

From Monopoly to Liberalization: Algeria's Natural Gas Market Reform

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من الاحتكار إلى التحرير: إصلاح سوق الغاز الطبيعي في الجزائر

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Abstract

The liberalization and restructuring of the natural gas market worldwide became a reality by the late 1990s, occurring in four distinct phases. In the beginning of the 2000s, Algeria initiated a reform process in the electricity and gas distribution through pipelines sector. This reform, formalized by the publication of Law No 02-01 in February 2002, opened the gas supply activity to competition, with the adoption of the principle of third-party access to networks, and introducing the authorization regime for natural monopolies (gas transmission) as well as the concessions system for gas distribution networks. In this paper, a comparative description of the natural gas market regulation models and network access frameworks between the European case and the Algerian case according to the Algerian regulatory is given. Additionally, it provides a provisional study of renewable gases i.e. hydrogen and biogases regulation principles and their adaptability to Algeria.

Keywords: Natural Gas ; Regulation ; Gas Market ; Gas Transmission ; Gas Distribution.

Jel Classification Codes : Q480 ; L220.

ملخص:

أصبحت عملية تحرير وإعادة هيكلة سوق الغاز الطبيعي على مستوى العالم واقعًا بحلول أواخر التسعينيات، وتم ذلك عبر أربع مراحل متميزة. في بداية العقد الأول من الألفية الثالثة، شرعت الجزائر في عملية إصلاح لقطاع توزيع الكهرباء والغاز عبر القنوات. وقد تم تقنين هذا الإصلاح من خلال صدور القانون رقم 01-02 في فبراير 2002، الذي فتح نشاط إمداد الغاز أمام المنافسة، مع تبني مبدأ إتاحة الوصول إلى الشبكات للغير، وإدخال نظام الترخيص للاحتكارات الطبيعية (نقل الغاز) بالإضافة إلى نظام الامتيازات لشبكات توزيع الغاز. يقدم هذا البحث وصفًا مقارنًا لنماذج ضبط سوق الغاز الطبيعي وأطر الوصول إلى الشبكات بين الحالة الأوروبية والحالة الجزائرية وفقًا للتنظيم الجزائري. كما يقدم دراسة أولية لمبادئ ضبط الغازات المتجددة مثل الهيدروجين والغازات الحيوية ومدى قابليتها للتطبيق في الجزائر.

الكلمات المفتاح : الغاز الطبيعي ؛ الضبط ؛ سوق الغاز ؛ نقل الغاز ؛ توزيع الغاز.

تصنيف JEL : Q480 ؛ L220.

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I. Introduction

The liberalization of the natural gas market has been one of the major topics over the past 20 years, especially for the import dependent countries that are heavily exposed to price volatility and supply uncertainty. The first European policy addressing gas market liberalization dates back to June 22, 1998 which is the directive 98/30/EC of the European Parliament and of the Council (European Communities, 1998). The liberalization of the natural gas market in the European Union focused on three key aspects: unbundling former monopolies, reducing their market share, and ensuring third-party access to the network according to Cardinale et al. (Cardinale, 2024). In a liberalized natural gas market, the responsibility of regulators is to ensure that liberalized markets continue to be safe, competitive, and fair for consumers according to Bentsos et al. (Bentsos, 2024).

Four years later, the Algerian gas market was reorganized after the issue of the law No. 02-01 of February 5, 2002, related to electricity and gas distribution through pipelines in the context of the liberalization and the organization of the natural gas market (République Algérienne Démocratique et Populaire, 2002). According to this law, the market regulator the “Electricity and Gas Regulatory Commission CREG” was created. CREG is the body responsible for ensuring compliance with technical, economic, and environmental regulations, consumer protection, and non-discrimination between operators. CREG ensures the competitive and transparent functioning of the national gas market, in the interest of both consumers and operators.

The aim of the present paper is to outline the key aspects of natural gas market liberalization according to the Algerian regulatory, with a focus on comparing the European Union's experience to that of Algeria. This paper begins by examining the steps both the European Union and Algeria undertook to liberalize their natural gas markets. The paper then explores the unbundling of the natural gas monopoly in both European Union and Algeria. Next, the paper describes the models of the third-party access to the natural gas transmission network in the liberalized markets with examples from the European Union and Algeria. After that it discusses the regulation of natural gas tariffs, which is crucial in an open market for protecting consumers from excessive competition. Finally, the paper reviews the regulation of renewable gases and assesses their prospects in Algeria.

II. Natural gas wholesale market

In 2023, global natural gas demand represented 23% of the global energy mix as (**Figure 1**). In addition to its energetic effectiveness, natural gas can be considered as clean fuel or “the transition fuel” as it was mentioned in the final text of COP28 Climate Change which states: “Recognizes that transitional fuels can play a role in facilitating the energy transition while ensuring energy security” (Volcovici, 2024).

In Algeria, natural gas represents 40% of the national energy consumption, followed by electricity with 31% (**Figure 2(a)**). For electricity production, natural gas is the feedstock of 95% of the electricity generated, mainly through gas turbines and combined cycle plants (**Figure 2(b)**), which makes Algeria a natural gas dependent country.

As an important energy product today and for the future, the organization of the wholesale natural gas market is a strategic element in the energy security of all countries. There are five types of natural gas transactions in the wholesale market:

1. Short-term Transactions: Used to maintain the balance between supply and demand. This type of trading is typically carried out by speculators and is mainly Over-The-Counter OTC. It is characterized by setting a price for future delivery to retailers, offering protection against gas price fluctuations. This price is the spot price.
2. Forward Transactions: This is an agreement to buy or sell natural gas on a specified future date at a fixed price. These OTC transactions are non-standardized, exposing participants to counterparty payment and delivery risks. To manage this risk, participants require guarantees or establish Futures contracts.

3. Futures Transactions: These are standardized Forward contracts. The exchange operator requires a deposit of collateral from both the buyer and seller when a position is opened.
4. Swaps Transactions: This is a financial transaction exchanging a floating (or market) price for a fixed price at a specified future date by settling the payment of the difference (Contract for Difference or CfD) between the fixed and floating prices.
5. Options Transactions: This is a financial transaction that involves the buying and selling of financial contracts that give the holder the right, but not the obligation, to buy or sell a specific volume of natural gas at a predetermined price within a specified future period. In Options transactions, the buyer pays a premium to the seller in exchange for this right.

Wholesale market integrity means that it operates fairly, with non-discriminatory access, and with transparency, while eliminating any market manipulation. In this context, market monitoring is the activity aimed at gathering information to detect and prevent manipulation. Market monitoring is generally referred to as "Ex ante". After the liberalization of the wholesale natural gas market, energy regulators have new responsibilities, including market monitoring, protection of competition, and ensuring market integrity.

III. Natural gas market opening

The gas market opening and restructuring in the European Union took place in four successive phases. Initially, production, pipeline transmission, and distribution activities were all managed by one entity, which supplied gas to the end users. The second phase began with the opening of the natural gas production market to multiple producers, who sold their gas to a single distribution operator via transmission pipelines where the transmission and the distribution activities are owned by the same entity, which then supplied the gas to end users. In the third phase, the producers can sell their gas either to the distribution operator via transmission pipelines or directly to traders. In the final phase, the transmission and the distribution activities were separated, and the distribution activity was liberalized.

For the Algerian case, the Law No. 02-01 of February 5 2002 related to electricity and gas distribution through pipelines provided the opening of the natural gas market by 30% after the promulgation of the law (République Algérienne Démocratique et Populaire, 2002). The law separates between the natural gas Transmission System Operator TSO which is a legal entity responsible for the operation, maintenance, and development of the transmission network and the natural gas distributors which are responsible for the distribution of the natural gas through pipelines in addition to the natural gas sale.

The natural gas transmission network is divided into that intended for the national consumption (or national market) and that intended for exportation. The management of the natural gas transmission network for the national market is carried out by one single operator, and this operator must be a commercial company, so, the management of the network is a natural monopoly. TSO has the responsibility of managing the national gas market, that has the following tasks:

- Receiving sales offers from gas suppliers;
- Receiving and accepting gas purchase offers;
- Balancing gas supply and demand, prioritizing the lowest-priced sales offers;
- Communicating the results of this balancing to operators (electricity producers, eligible customers, gas distributors, and commercial agents);
- Settlement operations: handling revenues and payments according to the actual operations for each scheduling period.

For the distribution of natural gas, the law gives this activity the title of public service in addition to the commercial activity. Public service has as objective to ensure the supply of natural gas under the best conditions of safety, quality, price, and with compliance with technical and environmental regulations. To fulfill this activity, the State grants concessions. The awarding of distribution concessions is carried out through a tender process. This concession is non-transferable.

VI. Unbundling in the Natural Gas Market

The liberalization of the natural gas market in the European Union focused mainly on unbundling former monopolies. The 1998 directive was applied gradually. Initially, it focused on preparing separate financial statements for the units managing energy sales and those managing the infrastructure network. The directive 2003/55/EC of the European Parliament and of the Council (European Communities, 2003) aimed to manage the national network through separate companies. The directive 2009/73/EC of the European Parliament and of the Council (European Communities, 2009) addressed the unbundling of the national network and import infrastructures, promoting ownership unbundling.

In the Algerian context, the process of the unbundling took place with the adoption of the Presidential Decree No. 02-195 of June 01, 2002 establishing the status of the Algerian Electricity and Gas Company, named Sonelgaz SPA, with the transformation of the public industrial and commercial establishment Sonelgaz into a joint-stock company keeping the same roles and monopolistic character (République Algérienne Démocratique et Populaire, 2002). Then, according to the Presidential Decree No. 11-212 of June 2, 2011, the activities of natural gas transmission and distribution were assigned to subsidiary companies (République Algérienne Démocratique et Populaire, 2011). These companies, along with others and the "Sonelgaz Holding Company" form the Sonelgaz Group. One of the objectives of the holding company, as stipulated in the decree is to oversee the conditions under which its subsidiary companies conduct gas transmission and distribution through pipelines, in compliance with applicable laws and regulations.

V. Natural gas network access

In an opened natural gas market, there are different models of the network access. The Entry-Exit model, is the mandatory model in the European Union. In this model, the transmission tariffs are independent of the distance and it is defined independently for each entry and exit point of the network.

In Algeria, the access model is the Postage Stamp Model according to the law No. 02-01 of February 5, 2002 (République Algérienne Démocratique et Populaire, 2002), where transmission tariffs are independent of the distance but it is uniform for all exit point and across the entire national territory.

In the Entry-Exit model, the natural gas producers, or the shippers who purchase gas from producers, resells it. The natural gas trading can be done in non-physical market known by Virtual Transmission Point VTP. The shippers enter into a contract with the TSO to reserve a capacity in the network to transport the gas through the pipeline at an entry and exit point. This capacity is referred to as "The Booked Capacity" which is a contract of payment, whether it is used or not. Then, shippers make a "Nomination" which is the amount of gas they request to transport through the booked capacity and the TSO deliver to the shipper the allocation of the natural gas capacity to be transmitted. The TSO main role in this model is to determine the imbalance in the transmission system i.e. the difference between the volume of gas entering at the entry points and the volume of gas exiting at the exit points. The lack of equal and transparent access to the transmission network is a challenge, which hinders the establishment of an internal gas market code to be applied in all the states members of the European Union. This code is referred to as the Gas Capacity Allocation Mechanisms Network Code CAM NC.

Algerian regulations give the right to the third parties to access to the transmission and the distribution network facilities, or both, in exchange for a fee paid to the transmission and the distribution network operators according to the law (République Algérienne Démocratique et Populaire, 2002) with non-discriminatory basis, according to the executive decree number 07-293 (République Algérienne Démocratique et Populaire, 2007). Access to the network is granted by the TSO for the gas transmission network or the natural gas distribution concessions for the gas distribution network. For access to gas transmission or distribution networks, the relevant network

operator must conduct a study and then informs the applicant of the acceptance or refusal of their request in a transparent and non-discriminatory way according to the order of February 21, 2008 (République Algérienne Démocratique et Populaire, 2008). After agreeing on the requested capacity, the relevant network operator concludes an access contract with the applicant.

The determination of access capacity is based on the criteria of safety, regularity, and quality of supply. It also takes into account the elements of the development plans for the gas transmission and distribution networks according to the law No. 02-01 (République Algérienne Démocratique et Populaire, 2002).

Third party access to the gas networks, can only be denied if there is a proven lack of capacity. The reasons for refusal can only be based on imperatives related to the proper accomplishment of public service missions and on technical issues concerning the safety and security of the networks, as well as the quality of their service according to the order of February 21, 2008 (République Algérienne Démocratique et Populaire, 2008).

The tariffs for the use of gas transmission and distribution networks are set by the CREG. The billing and payment terms are specified in the access contract (République Algérienne Démocratique et Populaire, 2008).

VI. Tariffs of the natural gas

In a liberalized gas market, there is four modalities of tariffs control: price regulation or rate of return, revenue cap, price cap and sliding scale.

The price regulation consists of the fact that the total revenue to be generated by the TSO is determined in advance by the regulator using calculation based on total expected operating and capital costs, and return on the value of capital investment in gas transmission pipeline.

Price cap and revenue cap principle are the same as the price regulation, but in addition, there is two parameters: the regulatory period which is a duration where the regulator regulate in advance in each year the allowed price (in the case of price cap) or the allowed revenue (in the case of revenue cap), and the efficiency factor which is the annual percentage decrease in revenue or price. For the revenue cap, it is possible to have variation in the tariffs within the regulatory period depending on the revenue of the TSO, while in the price cap, there is no variation in the tariffs.

In sliding scale, the regulator sets the revenue cap, but it allows the TSO as an incentive measure to recover more or less of revenue depending on its performance.

The tariff system in the Algerian natural gas market is the revenue cap, as outlined in Article 16 of the Executive Decree No. 05-182, dated May 18, 2005, related to the regulation of tariffs and remuneration for the transmission, distribution, and commercialization of electricity and gas (République Algérienne Démocratique et Populaire, 2005). The revenue cap for the TSO is determined by the CREG on a regulatory period of intervals not less than one year, taking on consideration the costs of investment, operation, and maintenance, as well as the taxes and other acknowledged costs. It also includes a fair return on invested capital, taking development costs into account. Additionally, it involves incentives for cost reduction and improvements in supply quality. In this context, the determination of gas transmission remuneration is accompanied by the establishment of objectives for enhancing supply quality and customer service.

The operating and maintenance costs of the network are determined by the CREG. Depreciation charges for assets in service are established by a decision of the CREG. The amounts of taxes and duties owed are also determined by the CREG.

The CREG implements incentive measures to encourage the reduction of operational losses. Any additional losses exceeding the level set by the CREG are the responsibility of the TSO. An

important condition for the tariffs set by the CREG is that they must be transparent and non-discriminatory.

Regarding network access and use tariffs, they are established by the CREG based on proposals from the TSO, in respect of transparency, non-discrimination, and uniformity of tariff structures across the national territory. These tariffs consist of a fixed charge and a variable charge, related to gas pressure and it can be varied within the day periods and also according to the season. In case of unexpected variations in the economic parameters used to determine gas transmission tariffs, the CREG or the TSO may initiate an early revision of these tariffs.

VII. Prospects for the development of renewable gases market

Renewable gases represent the future of the energy system due to multiple reasons, primarily their potential to reduce CO₂ emissions and to support energy supply diversity and flexibility. Renewable gases can be divided into three types: the first type consists of gases produced from biological sources, such as biogas and biomethane. The second and third types include gases produced from non-biological sources and from natural gas. Examples of the second and third types are green hydrogen and blue hydrogen, respectively.

Biogas is produced through the process of biomass methanization. The final product consists of methane in a proportion ranging from 55 to 85%, CO₂ at levels between 25 and 45%, and trace elements, notably H₂S and NH₃. Biomethane is a purified biogas with similar characteristics as the natural gas which make it possible to be injected into the natural gas network. Green hydrogen is produced through the electrolysis of water using electricity from renewable sources, representing a possible way for storing the intermittent renewable electricity. Blue hydrogen is produced in two stages: the first involves separating hydrogen from natural gas through steam reforming, producing what is known as gray hydrogen, and the second stage consist of capturing the CO₂ produced in the previous step.

European regulations regarding the injection of biomethane into the natural gas network are very advanced. The main condition for the biomethane injection is that it have the same properties as natural gas, these properties are defined in the German regulation by the DIN EN 16723-2 standard and in French regulation by HHV (Higher Heating Value) between 10 kWh/Nm³ and 10.8 kWh/Nm³ according to the order of May 19, 2011 (République Française, 2011). Another important condition concerns the source of the biomethane gas. German regulation for example requires that the gas must be produced exclusively by methanization as mentioned in the Renewable Energy Act (REA, 2021). In contrast, French regulation requires that the biomethane gas is produced only from biowaste, household waste, organic waste, agricultural and agri-food industry waste, muds, lubrications, and organic liquids resulting from wastewater treatment according to the order of November 23, 2011 (République Française, 2011). After the injection of the biomethane gas, every 1 MWh will receive a certificate of origin according to the decree number 2011-1596 (République Française, 2011).

Algerian regulations regarding biogas and biomethane need to be more enriched. Article 4 of the Law No. 04-09 of August 14, 2004, concerning the promotion of renewable energies within the framework of sustainable development (République Algérienne Démocratique et Populaire, 2004), defines two types of energy produced from biomass: those obtained through wet conversion processes: methanogenic and alcoholic fermentation, and those through dry conversion processes: combustion, carbonization, and gasification, without further details. Another article mentions that the conditions for using and valorizing biogas will be established through regulatory means. Article 4 of the Law No. 99-09 of July 28, 1999, concerning energy management (République Algérienne Démocratique et Populaire, 1999) includes the promotion of biomass transformation among the renewable energies to be developed in Algeria.

For green and blue hydrogen, Algeria, like most countries in the world, has published its national hydrogen development strategy with a horizon extending to 2050 (République Algérienne

Démocratique et Populaire, 2023). In this strategy, Algeria plans to develop green and blue hydrogen based on six elements:

1. Establishing a regulatory, normative, and institutional framework.
2. Developing human capital.
3. Involving different sectors of industry.
4. Establishing financing and incentive mechanisms.
5. Ensuring international cooperation for technology transfer.
6. Deploying the hydrogen sector.

Algeria aims to produce between 30 to 40 TWh of hydrogen for export and about 10 TWh of blue hydrogen for national consumption by 2040. To achieve these optimistic goals, Algeria has outlined a roadmap consisting of three phases:

1. The learning and initiation phase from 2023 to 2030, which includes establishing a regulatory and normative framework and implementing pilot projects for decentralized production, combustion in power plants, and fuel cell exploitation.
2. The deployment phase from 2030 to 2040, focused on large-scale production and creating a hydrogen market through the adoption of technology and reduction of the costs.
3. The industrialization and export phase from 2040 to 2050, where hydrogen and its derivatives will be widely used in an increasingly competitive market.

VIII. Conclusion

The liberalization of natural gas markets is a subject of current interest, particularly after each energy crisis. The primary objectives of gas market liberalization are the unbundling of former monopolies and ensuring third party access to the network. A crucial aspect of market liberalization is the creation of regulatory bodies which have the responsibility to ensure a fair, transparent and competitive market while protecting the consumers. In Algeria, the law No 02-01 of February 5, 2002 was issued to open the national gas market. According to this law, Electricity and Gas Regulatory Commission CREG was created as the gas market regulator. Under this law also, the management of natural gas transmission network is a natural monopoly, while the management of natural gas distribution is governed by a concessionaire system. The third-party access model to the transmission network follows a postage stamp model where the transmission tariffs are uniform regardless of distance or exit point, and the adopted tariff system is the revenue cap. For renewable gases, the Algerian regulation about biogas and biomethane require further enrichments, despite the ambitious strategy for the development of the renewable hydrogen.

References

- Bentsos C., Papacharalampous T. & Tsoukala O. (2024). Liberalization of the electricity and natural gas markets in Greece. In G. Archontas (Ed.), *Scientific Conference on the challenges of liberal democracy today* (pp. 75-88). Athens: Center For Liberal Studies.
- Cardinale R., Cardinale I., & Zupic I. (2024). The EU's vulnerability to gas price and supply shocks: The role of mismatches between policy beliefs and changing international gas markets. *Energy Economics*, 131, 107383. doi:10.1016/j.eneco.2024.107383.
- European Communities, (1998). Directive 98/30/EC of the European Parliament and of the Council of 22 June 1998 concerning common rules for the internal market in natural gas, *Official Journal of the European Communities*.
- European Communities, (2003). Directive 2003/55/EC of the European Parliament and of the Council of 26 June 2003 concerning common rules for the internal market in natural gas and repealing Directive 98/30/EC, *Official Journal of the European Communities*.
- European Communities, (2009). Directive 2009/73/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC, *Official Journal of the European Communities*.
- IEA, (2024). World Energy Outlook 2024, *International Energy Agency IEA*.
- Ministère de l'Energie et des Mines, (2023). Bilan Energétique National 2022, *Ministère de l'Energie et des Mines*.
- REA, (2021). REA Strategy for Renewable Energy and Clean Technologies, *Renewable Energy Act REA*.
- République Algérienne Démocratique et Populaire, (2008). Annexe de l'Arrêté du 14 Safar 1429 correspondant au 21 février 2008 fixant les règles techniques de raccordement au réseau de transport de l'électricité et les règles de

conduite du système électrique, *Journal officiel de la République Algérienne Démocratique et Populaire*, May 18.

République Algérienne Démocratique et Populaire, (2005). Décret exécutif n° 05-182 du 09 Rabie Ethani 1426 correspondant au 18 mai 2005 relatif à la régulation des tarifs et à la rémunération des activités de transport, de distribution et de commercialisation de l'électricité et du gaz, *Journal officiel de la République Algérienne Démocratique et Populaire*, May 22.

République Algérienne Démocratique et Populaire, (2002). Décret présidentiel n° 02-195 du 19 Rabie El Aouel 1423 correspondant au 1er juin 2002 portant statuts de la Société algérienne de l'électricité et du gaz dénommée Sonelgaz SPA. *Journal officiel de la République Algérienne Démocratique et Populaire*, June 02.

République Algérienne Démocratique et Populaire, (2007). Décret exécutif n° 07-293 du 14 Ramadhan 1428 correspondant au 26 septembre 2007 fixant les modalités d'alimentation et d'accès des tiers aux réseaux de transport et de distribution de l'électricité et du gaz, *Journal officiel de la République Algérienne Démocratique et Populaire*, October 03.

République Algérienne Démocratique et Populaire, (2011). Décret Présidentiel n° 11-212 du 30 Joumada Ethania 1432 correspondant au 2 juin 2011 modifiant et complétant le décret présidentiel n° 02-195 du 19 Rabie El Aouel 1423 correspondant au 1er juin 2002 portant statuts de la société algérienne de l'électricité et du gaz dénommée Sonelgaz SPA, *Journal officiel de la République Algérienne Démocratique et Populaire*, June 08.

République Algérienne Démocratique et Populaire, (1999). Loi n° 99-09 du 15 Rabie El Aouel 1420 correspondant au 28 juillet 1999 relative à la maîtrise de l'énergie, *Journal officiel de la République Algérienne Démocratique et Populaire*, August 02.

République Algérienne Démocratique et Populaire, (2002). Loi n° 02-01 du 22 Dhou El Kaada 1422 correspondant au 5 février 2002 relative à l'électricité et à la distribution du gaz par canalisations, *Journal officiel de la République Algérienne Démocratique et Populaire*, February 6.

République Algérienne Démocratique et Populaire, (2004). Loi n° 04-09 du 27 Joumada Ethania 1425 correspondant au 14 août 2004 relative à la promotion des énergies renouvelables dans le cadre du développement durable, *Journal officiel de la République Algérienne Démocratique et Populaire*, August 18.

République Algérienne Démocratique et Populaire, (2023). Stratégie nationale de développement de l'hydrogène en Algérie, *République Algérienne Démocratique et Populaire*.

République Française, (2011). Annexe de l'arrêté du 19 mai 2011 fixant les conditions d'achat de l'électricité produite par les installations qui valorisent le biogaz. *Journal officiel*, May 21.

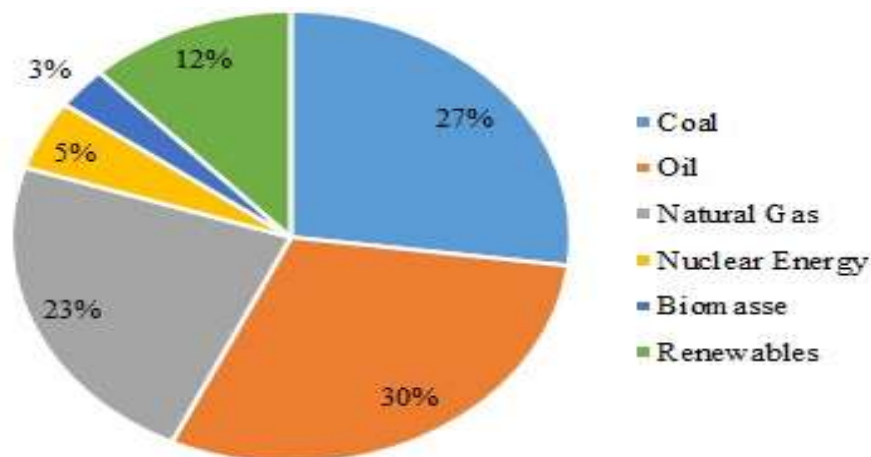
République Française, (2011). Arrêté du 23 novembre 2011 fixant la nature des intrants dans la production de biométhane pour l'injection dans les réseaux de gaz naturel, *Journal officiel*, November 24.

République Française, (2011). Décret n° 2011-1596 du 21 novembre 2011 relatif aux garanties d'origine du biométhane injecté dans les réseaux de gaz naturel, *Journal officiel*, November 22.

Volcovici, V. (2023). V What are the loopholes in the COP28 climate deal? *Reuters*, December 14. Retrieved from <https://www.reuters.com/business/environment/what-are-loopholes-cop28-climate-deal-2023-12-14>.

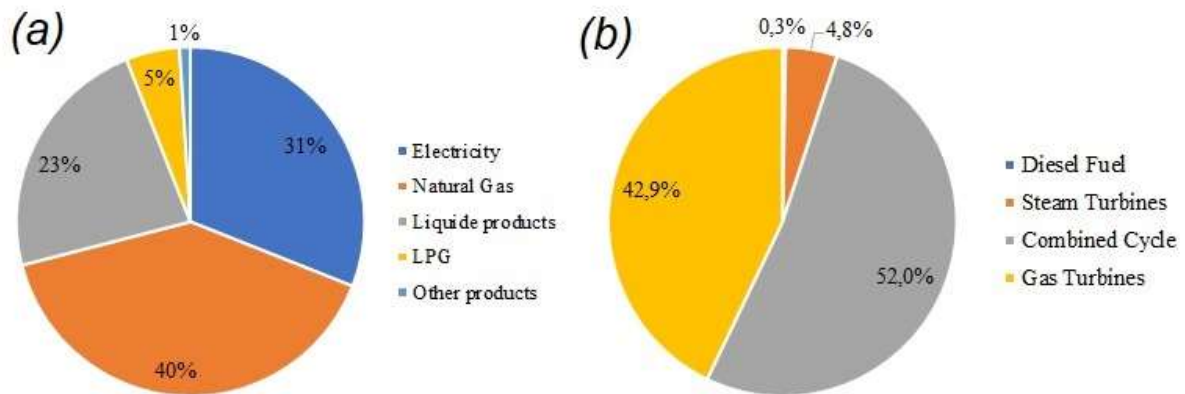
-Appendices :

Figure 1: World energy supply in 2023



Source: IEA, 2024

Figure 2: (a) National energy consumption in 2022 (b) Electricity production sources in 2022



Source : République Algérienne Démocratique et Populaire (2022)

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