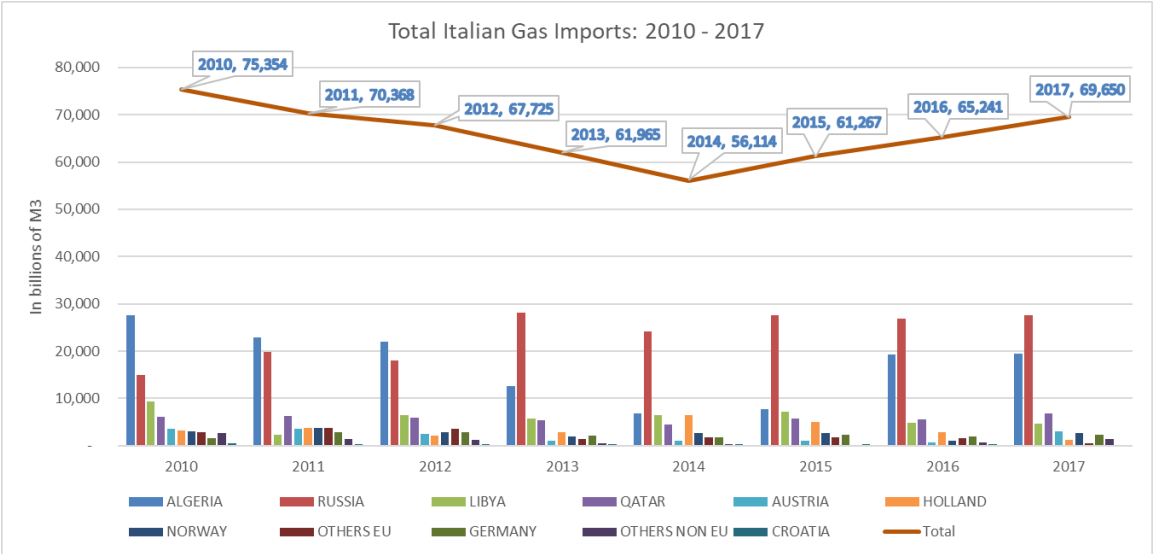

Figure 2 - Total Italian Gas Imports (Ministry of Economic Development, 2019)

From 2010 until 2017 there are two countries from which Italy imports more than 60% of the Gas, Algeria with more than 25% and Russia with more than 35% of the total amount.

There are two ways in which Gas enters in Italy. The first one is through Pipelines, the second way is by ship, but in the state of Liquefied Natural Gas (LNG – see glossary).

To enable maritime transport, the natural gas is cooled down by means of a refrigerated cycle that transforms gas into a liquid form, known as “LNG”. Once it has been liquefied it can be transported in LNG tanker ships. The volume of natural gas in its liquid state is about 600 times smaller than its volume in its gaseous state (US Energy Information Administration, 2019). The main producers of Gas are taking advantage of this fact and are introducing this new modality of Gas transport into their portfolio services, especially for the countries in which constructing a pipeline is not profitable or because of the distance between the two countries (seller and buyer).

In Italy there are eight principal points of Gas entry (ARERA, 2012-2017), these points of entry, interconnect the National network of Gas pipelines with the Intrastate/interstate pipeline system (transport natural gas from the processing plant to the centers of its consumption). Five of the points receive the Gas in its usual state form from Pipelines, and the other three receive the gas in its liquid form “LNG” by ship.

The following chart represents the relation between the quantity of Gas imported by point of entry and the main origin of it:

Point of origin	Main origin	Pipeline/Ship	Geographical Location of the point of origin	Billions of m3
Tarvisio	Russia	Pipeline	North of Italy	30,293
Mazara del Vallo	Algeria	Pipeline	South of Italy	18,815
Passo Gries	Norway/Holland	Pipeline	North of Italy	7,206
Cavarzere	Non-EU	Ship	North of Italy	6,648
Gela	Libya	Pipeline	South of Italy	4,640
Others	N/A	-	-	2,048

Table 4 - Gas imported by point of entry

The geographic location of Italy is privileged, from the north of the country, Italy receives the gas from major producers such as Norway, Holland and Russia, and from the south from Africa’s major producers such as Libya and Algeria.

As stated in Table 4 - Gas imported by point of entry, there are five main countries from which Italy imports a considerable amount of gas, this fact will change in the mid-term timeline, with the new constructions of international pipelines such

as the well-known: Trans Adriatic pipelines "TAP". With this new project, Italy will start importing gas from an important international producer: Azerbaijan.

After the previous analysis, it is important to consider and analyze the principal players in this activity.

4.3.1.3 Main importers

In Italy, there are three main players in the Gas import activity. The following table represents the quantity of Gas imported by the companies and the percentual from the total amount imported in 2017, the source of the data is the Authority ARERA.

Company	Amount imported	% of the total gas imported
Eni	35,155	50.474%
Edison	15,414	22.131%
Enel Trade	7,973	11.447%
DufEnergy Trading SA	1,730	2.484%
ENOI	886	1.272%
Axpo Italia	602	0.864%
Worldenergy SA	601	0.863%
Shell Energy Europe Limited	591	0.849%
PremiumGas	499	0.716%
Iren Mercato	359	0.515%
Met International AG	357	0.512%
Hera Trading	347	0.499%
Ascotrade	325	0.467%

Koch Supply & Trading	301	0.432%
Uniper Global Commodities SE	294	0.423%
A2A Trading	284	0.408%
Linea Più	267	0.383%
2B Energia	227	0.326%
Gas Intensive	206	0.296%
OMV Gas Marketing & Trading GmbH	203	0.292%
Altri	2,164	3.108%

Table 5 - Amount of Gas imported by Company in 2017 (ARERA, 2004-2017)

As stated in the previous table, more than 80% of the total amount of imported gas is made by three main companies: Eni, Edison, and ENEL.

Eni imports more than 50 % of the total Gas in Italy, even though the market has been liberalized, Eni has a strong international presence even in the countries from which Italy imports a high percentual of Gas. Before the liberalization process in Italy, the Gas Industry was a monopoly (except for the Distribution), and for many years Eni and the Italian Government took advantage of this fact.

Creating long supply contracts with different countries and investing in many of the countries for more than 50 years have contributed to the economic power of Eni, building strong economic relations with different companies in more than 60 countries from which Italy imports Gas. Eni has built for many years around the globe a strong capacity of negotiation based on experience and economic power, this gives Eni a notable advantage against its local competitors.

“Take or Pay clause”

The Long-term import contracts have a famous clause called: “Take or Pay”, this clause is usually defined by the two parties of the contract, the exporter and the importer party.

The clause obliges the importer the consumption of a determined amount of gas, if the Gas stated as the minimum amount in the contract is not consumed, the buyer will still pay for it. For the company that exports gas, this clause assures a minimum sales quantity, and for the company that imports the resource, it assures a continuative supply of it in a mid-long term.

As an example: two of the three main gas importers in Italy had sealed two long term agreements with the second country from which Italy imports Gas from, Algeria.

Eni has signed a contract of Gas import with one of the main international export oil companies: Sonatrach. The contract will go until 2027, with a possibility of two additional years. This contract will cover around 15% of the total Gas imported in Italy (Jewkes, 2019). The other company, Enel, has also renewed the contract with Sonatrach until 2028, with a possibility of two additional years (Enel, 2019).

4.3.2 Transportation and Dispatching

4.3.2.1 Overview

In the Law decree N°164/2000, in its 8th article, states that the activities of transportation and dispatching in Italy are declared as activities of National and Public interest.

The companies that perform the activities of transportation and dispatching are obliged to connect users (Distributors) to their own network, where the system they

have is suitably capable and assure the alignment between the works that should be made to connect the users to the network. They are also obliged to obey what it has been disposed of by the authority in terms of technical and economic feasibility.

As stated in the previous chapter “Import”, in Italy more than 90% of the Gas comes from imports, the other part is produced in Italy. The internal network in Italy is connected to the following “entry points” as follows:

There are eight entry points, where the network connects to the import pipelines and the “LNG” regasification terminals (see Glossary), and fifty-three entry points from the production facilities (see glossary), and storage facilities (see paragraph 4.3.3 Storage).

The transport of natural gas in Italy occurs at two main levels.

The first called “Primary Distribution” involves transport at a national scale through large pipelines around the country. The transport of gas in the country is guaranteed by more than 32,000 kilometers-long gas pipeline network that spans the whole of Italy.

The primary network or transportation network is organized in such a way that it ensures all consumers a fair balance between demand and supply of natural gas. This means that the most populated or industrialized areas will, therefore, have more gas available than in small population concentrations. The cubic meters available for each area are evaluated (Dispatching activity) thanks to a series of measurements and data that are constantly updated by the different players in the industry, in this way it is possible to always have the amount of necessary gas (Sorgenia, 2019).

4.3.2.2 Main transporters

4.3.2.2.1 Overview

As stated in the previous paragraph, the activities of transportation and dispatching in Italy are declared as activities of National and Public interest, and therefore, all of the companies that operate in this activity have been regulated in a proportion of the importance of the matter.

In Italy even though the transport activity has been liberalized there are three companies that dominate the market, SNAM with more than 90% of the total network and whose major shareholder is the Group “Cassa Depositi e Presiti”, this group is controlled by an 83% share from the “Ministero dell’economia e delle finanze”.

The second company is “Infrastrutture Trasporto Gas SpA (ITG), the company is controlled by Edison Group, controlled by the French Group “Electricité di France”, that is controlled by the French state with an 84% share of it.

The third one is “Società Gasdotti Italia”, it is controlled by Macquarie European Infrastructure Fund 4 e Swiss Life GIO II EUR Holding.

The following figure represents the network of pipelines in Italy best known in the country as “Rete Nazionale dei Gasdotti”

Figure 3 - Rete Nazionale dei Gasdotti (SNAM, 2018)

4.3.2.2.2 SNAM – “De facto Monopoly”

Snam is Europe’s leading gas utility, was founded in 1941 as Società Nazionale Metanodotti, it has been building and managing sustainable and technologically advanced infrastructure guaranteeing energy security for over the past 75 years. It is the first company in Europe with a transport network of 32,625 kilometers in Italy and over 41,000 kilometers with international subsidiaries (Snam, 2019).

Since 2001 Snam is a public company, is also one of the main shareholders of the TAP (Trans Adriatic Pipeline), which will bring a considerable amount of Gas in a mid-term term to the local (Italy) and international industry (rest of Europe) from Azerbaijan.

Snam operates more than 90% of the internal gas transportation pipelines in Italy, is considered as a “De facto Monopoly”, even though the market has been liberalized and Snam is a “public company” since 2001, the strong regulations by the Authority in this activity of the Industry, and the way it was ruled by the Law decree N. 164/200, describing the activity as a matter of “National and Public interest”, have created strong barriers to enter into this segment of the industry, and makes the company Snam a “De facto Monopoly”.

The total revenue for Snam in 2018 was around 2,500 million euros, with an EBIT (see glossary) adjusted of 1,405 million euros and a net profit adjusted of 1,010 million euros (Snam, 2019).

From the total of the 2018 revenues, more than 1,900 million euros came from regulated business activities, particularly from the activity of Gas transportation.

4.3.3 Storage

4.3.3.1 Overview

In the law decree N.164/2000 in its 11th article, states that: “the activity of storage of the natural gas in deep deposits or geological units is carried out in the basis of a Government concession (see Glossary), with a duration of no more than 20 years, and released by the: Ministero dell’industria, del commercio e dell’artigianato.” (Parlamento Italiano, 2000)

The applicants must have the necessary technical, economic, and organizational capacity, and must demonstrate their ability to carry out the activity fulfilling the public interest of the Nation, having a storage program that complies with the provisions stated in the Law decree.

The purpose of the storage activity is to compensate for the fluctuations of the system and to guarantee a strategic reserve inside of the national gas system. The storage activity can be distinguished by:

- Strategic storage. Control situations such as lack of supplies or crisis on the gas system;
- Modulation storage: satisfying the daily, seasonal, and peak consumptions variations;
- Mining storage: necessary for technical and economic reasons to allow the optimal development of the “cultivation” of natural gas deposits in the Italian territory.

4.3.3.2 Main players

In Italy, until the 31st of august of 2019, there are fifteen active concessions in the national territory (Ministry of Economic Development, 2019).

Company	Region
STOCCAGGI GAS ITALIA STOGIT	Emilia
STOCCAGGI GAS ITALIA STOGIT	Lombardia
STOCCAGGI GAS ITALIA STOGIT	Lombardia
Edison stoccaggio	Abruzzo
Edison stoccaggio	Veneto
Ital Gas Storage	Lombardia
STOCCAGGI GAS ITALIA STOGIT	Emilia
GEOGASTOCK	Basilicata
STOCCAGGI GAS ITALIA STOGIT	Abruzzo Molise
STOCCAGGI GAS ITALIA STOGIT	Emilia
STOCCAGGI GAS ITALIA STOGIT	Lombardia
STOCCAGGI GAS ITALIA STOGIT	Emilia
Edison stoccaggio (90%) Blugas Infrastrutture (10%)	Emilia
STOCCAGGI GAS ITALIA STOGIT	Lombardia
STOCCAGGI GAS ITALIA STOGIT	Lombardia

Table 6 - Concessions by region (Ministry of Economic Development, 2019)

As stated in the previous table there are two main players in the activity of Storage in Italy

1) Stogit: is the largest Italian and European player in the gas storage sector, in which it operates as described previously, as a concession, Stogit is controlled by Snam. Stogit uses depleted gas fields for storage, without altering the state of the places and maintaining the gas in the same safe conditions in which nature had stored it for millions of years. Its integrated system consists of fields, where the gas is stored, which makes the gas conform to the requirements of quality, pressure, and temperature necessary for its subsequent injection into the transmission network. The operational dispatching center, based at the headquarters in Crema, near Cremona, monitors the entire network with an advanced remote-control system (Snam, 2019).

2) Edison stoccaggio: is part of the Gruppo Edison and has more than thirty years of experience in the development and operation of natural gas storage facilities. Edison stoccaggio is active in the exercise of storage concessions of the three sites at Cellino, Cotignola and Collalto and San Potito, and in the sale of the related storage services.

There are two regions of Italy that concentrate an important amount of storage facilities these are: Emilia Romagna and the Lombardia, in the following paragraphs it will be analyzed the amount of gas distributed per region in Italy and will be explained the reasons of the high presence of storage facilities in these two regions.

4.3.4 Distribution

4.3.4.1 Overview

The companies that carry out the distribution activity are in charge of delivering the final good to the final customers: households, small businesses, and companies.

In the law decree, N.164/2000 in its 14th article states that: “The activity of distribution of natural gas is an activity of public service. The service is entrusted exclusively by tender for periods not exceeding twelve years. Local authorities that entrust the service, even in associated form, carry out guidance, supervision, planning and control activities on the distributors activities, and their relations with the service manager are regulated by specific service contracts, on the basis of a standard contract prepared by the authority of Electricity, Gas, and Environment and approved by the “Ministero dell’industria, del commercio e dell’artigianato”.

The Law decree states the following obligations for the Distribution companies.

1- They carry out dispatching activities in their own network (internal regulators);
2- Connect new customers who request the service and are under the territorial area of competence of the distributor to their network, provided that the capacity of the system available to them exists and the necessary works for the connection of the new customer are technically and feasible based on the criteria established by resolution of the authority of Electricity, Gas and Environment. (Parlamento Italiano, 2000)
3- “Distribution companies pursue energy savings and the development of renewable resources.” (Parlamento Italiano, 2000)

The distributors have other roles in the industry and control other processes, for example, they are the owners of the Gas meter devices, they are responsible for resolving failures on the devices, move the devices from one point to another, they

have also the responsibility of “detachments” of the gas meter devices from the network, when situations such as no payments or contractual termination occurs.

4.3.4.2 Amount of Gas distributed by region

The indicator of “Amount of Gas distributed by region in Italy” is fundamental to the industry analysis, as stated in the previous analysis for the main players in the storage activity, there is a large concentration of storage facilities in two regions of Italy. The main reason is that in these regions there is a considerable amount of Gas demanded by companies, thermoelectric plants, and households.

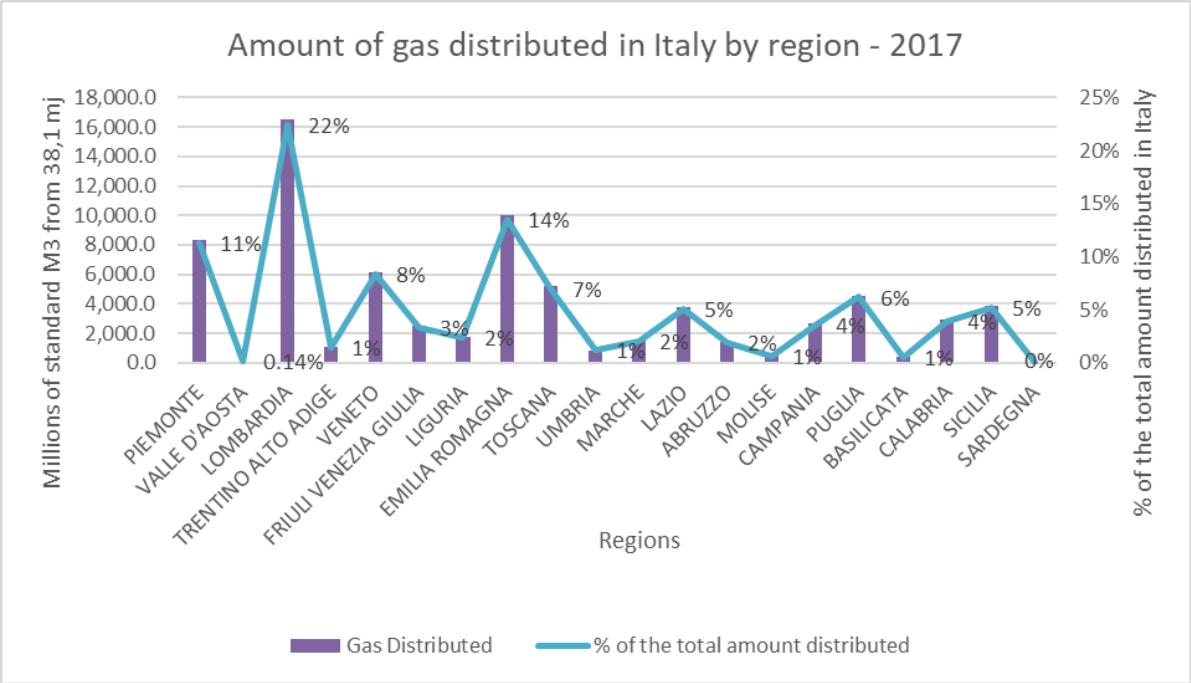

Figure 4 - Amount of gas distributed in Italy by region 2017 (Ministry of Economic Development, 2019)

As represented in the previous figure there are three regions where the gas distributed is more than 45% of the total amount of gas distributed in Italy. Lombardia (22%), Emilia Romagna (14%) and Piemonte (11%). For the first two regions, it is

now possible to deduce why the government has allowed a high concentration of storage places, the storage places are also in a strategic position, not so far to other regions that demand a high quantity of Gas such as Piemonte, Veneto, and Toscana.

4.3.4.2.1 Distributed gas per region by typology of consumption

To have a better understanding of the market it is important to understand how the gas is consumed in each region.

The successive graphs will represent the amount of distributed gas in each region by typology of consumption (Households, Thermoelectric plants, and Industrial).

Households

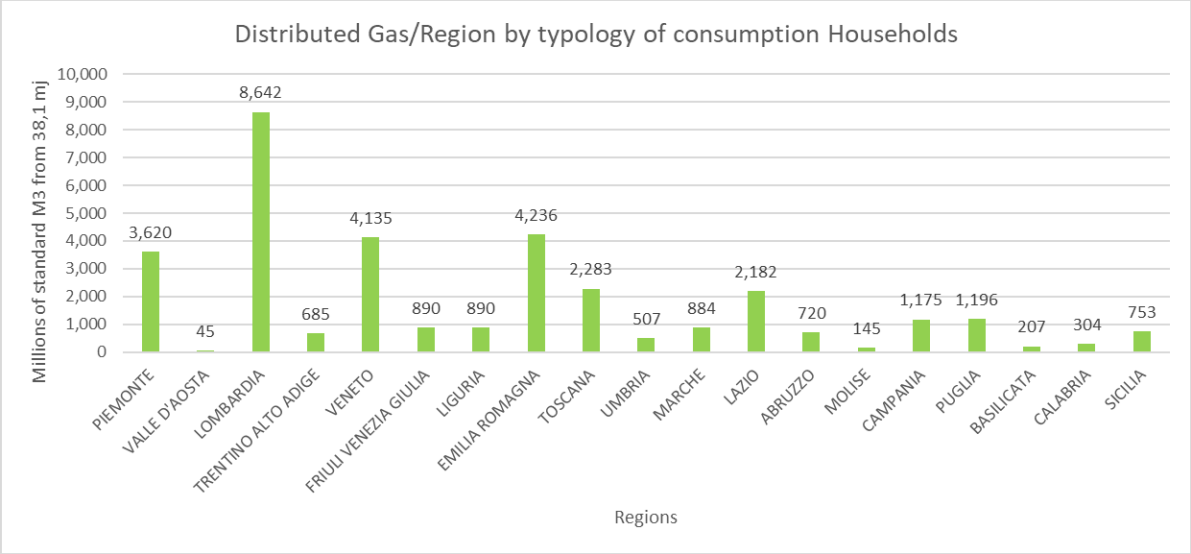

Figure 5 - Distributed gas/region by typology of consumption - Households (Ministry of Economic Development, 2019)

There are two main factors that increase the high consumption on this regions, the first one is the population living in the region (exhibit 1: Italian population per region) and the second one is strictly related to the first one, is the consumption

of Natural gas during peak seasons, especially for the regions located in the center north of the country in which is necessary the use of heat in the houses.

Thermoelectric plants

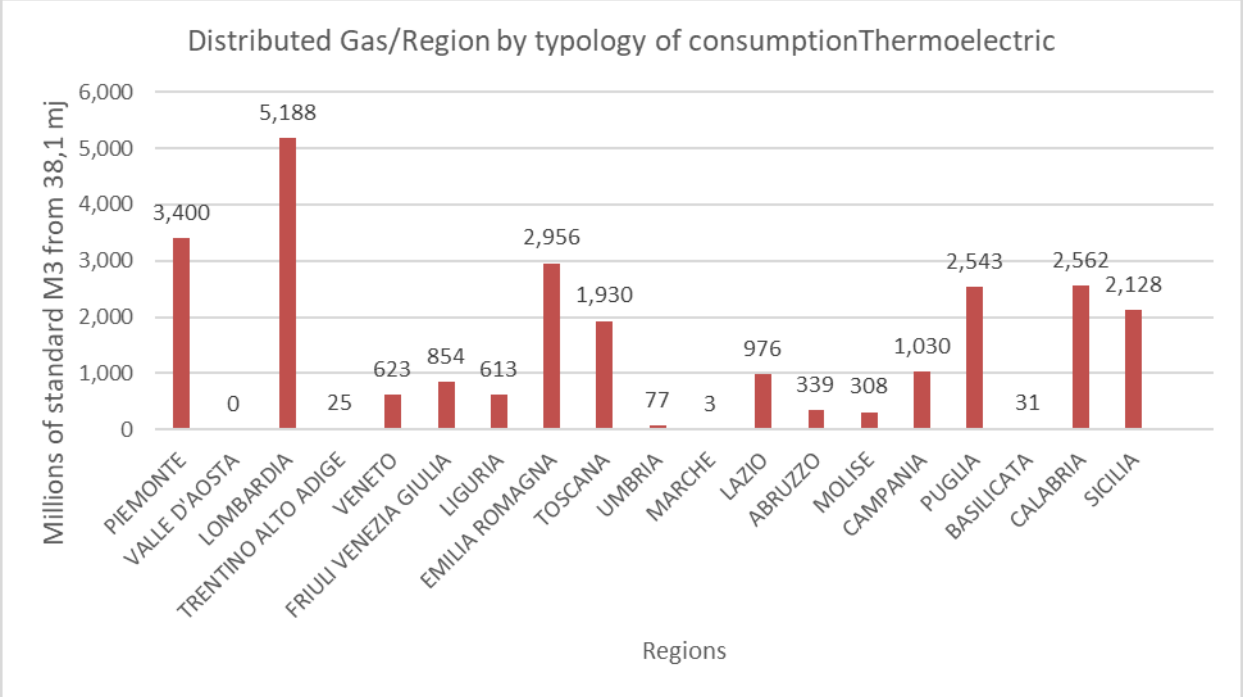

Figure 6 - Distributed gas/region by typology of consumption - Thermoelectric (Ministry of Economic Development, 2019)

This data is strictly related to the production of one important commodity in Italy, electricity. Thermoelectric plants use as main input natural gas, and, with other components such as carbon and oil derivatives that are transformed into heat, successively heat is transformed into electricity. More than 73% of the total electricity produced in Italy uses Natural Gas as the main input.

Industrial

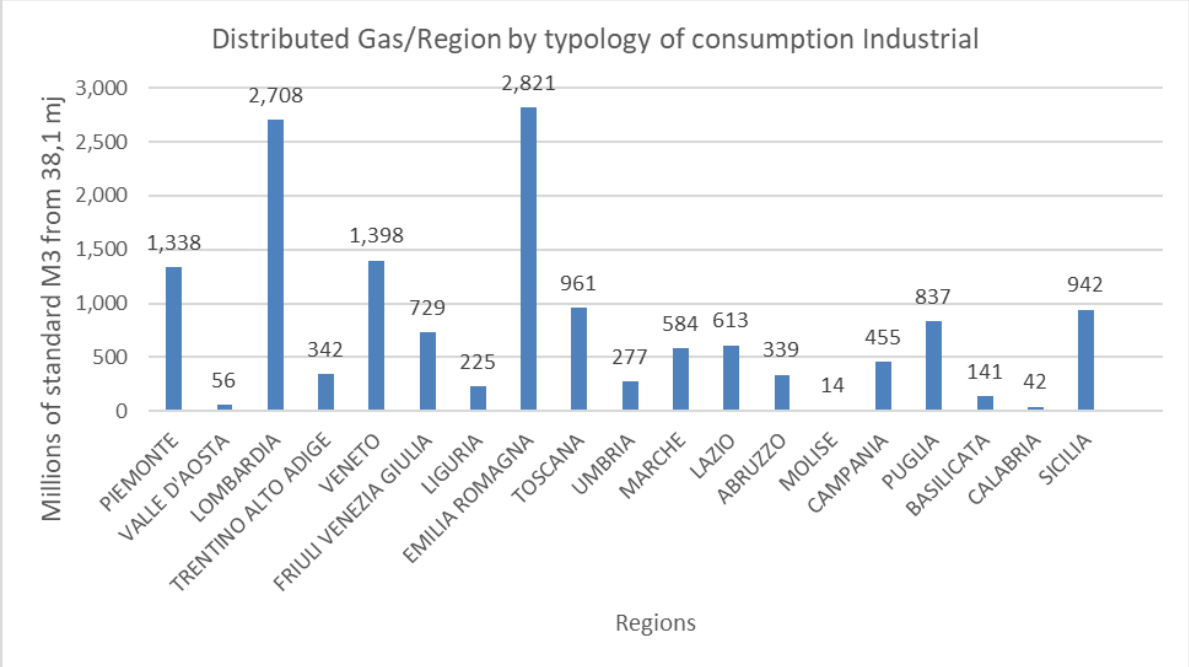

Figure 7 - Distributed gas/region by typology of consumption - Industrial (Ministry of Economic Development, 2019)

The previous figure represents a well-known situation of the productive industry (different business activities) in Italy, the amount of Natural gas that is used in private initiatives is superior for two regions compared to the rest of the regions.

4.3.4.2 Distributors

.4.3.4.2.1 Distributors per region

To have a better comprehension of the market, the following graph was constructed by using data obtained from the database of the Authority of Electricity Gas and Environment, ARERA.

The graph represents the total of companies that act as distributors in the different regions of Italy.

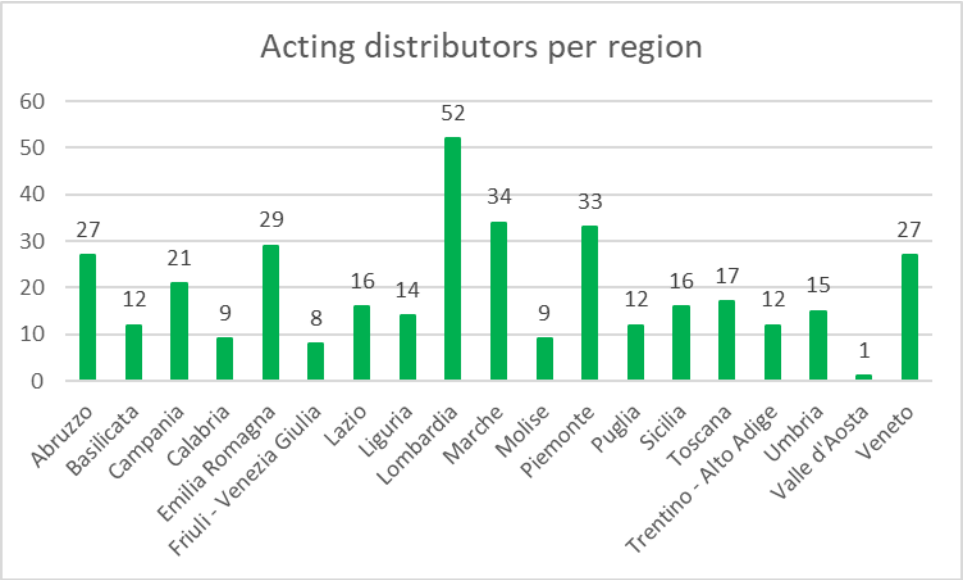

Figure 8 - Acting distributors per region (ARERA, 2018)

Many of the distributors have a presence in different regions of Italy, even though there are more than 200 distributors registered in Italy (ARERA, 2018), several of them run simultaneously in many regions of Italy. As stated at the beginning of this chapter, the distributors can participate in the different tenders in the market, many of the principal distributors have won many of them supported by their historical and economic power.

4.3.4.2.2 Main Distributors

The following figure represents the market share of the main distributors in Italy for the 2017 year:

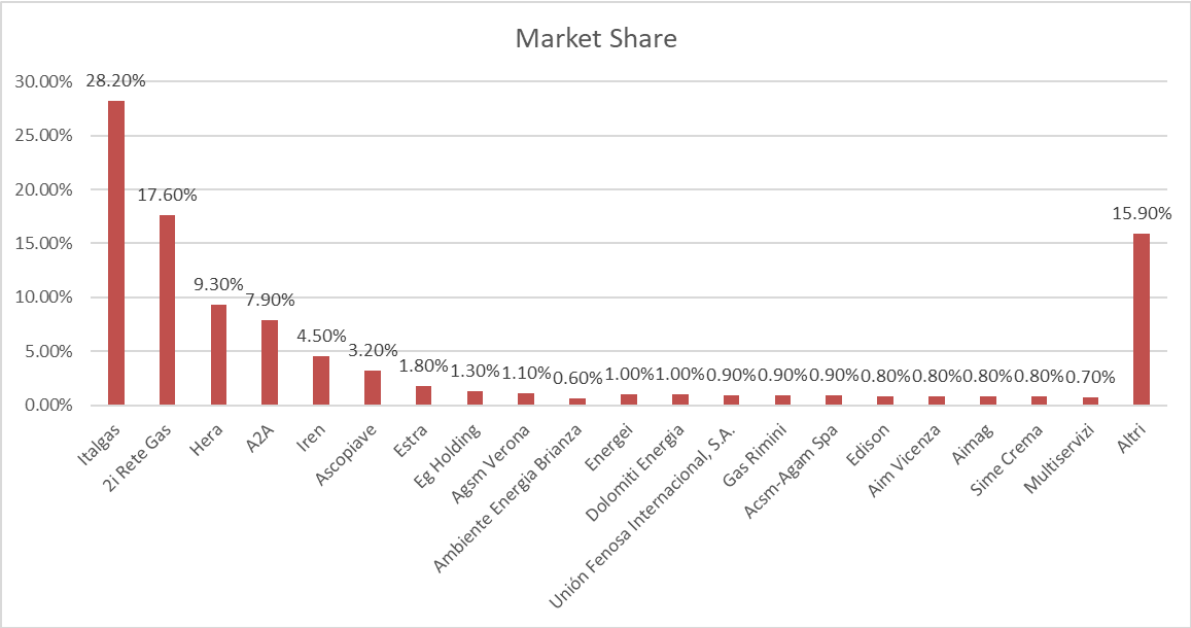

Figure 9 - Market share Main distributors in Italy 2017 (Ministry of Economic Development, 2019)

As stated in the previous paragraph there are more than 200 distributors operating in the Italian Market, nonetheless, there are only 5 companies that together have more than 67% of the market share, the reason is that many of the other companies legally constituted in Italy are municipality companies. that operate in their local context and has not expanded their representation on the market

Italgas (28.20%)

The main distributor of gas in Italy and the third one in Europe, is operating in the market for more than 180 years, one of the principal moments in the company was when Italgas was part of the big national gas company Eni in 1967, later on in 2003, with the scope of reorganization process, Eni delisted Italgas, and in 2009, Snam bought out the entire block of shares of Italgas. A new group made of Italgas, Snam, Stogit, and Gnl Italia was formed, and was active along the entire chain of regulated activities of the gas sector in Italy, from transportation to storage, and from urban distribution to regasification.

In 2016 Snam decided to focus on their core business and decided to separate Italgas from the absolute control of Snam, the decision was made alleging that the activities of Transport, Dispatching, storage, and regasification are carried out in national and international contexts and distribution in local contexts, also based on the competitive context, the regulations and the necessity of investments in each context are completely different.

After the agreement was approved by the shareholders of Snam in august of 2016, each of them received one share of Italgas for every 5 shares that they had on Snam.

Subsequently to the quotation in the stock exchange Snam remain with minority participation of 13%. (Snam, 2019) (ITALGAS, 2019)

The day to day activities of Italgas can be summarized as it follows:

- Network monitoring and modernization,
- Replacement of traditional gas meters;
- Gas odorization;
- Remote meter reading;
- Rapid response to emergencies;
- Works to meet end-customer requirements;
- Scheduled search for leaks.

All these activities listed are carried out to assure one of the main objectives of the liberalization of the activities in the gas industry in Italy: provide a service with exceptional quality standards and guaranteeing the continuity of the service for the customers.

In 2017 Italgas had revenues of 1,176.2 million euros, an EBITDA of 839,5 Million euros, EBIT of 453.5 million euros and a net profit of 313.7 million euros.

2I Rete gas (17,60%)

2I Rete Gas is the second distribution company with the highest market share in the Italian market, the origins of 2I Rete Gas comes from the second multinational company Enel, until 2008 the company “Enel distribuzione” had the second-highest market share in the Italian market with only 10%, Enel in order to find resources to reduce its debt decided to sell 80% of Enel rete gas to F2I rete Italia, in 2016 the company name changed to 2I Rete gas.

In 2017 2I rete gas reported revenues for 791 million euros, and an EBITDA of 408 million euros. (ARERA, 2019) (2I Rete Gas, 2019)

HERA INRETE (9,30%)

INRETE Distribuzione Energia S.p.A manages the distribution of natural gas mainly in Emilia Romagna, with the distribution of gas in 137 municipalities, plus three further municipalities in Toscana.

As a distributor, the company provides natural gas metering service, which includes: organizational, processing, IT and telematic operations aimed at calculating, measuring, making available, and archiving the validated natural gas measurement data released and collected at the gas distribution networks. (INRETE, 2019)

A2A – UNARETI (7,9%)

UNARETI is the society that manages the distribution of electricity and gas, has more than 1,500 employees it has revenues of more than 600 million euros, and

has a presence in more than 200 municipalities in Italy, has more than 20.000 km of network.

The objective of UNARETI is to professionalize and enhance skills to achieve a more flexible use of resources, obtaining management synergies on the multi-service model with lower costs and better services (UNARETI - A2A, 2019).

4.3.5 Sales

4.3.5.1 Overview

The distribution companies have the duty of delivering the gas to the final user, but the consumers that want to use the gas must buy it from a Gas seller.

Since the introduction of the Law decree N.264/2000 in Italy, there are numerous sales companies, which offer different rates to their customers, these rates are regulated by the Authority ARERA.

There are two types of sellers in the market: the retail seller that has a direct contractual relation with the final customers, but also with the distributor from the location of the final user. Usually, these retail sellers, have also a contractual relationship with a wholesaler seller, from which they buy the gas that will be distributed to the final customers. A wholesaler seller can be also a retail seller, in Italy, it depends on their capacity of acting in the international market as importers and in the national market as final customers sellers.

For example, a company as Eni can be a wholesaler seller and can simultaneously carry out the role of the seller to a final customer in a small municipality.

The following figure represents the relation between the different actors of the sales activity, considering specific roles, such as Wholesaler seller, retail seller, distributor, consumer and a market regulated by the ARERA.

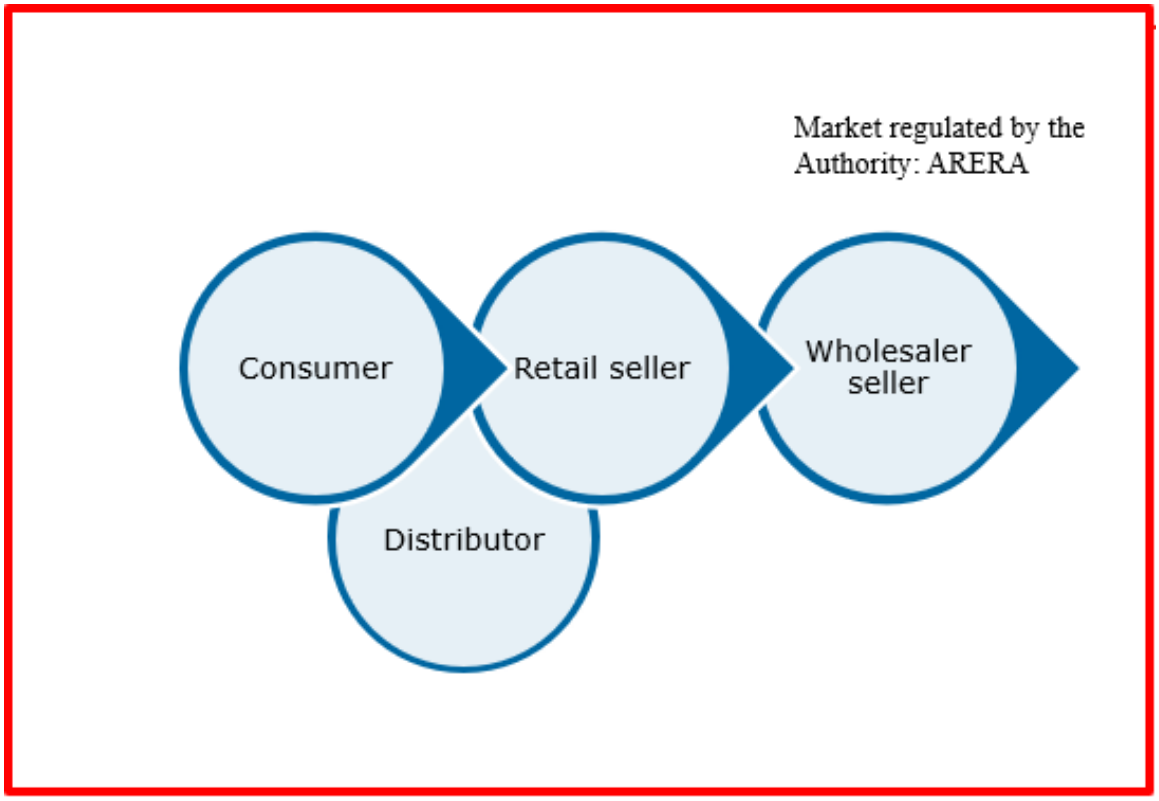

Figure 10 - Commercial Interaction in the sales market

The companies that want to enter the Italian gas industry as a seller the company must demonstrate:

- "To have the availability of the volumes of natural gas that is intending to sell:
- Possess technical and financial skills;
- To have adequate modulation service available to ensure continuity of supply to customers with annual consumption not exceeding 50,000 cubic meters;

- To have a considerable transport capacity in relation to the volumes of gas it intends to sell;
- That the physical-chemical characteristics of natural gas comply with the quality specifications set in Gas Network Code." (Ministry of Economic Development, 2019)

4.3.5.2 Main players

In Italy, there are more than five hundred companies that can sale Natural gas in the Market. The following figure represents the number of companies per year from 2013 to 2019 the following graph was built with data obtained in the Ministry of Economic Development of Italy:

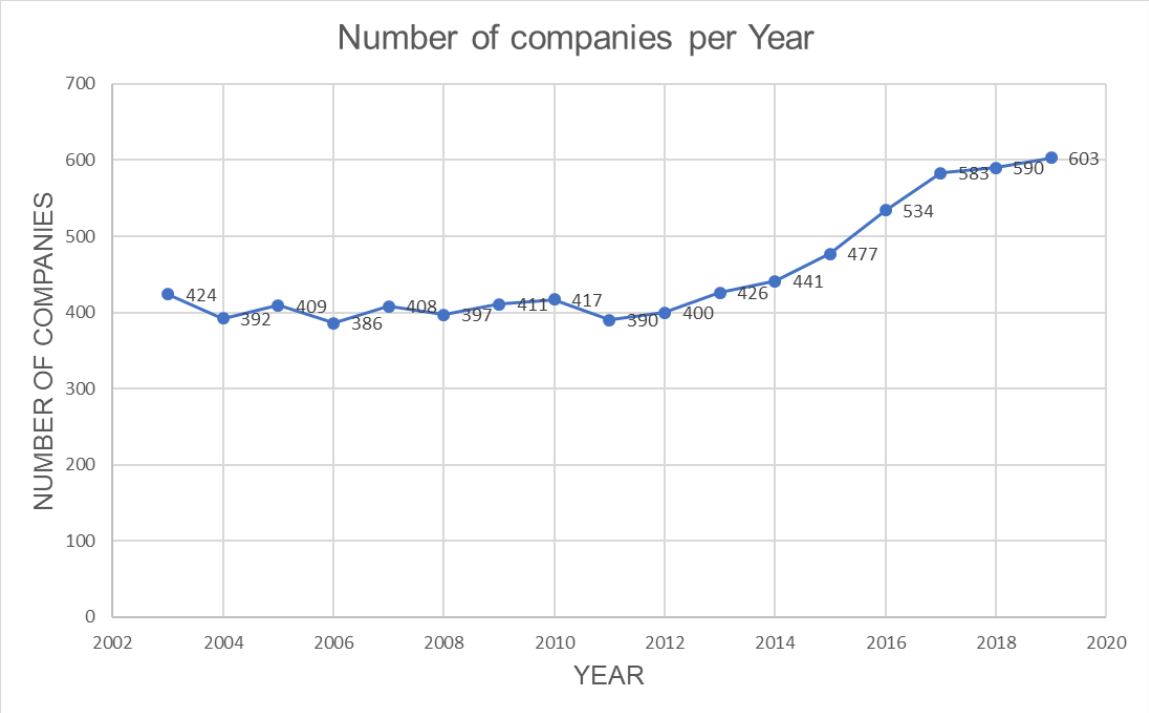

Figure 11 - Number of companies per year 2003- 2019 (Ministry of Economic Development, 2019)

As represented in the previous figure, since 2011 there has been a constant growth in the market, with more than 50% growth rate from 2011 to 2019. (Ministry of Economic Development, 2019)

Even though there are more than 600 companies operating in the Italian market, Eni has more than 40% of the total market share.

Eni

Eni is considered one of the global super major players in the Oil and Gas industry, it operates in 67 countries, the following table represents Eni sales and the market share for segments of use:

	2016		2017		2018	
	Volumes sold	Market share (%)	Volumes sold	Market share (%)	Volumes sold	Market share (%)
Italy to third parties	32.92	45.3	31.25	41.6	32.33	45.6
Wholesalers	9.15		8.36		7.93	
Italian gas exchange and spot markets	12.49		10.81		12.98	
Industries	4.79		4.42		4.54	
Mid-sized enterprises and services	0.79		0.93		1.72	
Power generation	1.5		2.22		0.77	
Residential	4.2		4.51		4.39	
Own consumption	6.11		6.18		6.1	
Total sales in Italy	39.03	53.07	37.43	40.8	38.43	54.2

Figure 12 - Eni Market share and volumes of Gas sold (Ministry of Economic Development, 2019)

To have a better comprehension of the numbers in terms of sales amount in the Industry the author recommends the consideration of the following two exhibits:

- Exhibit 2 - Wholesale market sales of major operators for the year 2017
- Exhibit 3 - Main groups for sales at the final market for the year 2017.

From the previous paragraphs, it has been demonstrated that the market has a significant number of sellers, but only a few of them have a significant real representation in the Industry. Further considerations and questions can emerge, about this fact, and at this point, it is fundamental to consider the other actor in the market, the Authority.

4.4 Authority

4.4.1 Overview

The ARERA (Autorità di Regolazione per Energia Rete e Ambienti), Authority for Energy, Networks and the Environment, "is an independent body created under Italian Law N.481 of 14th November 1995, for the purposes of protecting consumer interests and promoting the competition, efficiency and distribution of services with adequate levels of quality, through regulatory and control activities." (ARERA, 2019)

The ARERA was initially limited to electricity and natural gas, the scope of action has been extended during the years by means of some regulatory acts in the liberalized market, but also for the new models of business that companies have introduced over the years in the Utilities Industry.

The evolution of the Authority over the years can be described as follows:

- Italian Law N. 481 of 14th November 1995→ Creation of the Authority;
- Italian Law N. 214/11→ assignation of responsibilities as regards as water services. Competences of the Italian National Agency for Water Regulation and Supervision were transferred to the Authority for Electricity and Gas;
- Italian Legislative Decree N.102 of 4th July→ confers the Authority specific functions as regards district heating and cooling;

- Italian Law N. 205 of 27th December 2017→ allocated the Authority regulatory and control functions over the waste cycle included sorted, urban and related waste. (ARERA, 2019)

By Presidential decree, there are four members appointed to the ARERA and a President for the Authority. Two – thirds majority of the members of the competent Parliamentary Committees may express their binding opinion on the names proposed by the Ministry of Economic Development, jointly with the Ministry of the Environment and Protection of Land and Sea and approved by the Council of Ministers. (ARERA, 2019)

The economic resources that the Authority uses to operates comes from a contribution from the revenues of regulated operators in the Utilities Industry.

For further references to the main responsibilities of the Authority ARERA: Exhibit 4- Main Responsibilities of the Authority.

The main authority texts in which the activities are regulated are called “Delibera”, that refers to resolutions.

4.4.2 Access codes to services and Regulations

The authority has introduced during the years resolutions that regulate the way in which interested parties can access the services offered by the main players in the following activities:

- Storage;
- Transport;
- Regasification;
- Distribution.

In the different resolutions are stated the different ways in which the interested parties should access the services offered in the Industry, in the texts are also regulated the different duties of the company in each segment.

The following table represents the activities, the companies that carry them out, and the last updated resolution dictated by the Authority that regulates the activity. It is important to mention that the "Regasification" is included in the activity of Gas import.

Activity	Company	Resolution
Regasification	GNL Italia	500/2018/R/gas
	ADRIATIC L.N.G	112/2018/R/gas
	OLT OFFSHORE LNG TOSCANA S.p.A	110/2018/R/gas
Transportation	SNAM RETE GAS	648/2018/R/gas
	SGI (Società Gasdotti Italia)	723/2017/R/gas
	ITG (Infrastrutture Trasporto Gas)	670/2016/R/gas
Storage	STOGIT	594/2018/R/gas
	EDISON	80/2019/R/gas
Distribution		108/06

Table 7 - Access code to services (ARERA, 2019)

Network code for the Gas Distribution service

With the resolution N.108/06 the Authority has introduced the "Network code for the Gas Distribution service", is a fundamental act by the Authority for the development of the Gas Industry in Italy, it is the contractual instrument where are clearly declared the relations between the companies that manage the Distribution

services, the wholesaler sellers and retail sellers. With the adoption of this “Network code” the companies that carry out the Distribution activity in the industry are required to offer a neutral service and in a non-discriminatory manner.

Accountable Unbundling

The companies operating in the Gas industry in Italy with the introduction of the resolution 137/2016/R/COM are obliged to have: an accounting separation of the following activities in the Industry:

- Regasification of the Liquified Natural Gas;
- Storage;
- Transport;
- Dispatching;
- Distribution;
- Sales

(ARERA, 2016)

Functional Unbundling

With the introduction of the resolution 296/2015/R/com, the companies that operate in the gas industry in Italy are required to fulfill the functional separation obligations. The rules of functional unbundling have the following finalities:

- Contribute to the development of competition in the electricity and natural gas sectors;
- Guarantee the neutrality of the management of the essential infrastructures for the development of a free market;

- Prevent discrimination in access to the service and use of information commercially sensitive;
- Prevent cross transfers of resources between the different activities.

(ARERA, 2015)

In the previous paragraphs it has been represented the different segments of the Gas industry in Italy, the main players in each of them, and the role of an entity that is in charge of regulating the market, that has as its main purposes, the protection of the consumers interests and the promotion of fair competition in the market, endorse efficiency and a proper distribution of the services with adequate levels of quality. All of these purposes are necessary to protect the principal player in the market: The consumers, that will be described in the following paragraphs.

4.5 Customers

4.5.1 Overview

The customers in the Gas industry in Italy are divided into the following six main categories:

1- Residential: refers to final customers such as traditional households in the Italian market are categorized as “Domestico”;
2- Condominiums: refers to large property complex that have a direct contractual relation with the sellers, in Italy are diffused as “Condominio uso domestico”;
3- Public services activities: refers to companies that perform activities related to the different civil services in Italy are known also as “Pubblica amministrazione”;

4- Commerce and Services: refers to the consumption made by traditional is also known in the Italian Market as “business”;
5- Industry;
6- Electric Generation.

4.5.2 Consumption per typology of consumer

The following figure represents the total consumption by typology of consumer for the years 2013 to 2017, the graph was constructed with data obtained from the Authority and corresponds to the annual survey made to the companies that carry out activities in the regulated market.

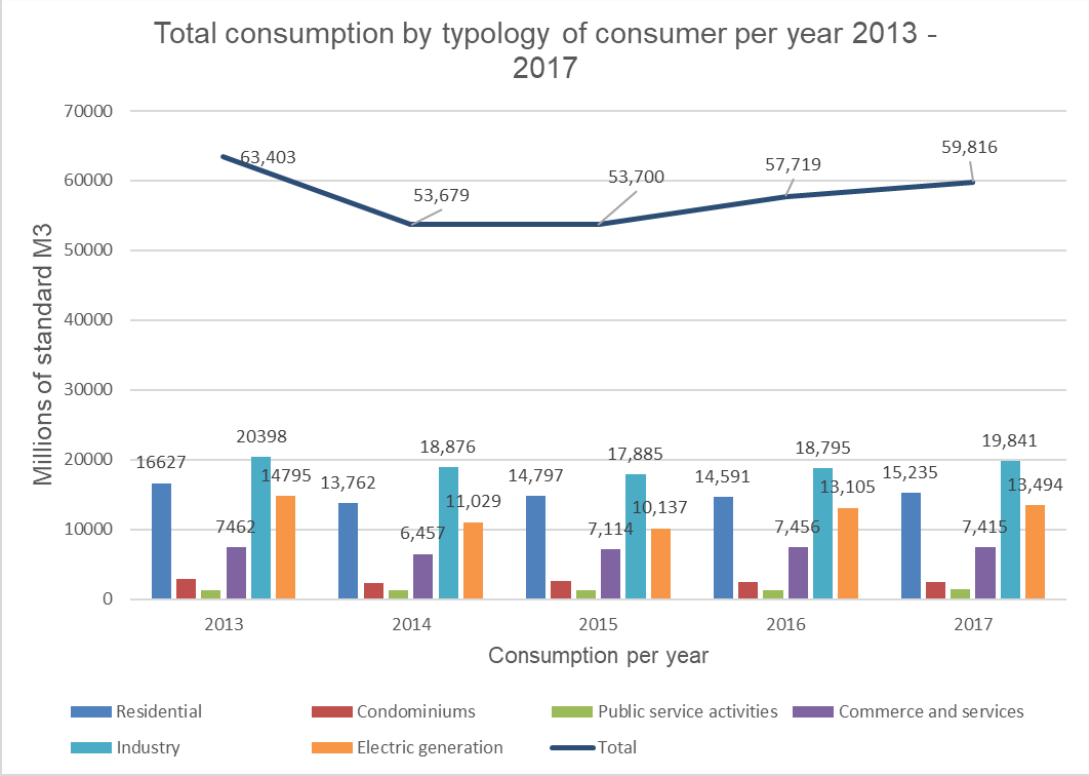

Figure 13 - Total consumption by typology of consumer per year 2013-2017 (ARERA, 2017))

The industrial consumers during the years represented in the graph represent more than 33% of the internal consumption in the Gas Industry.

There is consumption in the industry that has not been reported in the previous figure, it is called “Auto-consumption”, and refers to the Gas used by the sellers, this gas is mainly used in “Electric generation”, and in a small proportion by the companies. It is important to represent it at this point auto consumption is an indirect way of consuming gas by the final consumers.

The following Graph represents what stated previously for the years 2013 -2017, the data was obtained from the Authority ARERA and corresponds to the annual survey made to the companies that carry out activities in the regulated market.

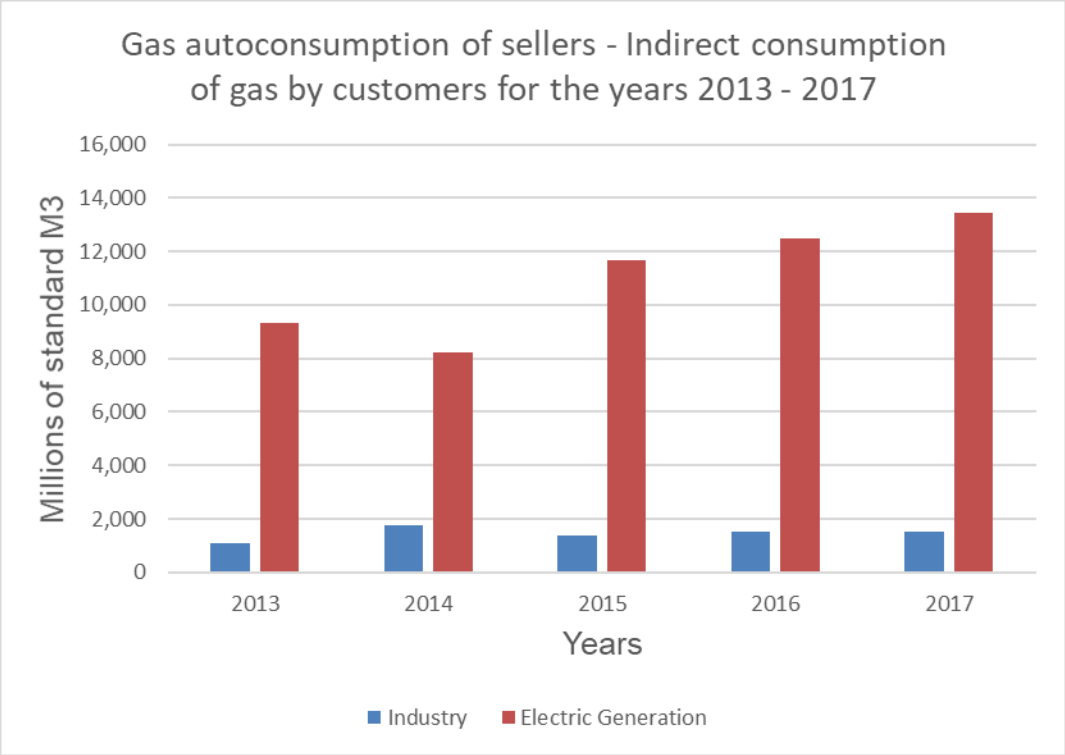

Figure 14 - Gas auto-consumption of sellers - Indirect consumption of gas by customers for the years 2013 - 2017 (ARERA, 2013-2017)

The following graph represents the total amount of Electricity produced in the Italian Industry using Natural Gas as input for the years 2013 -2017, the data was obtained from the Authority and corresponds to the annual survey made to the companies that carry out activities in the regulated market.

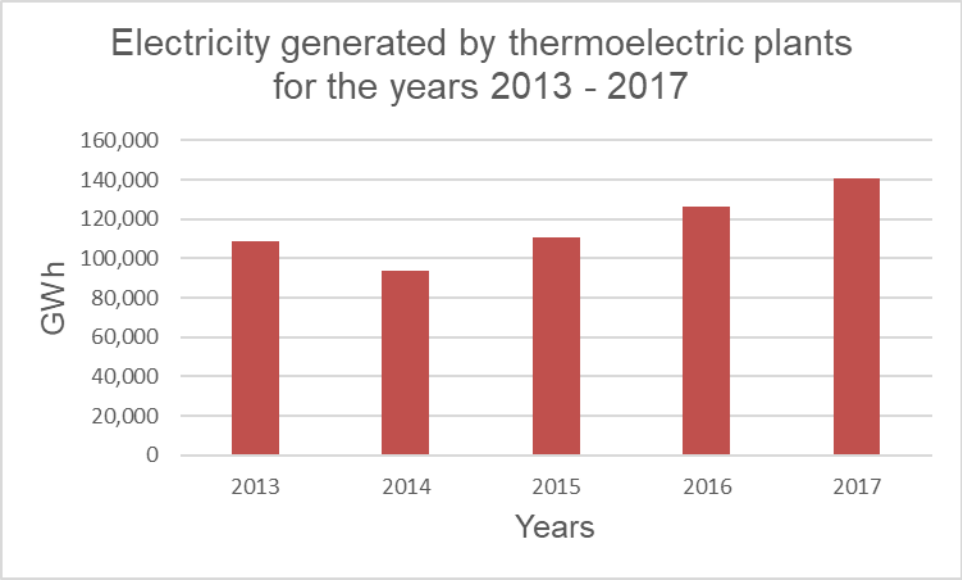

Figure 15 - Electricity generated by thermoelectric plants for the years 2013 - 2017 (ARERA, 2013-2017)

The previous figure is consistent with Figure 14, and as stated previously, the Gas is fundamental for the electricity production, hence, it is also important for the different typologies of consumers that are consuming in an indirect way the Natural Gas.

4.5.3 Types of relations between the different consumers with the other actors in the market

Understanding the interrelation that the different players in the market have, with the different typologies of consumers, will contribute to a complete mapping of the Gas Industry in Italy. The demand in the market is being fulfilled with the offer in the

Industry, and this is realized with the different contractual relations between the parties and with the duties and responsibilities that they have and are established by the Authority.

The following typologies of customers follow the same relations with other actors in the market.

1- Residential consumers, Condominiums, Public Services activities and Commerce and services.

This group of customers has direct contact with the retail sellers and with the distributor of competence in their municipality.

2- Industry

The industrial consumer has direct contact with retail sellers and distributors. In certain cases, they will have direct contact with the wholesaler sellers and a transporter.

It is possible for a combination of wholesaler sellers and distributors. In this case, depends on the location of the company and the amount of Gas used in its production processes.

3- Electric Generation

The electric Generation consumer (thermoelectric plant), usually have two types of relations:

- With the wholesaler sellers, because of the amount of gas demanded by the thermoelectric plant and a Transporter.
- Wholesaler sellers and a distribution company.

The combination with the distributor or the transporter will depend on the location of the Thermoelectric plant.

4.5.4 Switch rate of the final consumers

After the liberalization process of the Gas Industry in Italy the final consumers have the power to decide who to buy from the Natural Gas, many of them take the decision to change seller usually based on a better offer in the price of the cubic meter of gas.

The following graph represents the percentual of switch rate by typology of consumers. In the graph, the category others refer to the following typology of consumers: commercial and services, Industrial and electric generator. The data was obtained from the Authority ARERA and corresponds to the annual survey made to the companies that carry out activities in the regulated market.

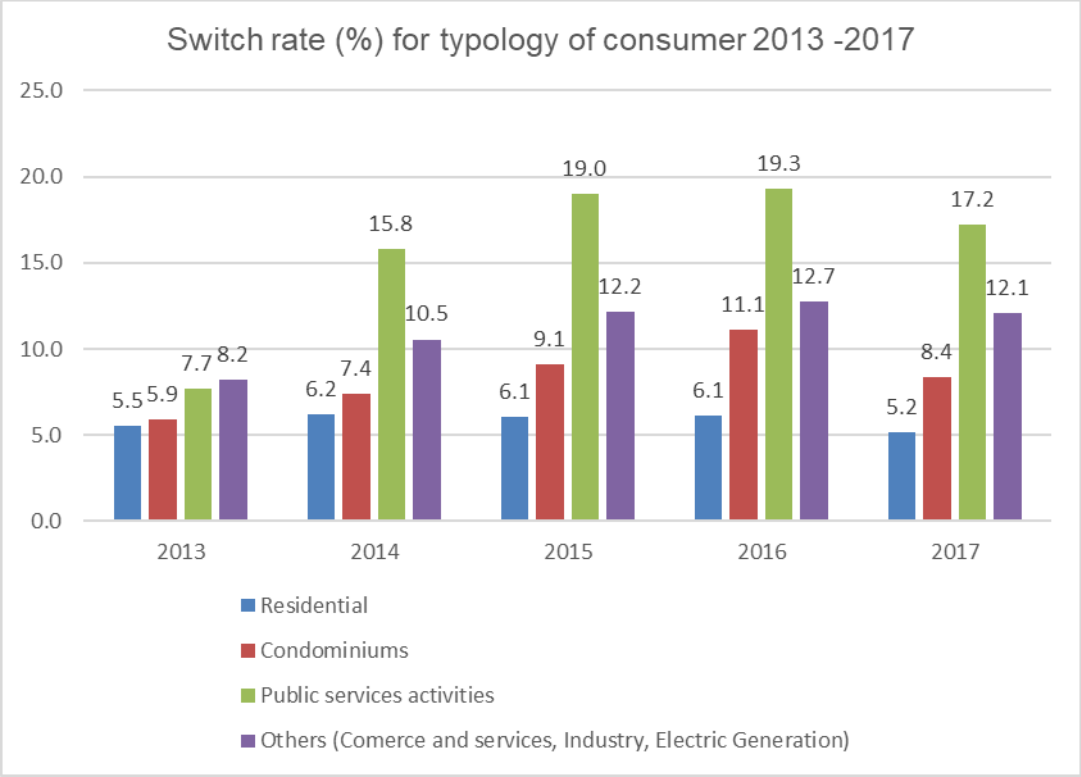

Figure 16 - Switch rate (in percentual) for typology of consumer 2013-2017 (ARERA, 2013-2017)

As represented in the figure during the years, the different customers have increased their switching rate from one seller to another, it is interesting that the segment in which there are more customers (Households/residential) the switching rate is not so high compared, for example, to the public services activities. The reason is linked with one special fact, the price of the cubic meter. The residential customers do not have a high bargain power against the sellers, and the price differentiation between sellers in this segment is not high.

After an analysis of the different players in the market and the relations between them is possible to assess the Gas Industry in Italy analyzing the competitive forces that shape the industry.

4.6 Porter's five forces analysis

4.6.1 Overview

Porter's five forces analysis is a model/tool created by Michael Porter and is mainly used to analyze industry profitability and understanding how the structure of the industry drives competition. It is also a way of understanding the attractiveness of the industry to potential new players, in many analyses is used to identify key success factors for competition.

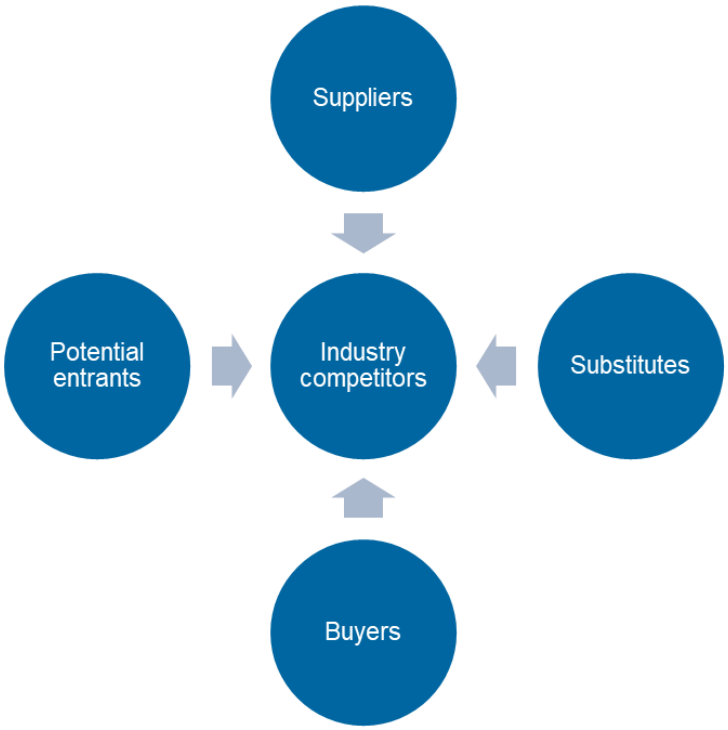

Figure 17 - Porter's Five forces

The horizontal forces are related to the intensity of competition and the vertical forces are related to the value chain.

Understanding the forces:

Substitutes: are products that are not considered competitors but fulfill and strategically equivalent role for the customer.

Potential entrants: entrants' threat to industry profitability depends upon the barriers to entry.

Buyers: the extent to which buyers can depress profitability depends on:

- Buyers' price sensitivity: is related to the concept of elasticity of demand (see glossary).
- Relative bargaining power: refers to the size and concentration of buyers relative to sellers, buyer's information on price, costs competitors' performance, quality.

Suppliers: the analysis of suppliers is like the one made by the buyers.

Industry competitors: refers to the rivalry in the industry.

4.6.2 Porter's five forces analysis of the Gas Industry in Italy

The following analysis is based on the previous paragraphs in which many of these forces or logics in the industry have been presented.

1) The threat of entry (High): after the liberalization process in the industry there has been a considerable reduction of the barriers to entry in the Gas industry, this has created a negative effect for incumbents, it is a positive fact to the potential new entrants and is a negative fact for the industry attractiveness.
2) Threat of substitutes (low): in the Gas industry there are non-imminent threats of products that can substitute the actual power of the Gas. At this moment the only good that can substitute the gas, depends actually on the gas itself (Electricity). Italian electricity production depends on more than 70% on the Natural Gas, is evident that in a while there cannot be substitutes that fulfill the necessities of the consumers.
3) Buyers (it depends): this force depends on the type of consumer, but also on the type of contractual relationship.
    - For the relation final customers and retail sellers the bargaining power of the customers is low, they can choose from the different alternatives on the market but their preference from choosing one or another is not dependent on what should be fundamental, the price of the cubic meter, the variation in the price of the cubic meter from one seller to another at this level is not fundamental. Usually, this type of consumer is pursuing another type of "benefit" from the sellers, such as complementary goods.

- For a buyer that consumes a high quantity of gas per month, the bargaining power is medium and this is also represented in the constant changes from sellers, see paragraph Switch rate of the final consumers.
- Between retail sellers and wholesaler sellers, the bargaining power is also medium.

4) Sellers (it depends): this force depends on the scope of the market in which sellers want to act.
   - The main considerations made in the buyers' force are applicable to the sellers' force. With one special remark: this force depends on other variables, there are many options in the market, the buyer will still need to buy the good from someone.
   - The natural gas is a commodity, in the actual conditions of the internal market is needed to be consumed in different segments of the market, for this, there will always be an advantage for the sellers.
5) Industry competitors (medium): there is a high competition in the last part of the value chain, there are more than 600 companies operating as sellers in Italy, and more than 200 companies operating as distributors, this is an important indicator of competition. But even if there are numerous companies in this segment the other activities are practically running as duopolies, for example, the Transportation, Dispatching and Storage. In the segment of Gas imports, there are three players that import more than 80 % of the total amount of gas imported in Italy.

The following chapter will illustrate the price composition of Natural gas in the Italian Industry.

5 Price composition

5.1 Overview

The way in which the price is charged to the consumer is fundamental in the comprehension of the Gas Industry in Italy after the liberalization process, at the begging of this chapter, it will be explained how the final price in the billed received by the customers is composed. Other from the price composition this chapter will also expose the price variation of the Natural Gas in the principal countries of the European Union.

5.2 Components of Price

The price in Italy is composed of the following expenses:

1) Expenses on the Natural Gas;
2) Expenses for transportation and management of the devices;
3) Expenses on systems charges;
4) Taxes.

5.2.1 Expenses on the Natural Gas

Refers to all the amounts billed in relation to the various activities performed by the seller to successfully supply Natural gas to the final customer. This expense refers to an approximated 36% of the total bill (ARERA, 2019), are included all the expenses for the wholesale supply of the raw materials and all the connected charges.

These expenses are subdivided into three components as follows (for a contextualization the components are listed in Italian):

- “Commercializzazione al dettaglio”: this component refers to the retail share, it is an import that covers the fixed costs that are maintained by the sellers, for the customers business management;
- “Approvvigionamento energia”: this component covers the costs incurred by the seller for the purchase of natural gas to wholesale seller;
- “Gradualità”: and the gradual charges necessary to cover the costs incurred by the seller for the adjustment of its procurement portfolio.

5.2.2 Expenses for transportation and management of the devices

Refers to the expenses billed related to the different activities that allowed the sellers the delivery of the natural gas to the final customers. These expenses represent an approximated 20% of the total amount billed to the final customer (ARERA, 2019).

These expenses are subdivided into five components as follows:

- TAU1, TAU3: components that cover the services of distribution and measurement of the gas supplied;
- UG1: components of equalization of distribution services. Serves to guarantee that the amounts actually paid by customers for distribution cover the cost of the service including any tariff adjustment;
- QT: a component that covers the expenses for gas transportation until the distribution networks;

- RS: components that cover the incentives gave to the companies that invest in the improvement of the quality services;
- Canoni comunali: applied only in the municipalities that have established an increase in concession fees to companies, to cover higher distribution costs.

5.2.3 Expenses on systems charges

Refers to the expenses billed related to the different activities of general interest for the gas system, these are paid by all the customers of the gas services. These expenses represent an approximated 4% of the total amount billed to the final customer (ARERA, 2019).

These expenses are subdivided into three components as follows:

- RE (Risparmio energetico): for the implementation of energy-saving projects and development of renewable resources in the Gas sector, and to support the implementation of heating networks;
- UG2: cost compensation of retail market is strictly related to the component “Commercializzazione al dettaglio”;
- UG3: component related to cover the costs incurred by the companies for supply interruptions due to no payments (“interruzione per morosità”).

5.2.4 Taxes

The taxes billed to the customers represent an approximated 40% of the total amount paid by the customers, these taxes are subdivided into three main sub-categories:

1) The consumption tax in Italy is also named “Accisa”, is applied to the amount of gas consumed regardless of the type of seller. The Accisa considers the type of use (households, Industrial, etc.) and the geographical location of the consumer to calculate based on the total consumption the amount of “Accisa” that should be pay.
2) The Regional surcharge “Addizzionale regionale (in Italian)”: is a tax that is decided by the region where the consumer is located, the amount varies based on the consumption.
3) V.A.T: is a percentual calculated based on the consumption (10% or 22%), but the interesting thing is that the base of calculus includes the other two taxes previously described, hence the Italian consumers are paying taxes over taxes, in an indirect way.

For further details of the surcharge of the taxes, refer to Exhibit 5 – “Imposte sul Gas 2017”

The previous analysis of the price composition contributes in the analysis to understand the way in which the companies and the government charge all the associated costs to the final consumer. The gas that is not produced in Italy and it is consumed in high amounts in the Country by different types of consumers.

The liberalization process has contributed to the development of the market price by giving the consumers the possibility to choose between buyers, even though there are few main players that concentrate more than 40 % of the sales market, before the liberalization the market was dominated by one company, Eni.

5.3 Price variation in the principal countries of the European Union

The following graph represents the Gas price variation in five countries of the European Union, the prices were “harmonized” by the Italian national institute of statistics (ISTAT), and allows a fair comparison between different countries that are part of the EU.

The following data was obtained from the ARERA for the years 2012 to 2018:

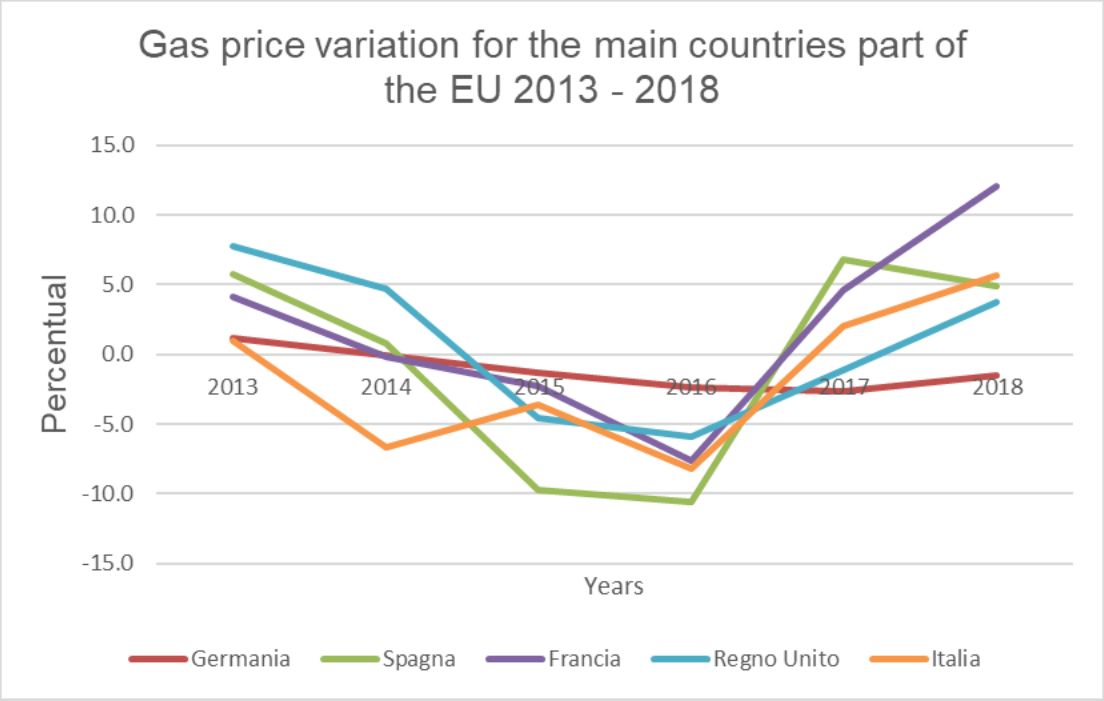

Figure 18 - Gas Price variation (%) for the main countries part of the EU for the years 2013 – 2018 (ARERA, 2013-2018)

There are many factors that affect the price of Natural gas in the market some of them are:

1. Government policies;
2. Economic Policy;
3. Demand and Supply;

As represented in the previous graph, the only country in which consumers have not been affected in a considerable way of the high variation prices of the gas is in Germany. For the rest of the countries, the impact of a negative variation in one year to a severe positive variation in another year has happened. The principal cause that can be identified is strictly related to the internal political situations of the rest of the countries.

In the last years, the only country that has a stable political situation has been Germany, for more than 10 years the leader of the country has been Angela Merkel.

Even though it is not scoped of this Thesis the analysis of other EU markets, it is important to understand that in other countries the Gas contribution to the Energy generation is around 8% (Rappresentanze tedesche in Italia, 2017) and not 74% as in Italy.

5.4 Key success factors

After the previous analysis, composition of the market, analyzing the industry forces and how the price is composed, is possible to evaluate the keys of success in the Gas industry in Italy, a key success factor is a result of an analysis of two prerequisites for being a successful company: the analysis of demand and the analysis of competition.

For the analysis of demand, it is possible to considerate questions such as: who are the customers and what do they want?

For the analysis of competition, it is possible to considerate questions such as: how intense is competition and how can companies obtain a superior competitive position? (Grant, 2014)

The previous figure was constructed analyzing and resuming many of the characteristics of the market and the players presented during the Thesis:

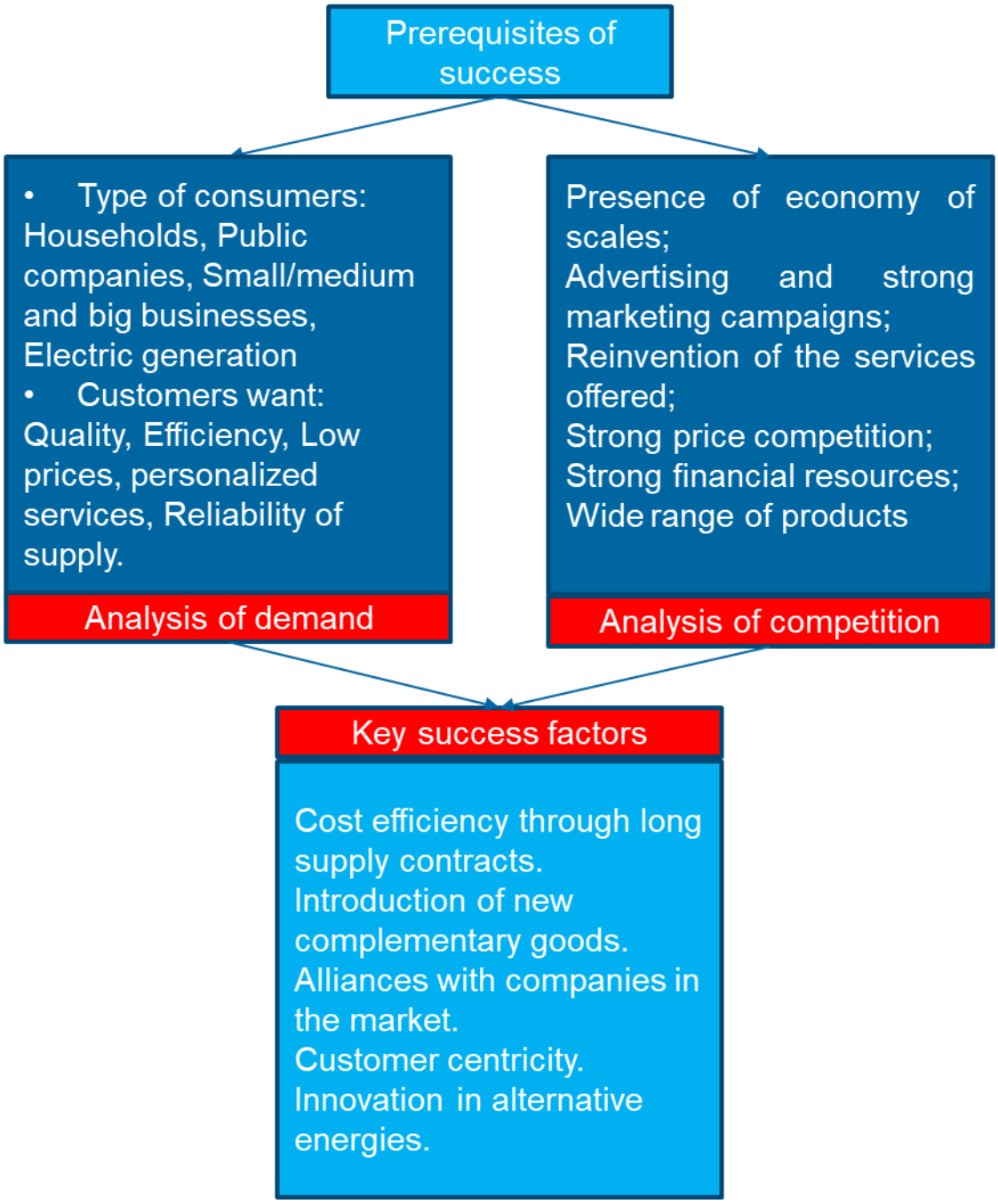

Figure 19 - Key success factors

- Long Supply contracts: this type of contracts assure the future availability of the product, even though is a good option to be more cost-efficient as a

company, at the final part of the chain the benefit is translated to the final customer;

- Introducing complementary goods: is a way of differentiating the companies, this type of goods can be attractive to an important segment of the consumers, the households and small businesses.
- Alliances with companies in the market: this introduces flexibility to the portfolio services of the companies, in many cases is better to share the revenues that not reaching a specific market.
- Customer centricity: is one of the essential Key success factors, understanding and giving the client solutions to their needs is fundamental to the Industry.
- Innovation in alternative energies: the industry is constantly changing, in Italy the Electricity production depends in more than 70% of Natural Gas, introducing new ways of creating energy will reduce the pressure on the need of Natural gas by consumers.

6 New business models

The following chapter will represent the new business models in the Industry in Italy, how the companies in the country have started to understand that it is possible to create business alternatives and satisfy the consumers' needs in different ways.

6.1 Blue Ocean Strategy

6.1.1 Overview

"Blue ocean strategy is the simultaneous pursuit of differentiation and low cost to open up a new market space and create new demand. It is about creating and capturing uncontested market space, thereby making the competition irrelevant. It is based on the view that the market boundaries and industry structure are not given and can be reconstructed by the actions and beliefs of industry players". (MAUBORGNE, 2004-2019)

To perform an analysis of the new business models on the gas industry in Italy, it is necessary the support in the book "Blue Ocean Strategy – W. Chan Kim/ Rene Mauborgne-2005", in this book there are two fundamental concepts that contribute in the analysis of the market universe.

- Red oceans: "are all the industries in existence today – the known market space. In red oceans, industry boundaries are defined and accepted, and the competitive rules of the game are known." (MAUBORGNE, 2004-2019) The concept of "red ocean" is fundamental and is the perfect description of the Gas industry in Italy, the market is composed of many players that are regulated by the Authority ARERA.

- Blue oceans: “all the industries not in existence today – the unknown market space, untainted by competition. In blue oceans, demand is created rather than fought over.” (MAUBORGNE, 2004-2019) This is the crux of the matter, many Companies in the Gas industry in Italy are trying to create different market spaces. The main objective of creating new business models is extracting all the possible economic benefits from the current position of the companies obtained in the Gas Industry in Italy.

6.1.2 Value creation for the companies

One of the main targets of companies in the Gas industry in Italy is differentiating from competitors, one of the ways of doing this is modifying an established product/service. In the case of the Gas Industry there is no space to differentiate from competitors in terms of the main product offered “Natural Gas”, but it is possible to create new alternatives. The following tool was developed by W. Chan Kim and Renée Mauborgne and is described in the book previously mentioned, is used to reconstruct buyer value elements, the framework poses four key questions that are used to challenge an industry’s strategic logic.

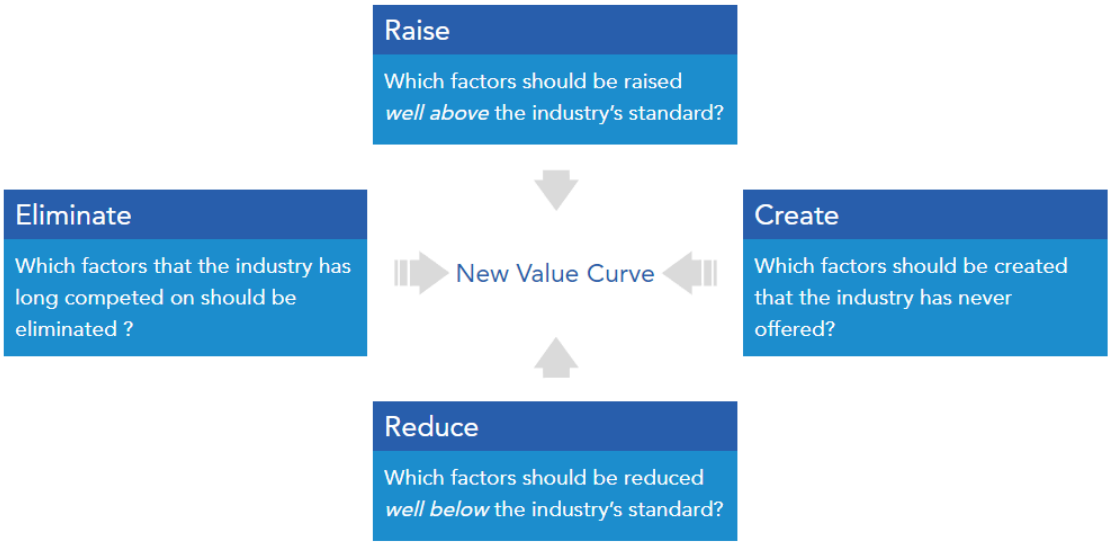

Figure 20 - Four action framework (Mauborgne, 2005-2019)

The following matrix was constructed based on the different identified characteristics that companies in the industry should have to create a new value curve, the following matrix is guided to one of the activities in the Industry: Gas Sales. The reason is that in this activity companies can pursue a real differentiation from competitors and is strictly related to the player that has the power to decide: The Consumer.

REDUCE COSTS	INCREASE BUYER VALUE
ELIMINATE	**RAISE**
Price competition	Complementary goods Digital transformation Renewable energy
REDUCE	**CREATE**
Bureaucratic staff Price of the final product	

Figure 21 - Value creation in the gas industry in Italy by applying the tool "four action frameworks"

The following paragraphs will analyze the factors that companies in the Gas industry in Italy should increment to have as a result an increase in the buyer value and achieve a different perspective in the Industry.

6.2 Complementary goods

Complementary goods, "refers to a complementary good/service used in combination with another good or service. Usually, the complementary good has little to no value when consumed alone, but when combined with another good or service, it adds the overall value of the offering. The joined demand for complementary goods causes an interplay between the consumer need for the

second product as the first product fluctuates. In economics, this connection is called negative cross-elasticity of demand. For example: when the price of a good rise, the demand for its complement falls because consumers are unlikely to use the complement product alone." (Banton, 2019)

Many of the companies in the Gas industry in Italy have introduced complementary goods on their portfolio, as an example, the main player Eni, has introduced the sale of products such as machine dryers, boilers, thermostat devices, all of these depends in a direct way of the main product offer by the company, the Natural Gas.

Another example of a complementary service that this company is offering to its customers is a maintenance service for boilers or water heaters. This offer is a way of indirectly creating customer loyalty, these plans of maintenance offered by Eni include a monthly technical control on the boilers or water heaters and have a contractual duration of 24 months, consumers can make a single payment or monthly payments. Technically the company is trying to increase the barriers of exit of the customers, but they are obtaining an economic benefit in the operation and entering a market in which Eni time ago did not have a presence.

The second competitor in the market is Edison (Refer to exhibit 3), Edison offers a 24/7 support services to their customers, the support refers to potential damages that the customers may have in their different domestic appliances, but not only in the device itself, also in the pipelines that may be damaged and are fundamental to the correct operation of the different home appliances. Edison differentiates from Eni in a particular fact, they do not have a determined duration of the service offered, consumers pay a monthly fee for the service and can stop paying whenever they want, so consumers are always free to change seller. Many consumers may appreciate this fact as attractive and is also a valuable fact to consider, especially in a Free Market.

The following paragraph will contribute to the analysis of how companies can increase value to the buyer by improving their way in which processes are managed by different digital tools.

6.3 Digital Transformation

New Business models imply also a change in the way companies manage the internal and external processes, a concept that contributes to this pursuit of efficiency and new ways of understanding the business is Digital transformation.

Nowadays companies in different industries are always introducing digital tools to manage their businesses, are they just want to go “digital”. But the most important thing is to understand how this factor is conceived by different managers. Some of them see it as a new way of engaging customers, others as a new way of doing business, and for many of them is all about introducing new technology to their companies. (Karel Dörner and David Edelman - Mckinsey, 2015)

Even though these definitions are not incorrect, the “crux of the matter” is another, and it depends on the way in which companies are actually taking all the digital advantages in the market and using it to manage in a proper way their business.

There are four main core challenges from which companies may focus at the moment in which they decide to start a digital transformation path:

1) Customer experience: as stated before having the customer in the center of the decisions and understanding their needs is fundamental to have a successful company in the Gas industry in Italy.

   Orchestrate the channels of the company to provide the greatest on-demand personalized services.

2) Operational excellence: Radically re-align the companies cost structure and generate efficiencies through all of the business processes.

3) Business reinvention: developing new monetization models in companies and gaining leadership in the economy.
4) Trust and compliance: secure the assets and transactions of the company, and lay the global foundation for digital trust. (ATOS, 2019)

Many of these core challenges that companies should focus at the moment in which they decide to initiate a digital transformation plan are supported in digital tools/software's.

SAP

One of the principal software's that the companies in the utilities industry use is SAP, the main player in Enterprise resource planning software's in the global market.

The SAP software is made of different modules or divisions that can manage different processes in the company. The names of the modules are easy to understand for any reader, some of them are:

- Production planning;
- Human resource management;
- Material management;
- Financial supply chain management;
- Project systems;
- Quality management;
- Plant maintenance;
- Controlling;
- Finance.

In the Italian industry, there is a powerful submodule that is called IS-U, that refers to Industry solutions for utilities, this sub-module is part/verticalization of the Finance Module.

The particular characteristic of this sub-module is that gives a huge capacity of action to the companies in the utilities industry.

The submodule is capable of manage different processes such as: Metering and devices→ billing (calculus of the bill) →financial and contract accounts (FI-CA/Credit management accountable information); but the main characteristic of this solution in the Gas industry is not only the capacity of managing these processes, but the ability of doing it by differentiating customer segments inside of each process (households, small businesses, condominiums, big companies, etc.).

This is a real advantage especially in a market in which a market that is regulated by an authority and many of these regulations are directed to a typology of consumer or activity.

Another advantage is that in the module of finance the managers do not see the single details but consolidated accountable data that has been bundle after it passes to the FI module.

CRM (Customer relationship management)

Other tools that contribute to the way in which companies are managing the customers' connection are the software's known as CRM (Customer relationship management).

In the Italian market there are three principal competitors used by many of the principal companies in the market:

- SAP CRM: is a module of the software SAP in charge of managing the customer relations, the main advantage to the companies is that is easier to integrate with other SAP modules (same company) respect with the other solutions in the market.
- SIEBEL: a CRM (customer relationship management) software the owner of this software is the multinational company ORACLE.

- Salesforce: is a recent customer relationship management software, the attractiveness of it is that runs on the cloud, initially was introduced to manage other industries, nowadays with its huge global popularity has entered in the companies in the Utilities industry as their CRM software.

Even though there are many digital solutions and tools in the market that allow companies to manage their internal and external processes in a more efficient way. If companies want to have a real transformation based on objectives and goals, the transformation must be measurable during the and after the implementation of the new collaborative tools.

Being part of a digital transformation program in the utilities industry, is about using the data in the new systems to make best and quicker decisions, preparing the employees that will use the new tools is fundamental to have a successful transformation in the company, and making them principal contributors of the new change in the company.

6.4 Renewable energy

This is a fundamental cross argument, as stated in the previous chapters the total production of electricity in Italy depends on a 74 % of Natural gas, if the Italian Gas industry has to import gas to produce another fundamental good for society it makes more interesting the industry, it is not only fulfilling the necessity of one good but another good.

Renewable energy refers to an endless supply of energy. In the last years, climate change has raised to an international concern, and for the next years it will be fundamental to replace fossil fuel electricity production with new alternative sources of energy. As stated at the begging of this chapter a way of differentiating

from competitors is also creating and working in undeveloped markets, and renewable energy is one of these markets.

In the Italian Gas industry, Eni, the main player in the market, is developing new technologies to make renewable energy more efficient and competitive.

As it follows the two sectors in which Eni is focusing its researches are solar and biomass, Eni believes that these two sectors offer the greatest potential for technological and market growth. (Eni, 2016)

1) Solar: Eni is focusing on systems that use fewer polluting materials, that can be produced at lower cost and can be easily integrated into structures such as buildings.

   Eni has been working in a special project called LSC ("Lastre fluorescenti di vari colori): intelligent windows, for more than 5 years, the panels captured the light, the radiation gravitates towards the edges of the panels, as in an optical fiber, making them luminescent. Small photovoltaic cells then transform the radiation received into electricity. (ENI, 2017)

   "Another important project that Eni is developing with MIT is the Organic Photovoltaic project (OPV) is one of the most innovative technologies that Eni is working in. there are numerous and varied fields where OPV technology can be applied: from its integration into electrical devices and building materials through power to remote and difficult to reach areas. The aim of the project is to create solar panels using polymers instead of silicon, thereby making them cheaper and more versatile." (Eni, 2017)

2) Biomass: "Eni is working on a pilot plant to produce biofuel from waste, successive to this plant, Eni's strategy will lead to the creation of waste to fuel plants on an industrial scale, disposing of a great quantity of organic waste

through reuse and contributing significantly too large urban areas in Italy." (Eni, 2019)

The other main player in the Gas industry in Italy, Edison, is pursuing a particular objective for 2030, the goal is to produce 40 % of Energy from traditional sources of renewable energy such as Eolic, hydroelectric and solar. (Edison, 2019)

It is clear from the previous paragraphs that companies in the Gas industry are pursuing new ways of producing revenues and increasing buyer value by introducing new business models and changing the way in which they are working in the market.

7 Conclusions

Continuous changes in the Gas industry in Italy are originated by two main factors: the constant regulations of the Authority that has as scope the protection of the free market and the new ways in which companies are analyzing the industry to conceived new opportunities in the Industry.

This work was realized to understand the way in which the liberalization process has contributed in the development of the Gas industry in Italy, this thesis has led to multiple conclusions regarding the current assessment made of the Gas Industry in Italy.

Aligning to the structure of the current work in terms of the objectives that were initially represented, the following conclusions are listed:

- The companies that play an important role in the Internal Market such as Eni and ENEL, have also a strong presence in the international market. Over the years, these companies have strengthened their contractual ties with many countries around the world, and have entered new markets. These relations have been built based on the absence in Italy of fundamentals non renewables resources such as oil and gas, fundamental for their internal activities in the Italian Utilities Industry. The technical and functional expertise built in the Italian companies over the years is reflected in consolidated economic indicators.
- The internal production of a fundamental resource such as natural gas in Italy does not cover the internal consumption. More than 90 % of the Gas comes from imports, the companies that work in the Gas industry in Italy have built strong relations around the globe with demonstrable expertise based on organizational capacities and capabilities constructed over the years.

- The different players in the Gas Industry in Italy have contributed to the constant growth of the internal market, the companies that work in the import, transport, distribution, and sale of the Natural Gas are willing to satisfy a need of the following group of consumers: households, small businesses, industries, and thermoelectric plants.
- More than 73% of the Electricity generated in Italy uses as main input Natural gas, nowadays Natural Gas is a fundamental resource for the Country.
- There are more than 200 Distributors in Italy and more than 600 sellers, this fact reflects the strong competition in these two activities. As for the other activities (Transportation, Dispatching and import), there are few numbers of competitors in the industry, mainly based on two facts:
    1) The transportation and Dispatching activities are declared as “activities of National and Public interest.”, is dominated by SNAM.
    2) Import activity requires a capacity of negotiation based on economic indicators and market trustworthiness, is a fundamental activity in the sector, and is mainly dominated by ENI.
- The National Authority ARERA has as its main purposes, the protection of the consumers' interests and the promotion of fair competition in the market, endorse efficiency and proper distribution of the services with adequate levels of quality, there are two main “Deliberas” that has regulated the way Companies move in the Industry:
    - Functional Unbundling;
    - Accountable Unbundling.
- The Gas Industry in Italy is characterized by a high threat of entry, low possibility of substitutes and a medium competition in the industry (depends on the industry activity).
- The Gas priced to the final consumers depends on 4 main components:
    - Expenses on the natural gas;
    - Expenses for transportation and management of the devices;
    - Expenses on systems charges;

- Taxes.

  The last component is particular and has contributed to the success of the industry, the consumers are paying taxes over taxes.

- The companies in the Gas Industry in Italy have entered in uncontested market spaces, many of the companies have started to create value from the existing position in the Industry by introducing new ways of doing businesses, represented in external changes by offering complementary goods and services to the consumers, and internally by implementing new tools that have contributed in the digital transformation of the companies, resulting in “cleaner” internal procedures in the companies.
- Even though the gas is a fundamental nonrenewable resource for the country, directly linked with the production of Electricity, companies in the Gas Industry have started investing in new ways of producing electricity by transforming solar energy and Biomass energy into electricity.

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9 Glossary

- Punto di riconsegna: “It is a point that identifies uniquely the physical point in which the gas is delivered to the final customer. The code does not change even if the supplier (seller) changes, this point is identified by an alphanumeric code of 14 digits” (EstEnergy, 2019).

- Complementary goods: “refers to a complementary service used in combination with another good or service. Usually, the complementary good has little to no value when consumed alone, but when combined with another good or service, it adds the overall value of the offering. The joined demand for complementary goods causes an interplay between the consumer need for the second product as the first product fluctuates. In economics, this connection is called negative cross-elasticity of demand. For example: when the price of a good rise, the demand for its complement falls because consumers are unlikely to use the complement product alone.” (Banton, 2019)

- Commodity: “a commodity is a basic good used in commerce that is interchangeable with other commodities of the same type. Commodities are most often used as inputs in the production of other goods and services. The quality of a given commodity may differ slightly, but it is essentially uniform across producers. When they are traded on an exchange, commodities must also meet specified minimum standards, also known as a basis grade.” (Investopedia, 2019)

- ARERA: “The Italian Regulatory authority for Energy, Networks and the Environment, is an independent body created under Italian law, for the purposes of protecting consumers' interests and promoting the competition, efficiency, and distribution of services with adequate levels of quality, through regulatory and control activities.” (ARERA, 2019)

- Unbundling: refers to the separation of activities in a production chain of a vertically integrated company.

In context: “is a regulatory characteristic introduced by the Law decree and successively regulated by the Authority ARERA. The Authority adopted the provisions for functional separation and accounting separation in the companies that carry out activities in the Gas and Electricity market in Italy.” (Edison, 2019)

- Installed Capacity: “maximum capacity that the system is designed to run.” (DARON CHRISTOPHER - Department of Energy, 2017)

- Key success factor: the result of the analysis of two questions:

    - What do customers want? Analysis of demand - who are the customers? What do they want?”
    - “How does a firm survive the competition? Analysis of competition - What drives competition? What are the main dimensions of competition? How intense is competition? How can we obtain a superior competitive position?

  The result of these two analyses is a key success factor. (Grant, 2014)

- LNG: “Liquified Natural Gas, liquefaction enables natural gas that would otherwise be “stranded” to reach major markets. Developing countries with plentiful natural gas resources are particularly interested in monetizing natural gas by exporting it as LNG.” (Department of Energy US, 2019)

- Regasification terminals: “in the regasification terminals the liquid methane (-160 C°) is returned to its gaseous state by the simple operation of heating and successively is injected into the national Transportation networks.” (Snam, 2019)

- Production facilities: refers to the place where Natural gas is extracted.

- EBIT: refers to the Earnings Before Interest and Taxes, which is one of the main indicators of a firm’s profitability. “EBIT is also referred to as operating earnings, operating profit, and profit before interest and taxes.” (Chris B.Murphy Investopedia, 2019)

- EBITDA: refers to the Earnings Before Interest, Taxes, Depreciation, and Amortization, “is a measure pf a company’s overall financial performance and is used as an alternative to simple earnings or net income in some circumstances. As the EBIT is, EBITDA is also a measure of firms' profitability.” (Chris B.Murphy Investopedia, 2019)

- Government concession: “refers to a contract between a company and a government that gives the company the right to operate a specific business within the government’s jurisdiction, subject to certain terms.” (Investopedia - Julia Kagan, 2019)

10 Exhibits

Exhibit 1 – Italian population per region (ISTAT, 2019)

Regione	Popolazione residenti	Superficie km2	Densità abitanti/km2	Numero comuni	Numero province
Lombardia	10.060.574	23.863,65	422	1.507	12
Lazio	5.879.082	17.232,29	341	378	5
Campania	5.801.692	13.670,95	424	550	5
Sicilia	4.999.891	25.832,39	194	390	9
Veneto	4.905.854	18.345,35	267	563	7
Emilia – Romagna	4.459.477	22.452,78	199	328	9
Piemonte	4.356.406	25.387,07	172	1.181	8
Puglia	4.029.053	19.540,90	206	257	6
Toscana	3.729.641	22.987,04	162	273	10
Calabria	1.947.131	15.221,90	128	404	5
Sardegna	1.639.591	24.100,02	68	377	5
Liguria	1.550.640	5.416,21	286	234	4
Marche	1.525.271	9.401,38	162	228	5
Abruzzo	1.311.580	10.831,84	121	305	4
Friuli Venezia Giulia	1.215.220	7.924,36	153	215	4
Trentino alto adige	1.072.276	13.605,50	79	291	2
Umbria	882.015	8.464,33	104	92	2
Basilicata	562.869	10.073,32	56	131	2
Molise	305.617	4.460,65	69	136	2
Valle d'Aosta	125.666	3.260,90	39	74	1

Exhibit 2 – Wholesale market sales of Main groups for the year 2017 (ARERA, 2019)

Company	Millions of M3
Eni	26,551
Enel Trade	21,277
Eni Trading & Shipping	18,124
Engie Global Markets	16,728

Edison	13,968
Engie Energy Management	8,372
Shell Energy Europe Limited	7,992
Dufenergy Trading Sa	6,243
Edf Trading Limited	5,162
Engie Italia	4,978
Roma Gas & Power	4,185
Gunvor International B.V.	4,184
Met International Ag	3,805
Hera Trading	3,787
Engie Sa	3,598
A2A	3,466
Axpo Italia	3,332
Banca Imi	3,126
Gazprom Marketing And Trading Limited	2,933
Enoi	2,648
Hb Trading S.P.A.	2,433
Koch Supply & Trading Sarl	2,423
Centrex Italia	2,097
Spigas	2,017
Repower Italia	1,993
Altri	35,390
Totale	**210,814**

Exhibit 3 - Main groups for sales at the final market for the year 2017 (ARERA, 2019)

Company	Millions of m3
Eni	12,406
Edison	7,954
Enel	6,581
Energeticky A Prumyslovy Holding, A.S.	2,526
Iren	2,483
Hera	2,145
A2A	1,948
Sorgenia	1,184
Axpo Group	1,020
Engie	979
E.On	924
Royal Dutch Shell Plc	862

Estra Spa	853
Ascopiave	811
Repower Ag	777
Unogas	697
Eg Holding Spa	637
Metaenergia Spa	504
Solvay Energy Services Italia	495
Gas Natural Sdg S.A.	482
Altri	13,548
TOTALE	**59,814**

Exhibit 4 – Main responsibilities of the Authority ARERA (ARERA, 2019)

The following text has been extracted for the ARERA site:

“The Authority regulates the areas of competence, through rulings (resolutions) and, specifically:

- For the energy sectors, it establishes the tariffs for the use of infrastructures and guarantees equal access for operators;
- Prepares and updates the tariff method for determining the fees for both the integrated water service and the integrated waste service and approves the tariffs prepared by the competent bodies;
- Defines the criteria for determining the users' fee for connection to the district heating network and the procedures for exercising the right to "disconnection";
- Encourages investments in infrastructure with an emphasis on adequacy, efficiency, and safety;
- Ensures advertising and transparency of service conditions;
- Promotes higher levels of competition and more acceptable safety standards in procurement, with attention to harmonizing regulation for the integration of markets and networks internationally;

- Establishes provisions on accounting separation for the electricity and gas sectors, the water sector and the district heating service, as well as on the compulsory functional separation for the electricity and gas sectors;
- Defines the minimum quality levels for services in terms of the technical and contractual aspects and the service standards;
- Encourages the rational use of energy, especially regarding the dissemination of energy efficiency and the adoption of measures for sustainable development;
- Until the complete opening of the markets scheduled for July 1, 2019, it updates the reference economic conditions for customers who have not chosen the free market in the energy sectors, on a quarterly basis;
- Increases levels of protection, awareness, and information to consumers;
- Monitors, supervises and controls the service quality, safety, access to networks, tariffs, incentives for renewable and similar sources, including in collaboration with the Guardia di Finanza (Tax Police) and other bodies, including the Cassa per i Servizi Energetici e Ambientali (Fund for Energy and Environmental Services - CSEA) and the Gestore Servizi Energetici (Energy Services Manager - (GSE).
- It can impose sanctions and assess and possibly accept commitments by companies to reinstate the adversely affected interests (Italian Legislative Decree No. 93/11).

The Authority also carries out an advisory role to the Parliament and the Government to which it can submit reports and proposals; each year it presents an Annual Report on the state of services and the activities carried out."

Exhibit 5 – Imposte sul gas (ARERA, 2017)

The following table represents the different taxes applied to the final customers:

c€/m3 per le accise e aliquote percentuali per l'IVA

IMPOSTE	USI CIVILI				USI INDUSTRIALI	
Fascia di consumo annuo	< 120 m^3	120-480 m^3	480-1.560 m^3	> 1.560 m^3	< 1,2 M(m^3)	> 1,2 M(m^3)
ACCISA						
Normale	4.4000	17.5000	17.0000	18.6000	1.2498	0.7499
Territori ex Cassa del Mezzogiorno[A]	3.8000	13.5000	12.0000	15.0000	1.2498	0.7499
ADDIZIONALE REGIONALE[B]						
Piemonte	2.2000	2.5800	2.5800	2.5800	0.6249	0.5200
Veneto	0.7747	2.3241	2.5823	3.0987	0.6249	0.5165
Liguria						
– zone climatiche C e D	2.2000	2.5800	2.5800	2.5800	0.6249	0.5200
– zona climatica E	1.5500	1.5500	1.5500	1.5500	0.6249	0.5200
– zona climatica F	1.0300	1.0300	1.0300	1.0300	0.6249	0.5200
Emilia Romagna	2.2000	3.0987	3.0987	3.0987	0.6249	0.5165
Toscana	2.2000	3.0987	3.0987	3.0987	0.6000	0.5200
Umbria	0.5165	0.5165	0.5165	0.5165	0.5165	0.5165
Marche	1.5500	1.8100	2.0700	2.5800	0.6249	0.5200
Lazio						
– territori ex Cassa del Mezzogiorno[A]	1.9000	3.0990	3.0990	3.0990	0.6249	0.5160
– altre zone	2.2000	3.0990	3.0990	3.0990	0.6249	0.5160
Abruzzo						
– zone climatiche E e F	1.0330	1.0330	1.0330	1.0330	0.6249	0.5160
– altre zone	1.9000	2.3241	2.5823	2.5823	0.6249	0.5160
Molise	1.9000	3.0987	3.0987	3.0987	0.6200	0.5200
Campania	1.9000	3.1000	3.1000	3.1000	0.6249	0.5200
Puglia	1.9000	3.0980	3.0980	3.0980	0.6249	0.5165
Basilicata	1.9000	2.5823	2.5823	2.5823	0.6249	0.6249
Calabria	0.5165	0.5165	0.5165	0.5165	0.5165	0.5165
ALIQUOTA IVA (%)	10	10	22	22	10[C]	10[C]

(A) Si tratta dei territori indicati dal decreto del Presidente della Repubblica 6 marzo 1978, n. 218.

(B) L'addizionale regionale si applica sui consumi nelle regioni a statuto ordinario; non si applica nelle regioni a statuto speciale. La Regione Lombardia ha disapplicato.

(C) Aliquota per le imprese estrattive, agricole e manifatturiere; per le altre imprese l'aliquota è quella ordinaria.