

# DESIGN MECHANISM FOR GAS MARKET ABLE TO FOSTER ENERGY TRANSITION

REF: MED20-30GA – 3.1.5



Gas  
Working group  
(GAS WG)

## ACKNOWLEDGMENTS

This report is the result of a work carried out by the MEDREG Gas Working Group (GAS WG), which provided the data and comments. MEDREG wishes to thank the GAS Working Group for their contribution and efforts.

Main drafters: Zitouni Lamine Abdelkader (MEDREG Secretariat)

Co-drafters: Vincenzo Cioffo (ARERA, Italy), Bardhi Hoxha (MEDREG Secretariat)

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## ABOUT MEDREG

MEDREG is the association of Mediterranean energy regulators, bringing together 27 regulators from 22 countries across the European Union (EU), the Balkans and North Africa.

MEDREG acts as a platform to provide information exchange and assistance to its members as well as capacity development activities through webinars, training sessions and workshops. Mediterranean regulators work together to promote greater harmonisation of regional energy markets and legislations, seeking progressive market integration in the Euro-Mediterranean basin.

Through constant cooperation and information exchange amongst members, MEDREG aims at fostering consumers' rights, energy efficiency, infrastructure investment and development based on secure, safe, cost-effective and environmentally sustainable energy systems.

The MEDREG Secretariat is located in Milan, Italy. For more information, visit [www.medreg-regulators.org](http://www.medreg-regulators.org)

If you have any queries related to this paper, please contact: Veronica Lenzi, MEDREG Secretariat.

E-mail: [vlenzi@medreg-regulators.org](mailto:vlenzi@medreg-regulators.org)

## EXECUTIVE SUMMARY

Energy transition refers to structural changes in the energy system to switch from a fossil-based to a zero-carbon system. Many countries have adopted new mechanisms and strategies to meet their clean energy objectives in terms of CO<sub>2</sub> reduction and minimise the use of fossil fuels.

The most prominent and obvious method for success in that transition is increasing the share of renewable energy in the total energy consumption along with using natural gas as a transition fuel for a totally decarbonised energy market in the long run. However, the deployment of renewable energy sources (RES) into the system has created several technical and political constraints and limitations. Therefore, some other actions and measures are necessary, such as demand-side management and energy efficiency. This is also because all these mechanisms are close to their maximum output and it becomes more complex and expensive to improve their impact on the reduction of CO<sub>2</sub> emission. From that perspective, a more efficient gas market can help reduce the CO<sub>2</sub> emissions and improve the performance of the energy systems without any major additional costs or structural changes to the power system. In addition, hydrogen can be used as feedstock, fuel or an energy carrier and storage and has many applications across the industry, transport, power and building sectors. Most importantly, it does not emit CO<sub>2</sub> and causes almost no air pollution when used, offering a solution to decarbonise industrial processes and economic sectors, where reducing carbon emissions is both urgent and hard to achieve. All these reasons make hydrogen essential in supporting the clean energy goals to achieve carbon neutrality and for the global effort to implement the Paris Agreement while working towards zero pollution. Therefore, hydrogen should be considered an important fuel, along with natural gas, to achieve a fully decarbonised Mediterranean energy market.

It has to be considered that the Mediterranean region has the particularity to have important natural gas producers and consumers. Therefore, there are conditions to realise a well-developed gas market in the region with a crucial role in the energy sector.

In this report, we focus on how the gas market can foster energy transition with focus on how natural gas is used in Mediterranean countries today and in the future. Next, we analyse the role of natural gas in the energy transition and the extent to which the gas market can contribute to climate-neutral energy systems.

Finally, in the last chapter, the role of the regulator is defined and some recommendations are given on how to foster the energy transition using natural gas.

This report aims to present an overview of the current gas market situation and its role in the energy transition in the Mediterranean region with a particular focus on the role of the regulator. This report also includes an analysis of the mechanism available for the gas market to foster the energy transition and the applicability of this mechanism in MEDREG countries.





## INTRODUCTION

For the purpose of the report, a questionnaire on the gas market was circulated in MEDREG countries, and we divided the responses into four categories:

- Nine countries replied positively.
- Three countries replied partially since their gas market is under development.
- Three countries don't have a gas market.
- Seven countries did not reply to the questionnaire.

For the sake of clarity and to complete the analysis, data from external sources such as OME, ACER, the Energy Community and BP statistical reports were used wherever data were missing.

Country	Colour in figures	Replied to the questionnaire	Additional information
Albania		Yes <sup>1</sup>	Gas market under development
Algeria		No	Data from BP statistical report <sup>2</sup>
Bosnia-Herzegovina		No	Data from Energy Community
Croatia		No	Data from ACER
Cyprus		Yes <sup>1</sup>	Gas market under development
Egypt		Yes	
France		Yes	
Greece		Yes	
Israel		Yes	
Italy		Yes	
Jordan		Yes	
Lebanon		Yes <sup>1</sup>	Gas market under development
Libya		No	
Malta		No	No gas market
Montenegro		No	No gas market
Morocco		No	Data from OME
Palestinian Authority		No	No gas market
Portugal		Yes	
Slovenia		Yes	
Spain		No	Data from ACER
Tunisia		No	
Turkey		Yes	

<sup>1</sup> Data related to the gas market is missing (natural gas production, consumption, import and export, etc.).

<sup>2</sup> BP report: Statistical review of world energy 2020, 69th edition.



## 1

# FACTS ON THE NATURAL GAS MARKET IN THE MEDITERRANEAN REGION

## 1.1 Natural gas consumption

In general, natural gas consumption has increased in most countries in the last three years by 5% from 2016 to 2019. Based on the questionnaire results, we noticed that the trends differ from country to country.

The data from the replies were divided into two categories: the first one is above 25000 million cubic meters (MCM), represented in Figure 1, and the second is below 25000 MCM and represented in Figure 2.

For the first category, the most recurrent evolution during the last four years is growth in the natural gas consumption from 2016 to 2018 and a drop in the consumption in the last year, mainly due to the mild winter and, according to the International Energy Agency (IEA), the effects of the pandemic in 2020, combined with a mild winter in the northern hemisphere, causing a drop of at least 4% in the global natural gas consumption. For Algeria and Egypt, however, gas consumption is driven by economic growth, especially in the industrial sector. Therefore, their consumption has increased during the last year and is expected to increase in the future.

It is also worth mentioning that in Albania, gas consumption is low mainly due to 100% of the electricity being produced using renewable energies (mostly hydro). For France, the trend is a slight decrease in natural gas consumption since 2016.

On the other hand, the evolution of the gas market in the second category differs from country to country.

For Portugal and Greece, each year is different than the last without any steady trend but remaining at the same level of 4700 MCM for Portugal and 5600 MCM for Greece.

For Croatia, Slovenia and Bosnia and Herzegovina, the consumption has differed from year to year without any common trend.

## 1.2 Natural gas production

The peculiarity of the Mediterranean region is the presence of both important consumers (Egypt, Jordan, Italy, France and Turkey) and producers (Algeria, Egypt and Israel). In addition, during the last few years, several new fields have been discovered<sup>1</sup>, which will have a considerable impact on the gas market in the region as well as in the world<sup>2</sup>.

One example of the impact is Egypt, which was a net exporter of gas until 2014. Then, following some circumstances, it turned into a gas importer until the last quarter of 2018, which is when it achieved self-satisfaction again, mainly due to the massive discovery of gas in 2015. This led to an increase in the production of natural gas (Figure 3) to satisfy the local needs, and Egypt became an exporter of natural gas once again.

<sup>1</sup> Between 2009 and 2010, Israel discovered two major gas fields offshore (Leviathan), followed by Zohr field off Egypt's coasts by the Italian company ENI. The results of the exploratory drilling of Cyprus in 2011 and the production test in 2013 showed the existence of a natural gas field "Aphrodite", which was declared as a commercial field in 2015.

<sup>2</sup> Another gas field discovered during 2020 in the Black Sea (Sakarya) will improve the production of gas in Turkey; the production is expected to start in 2023.

Figure 1 . Natural gas consumption above 25000 MCM

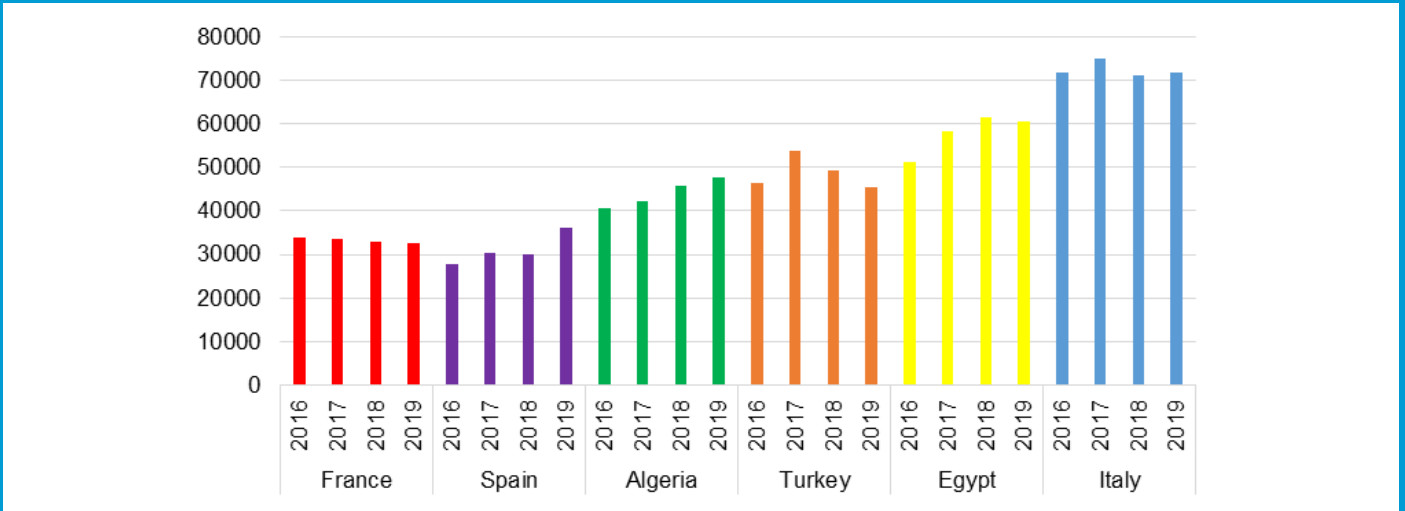


Figure 2 . Natural gas consumption below 25000 MCM

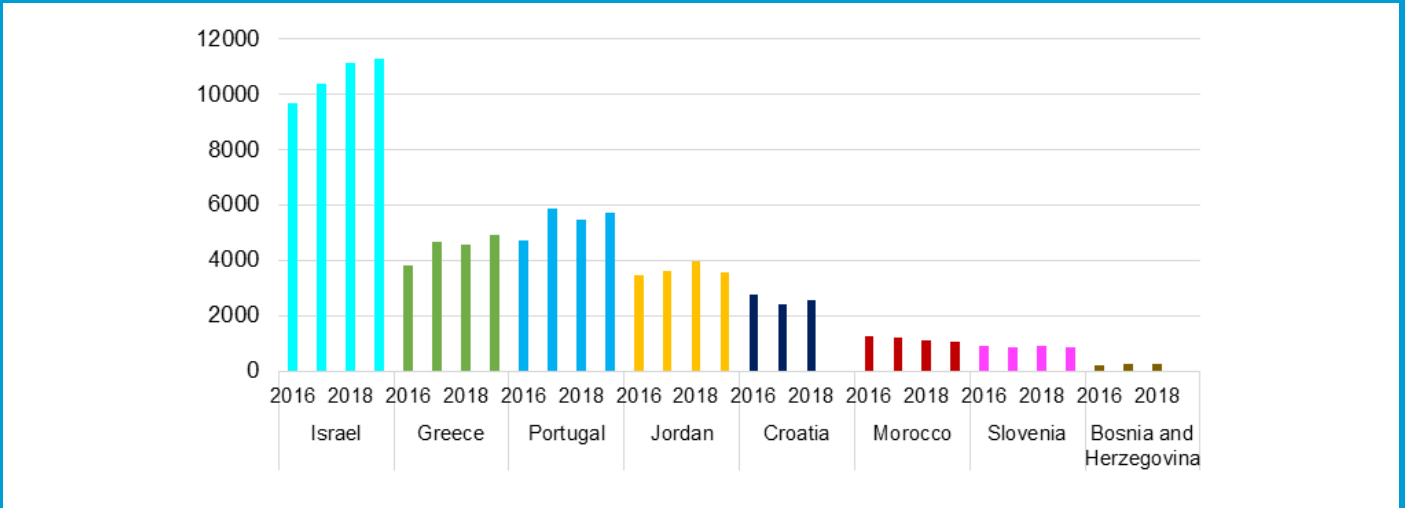
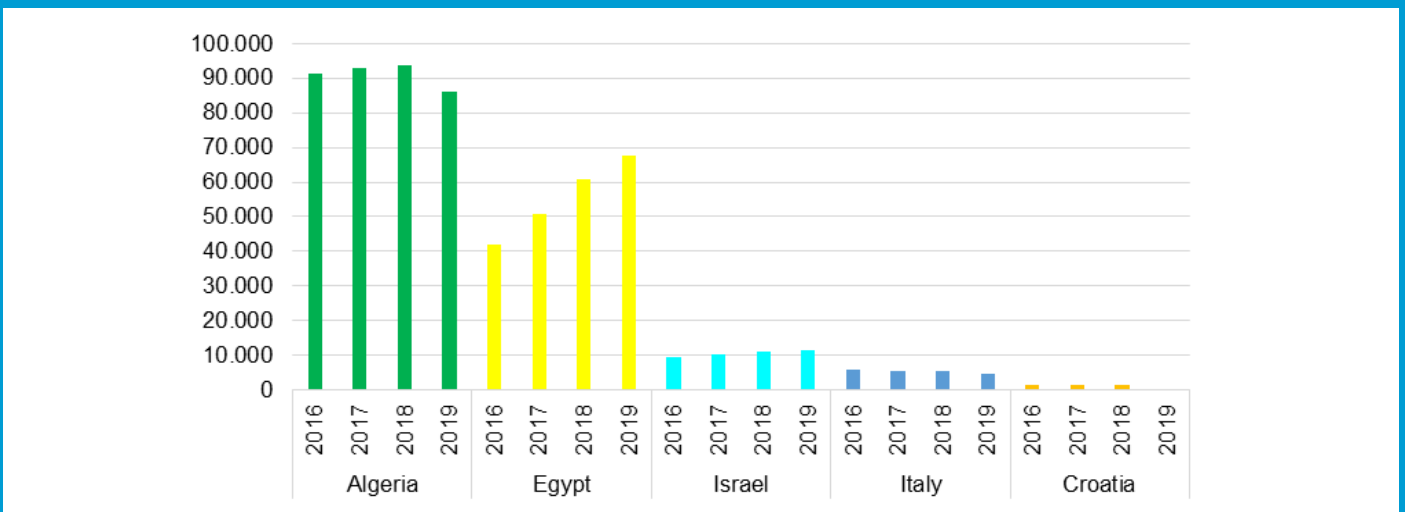


Figure 3 . Natural gas production MCMs <sup>1</sup>



<sup>1</sup> Jordan´s data for 2019 is not available. The level of production in the remaining countries is either really low or there is no production and, therefore, is not represented in the figure.

### 1.3 Natural gas import

#### 1.3.1 Natural gas trades in the world

Europe is the biggest consumer of natural gas, and the most commonly used method to supply the region is through pipelines. During the last year, exports of Liquefied Natural Gas (LNG) have grown by 12.7% worldwide. In addition, on the LNG import side, nearly all incremental supplies are headed to Europe, in contrast to 2018 when Asia drove import growth. European LNG imports rose by 49 bcm, representing an unprecedented increase of 68%. The next figure provides an overview of the major trade movements in 2019.

It is worth mentioning that LNG trades have grown considerably. In 2019, growth increased by 12% worldwide. In the Mediterranean region, several countries increased the share of LNG import during the last year, such as France (80%), Italy (65%), Spain (46%) and Turkey (13%). This increase was mainly driven

by the need for diversification of suppliers. LNG gives a real boost to the diversity of gas supply and, hence, greatly improves energy security. Also, the global LNG market is going through dynamic development with the entrance of new suppliers such as the United States, Russia and Australia.

#### 1.3.2 Natural gas trades in the Mediterranean region

Natural gas is one of the main energy sources in the world, and it is used in many sectors such as electricity production, heating, industrial use, and transport and residential sectors. Therefore, in energy chains, natural gas has a crucial role, and in cases where it is not available locally, importing from other countries is the only option.

Figure 5 provide an overview of the import of gas in MEDREG countries. There are two groups, the first with less than 12000 MCM and the second with more than 12000 MCM.

Figure 4. Trade flows worldwide in 2019 (billion cubic meters)

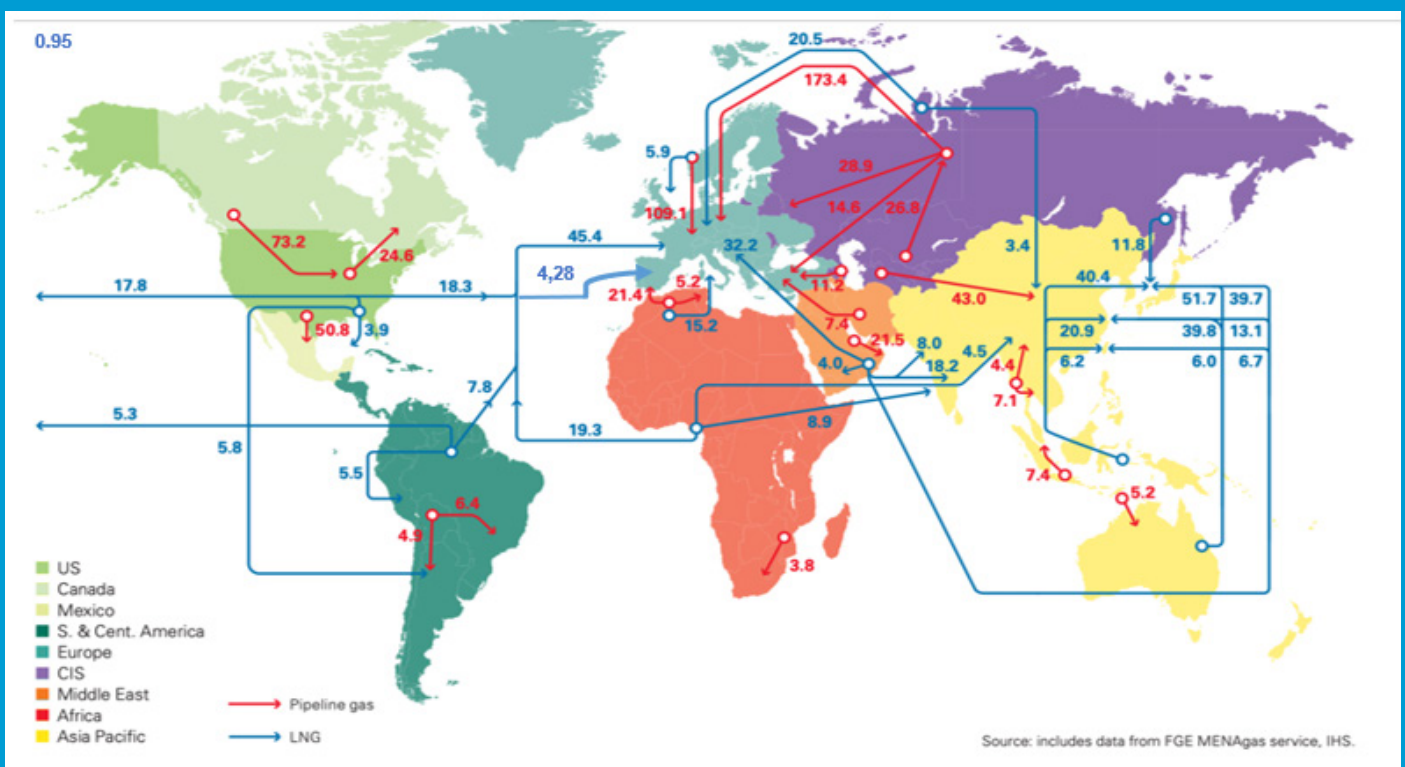


Figure 5 . Natural gas import below 12000 MCM

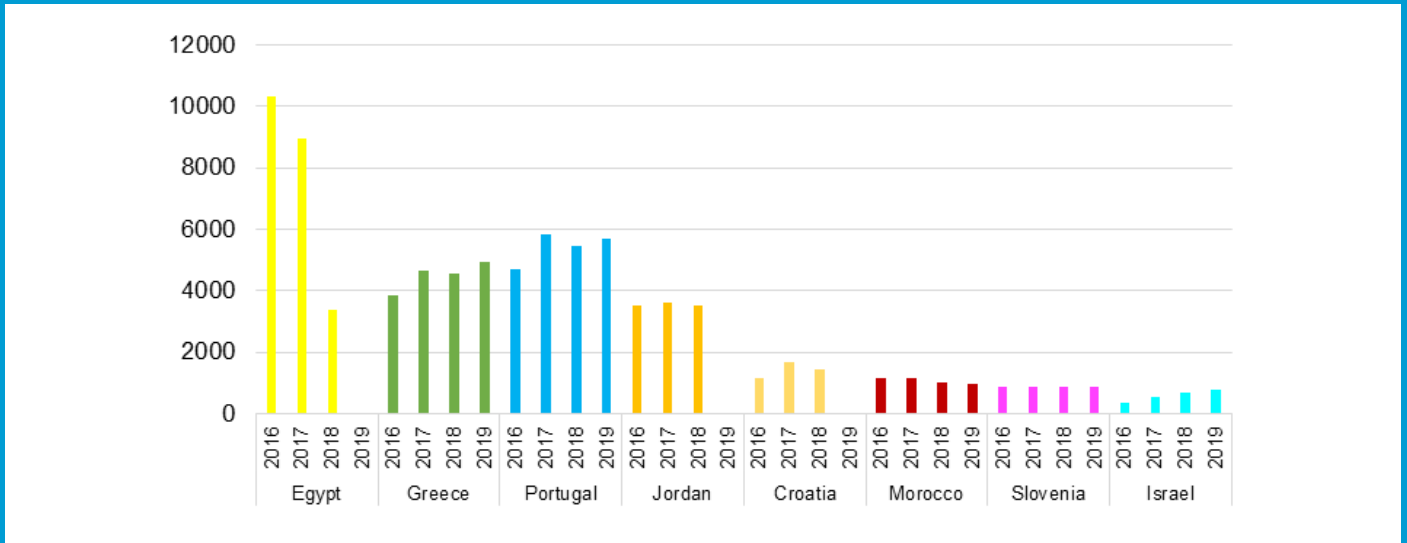


Figure 6 . Natural gas import above 12000 MCM

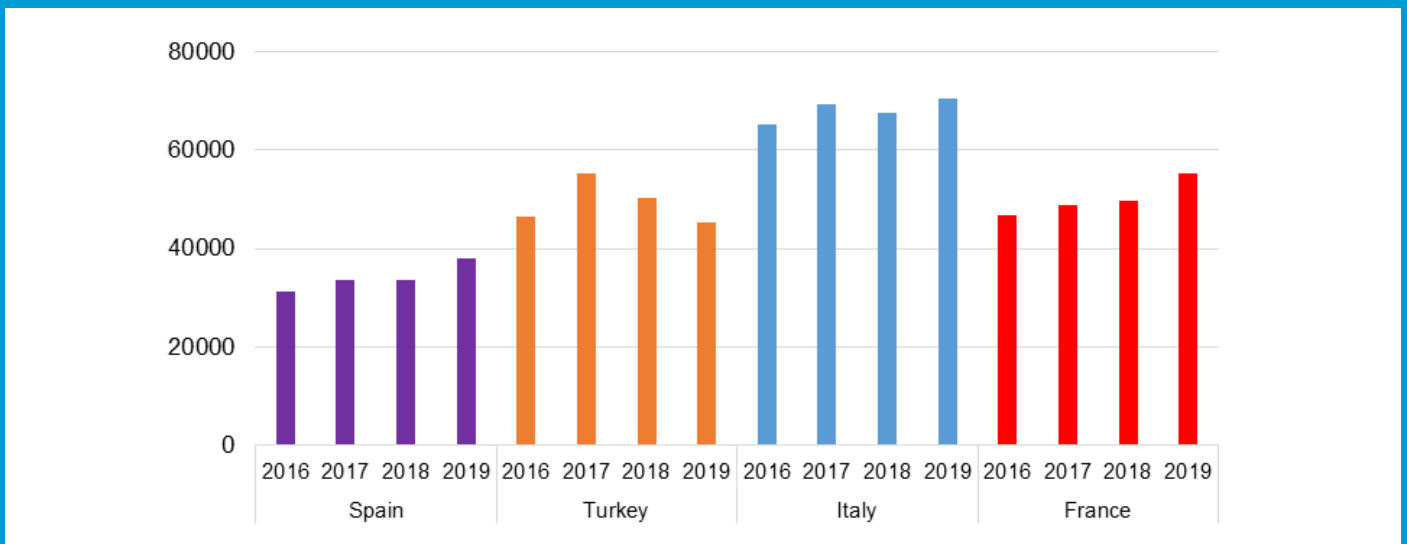
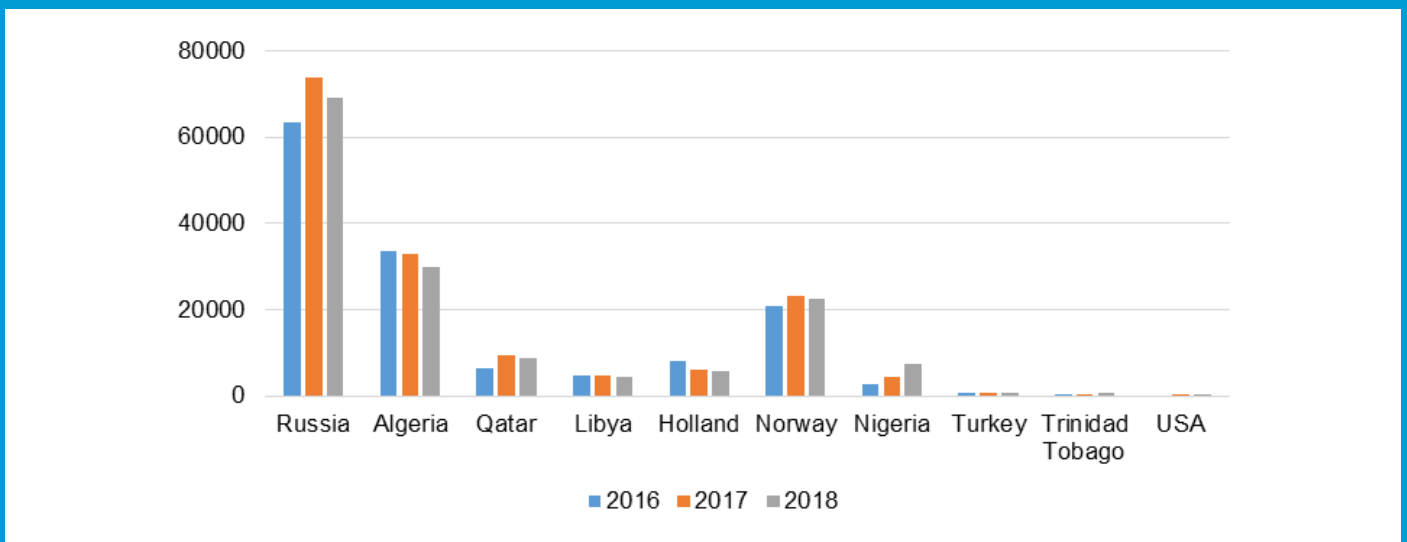


Figure 7 . Natural gas imports by source



As mentioned in the previous paragraph, Figure 5 shows the drop in the gas import in Egypt, starting from 2016 with 10000 MCM to only 9 MCM in 2019. For the other countries, the level of import remained steady over the last four years for both categories of importers (Fig. 6).

A closer look at the import's sources reveals that for the countries that responded to the questionnaire, the main natural gas sources in the Mediterranean countries are Russia, Algeria and Norway, followed by Qatar, Holland and Nigeria (Figure 7).

The diversification of the import's source is a common aspect in all the responses and there were at least four sources for each country. The dependency of EU countries on Russian supplies remains significant, mainly due to the important reserves in Russia and the need for new infrastructure with impressive investments to diversify the sources. Nevertheless, with the discovery of new supplies and cheaper LNG prices, some countries, such as Greece, have reduced their dependence. The Russian gas export to Greece, Turkey and other Southeast European countries fell by more than a quarter in the first half of 2019 with the emergence of cheaper LNG and new Azeri<sup>3</sup> supplies. More specifically, in 2019, the share of Greece's imports from Russia dropped by 52% (3064 to 1598 MCM), and those imports were substituted by LNG due to its price drop in 2019.

Even for the LNG imports, Greece made progress in terms of diversification of suppliers; in 2016, Algerian LNG imports were dominant, and in 2019 several other sources were used. Fig. 8 represents the evolution of the natural gas import by source and the second one represents the evolution of LNG imports by source.

In Portugal, new emerging gas suppliers such as Nigeria and USA gained important shares in the market in 2019, reducing the share of Algerian suppliers.

Diversification of supply sources is, therefore, paramount for energy security as well as competitiveness, especially for the EU countries that represent the biggest importers of natural gas in the world. However, it is important to remember that in the last few years, the share of Russia in the exports dominated the market. The share of Russia in the market dropped in 2019 only in some countries. This happened because LNG was not available to a lot of countries where the infrastructure was not developed or geographically not possible.

In addition to fostering energy security, the diversification of supply can realise a more efficient gas market that can trade gas from terminals to pipelines and storages.

The detailed imports by source for each response of MEDREG members is given in the annex 1.

<sup>3</sup> LNG supply from Azerbaijan

Figure 8 . Natural gas imports by country Greece case

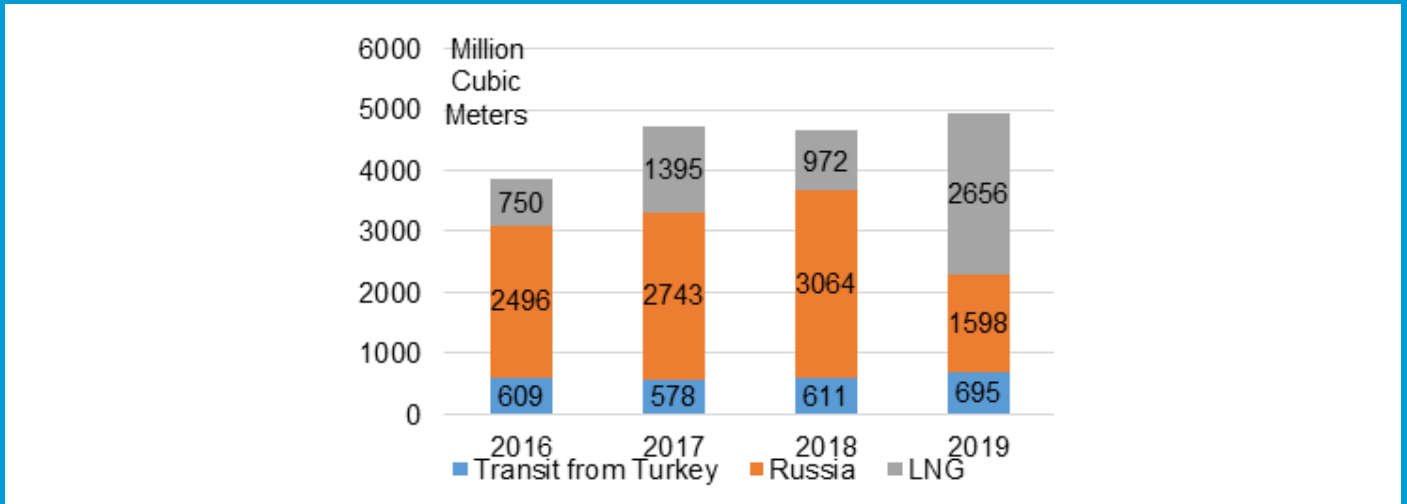


Figure 9 . LNG imports by country. Greece case

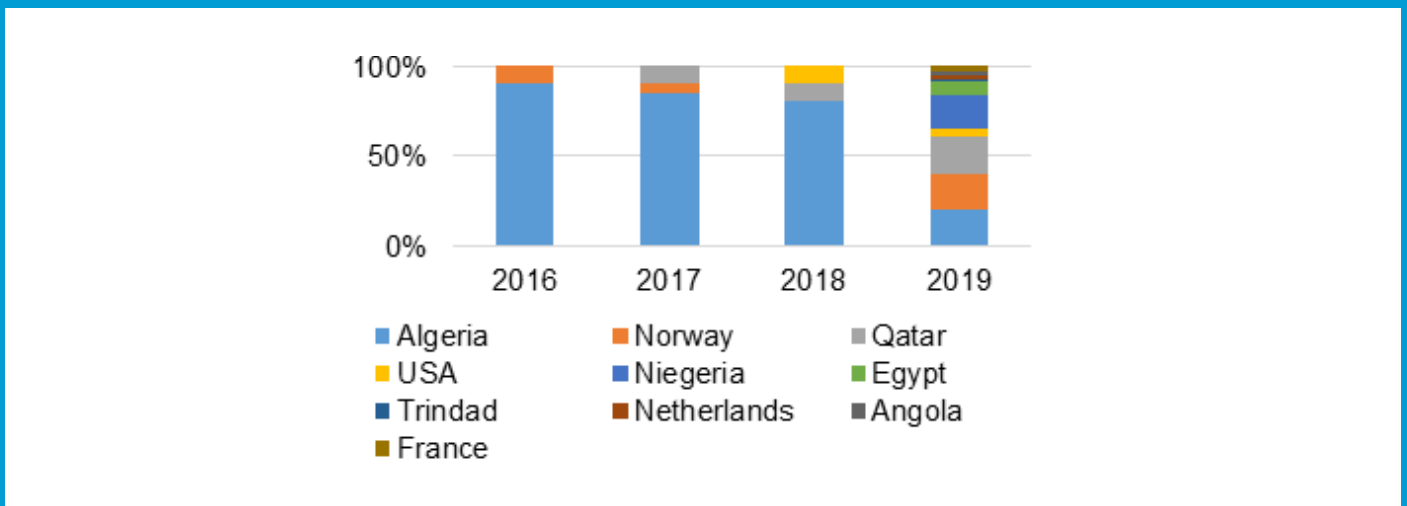
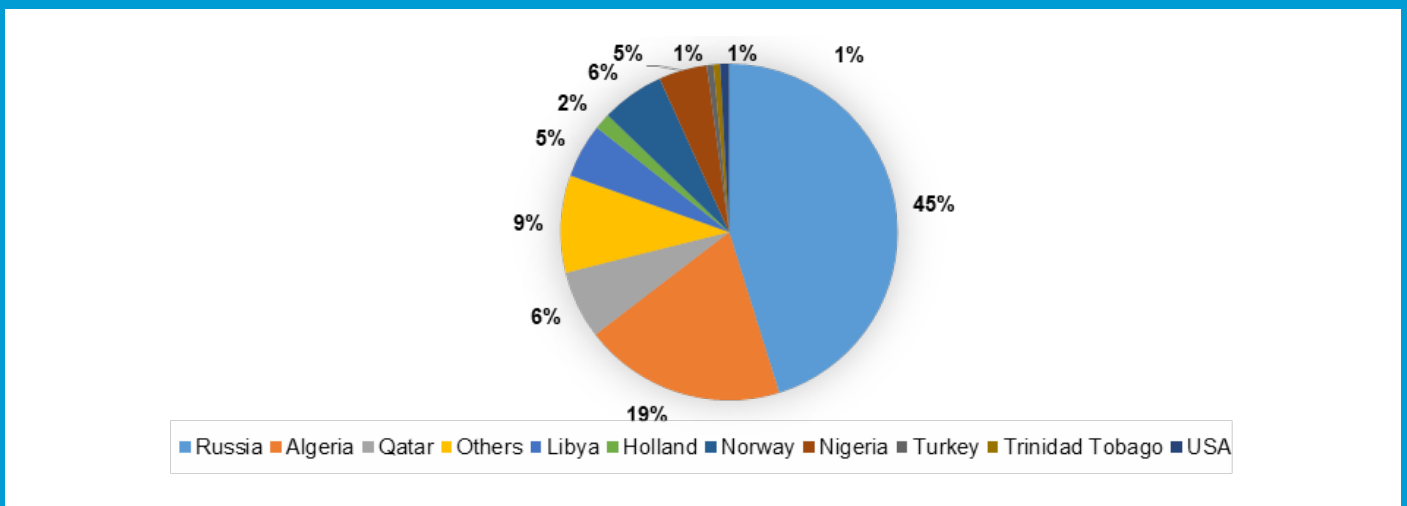


Figure 10 . Natural gas imports by country<sup>1</sup>



<sup>1</sup> Includes only the data received from the questionnaire.



## 2

## ROLE OF NATURAL GAS IN THE ENERGY MARKET

In the previous chapter, the importance of the natural gas market in the Mediterranean region was highlighted. This chapter will provide an overview of the role of natural gas in the energy market, with a focus on the share of natural gas in the electricity mix and demand sector.

### 2.1 Current situation and role of natural gas in power generation, residential and other sectors

#### • Natural gas share in electricity generation

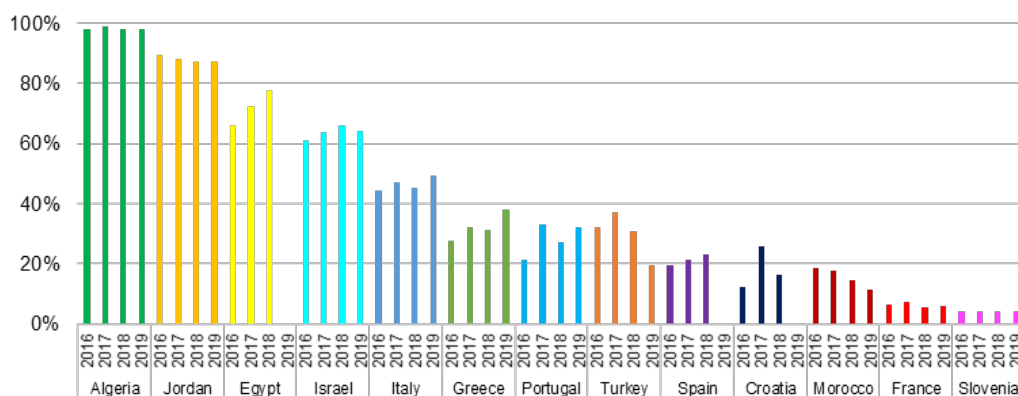
Natural gas remains the main source for the production of electricity. Its share in the electricity mix depends on the availability and

price of natural gas in the country (produced locally or imported). The electricity mix in some countries is highly dependent on natural gas due to the availability of the resource (in Algeria and Egypt, for instance) or due to the affordability (such as in Jordan). On the other hand, the electricity mix is more diversified in the remaining countries, mainly to reduce the dependency related to one source only. Therefore, the natural gas share is between 20–40%.

The next figure presents the share of natural gas in the electricity mix for each country over the last 4 years.

The detailed electricity mix can be found in the annex 2.

Figure 11 . Natural gas share in electricity production mix<sup>1</sup>



<sup>1</sup> The data for the rest of the countries is not available (Malta, Croatia, Montenegro, Bosnia and Herzegovina, Lebanon, Cyprus, Tunisia, Libya and Palestine). The share of natural gas is 0% for Albania.

• Share of natural gas in other sectors

Besides electricity production, natural gas is a main energy source in different sectors, such as industrial, residential and transportation. In these sectors, natural gas represents the most flexible and affordable and the cleanest energy source compared to other fossil-based energy sources to optimise energy systems.

Furthermore, in Egypt, the particularity of the usage of gas in the residential sector is that it is only used for cooking without heating, and the share of residential gas is 5.7% of the total gas consumption.

2.2 Future role of natural gas by countries

The strategies to achieve energy transition may be different from one country to another depending on the characteristics of each national energy market. This section provides the main national strategy related to the energy transition and the future of the gas market, describing the gas supply strategy<sup>4</sup>.

<sup>4</sup> This section only includes the countries that responded to the questionnaire.

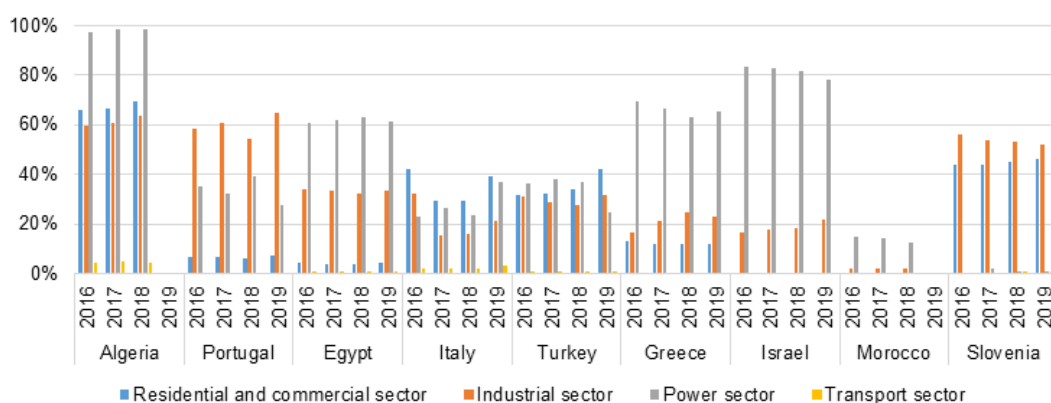
In **Albania**, the gas market is still under development, and the gas company Albgas is vertically integrated; for the moment the market is regulated. Furthermore, it is worth mentioning that the first through third-party access (TPA) was planned to be achieved by November 2020.

In **Cyprus**, the natural gas market is under development and the main goal is to create an organised market according to the standards of previously advanced markets worldwide but also in the best practice of the European natural gas industry with the proper operation of all market players. In 2016, the Council of Ministers issued a Decision regarding the natural gas supply options in Cyprus. Based on this Decision, the Council of Ministers approved the arrival of LNG in Cyprus as soon as possible.

Until the internal market of natural gas is supplied by indigenous fields<sup>5</sup>, LNG will be the exclusive supply option. Hence, when it is possible to supply the Cyprus market from indigenous fields, it will be an alternative option that will ensure the security of the energy supply.

<sup>5</sup> One exploitation licence was granted in November 2019 for the Aphrodite natural gas field and several other exploration licences for other fields.

Figure 12. Natural gas share in demand sector



In June 2017 two tenders for a long-term LNG supply and a strategic investor for the required infrastructure were announced. Following a Decision of the Council of Ministers in April 2018, a Special Purpose Vehicle was established to implement the required infrastructure for the introduction of LNG. In October 2018, a tender was published for the design, construction and operation of the LNG terminal in Vassilikos Bay. It was awarded to an international consortium in December 2019.

Currently, Cyprus does not have any cross-border interconnection but from the long-term perspective, the European Commission has declared several energy projects that are of strategic importance for Cyprus and Greece as potential PCIs<sup>6</sup>.

In **Egypt**, the sustainable energy strategy to 2035 is based on the least-cost approach whereby energy subsidies are eliminated by 2022 and different energy sources would be able to compete within a free and fair market structure. The strategy, developed in 2014, envisages a total share of 16% for coal, 3.3% for nuclear energy and 42% for renewable energy in the installed capacity mix by 2035<sup>7</sup>.

The development of the gas market should ensure the diversification and security of supply from a short-term perspective. From a long-term perspective, a liberalisation of the gas market is foreseen to encourage different types of gas supply, strengthening competitive markets and improving institutional and corporate governance.

For **France**, reducing fossil primary energy consumption is one of the main priorities, aiming at a reduction of 22% for natural gas, 34% for oil and 80% for coal compared to 2012 by 2028. In addition, other targets have been set for the reduction of final energy consumption compared to 2012 by -16,5% in 2028 with an

<sup>6</sup> "EastMed Pipeline" – A pipeline from offshore Cyprus to Greece mainland via Creteip.

"CyprusGas2EU" – Ending the isolation in Cyprus to allow the transmission of gas to the EastMed region.

<sup>7</sup> <http://nrea.gov.cy/test/en/About/Strategy>

increase of renewable energies to 33% of the gross final energy consumption in 2030. In the long-term scenario, France is seeking to reduce its dependence on nuclear power by reducing its share of electricity production to 50% by 2035, compared to more than 70% today, by shutting down 14 nuclear reactors.

The French gas supply strategy consists of ensuring the security of supply by diversifying the sourcing routes and geographical sources of gas. First, France benefits from several land interconnection points (IPs) with neighbouring countries, which provide access to various sources of gas (via pipelines): the Norwegian gas fields (Dunkirk IP), the Dutch L gas (via Belgium at Virtualys VIP), Russian gas (via Poland and Germany at Obergailbach IP), Switzerland and Italy (Oltingue IP) in order to access gas coming from North Africa and soon Azerbaijan via TAP pipeline and Spain (Pirineos IP). In addition, France takes advantage of significant LNG capacities (four LNG terminals), which led the country to attract significant volumes of liquefied gas over the last two years (reaching 34% of its imports in 2019). France possesses very high storage capacities and was, thus, able to "absorb" the excess LNG volumes available in the market at a very low price.

In **Jordan**, renewable energy remains the main solution to reduce dependence on natural gas for electricity generation, which represents more than 85%. In addition, the main source of natural gas in Jordan will remain imports from Egypt, Noble Energy Company<sup>8</sup>.

Similarly, **Greece** intends to increase the share of renewables in final energy consumption to reach at least 35% by 2030. More policy measures will be implemented to further liberate and reform the retail and wholesale market in Greece. In addition to increasing the use of natural gas for thermal purposes (mainly commercial and household) through the expansion of the existing distribution network, the construction of new distribution networks in new geographical areas and the

<sup>8</sup> Noble Energy Inc. is a company engaged in hydrocarbon exploration that is headquartered in Houston, Texas, USA.

development of compressed natural gas (CNG) and LNG infrastructure, there are plans of developing important infrastructure projects of national and international interest. The expansion of the gas transmission systems in the wider regions of Southeast Europe and the East Mediterranean is expected to have a huge impact on the domestic natural gas market, with many new stakeholders entering the market and great competition between them. In the short term, natural gas is used as an electricity-generating fuel to cover the gap created by phasing out the electricity-generating lignite units. In the long term, RES units will cover the electricity demand and the units generating natural gas will be gradually phased out.

In **Italy**, by 2030, renewable energy will represent the main vector to achieve the energy transition, with the target of a share of 28% of renewables in total consumption. On the other hand, investments in the gas market will strengthen the gas network in anticipation of the growth of the gas quota, not only as a reserve and back up for renewable sources but also for the role of substitute fuel, which will emerge with the abandonment of coal.

In **Malta**, an ongoing project for a new gas pipeline between Italy and Malta is currently under development. The capacity of the pipeline is 1.2 billion cubic meters per year with a length of 159 km, and it is planned to start operating by 2025.

For **Portugal**, the main objectives of a long-term strategy for carbon neutrality by 2050 consists of a 55% reduction in greenhouse gas emissions by 2030 compared to 2005 and an emission reduction trajectory from 85% to 90% by 2050 compared to 2005.

In addition, by 2030, Portugal is expected to achieve a target of 47% renewable energy in the gross final energy consumption. By 2050, there will be over 85% of renewable energy in final energy consumption. Furthermore, the use of the emergent new energy vectors, such as hydrogen, is expected to reach an

overall contribution of 4% in the final energy consumption by 2050. This hydrogen will be produced mainly by alkaline electrolysis using renewable electricity, and by 2050, 5–8% of all electricity produced will be used for hydrogen generation.

Regarding natural gas contracts, Portugal has four long-term contracts representing 96% of the import in 2019. LNG is acquired from Nigeria through three contracts, while natural gas is purchased in Algeria through a contract with Sonatrach via pipeline (ending in 2020).

In Lebanon, electricity production continues to depend on heavy fuel oil and diesel oil with import constituting around 93% of its total primary energy supply. In the 2019 updated Policy Paper for the Electricity Sector, the Lebanese government agreed to promote the role of natural gas in the country's energy mix, which could potentially lead to positive implications such as reducing power generation costs at existing plants by replacing the expensive fuel and diesel oil as well as increasing generation efficiency by introducing combined cycle gas turbines for new power plants. As a result, there will be a decrease in pollution as well as greenhouse gas emissions.

In 2018, a tender was launched by the Council of Ministers to design, finance, build and operate up to three Floating Storage Regasification Units (FSRUs), import terminals and their related infrastructure. The preliminary winner was a consortium comprised of Italy-based Eni and Qatar-based Qatar Petroleum, who submitted a bid worth \$13.5 billion over 10 years for three FSRUs with gas supply and infrastructure to get the gas to Lebanon's power plants.

It is important to highlight that the FSRU procurement is under the regulation of the National Oil Installations. Moreover, there is a regulatory authority, the Lebanese Petroleum Administration (LPA), that is responsible for the management, supervision and monitoring of offshore petroleum activities. LPA reports to the Minister of Energy and Water. It should

be noted that a consortium led by Total (40%) partnering with ENI (40%) and Novatek (20%) completed the first exploration well offshore in April 2020. Additional exploration well(s) could be drilled in the future that may prove the presence of commercial indigenous gas resources, which could contribute to the local energy mix in the medium to long run (7–10 years).

As for **Turkey**, the energy transition is mainly focused on the increase in the share of renewable energy sources in the energy sector. According to the National Renewable Energy Action Plan, the aim is to increase the share of renewable energy (including hydro) in total installed capacity to 30% by 2023. Of this total 61 000 MW of planned renewable energy capacity, 34 000 MW will be hydro, 20 000 MW will be wind, 1 000 MW will be geothermal, 5000 MW will be solar and 1 000 will be biomass.

Regarding the role and future of natural gas, the share of short-term contract and spot LNG imports is expected to increase in the future as a result of the flexibility granted by the Turkish Continuous Trade Platform as well as the increasing storage and regasification capacities of the Silivri and Tuz Golu storage facilities. In addition to the project for the gasification of all 81 districts of Turkey, the regulation adopted in 2016 by EMRA, which allowed distribution firms to supply LNG and CNG to regions where no network exists, was an important step for decarbonisation and decreasing the use of coal in residential heating in these regions.

The recent discovery of natural gas in Karadeniz, one of the largest natural gas discoveries of 2020 globally as well as the biggest reserve discovered by Turkey to date, is expected to be a game changer for Turkish gas markets. The gas deposit, which is estimated to be 405 BCM, with an additional 85 BCM, was discovered in October 2020. It has the potential to be one of the few markets in Europe where indigenous gas will be available for international trade. The derivatives market that will start operation in 2021 is expected to provide further flexibility for indigenous gas that will be supplied to the market as of 2023.

Furthermore, the end of the long-term pipeline import contracts with Russia in 2021 and 2025 will be an important opportunity to reshape the supply portfolio with short-term contracts as a result of the amendments in the Natural Gas Market Law and the capacity auction mechanism introduced by EMRA. The share of Russian gas decreased by 47% in 2019 when compared to 2017 as a result of the LNG imports reaching 28% of total imports thanks to two new FSRUs and the increasing imports from Azerbaijan. Besides the spot pipeline gas imports that commenced in September 2020 under the new short-term capacity auction methodology adopted by EMRA, indigenous gas production is expected to further increase diversification and market depth in the Turkish Continuous Gas Platform as well as benefiting decarbonisation in the Turkish energy markets.

In **Slovenia**, the gas sector is providing a fossil energy source with the lowest amount of carbon dioxide released into the atmosphere. It has the potential of replacing fuels such as coal. Additional potential of the gas sector is possible with the injection of renewable gases into gas systems and the use of sustainable renewable natural gas for power generation systems.



## 3

## GAS SECTOR CONTRIBUTION TO A CLIMATE-NEUTRAL ENERGY SYSTEM AND FUTURE GAS TRENDS

The contribution of natural gas to the energy transition differs from one country to another depending on their national targets<sup>9</sup>. The gas sector contributes to all the energy system pillars. In the power sector, most countries use natural gas as the main substitute for coal, oil and diesel for the decarbonisation of the power sector. In Turkey, the share of coal in electricity generation decreased from nearly 60% to as low as 28% from 1987 to 2015. Furthermore, natural gas is used as a reserve and backup for increasing the share of renewable energy. Amongst the other demand sectors, the gas sector contributes the highest to the domestic and industrial sectors, allowing efficient decarbonisation for end-use sectors.

### 3.1 Gas sector contribution to transport sector

The transportation sector is one with the most potential for decarbonisation and reduction of greenhouse gas emissions. In many countries, the gas sector is emerging in the transportation sector with different levels of integration. In Egypt, the government has begun the installation of a national CNG network promoting alternative fuels with a target to increase the percentage of vehicles using CNG<sup>10</sup>.

In Greece, CNG is promoted by a national strategy aiming to reduce the greenhouse gases emissions of the transport sector by using natural gas either in the form of CNG (for passenger cars and light

vehicles, especially within urban areas) or LNG (for heavy vehicles, especially on national roads). The same goes for Jordan and Portugal, where the objective is to ensure an effective energy transition and improve energy efficiency in all transport sectors. This involves the use of clean energy such as electricity, advanced biofuels and hydrogen instead of conventional fossil fuels.

In Turkey, although CNG license holders are already able to supply CNG to vehicles, the Auto CNG license was introduced by EMRA through amendment to the by-law on Natural Gas Market Licensing in 2017 in order to streamline the CNG sales to vehicles and widen the CNG supply station network. Moreover, within the scope of the same amendment, LNG wholesale license holders could supply LNG to vehicles. Another important Board Decision taken by EMRA in 2016 allowed LNG wholesale and CNG licensees to supply to vessels in Turkish territorial waters in order to meet their fuel needs, aiming to help Turkey fulfil its strong potential in this area. Currently, there are two 592 CNG vehicles operating in Turkey, and the amount of natural gas used as a vehicle fuel was 97.1 MCM in 2019.

In Slovenia, there are five refuelling points for CNG and two for LNG. According to the national plan, an appropriate number of LNG and CNG refuelling points are to be made accessible to the public. At least ten refuelling points should be established in the cities with a population larger than 10,000 by the end of 2020, and at least four refuelling points should be opened along the highway. Furthermore, the port terminal manager has an obligation to provide an appropriate number of LNG refuelling points at the port of Koper by the end of 2025.

<sup>9</sup> This section only includes the countries that replied to the questionnaire.

<sup>10</sup> Sale of CNG for cars increased from 30 MCM in 2016–2017 to 60 MCM in 2019–2020..

## 3.2 Future gas trends

After the expected drop in the world gas demand, which was 4% as mentioned by IEA<sup>11</sup>, the gas market is expected to regain its growth over the next few years in a different way than it has for the last decade. During the last year, several countries wanted to achieve better climate-neutral energy systems, starting with higher RES integration in electricity systems (as we can see in developing countries nowadays) and approaches related to the improvement of gas efficiency and promotion of new and more eco-friendly gases (Green Deal in Europe, hydrogen and biogas, for instance). Furthermore, it is foreseen that the liquefied gas markets and their share will grow in several countries.

The Mediterranean region constitutes both developing countries in the southern shore and European countries on the northern shore; therefore, the gas market in the region will witness a significant change over the next few years. In most of the developing countries (for instance, Algeria, Morocco, Egypt, Jordan), the governments are aiming for ambitious RES programs that will impact the electricity system and the gas sector in those countries. On the other hand, European countries will follow the European Green Deal and commence the decarbonisation of the gas sector via a forward-looking design for a competitive decarbonised gas market.

From that perspective, the southern shore countries can benefit from the experiences and lessons learnt by the northern shore countries to develop and orient their own gas sectors in harmony with those in the northern shore countries.

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<sup>11</sup> IEA report on the gas market “2021–2025: Rebound and beyond”.



## 4

# ROLE OF THE REGULATOR IN DESIGNING AND PROMOTING THE MECHANISM FOR GAS MARKETS TO FOSTER THE ENERGY TRANSITION

The role of the regulator depends on the maturity of the gas market in the country, especially if the gas market is not well developed. The priority of the regulator is to design a framework that enables the achievement of a competitive and efficient gas market, both at a wholesale and a retail level. On the other hand, if the market is already in place and mature enough, the regulator's role is focused on its monitoring and supervision<sup>12</sup>.

The European Commission's strategy is focused on the role of the regulator in the design of energy mechanisms that will foster the energy transition while ensuring fairness between the actors. In some countries, a form of transition has already begun, mostly in the MENA region; however, in those countries, the gas sector is mainly public owned and vertically integrated. The main concern in this case is to support the security of the supply to the internal markets. Therefore, this kind of transition might be not designed well and might be more in favour of those actors and less efficient in terms of achieving optimised energy transition that assures competitiveness amongst the operators and actors.

To overcome this challenge, governments make use of several independent actors with a crucial role. In particular, National Regulatory Agencies (NRAs) have the responsibility to ensure the completion of the energy transition in an environment of competitiveness while protecting the consumers' rights. Other institutions and operators are also important, such as International Financing Institutions, Unbundled Transmission

<sup>12</sup> This section only includes the countries that responded to the questionnaire.

System Operators (where they exist) and the wider community of energy stakeholders. NRAs ensure the optimal prices reflecting the least cost of service with the highest quality and reliability standards.

In addition, regulators work towards the achievement of long-term national strategies while ensuring the rights and obligations of all the actors in the sector (from producers to final consumers).

## 4.1 Main principles of regulators

In order to succeed in the role, regulators must be built around three main principles:

- Independence
- Transparency
- Investor/consumer protection

Furthermore, to obtain a well-functioning regulatory framework, it is imperative to maintain good and clear relations between the government and the regulator, keeping in mind that it may take a long time to achieve a good framework.

### • Independence and transparency

Independence is crucial for the regulator to accomplish its tasks even though the notion of regulatory independence remains controversial in some countries. The second principle, transparency, is the key to attract reliable investors. A clear and transparent regulatory

framework presents an image of trust and long-term security to investors. On the other hand, lack of transparency or recurrent changes in the regulatory framework will negatively impact investors' confidence.

#### • Investor/consumer protection

To maintain investors' confidence, regulators must provide protection from arbitrary government decisions while protecting consumers from any kind of abuse from operators with considerable market power. Therefore, to achieve its tasks, the regulator requires the right tools and resources, whether in terms of laws, budget or experienced staff. In the EU, several legislative acts have set down the principle of regulatory oversight through stable and transparent sectoral regulations.

Over the last decade, the internal security of supply was the main objective in many countries. However, focusing on the internal market does not appear to be enough to achieve security of supply and ensure the utilisation of cross-border infrastructure in an optimal way. Therefore, it has become essential for strengthening the relationship between neighbouring countries and regulators nowadays.

Regulators are now at the centre of the energy market design to ensure that the set of rules respect the competitiveness in the market and, at the same time, protect the end consumers and promote and attract more investments. Regulators can facilitate sustainable investments, support the market entry of new actors and promote the development of the energy sector as well as address challenges such as the integration of renewables into the system and encourage energy trading between the EU and Mediterranean countries in the longer term.

## 4.2 Risks of bottlenecks and the importance of good capacity allocation

It is important to identify two main challenges other than the regulatory ones, namely physical and contractual bottlenecks, particularly at cross-border IPs. These can hamper competition

in and the development of a liberalised and interoperated gas market.

The combination of high-capacity booking levels and low utilisation rates for booked capacity results in contractual congestion, with the potential of foreclosing other market participants from using otherwise unused technical capacity at some IPs. Capacity allocation mechanisms are in place in the EU, hence capacity is allocated through auctions according to a common EU-wide calendar and through purposely designed booking platforms. CMP provisions and the obligations of the TSOs for interoperability and data exchange are specified at a European level.

In non-EU cross-border projects or at mixed EU/non-EU pipelines, capacity allocation is mostly on a first-come-first-serve basis through long-term contracts. In some cases, a pro-rata scheme is in place; capacity is offered in various units of measurements such as kWh, Sm<sup>3</sup> and MMBtu. In general, short-term capacity is available only on limited occasions, mostly in the form of monthly products. Interruptible contracts are not available, and no part of the technical/available capacity is reserved for short-term bookings. Some congestion management mechanisms are in place, such as short-term "use it or lose it". Unused capacity is not offered in the secondary market. Cooperation between adjacent TSOs is limited in terms of the technical aspects of network operation<sup>13</sup>.

Ultimately, regional gas market integration can be affected by regulatory congestions that are linked to the barriers created by different regulatory systems between neighbouring countries. For instance, rules concerning TPA in neighbouring countries should be shared to facilitate gas trading. In fact, in order to have effective competition, the operators of transmission networks must allow gas suppliers non-discriminatory access to the transmission network to supply customers. This is the TPA principle. National regulatory authorities regulate the conditions of access to the networks. Furthermore, transmission networks must apply regulated tariffs to avoid any abuse of dominance and comply with specific rules

<sup>13</sup> European Commission strategy.

on unbundling. Some Mediterranean countries have already carried out or planned projects to achieve this objective, creating a fully functional and interconnected Mediterranean gas market. It is inarguable that the application of non-discriminatory and transparent capacity allocation and congestion management rules can promote gas-to-gas competition, prevent market foreclosure, ensure the security of supply and provide appropriate signals for new investments within a stable and well-defined regulatory environment.

### 4.3 Focus on the role of different NRAs in the gas sector

In **Cyprus**, the regulator CERA gives priority to serving the goal of fast and efficient penetration of natural gas on competitive terms in the market. The role of the regulator is defined by the law, and CERA works in alignment with a framework that assures the proper functioning of the gas market and the consumer's protection. In June 2019, CERA issued the Regulatory Decision 01/2019 (KDP 203/2019) concerning the statement of regulatory practice and methodology of natural gas tariffs for the validity period of the derogations on the basis of the emerging market, where the activities of supply, transmission, distribution, regasification and storage of natural gas are regulated.

In **Egypt**, to allow GasReg to perform its functions, one of the actions taken during the establishment of the gas regulator GasReg in 2017 was to put in place development and business plans, work programs and management rules and techniques. These functions included managing license regimes, network codes and transmission codes and setting methodologies for the calculation of tariffs for gas facilities. Furthermore, GasReg is responsible for approving the investment plans of gas infrastructures and facilities that run under the gas market's low provisions and granted licenses. GasReg also sets the unbundling rules to ensure the competitiveness and prevent monopolistic practices. In addition, the regulator elaborates studies and reports for the ministry pertaining to the prices of gas sales to non-eligible consumers and proposes the criteria for eligible consumers' identification. Finally, GasReg

addresses the consumer complaints regarding gas market activities.

In **France**, the gas market is well developed and the TSOs are incentivised in the tariff through a trajectory of R&D&I (Research, Development and Innovation) costs. At the end of the tariff period, the amounts not spent are returned to customers while the operators bear the costs of exceeding the trajectories. The TSOs have the possibility to revise this trajectory halfway into the tariff period so they may have more flexibility to adapt to their programme. The costs covered must be linked to the core business of the operators.

While the regulator CRE receives an annual report on the technical and financial information for all ongoing and completed projects, the operators publish a bi-annual report for the public, to ensure the implementation of the transparency principle and the efficiency of the programmes of the TSOs. In 2019, CRE adopted a Decision regarding the connection of green gases. It aims to achieve the national objective of green gas integration while following the principle of economic efficiency in order to minimise costs for the consumers.

In **Greece**, the regulator RAE approves the Ten-Year Network Development Plan of the TSO that provides higher LNG and CNG penetration into the market. The regulator also provides incentives for network development. Moreover, even though Greece is at an early stage in the penetration of green gases into the market, the development of a regulatory framework that will improve this process is mandatory.

In **Italy**, ARERA focuses on the establishment of a legal and regulatory framework that facilitates the connection of renewable gas plants with the network. ARERA also promotes an active and liquid market for cross-border exchanges of renewable and low-carbon gases amongst EU members. The Italian regulator encourages the use of the gas sector for the decarbonisation of the system with two options:

- Competition for the use of the infrastructures and/or competition with non-gas renewable solutions.

- Different regulatory views and a technologically neutral approach to allow the most cost-effective solution to be developed and/or removal of possible regulatory challenges.

In **Jordan**, EMRC approves long-term contracts and agreements based on the strategic plan.

In **Portugal**, ERSE is involved in the process of the approval of the ten-year plan for the development and investment of the national transport network, storage infrastructure and LNG terminals. The TSO submits a proposal of the 10-year plan to the Directorate General for Energy and Geology, which then sends the proposal to ERSE for public consultation and opinion. The approval of the TSO investments is carried out by the government<sup>14</sup>. According to the 10-year plan, the ERSE seeks a technologically neutral position with respect to the decarbonisation project. In addition, ERSE ensures that the economic conditions are favourable to maintain public service obligations in relation to the supply of natural gas (quality, continuity and security of supply and affordable prices).

Regarding the incorporation of renewable or low-carbon gases into natural gas networks, the regulator has stated that the transmission network operator shall proceed to create the actual conditions for the process, starting with the identification of the capacity to receive decarbonised gases into the network and any constraints to such injection and mitigation measures. It also identifies the investments necessary, where appropriate, to enable Global Technical Management to observe and manage the penetration of gases into the networks.

In **Turkey**, the gas market was established in 2001, and EMRA undertook severable decisions to develop and liberalise the natural gas market further. The regulator established an organised spot gas market and regulations on cross-border trade and liberalisation on LNG imports. In 2017,

<sup>14</sup> ERSE's opinion on the 10-year plan (2020–2029) was published in June 2020 and is available at <https://www.erse.pt/media/qxahptud/parecer-%C3%A0-proposta-de-pdirgn-2019.pdf>.

the establishment of the foundation of the Turkish Continuous Trade Platform allowed the market players to trade natural gas anonymously in an organised liberal market and let the transmission system operator balance the system as the “Residual Balancer”. The market design of EMRA, which is based on continuous trading principles, allows import, wholesale and export companies to perform day-ahead, intra-day and after-the-day operations within a single trading window. By the end of 2019, the total transaction volume in the organised market was 2.84 billion Turkish Lira (approximately 319 million €) and the amount of the traded natural gas amounted to 1.87 BCM.

Furthermore, with the amendment of the Market Operation Code in January 2020, Balance of Week, Weekends and Working Days Next Week contracts were introduced to the organised market and will form the basis of Weekly Reference Price, providing another benchmark for gas prices in the Turkish gas market. Legislation on physically settled derivatives markets is currently being prepared and is planned to be published in 2021.

#### 4.4 Barriers faced by regulators in promoting the use of natural gas

Several regulators have reported facing many barriers in promoting the natural gas market, which are as follows:

- Need for measures to ensure the continuity of energy supply to all consumers, protect vulnerable consumers from poverty and reduce the number of households facing energy poverty.
- The lack of investments in infrastructure.
- Regulatory interventions for the determination of long-term funding for natural gas projects.
- Lack of involvement of TSOs/DSOs in power-to-gas (P2G) and CNG/LNG fuelling infrastructures.
- Role and tariffication of P2G infrastructures; electricity and gas tariff systems do not

acknowledge any specific role of P2G infrastructure.

- A national regulatory framework should not create distortions to the efficient deployment and use of this technology; there must be a level playing field with other technologies.
- Sector coupling: Different sectors must be aligned and optimised to achieve horizontal synergies and efficiencies across energy vectors and interlinked sectors.
- A whole system perspective to contribute to energy transition at the lowest cost: technological development is required (for instance, power-to-gas and digitalisation) to interlink the sectors and reduce transaction and coordination costs, which will require a new market design and regulatory framework.
- In the case of Portugal, given the national energy and climate plans scenarios, natural gas will play a transitional role (as an alternative for coal), but a significant reduction in its use is planned to start in 2040. In this context, the regulator's position towards new investments for network growth is conservative, favouring maintenance investments over new networks.
- The planning of the gas network and its role in the new carbon neutrality scenarios is still very uncertain.
- The role of hydrogen and the evolution of energy use (self-consumption and electrical vehicle) and storage (for instance, batteries) are still major uncertainties that cannot safely identify gas network development scenarios.



## 5

## CONCLUSION AND RECOMMENDATIONS

In 2020, the world suffered from the Covid-19 pandemic, which had an important impact on human lifestyles, the economies of countries and, most importantly, loss of lives. These dramatic declines in economic activity have reduced energy demand and the use of fossil fuels, which supply 85% of our energy demands. The collapse in oil demand exacerbated market imbalances and contributed to Brent crude prices dipping to their lowest level in over two decades<sup>15</sup>. On the gas market side, Covid-19 had a huge impact on the industry and the economy; gas consumption, as expected, dropped in 2020.

On the other hand, several countries managed to boost their economies by including climate-friendly policies in the recovery process. It is well known that green projects create more jobs, deliver higher short-term returns per euro and lead to increased long-term cost savings. A study by Oxford University listed five main policy types:

- Clean physical infrastructure investment in the form of renewable energy assets.
- Building efficiency spending for renovations and retrofits, including improved insulation, heating and domestic energy storage systems.
- Investment in education and training to address immediate unemployment resulting from Covid-19.

<sup>15</sup> See Cameron Hepburn, Brian O'Callaghan, Nicholas Stern, Joseph Stiglitz, Dimitri Zenghelis *Will COVID-19 fiscal recovery packages accelerate or retard progress on climate change?* Oxford Review of Economic Policy, 8 May 2020

- Natural capital investment for ecosystem resilience and regeneration, including restoration of carbon-rich habitats and climate-friendly agriculture.
- Clean R&D spending.

Furthermore, natural gas can contribute efficiently to fostering the energy transition through coal phasing out. The combination of RES sources with natural gas represents the more effective and economic alternative to coal-based electricity generation units. In Greece, by 2028, all coal units are planned to be phased out and RES units (mainly PVs and wind farms) and natural gas as a transition fuel will cover the resulting electricity generation deficit.

However, there are some risk scenarios for natural gas as well. Covid-19 was expected to lead to a 4% cut in world consumption in 2020, but the drop in prices is global and the dynamics of gas demand could have consequences on the risk of investments already realised and ones in the future.

It is possible to consider that Europe will have to deal with too many new gas pipeline and regasification projects (as many as 32) that run the risk of being under-utilised in light of the European challenge of reaching “carbon neutrality” by 2050. In other words, it can be said that a strategic battle is being fought on gas. The owners of gas infrastructures, aware of the prospects, would see a residual gas demand in just 30 years and try the hydrogen chain, especially its production in Africa using renewable sources.

In Europe, some argue that in the face of economic difficulties it would be better to concentrate resources on what exists, in this case the Gas Deal rather than the Green Deal. Once the Covid-19 emergency has passed, the environmental climate will return to impose itself, with a need for the decisive transformation of the economy and of industrial and agricultural models.

A powerful signal in this direction comes from the 750 billion Euro post-Covid-19 recovery plan proposed by the European Commission – Next Generation EU – based on green, digital and resilience priorities. As a result, European countries will have to reflect on the risk of seeing huge investments “stranded”<sup>16</sup>.

In this direction, European gas import infrastructures will have to be rethought. The EU as an organisation, through Projects of Common Interest and individual EU member states, has been financing the development of both gas interconnection all over the continent and LNG regasification terminals for years. Europe has important excess capability in regasification, which explains the low levels of terminal use (roughly 30% on average). These capabilities all over Europe, already financed for the most part, will allow gas to flow without substantial new investment. Moreover, this European situation is also in line with the development of LNG exports in America, especially with the US policy towards the security of the Euro-Atlantic area – Africa, Asia and Middle East and North Africa (MENA), unlocking new gas sources for Europe.

Regarding the supply from pipelines, Russian and also Eastern Mediterranean (Cyprus, Israel) and Caucasus (Azerbaijan) sources are to be connected to Europe through new (Turkstream, Nord Stream 2, TANAP/TAP) or potential (EastMed) gas pipelines. Russia alone is due to have export capability of nearly 350 BCM to Europe yearly in 2021–2022 once Nord Stream is inaugurated<sup>17</sup>.

<sup>16</sup> See Silvestrini, *Come il Covid cambia gli scenari mondiali dell'energia e della mobilità*, Micromega, 11 September 2020.

<sup>17</sup> See Mazzucchi, *European energy transition after Covid-19: from Green Deal to 'Gas Deal'?* Fondation pour la Recherche

In this regard, it is necessary to analyse the LNG industry that, even before the Covid-19 pandemic, was managing the impact of oversupply. Since 2015, the annual growth in global liquefaction capacity has averaged more than 30 million tons per annum (MTPA), increasing LNG supply by around 10% per year. Markets were able to absorb this additional supply until the first quarter of 2019, when slower growth in the Chinese gas market and a contraction in Northeast Asian demand pushed spot prices from a range of \$7–11 per million British thermal units (MMBTU) to less than \$5 per MMBTU in Europe and Asia.

With 24 MTPA of new liquefaction capacity set to come online in 2020, the global LNG market is likely to continue being oversupplied. In 2019, Europe was able to act as a so-called market of last resort by absorbing incremental LNG supplies due to declining local gas production and relatively larger storage injections and substituting pipeline supply for LNG. As a result, European LNG imports nearly doubled between winter of 2018 and 2019. However, Europe's ability to reprise this role in 2020 was challenged by a warmer winter and record-high storage levels.

Covid-19 is expected to make the situation significantly worse. By slowing down economic activity, the pandemic has curtailed the natural gas demand in China, which was, up until now, the second-largest LNG importer and the fastest-growing market for LNG in the world. Even as economic activity in China shows signs of recovery, the annualised rate of growth in the demand for Chinese natural gas is set to halve from previous projections.

Europe and other LNG import markets are currently looking fragile. A contraction in economic activity will most likely translate into near-term demand impacts in the power generation and industrial sectors. While low LNG prices will enable some fuel-switching opportunities in the near future, the structural and seasonal nature of natural gas demand in many markets, combined with rapidly dropping overall energy demand, is

Stratégique, 8 April 2020.

likely to limit any upside potential<sup>18</sup>. At the same time, it is important to consider that Covid-19 has changed government as well as regulator rules. In fact, governments have adopted several measures to ensure the continuity of energy supply to all consumers as well as to protect vulnerable consumers by taking into account the dramatic decline in economic activity and the consequences to reduce the energy demand and use of fossil fuels<sup>19</sup>.

In this context, energy transition is a big challenge today. Rapid changes due to technological innovation and new regulatory frameworks have made it increasingly critical to evaluate the infrastructural configuration to be pursued, especially in this phase, wherein the transitory elements are still prevalent with respect to the definition of a new structure. Using a chemical metaphor, we could speak of a “meta-emergence”, or a process of transition to a more complex phase than the one we come from<sup>20</sup>.

The international debate is evolving by identifying solutions and tools capable of combining the theoretical suggestion of electrification with the mix of technologies capable of affecting even sectors where the decarbonisation process appears more difficult. In the process of energy transition, gas continues to play a crucial role. Infrastructures and models are at the centre of this debate, especially in light of the temporal coherence between the achievement of decarbonisation goals and the characteristic return on investment time. Following up with the Green Deal strategy without taking the global situation into account would have a hard impact on European and Mediterranean economies and companies.

Europe is a free market built on a set of economic rules, including the free flow of people and goods.

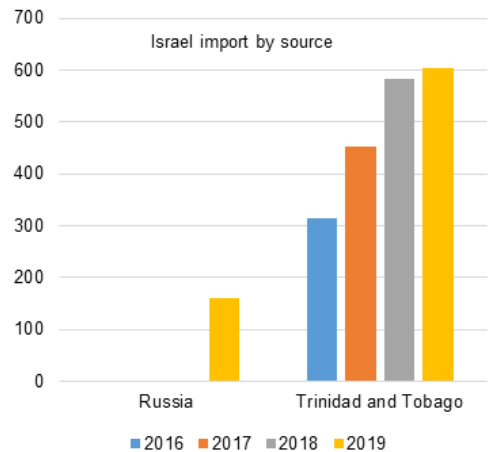
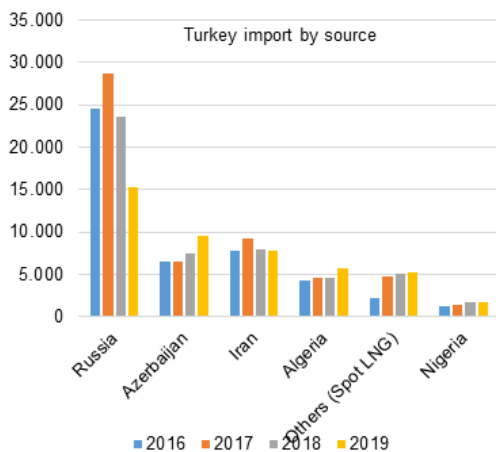
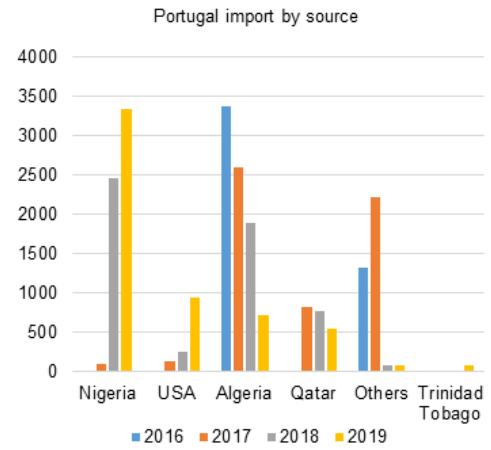
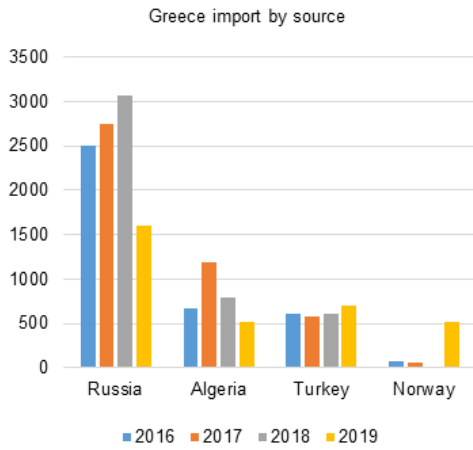
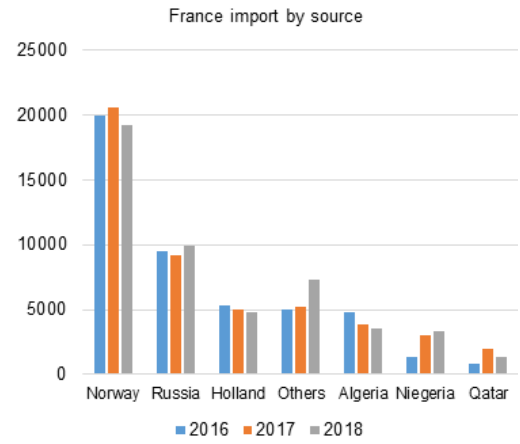
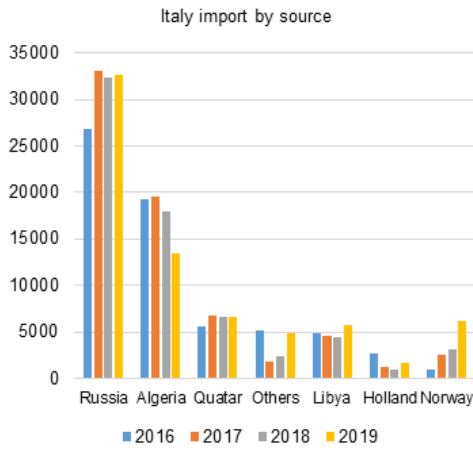
<sup>18</sup> See Dewar, Vázquez, and Bori, *What Will COVID-19 Mean for LNG?*, BCG, 30 March 2020.

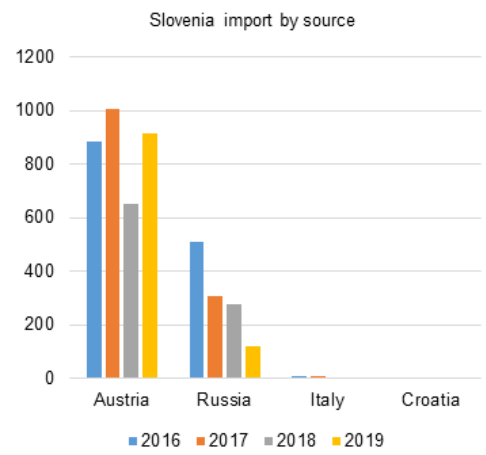
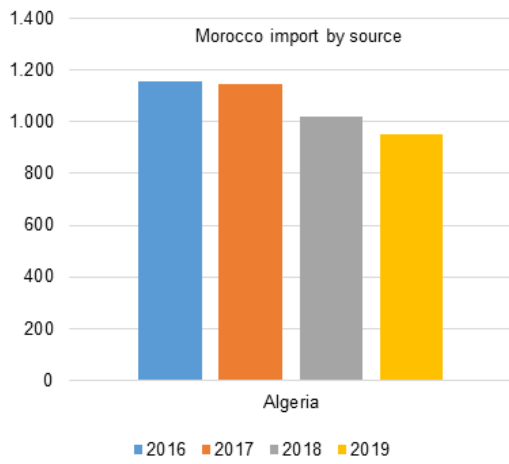
<sup>19</sup> See *Regulatory measures to mitigate the impact of COVID-19 outbreak in the Mediterranean region*, report Medreg, 21 May 2020.

<sup>20</sup> See *Annual Report on the State of Services and Regulatory Activities, Presentation by the President ARERA Stefano Besseghini*, Rome, 17 September 2020.

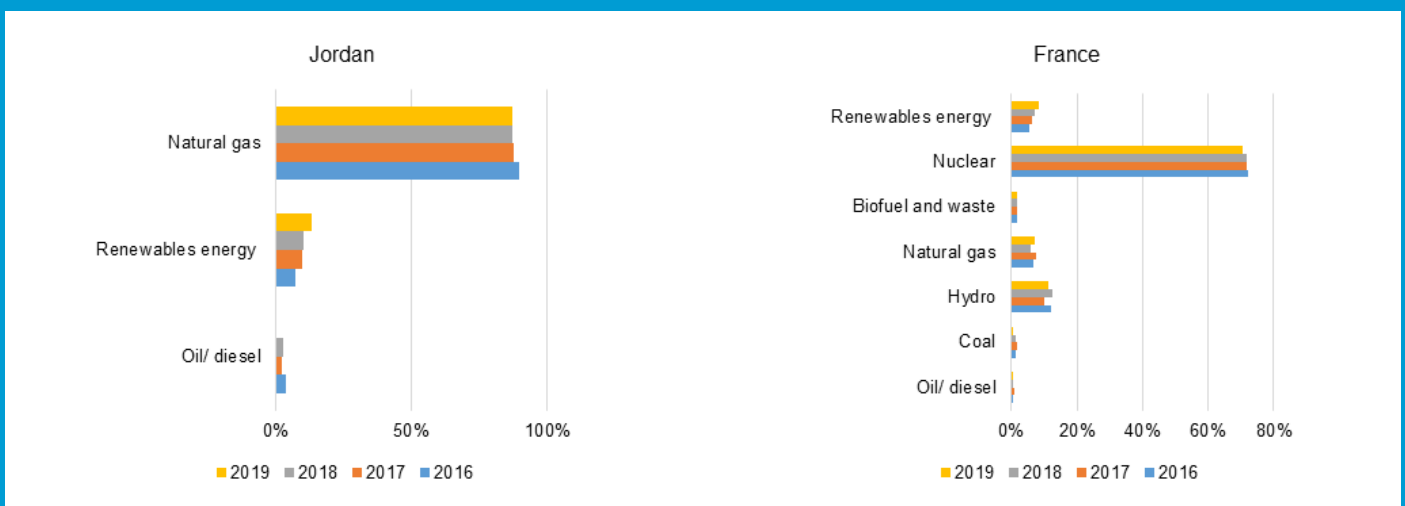
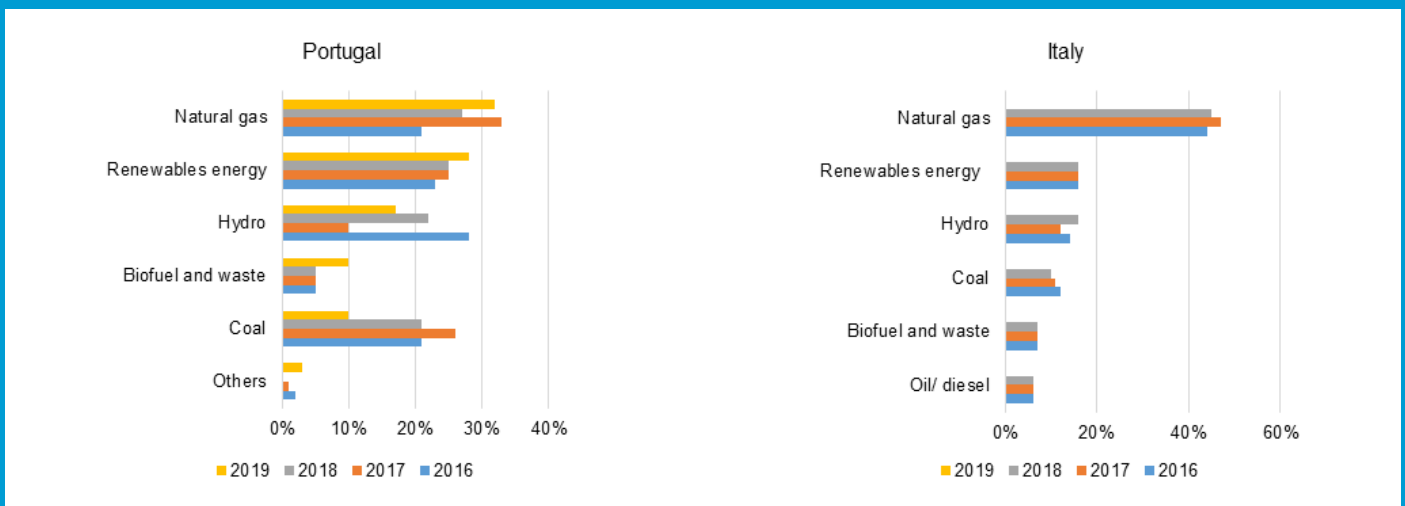
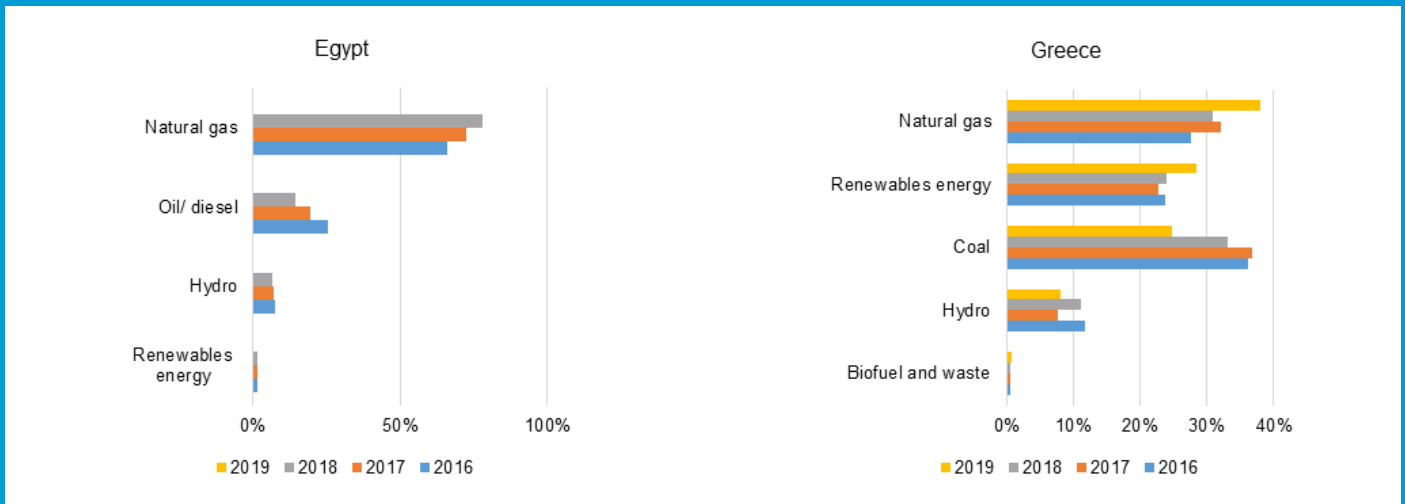
This European philosophy is flexible enough to allow, in theory, the adaptation of European policies to a vast array of economic situations. The Covid-19 crisis is creating, now and for an undefined future time, a turmoil, the magnitude has not been assessed yet. With the possibility of living through harsher times than in 2008–2009 with important negative figures in GDP growth, the EU has to play its role as a Union and as a tugboat for all its member states.

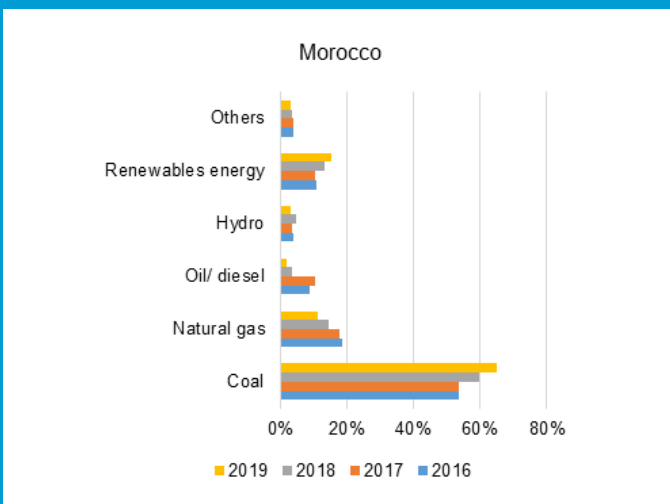
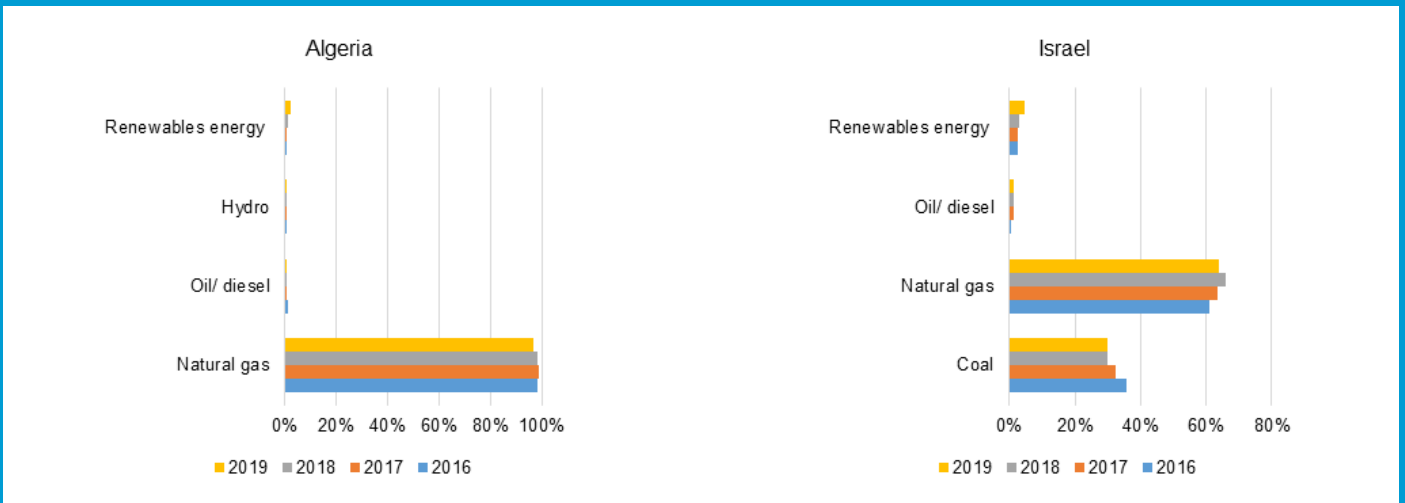
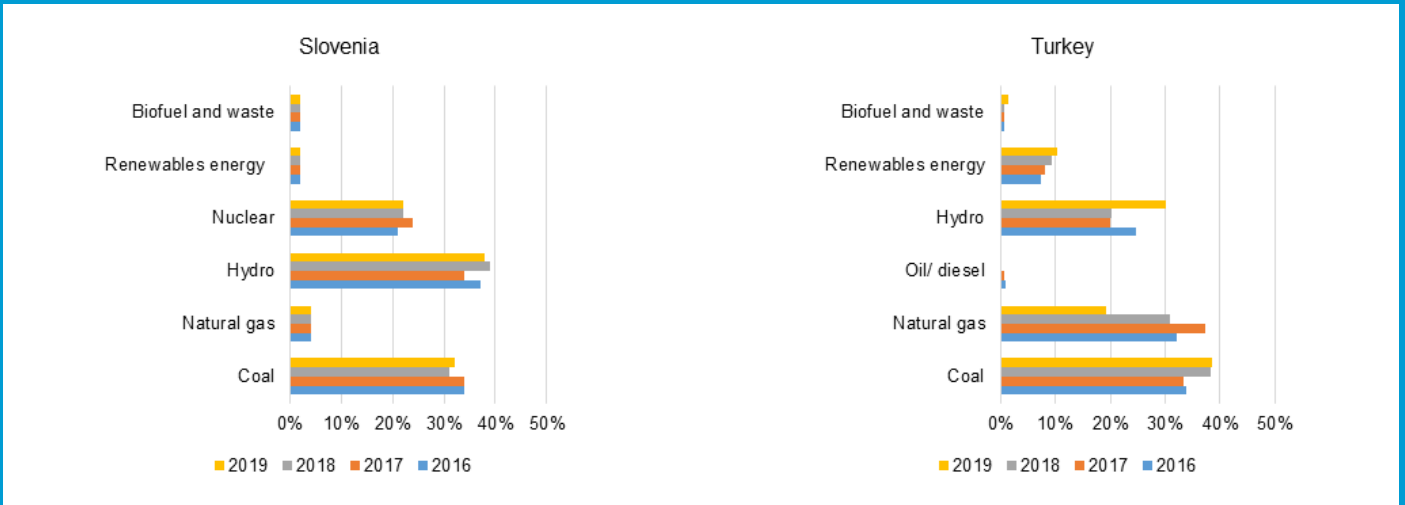
## ANNEX 1: IMPORT BY SOURCE FOR EACH COUNTRY





## ANNEX 2: ELECTRICITY MIX BY COUNTRY







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MEDREG – Association of Mediterranean Energy Regulators  
Via Fieno 3, 20123 Milan, Italy – Tel: +39 3402938023  
[info@medreg-regulators.org](mailto:info@medreg-regulators.org) [www.medreg-regulators.org](http://www.medreg-regulators.org)

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