2025

REPORT ON THE ASSESSMENT OF OIL INDUSTRY IN THE REPUBLIC OF ALBANIA: HEALTH, SAFETY, SOCIO-ECONOMIC IMPACT, GREENHOUSE EMISSIONS, AND SUSTAINABILITY

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1. INTRODUCTION

1.1 History of Oil in Albania

The oil industry in Albania has undergone various stages of development and challenges, while continuing to hold a significant role in the national economy. Albania, with a long history of oil extraction dating back to the early 20th century, has remained one of the main oil producers in the Balkans. In the early years of this period, the sector focused on modernizing existing infrastructure and improving production efficiency, primarily through cooperation with foreign companies and investments in more advanced technologies.

Albpetrol, the state-owned company, remained the key actor in managing existing wells and in developing exploration activities. The sector faced significant challenges due to the decline in oil reserve production and the search for new exploratory fields, while also shifting its focus toward the diversification of energy sources.

During this period, the Albanian government adopted several legal and regulatory reforms aimed at improving the investment framework and increasing transparency in the sector, including alignment with EITI standards. These measures contributed to enhancing the sector's credibility and attracting new investments. However, environmental and social challenges remained key issues to be addressed.

An important aspect was the gradual improvement of safety standards and environmental management, particularly in reducing water and air pollution, as well as implementing measures to prevent industrial accidents. However, local pollution and the impacts on surrounding communities remained ongoing concerns. From a socio-economic perspective, the oil sector continues to provide employment opportunities and contribute to the development of several rural regions. Nevertheless, the need for greater community engagement and improved social relations has become increasingly evident.

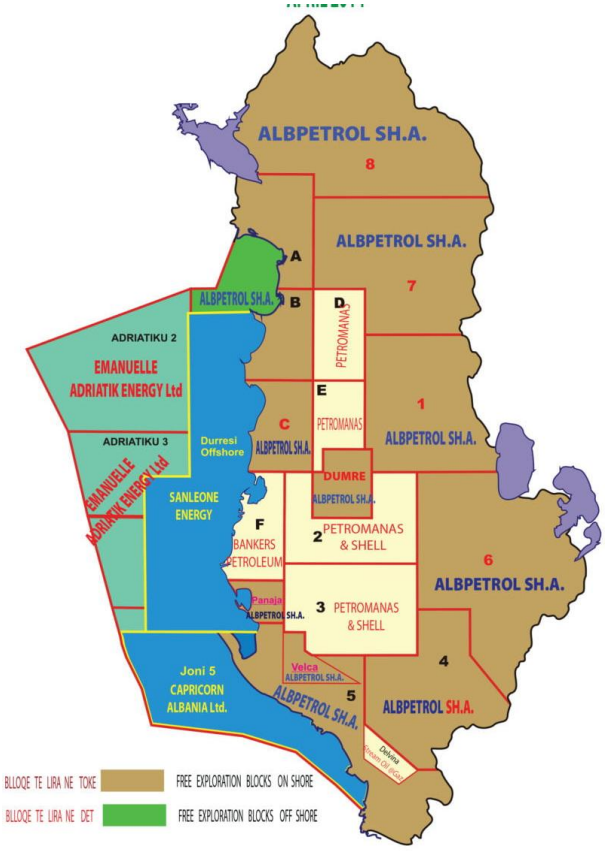

Figure 1. Blloqet e kerkimit te naftes ne Shqiperi.

During the period 2014–2024, the oil sector has undergone a deep phase of transition, influenced by both internal and external factors: changes in international energy markets, the entry and exit of foreign investors, legislative improvements, and increasing demands for transparency. These developments have affected not only production volumes but also the governance model of the sector.

The economic importance of this sector was reflected in the fiscal revenues it generated: according to EITI Albania (2022), the oil industry contributed 4.7% of the total revenues from extractive industries and approximately 0.9% of the national GDP in 2021. This share is lower than in the previous decade, but it

still represents a significant source of public budget revenue, especially for municipalities that benefit from the distribution of mining royalties.

The oil industry in Albania is composed of several key companies operating in various fields. Some of them are active in oil extraction, while others are engaged in its trading and distribution.

Some of the main companies in the oil sector in Albania include:

- Albpetrol – The state-owned company responsible for managing oil wells in major fields such as Patos-Marinza and Ballsh, with an annual production of over 110,000 tons;
- Bankers Petroleum Albania;
- Other companies – Transoil Group (IEC Visoka / Terraoil Swiss), Phoenix Petroleum sh.a., TransAtlantic Ltd (formerly Stream Oil & Gas), Sherwood International Petroleum, and Kastrati Group, which are involved in exploration, production, and distribution.

As for oil processing (refining), the following entities can be mentioned:

1. Bitex Refinery (formerly the Metallurgical Plant), located in Balldren, Elbasan – currently the only active industrial facility in the country for the processing of heavy oil, with a capacity of approximately 200,000 tons per year. It processes bitumen, heavy gas oil, and naphtha).
2. ARMO (Ballsh & Fier) – currently non-operational. The Ballsh refinery was dismantled for scrap after 2021 and holds significant outstanding debts, while the Fier facility is no longer functioning as an active refinery
3. Fuel importers and traders – In the absence of domestic production of refined fuels, Albania imports the majority of its fuel needs.

In the last decade, the oil sector in Albania has been characterized by a high concentration of production in the hands of a few companies.
Albpetrol SHA, the state-owned enterprise, has continued to operate as the holder of rights over many oil blocks. In many cases, it acts as a co-contractor or supervisory agent for private operators. Its institutional role is important for ensuring technical continuity and maintaining control over strategic reserves, but financial challenges and lack of investments have limited its operational role.

Transoil Group and Phoenix Petroleum are among the medium and small operators that have been granted exploitation rights in several smaller blocks or fields with lower production levels. Their contribution to total production remains modest, but they have played an important role in maintaining activity in areas that would otherwise remain untouched. Data from EITI and AKBN reports indicate that, on average, 85% of total oil production during the period 2014–2024 was carried out by Bankers Petroleum. Albpetrol maintained a share of around 10–12%, while the remaining portion was distributed among smaller operators.

The economic impact of these companies is not measured solely by the volume of crude oil they produce, but also through several other important factors, such as: the taxes and levies they pay (including corporate income tax, royalties, VAT, and others), the employment they generate both locally and through subcontractors, the investments they make in infrastructure such as roads and technological facilities, as well as their contributions in the form of royalty payments to the respective municipalities.

In conclusion, the main companies are not only engines of production but also key players in the system of state relations, transparency, and public benefit. Public policies must ensure a balance between encouraging investments and enhancing oversight through strong governance mechanisms and community representation.

The development of hydrocarbon activities in Albania—including investments and operations by companies engaged in exploration and production—brings significant economic benefits and helps meet national energy needs. This sector contributes to increasing state revenues, creating jobs, and ensuring domestic supply of oil and gas. However, despite these clear benefits, extraction and processing activities in the hydrocarbon sector have negative environmental impacts, including:

- Air pollution from harmful gases (H_2S, CO_2).
- High levels of heavy metals and toxic compounds have been detected in surface waters and surrounding soils, threatening agriculture and ecosystems.
- The use of fracking has caused ground tremors and raised concerns over environmental and safety risks.
- The lack of clear protocols for the treatment of radioactive and chemical waste poses long-term environmental hazards.
- Increased incidence of diseases, particularly respiratory and cancer-related illnesses, in production zones.
- Protests and social tensions due to pollution and lack of compensation.
- Issues of social inequality and insufficient inclusion of local communities in the economic benefits.

For this reason, it is essential to implement strong environmental protection measures and sustainable development policies to minimize harmful effects. Strengthening environmental regulation and monitoring is crucial to reduce pollution and negative impacts.

- Transparency and social justice are needed in the distribution of economic benefits, with a focus on improving conditions for local communities.
- The development of clean technologies and investments in new refining capacities should be prioritized to reduce dependency on imports.
- Initiatives for waste treatment and the protection of natural resources should be implemented in cooperation with local and international organizations.

Furthermore, improvements in production monitoring technology and the implementation of the beneficial ownership register system have increased institutional credibility and oversight over the industry. These reforms are vital to ensuring a fairer distribution of benefits and reducing the risks of corruption in a strategically significant sector.

From an institutional perspective, the period 2014–2024 coincided with the consolidation of the transparency framework through Albania's engagement in the Extractive Industries Transparency Initiative (EITI). The country has significantly improved contract disclosure, revenue reporting, and the involvement of local stakeholders in decision-making processes[1]. These developments accelerated after 2020, when Albania began full implementation of the 2019 EITI Standard and preparation for the 2023 EITI Standard.

In conclusion, the oil sector has been not only a fiscal contributor but also a testing ground for institutional and legal reforms in Albania. It represents an example of the country's gradual approach toward good governance and transparency, as well as an ongoing challenge to align the industry with the new demands of sustainable development and the energy transition.

[1] Furthermore, see https://qbz.gov.al/, http://www.akbn.gov.al/marreveshjet-hidrokarbure-kompanite/, https://www.infrastruktura.gov.al/kompanite-2/.

1.2 Purpose and objectives of the report

The purpose of this assignment is to assess the scope, characteristics, and impacts of oil industry investments in Albania, with a particular focus on the following key aspects:

- Assessment of the impacts of extractive activities on public health, including access to clean water, air quality, and health effects related to proximity to hazardous oil industry infrastructure.
- Evaluation of workplace safety standards, emergency response capacity, the frequency and management of accidental spills, as well as risks posed to surrounding communities.
- Analysis of job creation, engagement of local suppliers, investments in supporting infrastructure, population displacement, and the quality of community engagement.
- Review of greenhouse gas emissions, water and air pollution, gas flaring practices, soil contamination, impacts on natural habitats, biodiversity loss, and other environmental risks associated with the oil industry's operations in Albania.

1.3 Assessment Methodology

To carry out this comprehensive assessment of the oil industry in Albania during the period 2014–2024, a methodological approach was applied that combines document analysis, data collection, and the evaluation of impacts across health, social, economic, and environmental dimensions. The main data sources include annual and interim reports from key companies such as Albpetrol and other private operators in the sector, which provide information on production, investments, safety standards, and measures for managing environmental impacts. Additionally, data from state institutions such as the Ministry of Energy and Infrastructure, the Ministry of Environment, the Bank of Albania, and the Institute of Statistics (INSTAT) were used to provide official figures on economic impacts, sector revenues, and environmental and health issues related to industrial activities.

In addition, various environmental and socio-economic studies conducted by non-governmental organizations, international agencies, and academic institutions were reviewed, which helped identify key issues related to water pollution, air quality, and the effects on surrounding communities. The methodology included a review of the available literature, analysis of secondary data to identify trends and challenges in the sector, as well as the collection of primary data through interviews with representatives of state institutions, companies, and local organizations to obtain a deeper understanding of the on-the-ground situation. Furthermore, a comparative analysis with international standards was carried out to identify gaps and opportunities for improvement.

However, the methodology has some limitations, including the lack of detailed data from certain private companies due to confidentiality policies, as well as the absence of continuous environmental and health monitoring in some areas, which has made it difficult to develop a complete picture.

2. RESOURCE ASSESSMENT

Albpetrol sh.a. is a fully state-owned oil and gas exploration and production enterprise, which holds exclusive rights for the development of all existing oil and gas fields. The majority of the oil production over which ALBPETROL holds production rights has been contracted to foreign companies, from which almost 60% is exported for refining into products abroad. This depends on the dynamics of the domestic crude oil refining market, with continuous fluctuations in the quantities of crude oil processed within the

country. Undiscovered oil and gas reserves in Albania, both offshore and onshore, are believed to be significant, but their exploration will require the use of sophisticated technologies, which are intended to be secured through the attraction of foreign investors possessing such capacities. Efforts are underway to develop programs to present these opportunities to the international oil industry in a structured manner, as a means to transform them into highly significant sources of economic development for Albania.[2]

Albania's geological resources have been assessed by Albpetrol SHA at a total of approximately 437.6 million tons, of which 81 million tons were considered recoverable based on the technologies available up to the 1990s. As of January 1, 2018, a total of 61.36 million tons of crude oil had been produced, representing about 75.7% of the recoverable reserves and 14% of the total geological reserves. Based on technological developments over the past 20 years, it is estimated that recoverable reserves could be 50–60% higher, placing them in the range of 110–120 million tons. According to international sources for the period 2016–2021, Albania held 150–168 million barrels of proven oil reserves, ranking 59th globally.[3]

Albania's market for refined oil products is small by European standards, with a total annual consumption of approximately 1 million metric tons (mt). In the current context, there is a pressing need to increase domestic crude oil refining capacities, either through upgrading technologies in the existing refineries (in Ballsh and Fier) in line with modern standards or by developing new refineries according to European standards.[4]

Existing and potential hydrocarbon reserves hold considerable potential for Albania to derive significant economic benefits from more extensive and intensive oil exploitation. In Albania's main oil fields, which have been assessed with geological reserves of 437 million tons, approximately 62.3 million tons of oil have been produced so far, leaving an estimated 46.9 million tons of recoverable oil reserves remaining, according to AKBN's assessment. Considering that recoverable oil reserves are also conditioned by the methods of exploitation and the technology applied in the oil fields, the calculated quantity of recoverable reserves may vary over time. All the aforementioned figures are based on the data declared by the Ministry of Infrastructure and Energy and AKBN.[5]

2.1 Main Oil Reserves in Albania by Field

2.1.1 Sandstone Oil Fields

A. PATOS-MARINZA FIELD

The Patos–Marinëz oil field is located in the southeastern part of the Adriatic Foredeep Basin. Within the Tortonian sandstone formations, five oil-bearing layers are found, which, from bottom to top, are named: Bubullima, Marinëza No. 1, Marinëza No. 2, Driza, and Gorani.

[2] Council of Ministers. (2018). *Decision No. 480, dated 31.07.2018; On the approval of the National Energy Strategy for the period 2018–2030 – Albania 2030*. Ministry of Infrastructure and Energy. Retrieved fromhttps://www.infrastruktura.gov.al/wp-content/uploads/2024/09/vendim-2018-07-31-480.pdf, page 36.
[3]Albpetrol. (2018). *Geological reserves*. Retrieved from https://www.albpetrol.al/en/geological-reserves/
[4] Council of Ministers. (2018). *Decision No. 480, dated 31.07.2018; On the approval of the National Energy Strategy for the period 2018–2030 – Albania 2030*. Ministry of Infrastructure and Energy. Retrieved from https://www.infrastruktura.gov.al/wp-content/uploads/2024/09/vendim-2018-07-31-480.pdf, page 36.
[5] Ibid

The primary method of oil extraction from the reservoir is through the solution gas drive mechanism, where dissolved gas in the oil provides the necessary pressure for production.[6]

MAIN CHARACTERISTICS OF THE PATOS–MARINËZ FIELD	
Formation	Sandstone
Geological reserves (tons)	258 393 913
Initial recoverable reserves (tons)	31 120 186
Fluid type	Oil
Oil type	Semi-aromatic – asphaltic aromatic
Density (^{0} API)	3 – 38.8
Viscosity 20^0 C(Cp)	50 – 190, 000
Initial reservoir pressure (atm)	20 – 185
Sulfur content (%)	2 – 6
Temperature (^{0} C)	0 – 50
Total sandstone layer thickness (m)	1 – 120
Permeability of sandstone layers (MD)	10 – 7500
Salinity of sandstone formation water (mg/l)	1000 – 42 000

Table 1. Main Characteristics of the Patos–Marinëz Field[7]

B. KUÇOVË – ARRËZ FIELD

This field consists of oil-bearing layers with limited surface areas in the form of lenses, positioned one above the other and separated by clay layers.

MAIN CHARACTERISTICS OF THE KUÇOVË FIELD	
Formationi	Sandstone
Geological reserves (tons)	78 331 796
Initial recoverable reserves (tons)	11 772 485.7
Oil produced (tons) until 01.01.2023	4 415 248.14
Remaining recoverable reserves (tons) until 01.01.2023	7 357 237.56
Fluid type	Oil
Oil type	Naphthenic – aromatic
Density (^{0} API)	12 – 22
Viscosity 20^0 C(Cp)	50 – 200
Initial reservoir pressure (atm/10m)	1.05, Arrëza (118 atm)
Sulfur content (%)	2,4 - 5
Temperature (^{0} C)	30-35
Permeability of sandstone layers (MD)	20 – 900
Salinity of sandstone formation water (mg/l)	10 000 – 45 000
Total thickness (m)	2 – 19 dhe 10 – 160

Table 2. Main Characteristics of the Kuçovë – Arrëz Field.[8]

[6] Albpetrol. *Neogene Reservoirs*. Albpetrol. https://albpetrol.al/vendburimet-neogenike/
[7] Albpetrol. *Neogene Reservoirs*. Albpetrol. https://albpetrol.al/vendburimet-neogenike/
[8] Albpetrol. *Neogene Reservoirs*. Albpetrol. https://albpetrol.al/vendburimet-neogenike/

2.1.2 Limestone Deposits

A. GORISHT – KOCUL FIELD

This field is located approximately 20 km east of the city of Vlorë. The Gorisht – Kocul field was discovered in 1965. The distances between wells in the central area of the field have been reduced from 150–200 m to about 100 m.[9]

MAIN CHARACTERISTICS OF THE RESERVOIR	
Formation	Sandstone
Geological reserves (tons)	30 500 000
Initial recoverable reserves (tons)	14 674 087
Oil produced (tons) until 01.01.2023	12 228 617.537
Remaining recoverable reserves (tons) until 01.01.2023	2 245 469.5
Fluid type	OIL
Oil type	Asphaltic – Aromatic
Density (^{0} API)	13 - 23
Viscosity 20^0 C(Cp)	2000
Initial reservoir pressure (atm/10m)	120
Sulfur content (%)	3.16 - 6.3
Temperature (^{0}C)	32 - 38
Permeability of sandstone layers (MD)	300
Salinity of sandstone formation water (mg/l)	28 000 - 58 000
Total thickness (m)	350 - 450

Table 3. Main Characteristics of the Gorisht-Kocul Reservoir.[10]

B. CAKRAN – MOLLAJ FIELD

This field is located 6 km west of the city of Ballsh. The Cakran – Mollaj gas condensate field was discovered in 1977. Its structure is a brachyanticlinal that extends in the southeast-northwest direction. The initial well spacing was 600 meters, but the current well network is denser, with the distance between wells now at 300 meters.[11]

MAIN CHARACTERISTICS OF THE RESERVOIR	
Formation	Sandstone
Geological reserves (tons)	16 127 983
Initial recoverable reserves (tons)	8 144 469
Oil produced (tons) until 01.01.2023	4 371 991.1
Remaining recoverable reserves (tons) until 01.01.2023	3772 477.9
Fluid type	Oil
Oil type	Semi-aromatic to paraffinic
Density (^{0} API)	11.5 - 37
Viscosity 20^0 C(Cp)	10-30
Initial reservoir pressure (atm/10m)	368

[9] Albpetrol. *Limestone Reservoirs*. Albpetrol. https://albpetrol.al/vendburimet-neogenike/
[10] Albpetrol. *Limestone Reservoirs*. Albpetrol. https://albpetrol.al/vendburimet-gelqerore/
[11] Ibid

Sulfur content (%)	3.16 - 6.3
Temperature (^{0}C)	68
Permeability of sandstone layers (MD)	2 - 600
Salinity of sandstone formation water (mg/l)	30 000 - 50 000
Total thickness (m)	400 - 800

Table 4. Main Characteristics of the Cakran-Mollaj Field.[12]

C. AMONICË FIELD

This field is located 30 km east of the city of Vlorë. The Amonicë field was discovered in 1980. It is situated in the Selenicë – Amantia range of the Kurveleshi belt.

MAIN CHARACTERISTICS OF THE RESERVOIR	
Formation	Limestone
Geological reserves (tons)	2 835 849
Initial recoverable reserves (tons)	1 503 000
Oil produced (tons) until 01.01.2023	737 257.0
Remaining recoverable reserves (tons) until 01.01.2023	765 725.0
Fluid type	Oil
Oil type	Asphalto-aromatic – semi-aromatic
Density (^{0} API)	14.5 – 22
Viscosity 20^0 C(Cp)	150 – 2300
Initial reservoir pressure (atm/10m)	241
Sulfur content (%)	4
Temperature (^{0}C)	35 - 52
Permeability of sandstone layers (MD)	20 - 150
Salinity of sandstone formation water (mg/l)	10 000 - 45 000
Total thickness (m)	Up to 200

Table 5. Main Characteristics of the Amonicë Field.[13]

D. GORISHT FIELD

Gorisht is one of the oil fields in Albania and is treated as a joint zone together with the Gorisht-Kocul field, overlapping each other. The field has a total of 284 vertical wells in inventory, of which 142 are active for oil and gas production. The well depths range from 700 m to 1,500 m. The produced oil is relatively heavy, with a specific gravity of 0.965 g/cm³. Production in this area has fluctuated since 1962, with total production in 2024 reaching 11.6 thousand tons of oil.

E. BALLSH-HEKAL FIELD

The Ballsh–Hekal field is part of the Kremenarë–Patos–Verbas range in the Kurveleshi belt and dates back to the Cretaceous–Paleogene period. This field contains a gas cap with an initial gas-oil contact at a depth of 730 m. The wells drilled into the gas cap have casings set a few meters below the gas-oil contact. The reservoir is a typical massive structural trap with active bottom water. The main characteristics of the reservoir are as follows:

[12] Albpetrol. *Limestone Oil Fields*. Albpetrol. https://albpetrol.al/vendburimet-gelqerore/
[13] Albpetrol. *Limestone Oil Fields*. Albpetrol. https://albpetrol.al/vendburimet-gelqerore/

FORMATION	Carbonate (Limestone)
Geological Reserves (tons)	19,269,224
Recovery Factor	33%
Initial Recoverable Reserves (tons)	6,359,844
Produced Oil (tons) as of 01.01.2018	5,153,222
Remaining Recoverable Reserves (tons) as of 01.01.2018	1,206,622
Fluid Type	Oil
Oil Type	Asphaltic–aromatic
Density (°API)	8 – 17
Viscosity at 200°C (cP)	2000
Initial Reservoir Pressure (atm)	133
Sulfur Content (%)	5.7 – 6.4
Temperature (°C)	41
Carbonate Permeability (MDI)	40 – 300
Salinity of Reservoir Waters (mg/l)	15,000 – 35,000
Total Reservoir Thickness (m)	350

Table 6. Oil Production Over the Years – Albpetrol.[14]

"Albpetrol" SH.A, with more than 100 years of experience in oil and gas extraction, currently produces oil from 2 sandstone fields and 4 limestone fields. Today, it carries out oil extraction activities in the following fields: Kuçovë, the southern part of the Patos-Marinëz field, Cakran-Mollaj, Gorisht-Kocul, Amonicë, and Karbunarë.

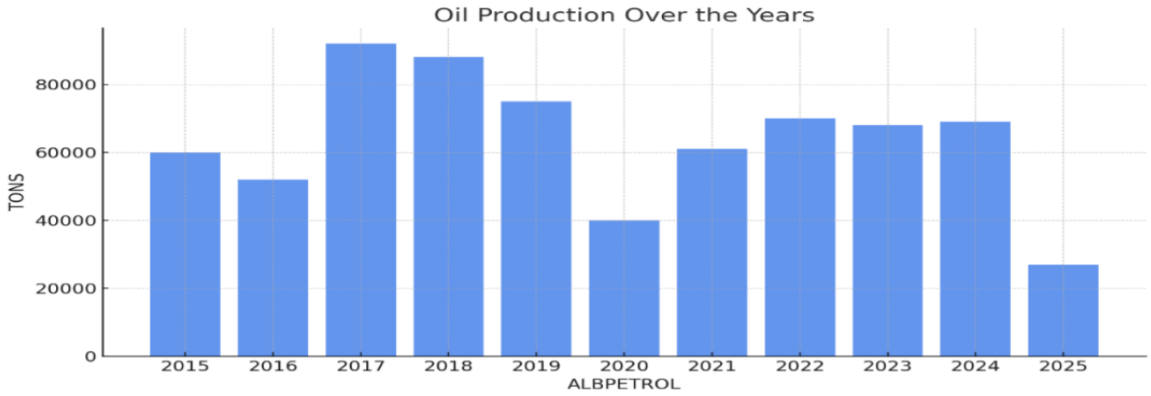

Table 7. Oil production over the years by Albpetrol.[15]

2.2 Main Oil Fields and Their Production Over the Years in Albania

A. KUÇOVË OIL FIELD

Kuçovë is a sandstone oil field that has been exploited through relatively shallow vertical wells (approximately no deeper than 1,000 meters). Due to the low reservoir energy, these wells produce at very low flow rates (in the range of 50–200 liters of oil per day). The section under the administration of the company "Albpetrol" JSC includes a total of 1,613 wells in its inventory, among which 100 are classified as shut-in wells.

[14] Anio.al. *Ballesh – Hekal Field*. Anio.al. https://anio.al/prodhimi-nder-vite/
[15] Albpetrol. *Oil Production Over the Years*. https://albpetrol.al/prodhimi-i-naftes-nder-vite/

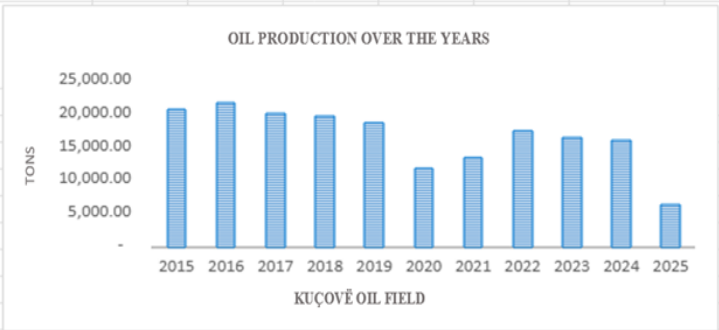

Table 8. Oil Production Over the Years in the Kuçovë Oil Field.[16]

Since closely tied to the overall progress of hydrocarbon operations, the number of active wells is constantly subject to change. On average, the company "Albpetrol" JSC operates approximately 950 wells in this area.

B. PATOS OIL FIELD

The Patos oil field is a sandstone reservoir, and currently, "Albpetrol" JSC manages a small portion of the larger Patos–Marinza field. This reservoir is exploited through relatively shallow vertical wells, which typically do not exceed a total depth of 1,200 meters.

The section under the administration of "Albpetrol" JSC includes a total of 888 wells in inventory, of which 307 are in storage and are no longer capable of being returned to production. Currently, approximately 22 wells are considered active. About 542 wells belong to the shut-in fund and present major challenges for reactivation.

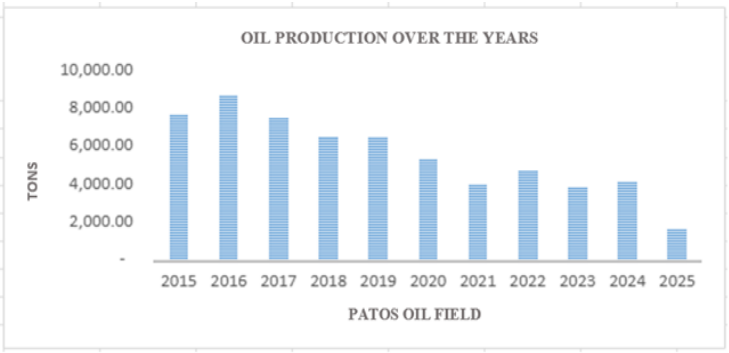

Table 9. Annual Oil Production in the Patos Oil Field [17]

C. CAKRAN–MOLLAJ OIL FIELD

This field is a carbonate limestone reservoir with abnormally high pressure. It was discovered in 1977 and is exploited through very deep vertical wells reaching depths of up to 3,800 meters. A total of 63 wells are included in the inventory of this sector, 32 of which are active for oil and gas

[16] Albpetrol. *Oil Fields*. Albpetrol. https://albpetrol.al/vendburimet/
[17] Albpetrol. *Oil Fields*. Albpetrol. https://albpetrol.al/vendburimet/

production. The remaining wells require overhauls and substantial investments to be returned to operation. Compared to other Albanian fields, the oil from this reservoir is classified as light, with a specific gravity of approximately 0.9 g/cm³.

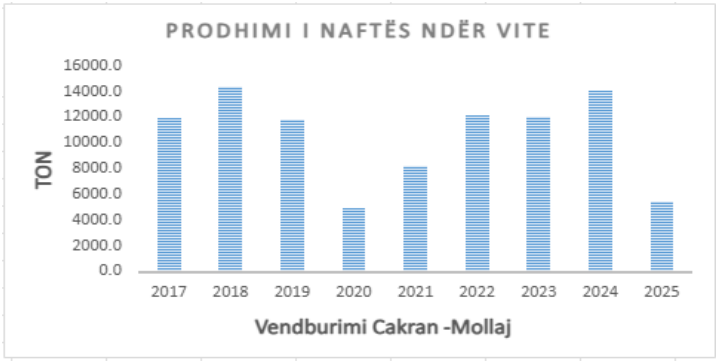

Table 10. Annual Oil Production in the Cakran–Mollaj Oil Field.[18]

D. GORISHT–KOCUL OIL FIELD

The Gorisht–Kocul field is a carbonate oil reservoir composed of two overlapping anticlines: Gorisht and Kocul. The field contains a total of 284 vertical wells in inventory, of which 142 are active for oil and gas production. Well depths range from 700 to 1,500 meters. The oil produced here is relatively heavy, with a specific gravity of 0.965 g/cm³.

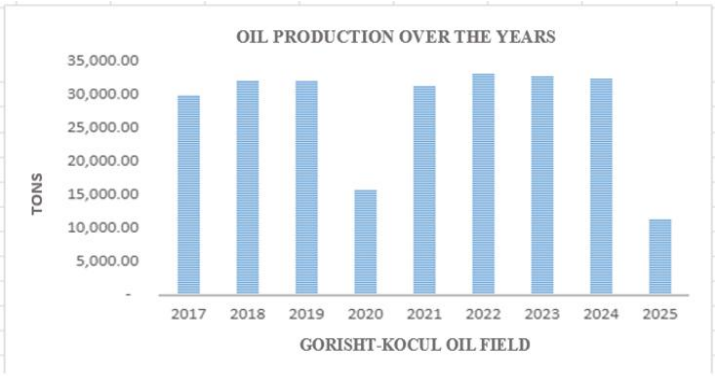

Table 11. Annual Oil Production in the Gorisht–Kocul Oil Field.[19]

E. AMONICË OIL FIELD

Geologically, this is a carbonate oil field and is part of the Amonicë–Kocul–Selenicë anticline, which has a near-meridional extension and occupies the southern part of the current oil-bearing structural belt.
Currently, there are 59 wells in inventory, of which only 23 are active for oil and gas. Well depths reach up to 3,000 meters. The oil produced is relatively light, with a specific gravity of approximately 0.9 g/cm³.

[18] Albpetrol. *Oil Fields*. Albpetrol. https://albpetrol.al/vendburimet/
[19] Albpetrol. *Oil Fields.* Albpetrol. https://albpetrol.al/vendburimet/

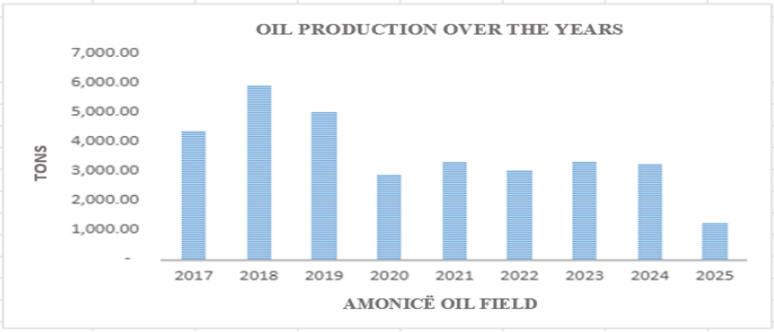

Table 12. Annual Oil Production in the Amonicë Oil Field.[20]

F. BALLSH–HEKAL OIL FIELD

The Ballsh-Hekal oil field was put into production in 1967, reaching an annual oil output of 13,410 tons. The initial years of exploitation were highly productive, with the highest annual production ever recorded in 1972, reaching 383,010 tons of oil. The Ballsh-Hekal oil field is located 29 km southeast of the city of Fier, within the anticlinal structure of Ballsh. The Ballsh-Hekal reservoir is a carbonate reservoir, approximately 1,000 meters deep, containing relatively heavy oil with a specific gravity of 0.97 gr/cm³. The field is divided into two sections by a ridge; the smaller section, Hekal, is a gas-capped reservoir that appears to lack water, unlike the larger Ballsh section, which does contain water.

The reservoir was discovered in April 1966 and production began in 1967. The reservoir reached peak production of 383,010 tons (376,000 m³, 2,400,000 barrels) of oil in 1972 (~6,500 barrels of oil per day) and subsequently declined significantly, despite intensified drilling activity, which reduced well spacing to less than 200 meters (10 acres). Recent studies and testing indicate that the Ballsh reservoir has the potential to become a significant oil producer in Albania once again. The field inventory includes 206 wells, of which approximately 120 are considered active. The Ballsh-Hekal oil field is located adjacent to the Shpirag oil field, which is operated by Shell.

In the spring of 2019, Shell announced the discovery of a significant quantity of oil in this field, increasing the potential of the area's oil reserves. This is also the first discovery of a new oil field in Albania in the last 30 years.

[20] Albpetrol. *Oil Fields.* Albpetrol. https://albpetrol.al/vendburimet/

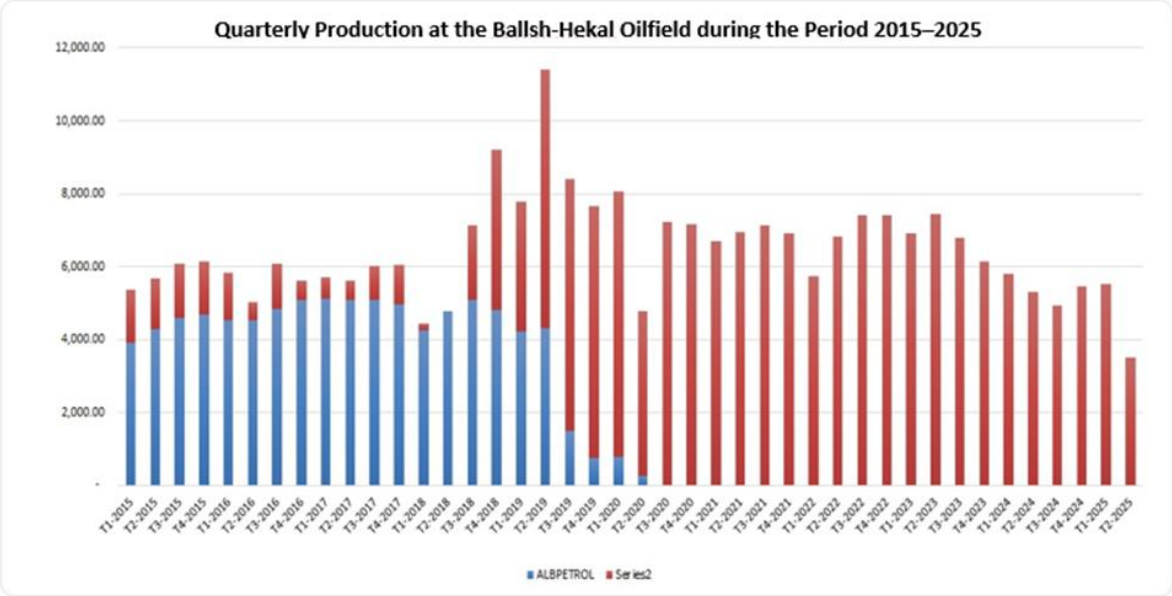

Table 13. Quarterly Oil Production in the Ballsh–Hekal Oil Field (2015–2025).[21]

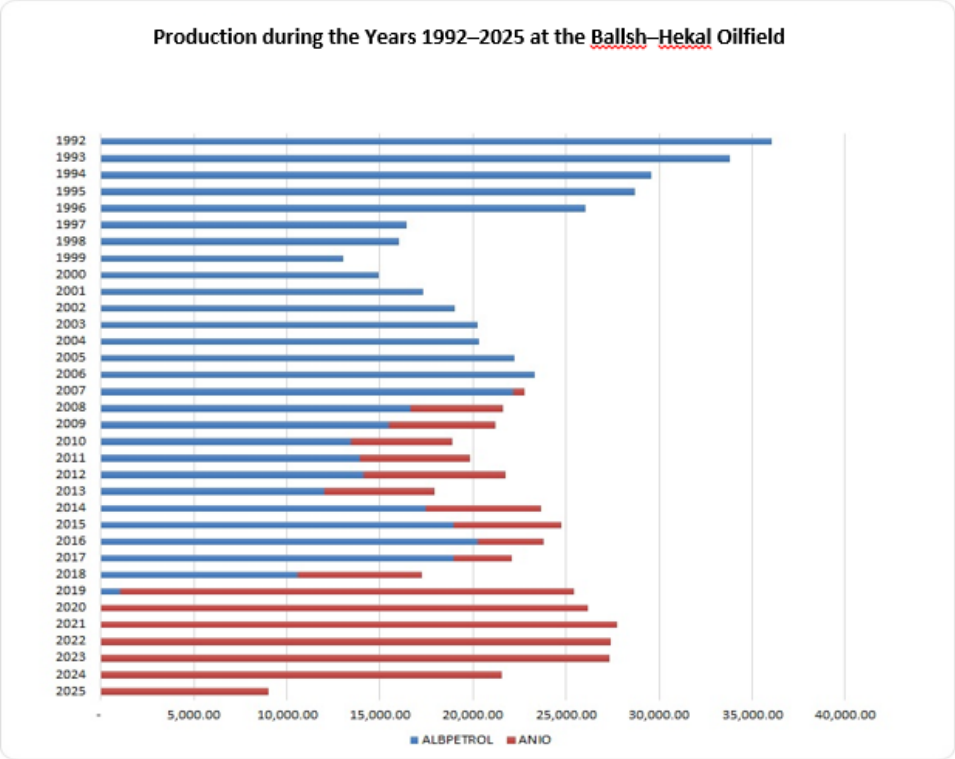

Table 14. Annual Oil Production in the Ballsh–Hekal Oil Field (1992–2025).[22]

[21] Anio.al. *Oil production over the years*. Anio.al. https://anio.al/prodhimi-nder-vite/
[22] Anio.al. *Oil production over the years*. Anio.al. https://anio.al/prodhimi-nder-vite/

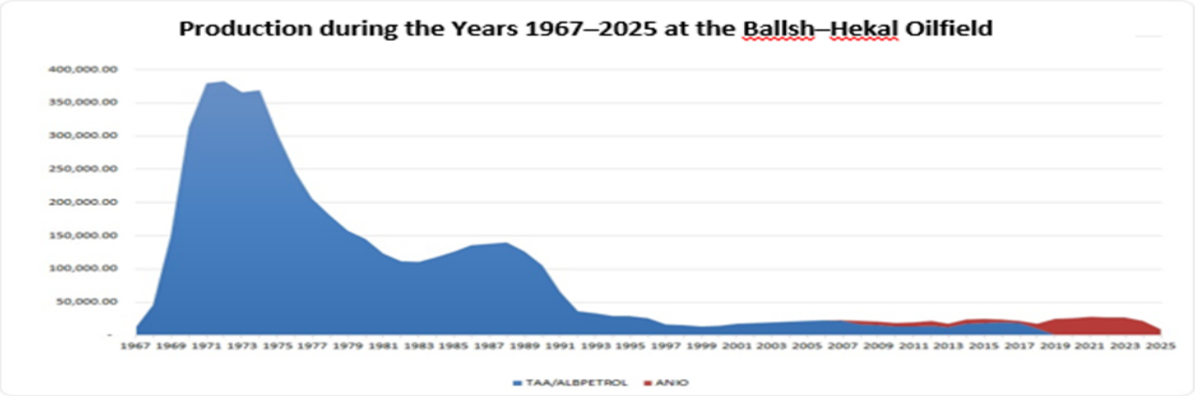

Table 15. Annual Oil Production in the Ballsh–Hekal Oil Field (1967–2025).[23]

2.3 Production Capacity, Exploration and Prospecting of Hydrocarbon Reserves in Albania (2014–2024)

The country's total oil production capacity relies heavily on the Patos–Marinza field, which accounts for approximately 88% of Albania's gross national oil output.
In 2014, production peaked at nearly 20,000 barrels per day (bpd) in Patos–Marinza.
In 2023, total national crude oil production reached 642.04 ktoe, marking a decrease of 15.36 ktoe or 2% compared to 2022, mainly due to sales market issues. Of this, production from hydrocarbon agreements accounted for 572.243 ktoe, with 150.353 ktoe sold domestically and 515.792 ktoe exported.

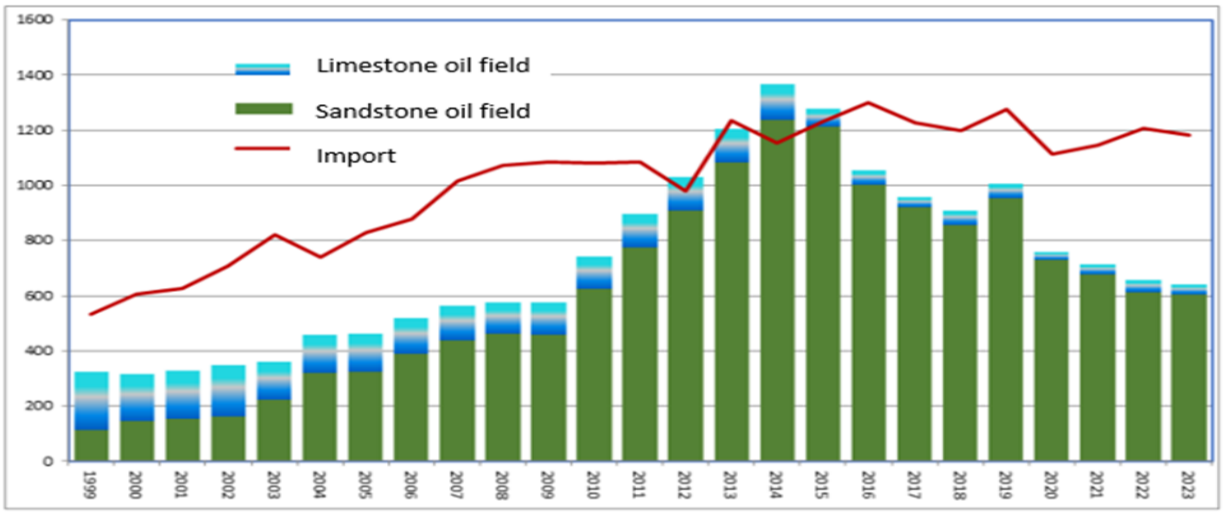

Figure 2. Graph: Trends in the production, import, and export of oil products (in ktoe) over the years.[24]

[23] Anio.al. *Oil production over the years*. Anio.al. https://anio.al/prodhimi-nder-vite/
[24] Ministry of Infrastructure and Energy, National Agency of Natural Resources, Technical Division, & Directorate of Renewable Energy. (2024). Preparation of the energy balance based on the processing of information according to the standards and regulations of the EU energy statistics: Energy Balance 2023., Pg. 23 http://www.akbn.gov.al/wp-content/uploads/2014/06/Bilanci-Komb%C3%ABtar-i-Energjis%C3%AB-2023.pdf

In 2023, the volume of crude oil processed for refining was 172.40 ktoe, showing an increase of 55.77 ktoe compared to 2022. This growth in refining volume is attributed to rising demand for oil products in foreign markets.

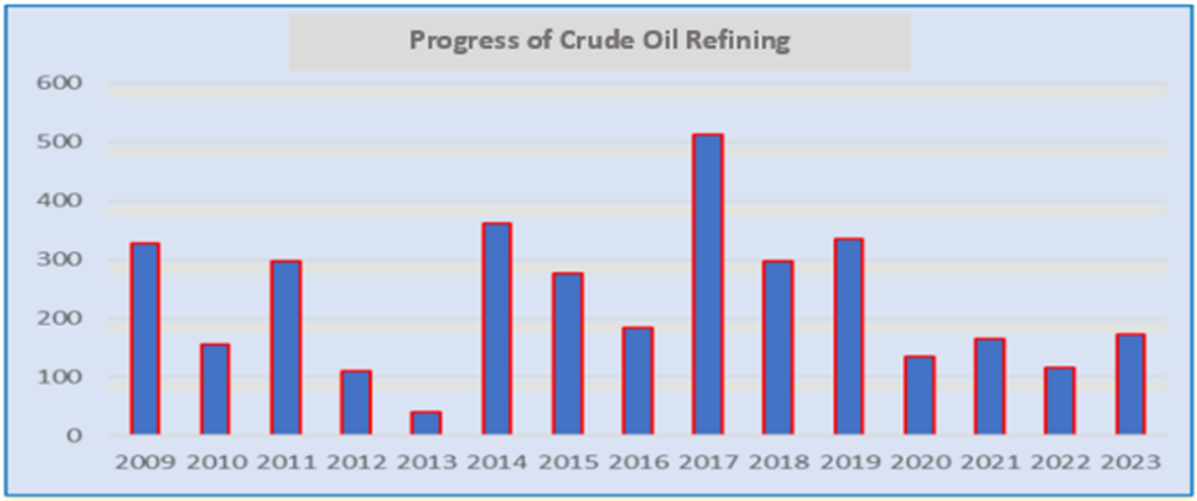

Figure 3. Graph: Crude Oil Refining Trend (ktoe).[25]

Oil product imports in 2023 totaled 1,181.679 ktoe, reflecting a decrease of 24 ktoe compared to 2022. Products such as gasoil, gasoline, jet fuel, and liquefied petroleum gas (LPG) continue to dominate oil product imports.

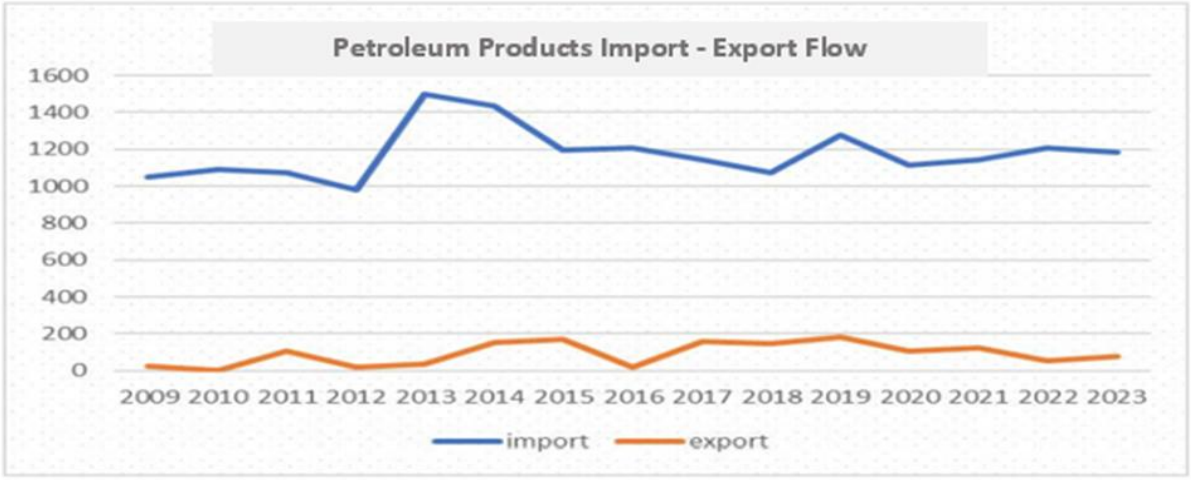

Figure 4. Graph. Import and Export Trend of Oil Products, (ktoe).[26]

[25] Ministry of Infrastructure and Energy, National Agency of Natural Resources, Technical Division, & Directorate of Renewable Energy. (2024). Preparation of the energy balance based on the processing of information according to the standards and regulations of the EU energy statistics: Energy Balance 2023., Pg. 23 http://www.akbn.gov.al/wp-content/uploads/2014/06/Bilanci-Komb%C3%ABtar-i-Energjis%C3%AB-2023.pdf

[26] Ministry of Infrastructure and Energy, National Agency of Natural Resources, Technical Division, & Directorate of Renewable Energy. (2024). Preparation of the energy balance based on the processing of information according to the standards and regulations of the EU energy statistics: Energy Balance 2023., Pg. 24 http://www.akbn.gov.al/wp-content/uploads/2014/06/Bilanci-Komb%C3%ABtar-i-Energjis%C3%AB-2023.pdf

Crude oil and its derivative exports in 2023 amounted to 592.92 ktoe, representing an increase of 7.63 ktoe compared to 2022, mainly driven by bitumen demand.

Natural gas production in Albania for 2023 consisted entirely of associated gas, totaling around 48.49 million Nm³-a negligible amount, used solely for technological processes in the oil industry. It is evident that Albania's connection to the international gas network would significantly improve the national energy situation, shifting the current energy mix that heavily relies on oil by-products and electricity.

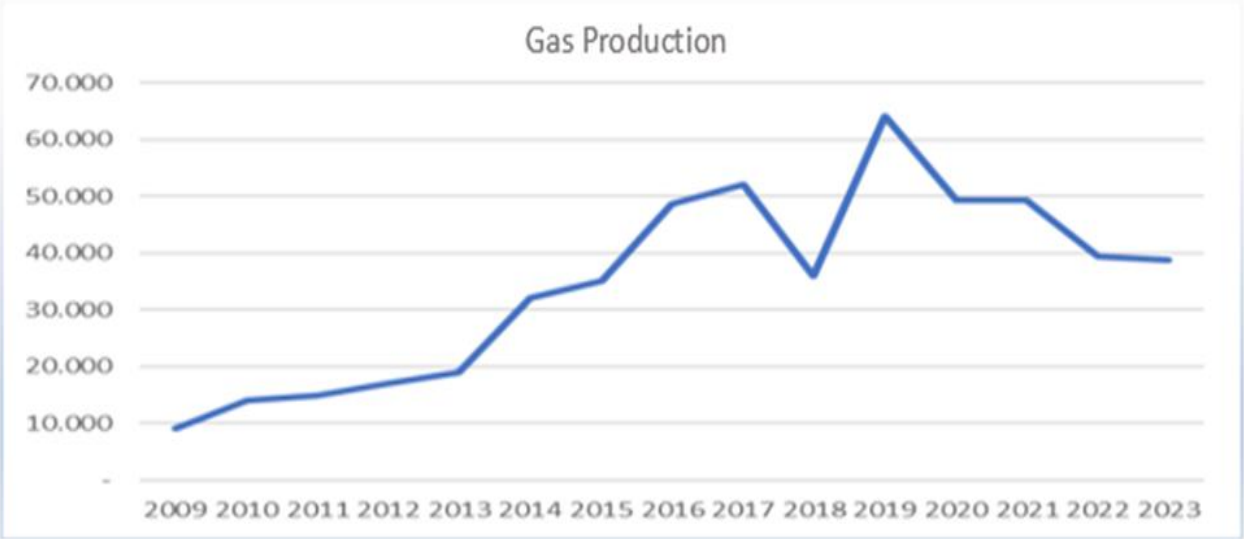

Figure 5. Graph. Natural Gas Production Over the Years (ktoe).[27]

During the period 2014–2024, Albania has demonstrated untapped potential in the field of hydrocarbon exploration, particularly in underutilized onshore blocks and the offshore segment, which remains virtually untouched.

According to data from the National Agency of Natural Resources (AKBN), several bidding rounds for exploration areas were announced during this period, including the onshore blocks 'C', 'Panaja', 'Velça', and 'Dumre'.

It is important to highlight that Albania holds several areas with significant unexplored potential, such as the blocks near Dumre and Maliq, as well as the offshore segment in the Ionian Sea. Historical geological studies suggest the presence of possible structures with hydrocarbon-bearing deposits. Developing these potentials requires fundamental reform in licensing policies, digitization of existing data, and offering attractive packages for international investors.

AKBN has initiated a data digitization process in cooperation with international donors, which is expected to provide easier access for investors and researchers. Alongside the creation of an open application and contract disclosure platform, this development could yield its first results by the end of the decade.

[27] Ministria e Infrastrukturës dhe Energjisë, Agjencia Kombëtare e Burimeve Natyrore, Divizioni Teknik, & Drejtoria e Energjisë së Rinovueshme. (2024). *Hartimi i bilancit energjetik bazuar në përpunimin e informacionit sipas standardeve dhe rregulloreve të statistikës së energjisë të BE-së: Bilanci energjetik 2023.Pg. 24.* http://www.akbn.gov.al/wp-content/uploads/2014/06/Bilanci-Komb%C3%ABtar-i-Energjis%C3%AB-2023.pdf

In conclusion, exploration and prospecting in Albania hold potential for growth, but require structural reform, increased transparency, and alignment with international best practices in order to attract the necessary capital and expertise for development.

2.4 The TAP Project (Trans Adriatic Pipeline)

Albania will secure a key connection and will have a concrete institutional role in fulfilling the energy nodes that connect Italy, Central Europe, and the Balkan states. The vision of the Albanian government is to promote economic development, serving as a transit corridor for electricity, natural gas, and oil in all its forms, to pass to most of Europe through the sea and via the onshore oil pipeline. Its geographical location places Albania in the position of sharing the newly acquired energy resources with those of its neighbors in Southeastern Europe through the development of energy circulation networks to strengthen the regional energy security of neighboring countries, as well as its own security.

The TAP pipeline will be functional in a few years, which makes essential the strengthening of the potential for oil and gas exploration and production in Albania and offshore, the drafting of an integrated strategic plan for the entire economic subsector of oil and gas. Under these conditions, naturally, a national strategy for the oil and gas sector includes:

a) The creation of a basic standard that appropriately defines the current position of Albania in the development of the oil and gas sector in the region;
b) The determination of a set of development objectives that must be achieved by 2030;
c) The creation of detailed plans for the implementation of each component of the strategic plan;
d) Policies and institutions capable of the elements of technical, legal, regulatory, and compliance administration required to efficiently administer and manage the economic development of the national oil resources. Most of these elements have already been realized, but it is necessary to organize and put them in the form of a plan.

So far, there have been clear steps in this direction within the hydrocarbon sector in Albania, since as far as the gas sector is concerned, the master plan for the development of gasification in Albania has been approved (approved by DCM No. 84, dated 14.2.2018), which in the coming period must be harmonized and integrated with the oil sector as well. [28]

By the end of 2023, TAP has finalized the concepts for the implementation of the Within-Day product in TAP, after coordination with the Regulatory Authorities, as a flexibility tool offered to shippers and neighboring TSOs in Greece, Italy, and Bulgaria. In the Annual Operation for 2024, TAP will inform ERE about the status of the implementation of the new product. Thus, by the end of 2023, TAP has transported a total of 29.37 bcma from the Greek-Turkish border at Kipoi, of which 25.9 bcma were transported to Italy through Albania and approximately 2.87 bcma were delivered to Greece and 1.73 bcma to Bulgaria, as shown below:

[28] Council of Ministers. (2018). *Decision No. 480, dated 31.07.2018; On the approval of the National Energy Strategy for the period 2018–2030 – Albania 2030*. Ministry of Infrastructure and Energy. Retrieved from https://www.infrastruktura.gov.al/wp-content/uploads/2024/09/vendim-2018-07-31-480.pdf, page 33

From COD (15/11/2020) to 31 December 2023	Total KWh	Total Nm³	Total BCMA
TAP Entry Point (Kipoi)	344,746,893,269	29,372,582,610	29.37
TAP Exit Point (Nea Mesimvria – Greece)	33,651,439,365	2,868,977,401	2.87
TAP Exit Point (Komotini – IGB)	20,294,983,310	1,730,946,066	1.73
TAP Exit Point (Melendugno – Italy) via transit through Albania	287,673,713,593	24,540,814,317	25.90

Figure 6. Expansion of TAP Project Capacity.[29]

Depending on the level of expansion for which offers were accepted by 22 January 2023, the expansion capacity may become available as follow:

1. Level 1 – Minimum Expansion Project: 39.8 MSm³/day (387 GWh/day) – December 2025
2. Level 2 – TAP Limited Expansion Project: 45.3 MSm³/day (440 GWh/day) – December 2026
3. Level 3 – Partial Expansion Project: 52.7 MSm³/day (512 GWh/day) – December 2027
4. Level 4 – Full Expansion Project: 62.6 MSm³/day (608 GWh/day) – December 2027.

2.5 Rafineries

In 2023, the refineries operated periodically, processing approximately 172.04 ktoe, mainly in two refineries, Fier and Elbasan, with a technological loss of 0.6%. The crude oil refining sector continues to face serious difficulties due to economic problems of the company managing this sector. It is worth noting that our refineries face significant issues in environmental pollution control due to the lack of investment in this sector, as the technology used is outdated and worn out;

- In 2022 – the refineries operated periodically, processing approximately 116.54 ktoe, mainly in the Fier and Elbasan refineries, with a technological loss of 0.6%.
- In 2021 – the refineries operated periodically, processing approximately 164.59 ktoe, mainly in the Fier and Elbasan refineries, with a technological loss of 0.4%.
- In 2020 – the refineries operated periodically, processing approximately 134.37 ktoe, of which 85% was processed by the Ballsh refinery, with a technological loss of 0.4%.
- In 2018 – the refineries operated periodically, processing approximately 335.27 ktoe, of which 85% was processed by the Ballsh refinery, with a technological loss of 0.4%.

[29] Trans Adriatic Pipeline. https://www.tap-ag.com/infrastructure-operation/tap-route-and-infrastructure

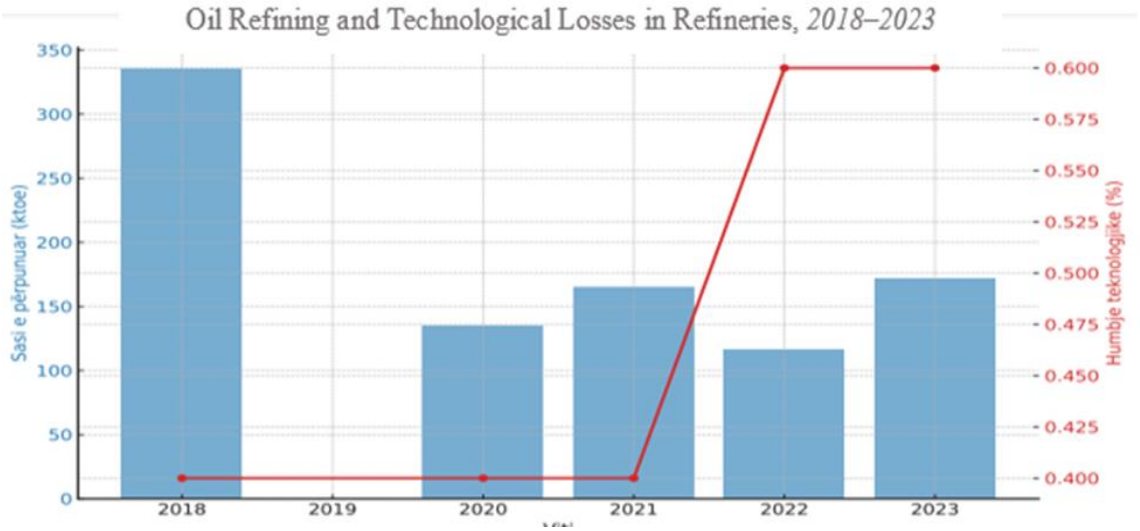

Figure 7. Graph: Annual quantity of processed oil in ktoe (blue bars) and corresponding technological loss in percentage (red line).[30]

3. ECONOMIC ASSESSMENT

3.1 Investment Climate

A. TRENDS IN EXPENDITURE ON MATERIALS AND SUPPLIES IN THE OIL SECTOR (2014–2023)

Expenditures for materials and supplies constitute an important component of operating costs in the oil sector, reflecting the level of economic activity and the pace of operations. During the period 2014–2017, these expenditures remained relatively stable, ranging from ALL 19,677 million in 2014 to ALL 18,159 million in 2017. The year 2015 recorded the highest level within this period, at ALL 21,179 million, aligning with a year of high investment activity.

In 2018 and 2019, a moderate decline is observed, with expenditures amounting to ALL 14,502 million and ALL 14,403 million, respectively, indicating a shift toward restructuring and more cautious cost management. In 2020, as a result of the impact of the COVID-19 pandemic, expenditures further decreased to ALL 13,167 million, and dropped even further in 2021 to ALL 12,231 million – the lowest level of the decade. A notable recovery occurred in 2022, reaching ALL 26,775 million, while in 2023, expenditures declined again to ALL 18,978 million, reflecting a post-pandemic stabilization and a return to a more moderate pace of operations.

[30] Graph. Annual amount of processed oil in ktoe (blue bars) and corresponding technological losses in percentage (red line), based on data published by EITI over the years and INSTAT.

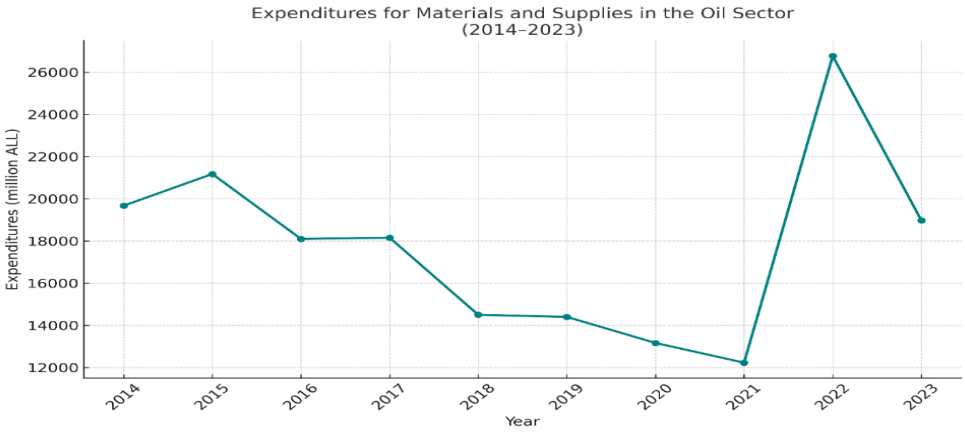

Figure 8. Expenditures on materials and supplies in the oil sector (2014–2023), based on data from INSTAT.

B. ANALYSIS OF TOTAL EXPENDITURES IN THE OIL SECTOR (2014–2023)

During the period 2014–2023, total expenditures in the oil sector reflected the pace of economic activity and the operational intensity of the industry, encompassing costs related to materials and supplies, maintenance, administration, wages, and other supporting services. The highest expenditure was recorded in 2015, reaching ALL 50,721 million, following a significant increase compared to 2014 (ALL 45,315 million). Between 2016 and 2018, spending remained relatively stable, ranging from ALL 32,270 to 38,964 million. The impact of the COVID-19 pandemic was clearly reflected in 2020 and 2021, when expenditures dropped to the lowest levels of the decade (ALL 26,672 and 27,078 million, respectively), due to restrictions on field operations and increased operational uncertainties. A notable recovery occurred in 2022 with ALL 43,712 million, followed by a decline to ALL 31,892 million in 2023. These developments reflect the transition to a new phase of more prudent expenditure management, driven not only by the need for efficiency, but also by the imperative to navigate a changing market and economic reality, where global uncertainties, such as those triggered by the pandemic, remain key influencing factors.

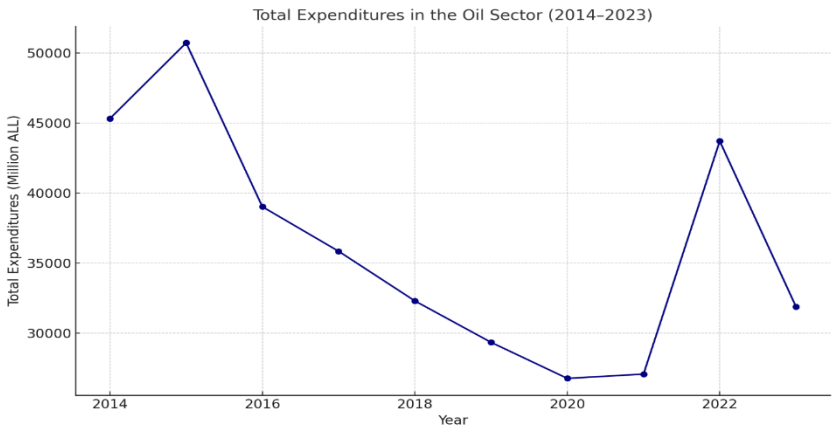

Figure 9. Expenditures for materials and supplies in the oil sector (2014–2023), according to data from INSTAT.

C. ANALYSIS OF TOTAL INVESTMENTS IN THE OIL SECTOR (2014–2023)

During the period 2014–2023, investments in the oil sector have reflected both the dynamism and challenges of the past decade. They began at a high level in 2014 (35,676 million ALL) and, after moderate fluctuations, experienced a revival in 2017 (29,103 million ALL). From 2018 onwards, investments declined steadily, reaching a low point in 2021 with just 1,413 million ALL – a direct reflection of international uncertainties, the oil price crisis, and the impacts of the global pandemic.
However, the last two years show signs of cautious recovery, with investments reaching 2,845 million ALL in 2023. This trend suggests continued potential for rebound, provided it is supported by clearer policies, stable incentives, and a reliable investment climate.

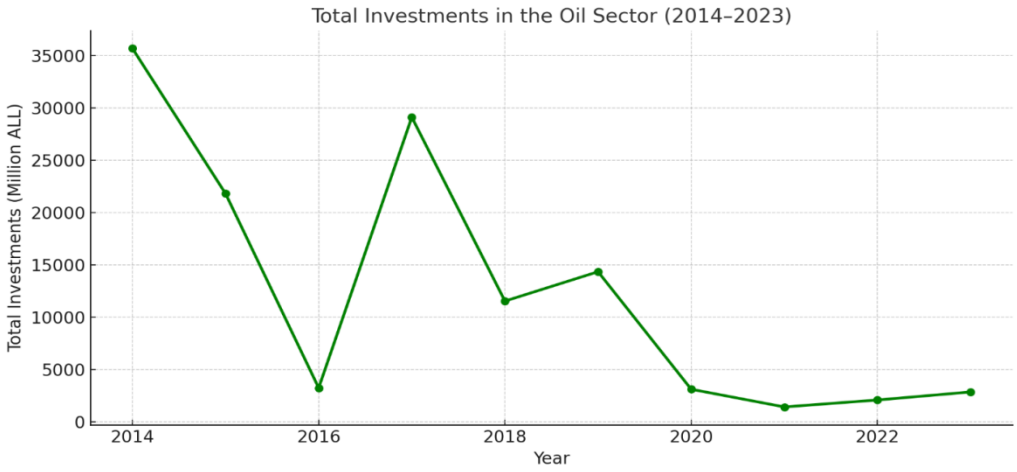

Figure 10. Total Investment Expenditures in the Oil Sector (2014–2023) according to data from INSTAT.

Following the above theoretical treatment, the presentation of data in tabular and graphical form for the three previously addressed sections aims to provide an empirical grounding for the analysis. This method of presentation serves to illustrate more clearly and in a structured manner the trends of economic indicators in the oil sector during the period 2014–2023, thereby facilitating the interpretation of the analysis.

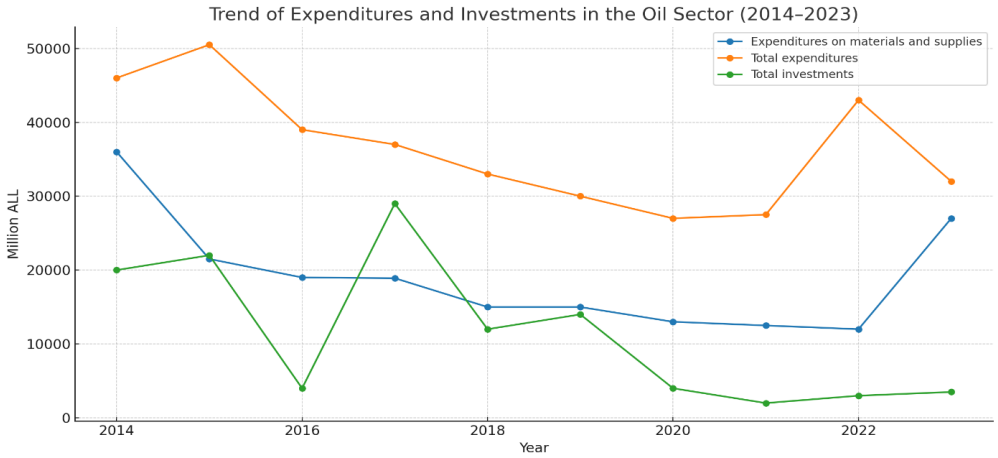

Figure 11. Trends in Expenditures and Investments in the Oil Sector in Albania According to INSTAT Data (2014-2024).

Year	Expenditures on Materials and Supplies (million ALL)	Total Expenditures (million ALL)	Total Investments (million ALL)
2023	18,978	31,892	2,845
2022	26,775	43,712	2,077
2021	12,231	27,078	1,413
2020	13,167	26,672	3,103
2019	14,403	29,437	14,336
2018	14,502	32,270	11,529
2017	18,159	35,820	29,103
2016	18,100	38,964	3,235
2015	21,179	50,721	21,800
2014	19,677	45,315	35,676

Table 16. Values of expenditures and investments made by companies in the oil sector in Albania, according to INSTAT data (2014-2024).

3.2 Analytical Overview of the Economic Impact of Key Activities in the (Oil and Extractive Industry) (2014–2024)

According to accounting data provided by INSTAT, the extractive industry exhibits a high level of volatility over the years, reflecting its sensitivity to external factors and global economic cycles. The peak of its positive contribution was recorded in 2014, with a value of +0.68%, while the following year, 2015, saw a significant negative deviation of -0.91%. This drastic shift of 1.59 percentage points had direct consequences on public sector balances and fiscal revenues linked to the industry.

In 2020, the sector's negative impact (-0.62%) coincides with the global economic crisis caused by the COVID-19 pandemic, highlighting the cyclical and highly exposed nature of the industry to international shocks. For the period 2022–2024, a stable regressive trend is observed, with respective values of -0.09%, -0.31%, and -0.39%, signaling a structural slowdown in extractive activity and a diminished capacity to generate sustainable gross value added. From an accounting standpoint, this situation suggests a declining rate of return on investment, rapid depreciation of physical capital, and reduced efficiency in the use of natural resources. This scenario opens space for targeted fiscal, structural, and incentive policy interventions within the sector.

In contrast, the manufacturing industry demonstrates a high level of operational and financial stability throughout the decade under review. From 2014 to 2019, this sector consistently contributed positively, fluctuating between +0.28% and +0.62%, representing a stable fiscal base and a reliable source of national value added. This consistency reflects well-managed production capacities and clearly defined production cycles, capable of absorbing macroeconomic factors with relative efficiency.

The decline registered in 2020, with an impact of -0.25%, reflects the systemic shock of the pandemic, which caused disruptions in supply chains and a drop in overall demand. However, the recovery in 2021 and 2022 was both immediate and sustainable (+0.71% and +0.43%, respectively), demonstrating structural resilience and a strong recovery capacity-typical of sectors with diversified revenue streams. The declines in contribution in 2023 and 2024 do not indicate internal regression within the industry, but rather represent cyclical adjustments or temporary external factors.

The activity of Coke Production and Refined Petroleum Products shows a nearly neutral accounting contribution, with values ranging from -0.01% to +0.02%, and an annual average close to zero (≈0.00%). Despite operating within a sector with high economic potential, this activity has not managed to produce a measurable impact on the country's macroeconomic structure during the period analyzed. From an accounting perspective, this indicates a lack of multiplier effect, limited annual capital turnover, and possibly underutilization of existing capacities.

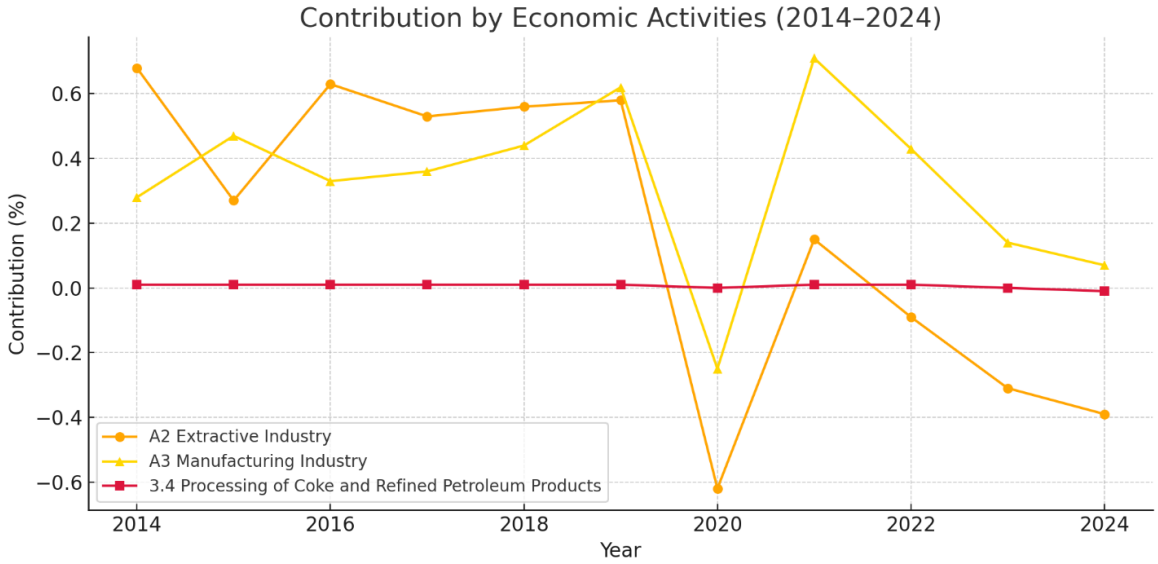

Figure 12. The Contribution of Oil and Its By-products to the National Economy (2014–2024), According to Data from INSTAT.

3.3 Contribution to GDP and Public Finances (2014–2024)

3.3.1 Contribution to GDP (2014-2024)

The year 2014 marks the peak of the decade, with the extractive industry contributing 3.99% to GDP – a high level that coincides with the global commodity price boom and significant revenues from major concessionaires in the hydrocarbons sector. However, in 2015, a sharp decline to 2.63% begins, influenced by the global drop in oil prices and reduced production intensity.

The period 2016–2019 is characterized by relative stabilization, with the industry's contribution ranging between 1.9–2.1% of GDP. These figures indicate a maturing sector, with lower production cycles and a more cautious capital allocation approach. It is also important to note that during this period, environmental and fiscal controls on natural resource exploitation were strengthened.

During the COVID-19 pandemic, there was a noticeable contraction in extractive activities due to disruptions in supply chains, the temporary shutdown of certain operations, and uncertainty in international markets. This is reflected in the industry's lowest contribution to GDP in the decade: 1.53% in 2020 and 1.49% in 2021.

While 2022 shows a slight stabilization at 1.50%, the following years indicate a continuous decline, reaching 1.27% in 2023 and a projected 1.10% in 2024. This trend highlights the gradual fading of the sector's role in the structure of the national economy.

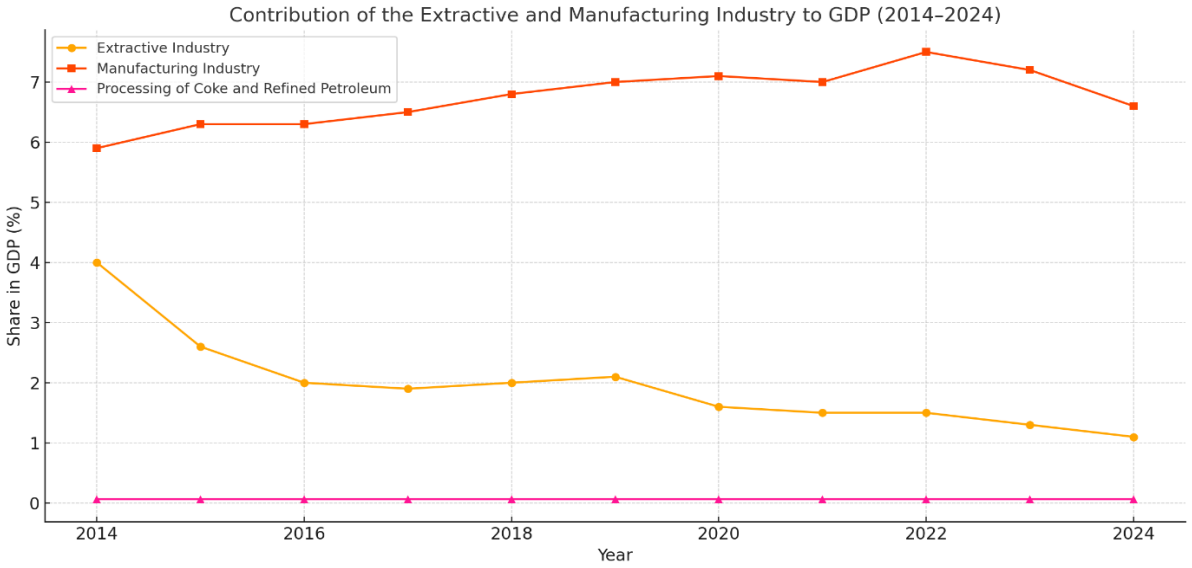

Figure 13. Contribution of the extractive and processing industry (oil) to GDP (2014–2024), based on data from INSTAT (in percentage terms).

Year	Extractive Industry (%)	Manufacturing Industry (%)	Refining of Coke and Refined Petroleum Products (%)
2014	3.99	5.91	0.00
2015	2.63	6.28	0.02
2016	1.98	6.30	0.02
2017	1.93	6.52	0.02
2018	2.01	6.71	0.02
2019	2.12	6.97	0.02
2020	1.53	7.07	0.03
2021	1.49	6.92	0.03
2022	1.50	7.50	0.03
2023	1.27	7.20	0.04
2024	1.10	6.51	0.03

Table 17. Contribution of the extractive and processing industry (oil) to GDP (2014–2024), based on data from INSTAT (in percentage terms).

3.3.2 Public Finances

Based on Decision No. 55, dated 04.01.2023, of the General Assembly of the company "Albpetrol" SH.A, "On the approval of the Economic Development Program of the company "Albpetrol" SH.A for the year 2023", the budget and financial plan are as follows:

No	Key Indicators	Unit	Program
1	Total Oil Production	ton	117,023
2	Total Gas Production	000/Nm³	2,932
3	Total Revenues	000/ALL	8,263,820
4	Total Expenditures	000/ALL	7,240,126
5	Average Number of Employees	Number	1,790
6	Average Salary per Employee	ALL/month	57,317
7	Wage Fund	000/ALL	1,231,160
8	**Total Investments**	**000/ALL**	**997,470**

Table 18. The Economic Development Program of "Albpetrol" SH.A for the year 2023.[31]

Based on Decision No. 2155/1, dated 08.03.2024, of the General Assembly of the company "Albpetrol" SH.A, "On the approval of the Economic Development Program of the company "Albpetrol" SH.A for the year 2024", the budget and financial plan are as follows:

No	Key Indicators	Unit	Program
1	Total Oil Production	ton	112,307.0
2	Total Gas Production	000/Nm³	2,383.0
3	Total Revenues	000/ALL	6,838,521.0
4	Total Expenditures	000/ALL	6,664,751.0
5	Average Number of Employees	Number	1,532.0
6	Average Salary per Employee	ALL/month	90,635.0
7	Wage Fund	000/ALL	1,666,329.0
8	**Total Investments**	**000/ALL**	**755,543.0**

Table 19. The Economic Development Program of "Albpetrol" SH.A for the year 2024.[32]

Based on the Economic Development Program of the company "Albpetrol" JSC for the year 2022, the implementation of revenues and expenditures is presented in the table below:

NO	REVENUES	000/ALL
1	Revenues from exploitation activity (a + b + c + d)	6,955,072
a	From oil sales	4,975,673
b	From gas sales	4,659
a	From electricity sales	1,970,602

[31] Albpetrol SH.A. The budget and expenditure plan for the upcoming financial year and previous years (by year) https://www.albpetrol.al/buxheti-plani-i-shpenzimeve-per-vitin-financiar-ne-vijim-dhe-vitet-e-kaluara-sipas-viteve/

[32] Albpetrol SH.A. Annual report on budget implementation and annexes (by year). https://albpetrol.al/raport-vjetor-per-zbatimin-e-buxhetit-dhe-anekset-sipas-viteve/

b	Other services	4,138
2	Investments	33,134
3	Other exploitation-related income	76,966
4	Interest income	6,155
I	**TOTAL REVENUES (1+2+3+4)**	**7,071,327**
II	**Change in inventory of products and work in progress**	**1,415,027**
	EXPENDITURES	
1	Raw materials	2,385,481
2	Personnel	1,532,255
3	Depreciation	402,196
4	Other exploitation-related expenditures	3,676,690
	Internal Management Report – Albpetrol sha 2022	
5	Interest expenses	3,661
III	**TOTAL EXPENDITURES (1+2+3+4+5)**	**8,000,283**
IV	**Profit before tax (I+II-III)**	**486,071**
V	**Income tax**	**469,880**
	NET PROFIT (IV-V)	**16,191**

Table 20. Economic Development Program of the company "Albpetrol" JSC for the year 2022 – Implementation of revenues and expenditures.[33]

Revenue performance depends not only on production levels but also on the international price of oil, fluctuations in reported expenditures by companies, and the pace of revenue collection by the relevant fiscal authorities.

Another important aspect is the distribution of the mining royalty to municipalities where hydrocarbon activities take place. In accordance with current legislation, a percentage of this royalty (usually 5%) is transferred to local government units. In practice, municipalities such as Fier, Kuçovë, and Vlorë have received significant amounts, which have been used for investments in infrastructure and public services. However, EITI reports and audit findings have raised concerns regarding the transparency and efficiency of the spending of these funds.

Moreover, there is a noticeable gap between the companies' contributions to the state budget and the perceived benefits by local communities. This has increased pressure on public institutions to disclose more detailed data on payments and the use of these funds.

In conclusion, although the sector's share in GDP has decreased compared to the past, it remains an important source of revenue for the state and producing areas. Increasing transparency, strengthening fiscal oversight, and ensuring the effective use of royalties will be key to maximizing economic benefits in the future.

Based on the Economic Development Program of the company "Albpetrol" SH.A for the respective year, the sponsorship fund made available has been executed according to the data in the table below:

[33] Albpetrol SH.A. Raport vjetor për zbatimin e buxhetit dhe anekset (sipas viteve). https://albpetrol.al/raport-vjetor-per-zbatimin-e-buxhetit-dhe-anekset-sipas-viteve/

No	YEAR	Sponsored amount (ALL)
1	2019	960,000
2	2020	10,000,000
3	2021	–
4	2022	399,000
5	2023	–
5	2024	–

Table 21. Donations, sponsorships (by year).[34]

The main investment is in crude oil exploration and production (€1,020 million), which represents approximately 70% of the sector's total. The construction of new refineries ranks second in importance, accounting for €350 million (~24% of total investments). Meanwhile, the rehabilitation of existing refineries (€59 million) and the improvement of byproduct infrastructure (€24 million) make up a very small portion of the total (~6% combined), indicating a stronger focus on expansion rather than the maintenance of existing infrastructure. Donor funding amounts to €530 million, which represents a significant share of the sector's resources. In comparison to domestic investments (€1,453 million), donors contribute around 27% of the total. When donor contributions are included, the total funding for the sector reaches €1,983 million. This indicates that the oil sector enjoys substantial financial support not only from domestic sources but also from international donors.

This table represents the distribution of funds in Albania's oil sector, including investments in exploration, production, refining, and donor assistance.

ACTIVITIES IN THE OIL SECTOR	Amount (EUR million)
Exploration and production of crude oil	1,012
Rehabilitation of refineries in Ballsh and Fier	59
Improvements in the infrastructure of oil by-products	24
Construction of new refineries	350
Total – Exploration, production, processing, refining, and distribution	1,453
DONORS	530

Figure 14. Total cumulative investment demand in oil sector activities, 2018–2030.[35]

3.4 The relative weight of the oil sector in the creation of gross value added in Albania's economy

The structure of gross value added (GVA) in the Albanian economy over the period 2014–2024 clearly shows a continuous decline in the contribution of the extractive industry, which once represented a significant component of economic activity. In 2014, the extractive industry accounted for about 4.66% of total GVA, marking one of the highest levels of the decade. However, in the following years, its share declined considerably, reaching 1.28% in 2024. This decline has been steady and ongoing, indicating not merely a cyclical fluctuation but a structural trend toward the weakening of the sector's role in the

[34] Albpetrol SH.A. Donations, sponsorships (by year). https://albpetrol.al/donacione-sponsorizime-sipas-viteve/#
[35] Council of Ministers. (2018). *Decision No. 480, dated 31.07.2018; On the approval of the National Energy Strategy for the period 2018–2030 – Albania 2030*. Ministry of Infrastructure and Energy. Retrieved from https://www.infrastruktura.gov.al/wp-content/uploads/2024/09/vendim-2018-07-31-480.pdf, Page 54.

economy. From an accounting and economic perspective, this means that the extractive industry has gradually lost its influence in the creation of net added value, as a result of a range of interrelated factors.

First, the decline in GVA contribution clearly reflects a decrease in gross production volume in this industry, which may result from the depletion of exploitable reserves, lack of investment in new geological exploration, and the inability to absorb modern technologies that increase productivity and efficiency. Furthermore, the reduction of fixed capital, depreciation of production assets, and the absence of technological revitalization directly affect the decrease in the inputs that this sector contributes to the calculation of gross value added. On the other hand, this reduction also suggests a shift in economic and fiscal priorities toward more sustainable and environmentally friendly sectors, such as renewable energy and clean technology. Consequently, the extractive industry has also lost its position as a major contributor to state budget revenues, particularly in terms of profit taxes and indirect taxation.

Unlike the extractive industry, the manufacturing industry has experienced steady and progressive development during this period. From 6.89% in 2014, its share in the creation of GVA gradually increased, peaking at 8.70% in 2022, and then slightly declining to 7.52% in 2024. This trend reflects a structural transformation of the Albanian economy—from a resource-based economy toward a more industrial one, supported by value added generated through the transformation of raw materials. The rise in the manufacturing sector's share of GVA aligns with the growth of technical and technological capacities in the industry, improved human resource management, and increased competitiveness of domestic production in foreign markets. This growth also implies greater operational efficiency, better cost control, and potentially an expansion of processed goods exports.

Within the manufacturing industry, the sub-sector of coke and refined petroleum products presents a modest but slowly increasing contribution. In 2014, this sub-sector showed no measurable share in GVA creation (0.00%), while in the following years, it reached a symbolic contribution of 0.03%–0.05%. Although seemingly small, these percentages indicate a revival of refining activity, which may be the result of reactivating some industrial capacities or efforts to process a larger portion of crude oil domestically. This trend has positive implications for the trade balance and revenues from excise and VAT, provided it is supported by favorable fiscal policies and technological investments.

In summary, the relative weight of the extractive industry sector in the creation of gross value added in Albania has significantly declined over the past decade, reflecting a structural transformation of the Albanian economy. This transformation is characterized by a shift in focus from raw resource-based sectors toward processing and manufacturing sectors with higher added value. This shift aligns with global trends in sustainable development and economies based on technology and innovation. However, it also requires careful attention to ensure that the transition does not have negative consequences for areas traditionally dependent on the extractive industry. To maximize the benefits of this dynamic, economic policy should focus on promoting local processing, industrial diversification, and the creation of integrated value chains that incorporate modern technology and a skilled workforce.

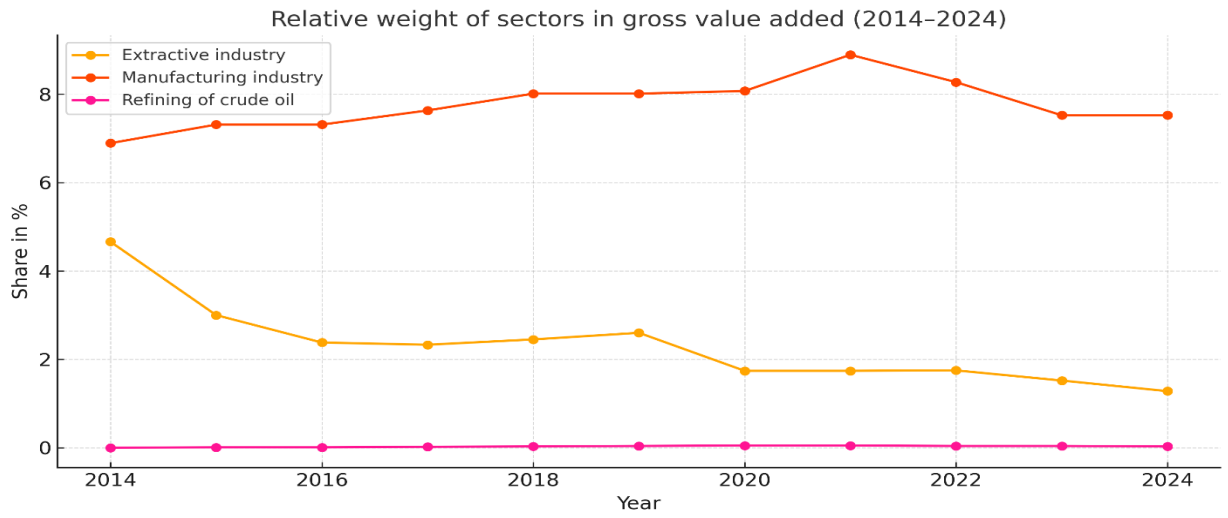

Figure 15. Graph. Relative weight of the oil sector in gross value added (2014–2024) according to data from INSTAT.

Year	Extractive Industry (%)	Manufacturing Industry (%)	Refining of Petroleum Products (%)
2014	4.66	6.89	0.00
2015	3.05	7.29	0.03
2016	2.29	7.29	0.03
2017	2.25	7.61	0.03
2018	2.34	7.79	0.03
2019	2.45	8.05	0.03
2020	1.74	8.03	0.03
2021	1.75	8.09	0.03
2022	1.73	8.70	0.03
2023	1.46	8.27	0.05
2024	1.28	7.52	0.04

Table 22. The Relative Weight of the Oil Sector in Gross Value Added (2014–2024) According to Data from INSTAT.

4. ENVIRONMENTAL AND SOCIAL ASSESSMENT

4.1 REGULATORY AND POLICY ASSESSMENT

4.1.1 Analysis of the Legal and Regulatory Framework for the Oil Sector in Albania

Albania's oil sector is governed by a comprehensive legal and sub-legal framework that regulates all phases of the hydrocarbon lifecycle—from exploration and discovery to production, processing, transportation, and marketing. This legal framework not only defines the rights and obligations of

economic operators in the sector, but also aims to ensure the sustainable development of the industry by guaranteeing worker safety, environmental protection, and the efficient use of natural resources. The framework includes the following laws and key regulations::

Law No. 7746, dated 28.07.1993, "On Hydrocarbons" (Exploration and Production), as amended.

Law No. 7746, dated 28.07.1993, "On Hydrocarbons" (Exploration and Production), as amended, governs hydrocarbon activities in the Republic of Albania. This law provides a framework for the management of natural hydrocarbon resources, based on the principle that these resources are the exclusive property of the Albanian state and must be exploited in the interest of the people, as provided in Article 3 of the law. The law is structured to address property rights, authorizations, contractual arrangements, and the administrative aspects of hydrocarbon operations, delineating the role of the state through the relevant Ministry, Albpetrol, the National Agency of Natural Resources (AKBN), and the Hydrocarbons Scientific Institute.

The law reflects a clear balance between sustainable development, the safeguarding of national interests, and the establishment of a structured public–private partnership. Its fundamental definitions point to a model of controlled natural resource management, where economic development is harmonized with environmental protection and the rational use of public wealth. By involving private actors as contractors and designating "Albpetrol" as a dual-function entity, the law reinforces the principle of structured and controlled public-private partnerships. In this framework, the state retains a key role in overseeing and directing hydrocarbon operations, particularly during the critical phases of exploration, development, and production. The law establishes a robust framework of technical, environmental, and economic guarantees that apply across the entire lifecycle of hydrocarbon operations, from exploration to production and well closure, reflecting a comprehensive approach to safety and sustainability in the sector.

This law strengthens the position of the state as the sole authority entitled to exercise the right to explore, develop, and produce hydrocarbons through the mechanism of Hydrocarbon Agreements, which are contractual in nature and contain specific provisions regarding the rights, obligations, and guarantees of the contractors. Particularly important is the inclusion of fiscal stability clauses (*which may not exceed a term of 12 years from the commencement date of production*), aimed at preserving predictability in the fiscal environment for investors. However, these clauses are subject to limitations and do not extend to legislation concerning national security, the environment, or public health. This legal position ensures a balance between investor interests and the state's sovereign rights over natural resources.

The law establishes clear standards for hydrocarbon operations, which must be conducted in accordance with "*international best standards and practices*" as well as national environmental protection legislation. The provisions require that each contractor submit a Development Plan (*a plan for the development and production of hydrocarbons discovered within a contract area*) and a Discovery Appraisal Plan (*a plan for determining the parameters of the discovered hydrocarbons and the reservoir*), both of which are subject to approval by the competent ministry (the Ministry of Infrastructure and Energy).

The amended law provides that the Ministry of Energy (*either directly or through authorization of Albpetrol*) may enter into Hydrocarbon Agreements with legal entities that possess the financial and technical capacity to explore, develop, and produce hydrocarbons in Albania. These agreements are concluded through open and transparent procedures, whereby the Ministry may either invite interested parties to apply or accept unsolicited proposals for specific blocks. The agreements grant the contractor exclusive rights to conduct exploration within the designated area for a period of up to 5 years (extendable to 7 years), and to develop and produce for up to 25 years, with the possibility of renewal for an additional 5 years. Furthermore, the contractor is authorized to construct and operate pipelines in

accordance with national regulations and international treaties. The agreement guarantees the contractor ownership of the produced hydrocarbons and the right to sell or export them, except in emergency situations where the supply of the domestic market is prioritized. The Ministry may refuse to conclude an agreement on grounds of national security. This framework aims to ensure a transparent, controlled, and efficient process for the management of the country's hydrocarbon resources.

Regarding the role of public institutions, the law clearly defines functional divisions. The Ministry plays a key role in concluding agreements and overseeing sectoral policies, while the National Agency for Natural Resources (AKBN) is responsible for implementing government policy in the field of hydrocarbons. It participates in the negotiation of hydrocarbon agreements with both domestic and foreign entities, supervises hydrocarbon activities, monitors the implementation of signed agreements, and prepares the necessary documentation and procedures for the issuance of permits, licenses, and authorizations. The National Agency also cooperates with the Hydrocarbons Scientific Institute on all scientific matters related to hydrocarbons, including research, evaluations, consulting, and technical assistance. The Institute, established by decision of the Council of Ministers upon proposal of the relevant Minister, operates as a public entity under the authority of the Ministry and provides advisory support on scientific issues in the hydrocarbon sector. This institute does not constitute a new creation by the legislature, but rather an institutional reorganization of a pre-existing structure, taking into account the functions of the former National Scientific Center of Hydrocarbons, which was dissolved in 2006 and later reinstated and institutionalized through the 2017 amendments to the hydrocarbon legislation. Law no. 6/2017 "On Hydrocarbons (exploration and production)" provided for the re-establishment of the Scientific Hydrocarbon Institute as a state entity conducting studies, analyses, consultancy, and monitoring for state institutions, covering the entire cycle of activities from exploration to production, processing, and marketing of hydrocarbons. It also develops and applies knowledge in fields such as geology, geophysics, and oil extraction technology, cooperating with universities for professional qualification. The institute manages technical and scientific data according to international standards, guaranteeing state ownership over strategic information in this sector.

Article 13/3, added by law no. 6/2017, establishes that revenues from hydrocarbon agreements, in addition to mineral rent and fiscal obligations, are distributed by the minister in favor of the institutions specified in Articles 13/1 (Scientific Hydrocarbon Institute) and 13/2 (State Hydrocarbon Agency), after verification of their financial needs. For this purpose, the State Hydrocarbon Agency submits to the minister, within the first month of the year, a plan for expected revenues from hydrocarbon agreements. This provision reinforces the principle of sustainable and transparent management of public financial resources deriving from hydrocarbon activities.

An important feature of the law is the special status of the company "Albpetrol" sh.a., which benefits from a specific hydrocarbon agreement—the "Albpetrol Agreement"—that guarantees the right to develop, produce, and market hydrocarbons on behalf of the state in areas where no agreements have been concluded with third parties, while also acting as a contractor with exclusive rights to operate in areas not assigned to other agreements, thus positioning it uniquely within the market.

4.1.2 Analysis of the Fiscal Legal Framework of the Oil Sector in Albania

Law No. 153/2020 "On the Fiscal Regime in the Hydrocarbon Sector".

Law No. 153/2020 "On the Fiscal Regime in the Hydrocarbon Sector" aims to regulate the fiscal treatment of hydrocarbon operations, in accordance with the applicable legislation governing hydrocarbon exploration and production. This law applies to legal entities engaged in *onshore* hydrocarbon activities, whereas *offshore* operations are subject to a separate legal framework. It has introduced significant innovations in the taxation method of companies operating in the hydrocarbon sector by establishing a distinct fiscal regime for this industry, separate from that of standard commercial activities.

The law also extends its effects to subcontractors affiliated with the main contractor, in cases where one of the following conditions is met: when the subcontractor is considered a "related party" to the contractor, as defined by the applicable income tax legislation; when the subcontractor is an operator performing activities that are essential to hydrocarbon operations—specifically, when its invoicing accounts for at least 25% of the total operational expenditures; or when the primary purpose of the agreement with the subcontractor is to circumvent the tax rate established by this law and to benefit from a more favorable rate under the income tax law.

The law regulates obligations concerning corporate income tax and the mineral royalty applicable in this sector, and it also defines the impact of hydrocarbon agreements on both national and local tax obligations. It provides the fiscal legal framework applicable to the *onshore* hydrocarbon sector, addressing the mineral royalty, income tax on hydrocarbon operations, the application of the corporate income tax, special hydrocarbon operations, taxable profits and allowable losses, deductible and non-deductible expenses, distribution, allocation and accounting rules, fiscal stability, as well as relief from local and other taxes, and the avoidance of double benefits derived from hydrocarbon agreements.

The definition of mineral royalty is provided by the Law on Hydrocarbons. It is defined as a tax levied on minerals extracted from the surface and subsurface of the territory of the Republic of Albania, as well as on by-products derived from such minerals. Article 5 of the law establishes a clear legal framework designed to ensure that the state benefits from the exploitation of natural resources through the imposition of mineral royalties on hydrocarbons. This article stipulates that any holder of a hydrocarbon right is obliged to pay a royalty on the quantity of hydrocarbons extracted within the territory of the Republic of Albania. The royalty is calculated as a fixed percentage of 10% of the market value of oil and gas, thereby creating a direct link between the volume extracted and the state's economic benefit. The quantity of hydrocarbons is measured at the delivery point, ensuring objectivity and transparency in the calculation process.

Law No. 9957, dated 28 July 2008, "On National Taxes", as amended.

Moreover, a rule on the mineral royalty prior to the entry into force of Law No. 153/2020, "On the Fiscal Regime in the Hydrocarbon Sector" was also provided for by **Law No. 9957, dated 28 July 2008, "On National Taxes"**, **as amended.** The mineral royalty, as provided in Article 4 of the law, applies as a monthly obligation for entities conducting mining activities, and it is calculated at the moment when these entities carry out the sale of mineral products. Its payment deadline is until the 15th of the month following the realization of the sale. In the case of export, collection is carried out by customs branches, whereas for sales within the country, tax branches are responsible. A portion of 5% of the revenues from the royalty belongs to the local government in whose territory the mining activity is conducted, and these funds are used for investments at the local level. In cases where the mineral royalty is applied as a percentage, that royalty is calculated by multiplying the sales value of the product (excluding VAT) by the royalty percentage. When the mineral royalty is applied as a fixed amount per unit, the royalty amount is calculated by multiplying the quantities sold by the unit value of the mineral royalty.

Article 5 of Law No. 9957, dated 28 July 2008, "On National Taxes" envisages that the customs and tax authorities are charged with the collection of the mineral royalty. In Annex No. 2 of this law, the mineral royalty is determined according to the classification where oil and gas are part of Group VII, according to which the mineral royalty percentage is set at 10%.

Furthermore, we continue again with the legal analysis of Law No. 153/2020, "On the Fiscal Regime in the Hydrocarbon Sector", as a highly significant legal space in the hydrocarbon system in Albania. This law also envisages the obligation to pay the mineral royalty for hydrocarbons extracted during a calendar month by the holder of the hydrocarbon right by the 15th of the following month, accompanying this

payment with the submission of the tax declaration to the tax administration. The declaration must include information on the quantity of hydrocarbons, the market value according to the law, the amount of mineral royalty paid, as well as any other data required by the relevant instructions.

A person conducting hydrocarbon operations is subject to the profit tax provided in the current income tax legislation, while the taxable profits of a person from hydrocarbon operations are calculated and taxed according to the provisions of this law. Hydrocarbon operations are subject to profit tax according to the current income tax legislation, calculating taxable profits separately for hydrocarbon and non hydrocarbon operations to avoid overlap. The profit tax from hydrocarbon operations for a tax period is calculated by applying a tax rate of 50% on the taxable profit from those hydrocarbon operations for that period.

The taxable profits from hydrocarbon operations for a tax period consist of the total sum of profits of each special operation, excluding losses. Each hydrocarbon operation is treated as a standalone business, where the person must keep separate financial records and calculate profit, losses and tax liability separately for each period. To prevent tax avoidance, transfers of assets between operations are treated as sale purchase transactions. In cases where multiple persons are co holders of a hydrocarbon right, each calculates separately their taxable profits, treating transactions among them as related party transactions in order to ensure transparency and fiscal fairness.

Law No. 153/2020 also addresses special hydrocarbon operations. Any group of operations related to a specific hydrocarbon right is considered a special operation. In case a development and production area is approved within the contract area, operations carried out before and after approval within that area are considered part of the same special operation. However, operations carried out after the approval date outside that area are treated as a new and separate operation.

Article 9 of Law No. 153/2020 regulates the method of calculating taxable profit and the treatment of losses for special hydrocarbon operations. Taxable profit is calculated by deducting from income the period's expenses and carried forward losses, but this deduction cannot exceed 85% of the period's income. Priority in deduction is given to current period expenses before carried forward losses. Allowed losses are those exceeding the 85% threshold and may be carried forward indefinitely into the future until fully offset, but they cannot be used to reduce profits from other hydrocarbon or non hydrocarbon operations. Likewise, losses from non hydrocarbon operations cannot affect profits from hydrocarbon operations, preserving fiscal separation between activities.
Article 10 of Law No. 153/2020 defines the composition of income that a person derives from a special hydrocarbon operation during a tax period. Income includes the market value of the sold hydrocarbons, income from the use or sale of operational assets, insurance compensations and payments, any surplus from the rehabilitation fund, as well as any other income linked to the provision of services or information within the operation. However, some items are excluded from taxable income, such as interest and financial gains, as well as payments related to the transfer of hydrocarbon rights. This article aims to clarify the income base that will be used for the calculation of taxable profit.

Articles 11 and 12 of Law No. 153/2020 "On the Fiscal Regime in the Hydrocarbon Sector" define the legal framework for the tax treatment of expenses in special hydrocarbon operations. Article 11 details categories of expenses that may be deducted from taxable income, emphasizing the direct connection of those expenses with the operation, compliance with the hydrocarbon agreement, and adherence to international financial reporting standards (IFRS). Deductible expenses include those related to salaries, insurance, medical treatment of employees, transportation costs, materials and equipment, consultancy and administrative services, rehabilitation and well closure costs, and many others, including capital expenditures. Meanwhile, Article 12 excludes from deduction certain types of expenses that do not constitute allowable tax expenses, such as interest and financial costs, payments for hydrocarbon rights

(e.g., bonuses, profit sharing amounts), profit tax, and other expenses specified in the existing income tax legislation.

The transfer of hydrocarbon rights, whether partial or complete, produces tax consequences for the seller, both in hydrocarbon and non hydrocarbon operations. When the right is transferred together with the same interest in the corresponding operation, the acquirer proportionally inherits the losses, income, expenses and tax installments related to the operation.

Amounts paid from an approved rehabilitation fund of a special hydrocarbon operation to the person conducting the operation, to cover abandonment, rehabilitation and decommissioning expenses, are not income of the person. The law provides that approved rehabilitation funds are exempted from tax.

Article 17 of the law provides that hydrocarbon agreements, except in special cases, do not affect the application of fiscal laws, obliging the tax administration to apply the legal framework regardless of the content of the agreement. For agreements approved by a decision of the Council of Ministers and submitted by the Minister of Finance, fiscal rules are taken into account only for the parties involved in the agreement. If the agreement was concluded before the law's entry into force, its fiscal protections or exemptions apply. If it was concluded after the law's entry into force, only the fiscal stability clauses and local tax exemptions are taken into account.

Article 18 establishes the fiscal stability clause. Under hydrocarbon agreements entered into after the law's entry into force, the fiscal stability clause provides special protection for holders of hydrocarbon rights against adverse fiscal changes. This clause prohibits the imposition of new discriminatory taxes, fees or levies that did not exist at the time of the agreement's execution, as well as discriminatory changes to existing taxes. Furthermore, it protects against changes causing material damage through increases in mineral royalty, profit tax rate, withholding tax, or through alterations to the tax structure and methodology, including limitations on deductibility of expenses and losses. This protection is valid for twelve years from the commencement date of production under the hydrocarbon agreement. However, excluded from this clause are laws related to national security, environmental protection, public health, labor relations, and international treaties to which the Republic of Albania is a party. If the fiscal stability clause is extended through a subsequent agreement, it may remain in effect beyond the twelve year period.

Article 19 stipulates that local government units must implement the local tax/tariff relief provided by the hydrocarbon agreement.

Meanwhile, Article 20 addresses the principle of avoidance of double benefits from hydrocarbon agreements, clearly stating that a party to these agreements may not benefit simultaneously from specific protection or tax exemption guaranteed in the agreement and from subsequent fiscal relief introduced by legislation after the agreement's approval. This principle aims to prevent abuse and to ensure sustainability and fairness in the fiscal system.

The law places the obligation on entities conducting hydrocarbon operations to submit separately a tax declaration for those operations and another for non hydrocarbon activities. Profit reporting must be done individually for each special hydrocarbon operation, ensuring fiscal separation and transparency. This provision aims to enhance tax control and prevent unfair advantages through the intermingling of different business activities.

Instruction No. 6, dated 22.2.2022 "On the Fiscal Regime in the Hydrocarbon Sector".

In support of the implementation of Law No. 153/2020 "On the Fiscal Regime in the Hydrocarbon Sector", **Instruction No. 6, dated 22.2.2022, was adopted, which provides a clearer and more practical interpretation of the legal provisions.** This instruction assists entities and the tax administration in the proper implementation of fiscal rules related to income, expenses, declaration, and payment of taxes for hydrocarbon operations. It also aids in the separation of hydrocarbon and non hydrocarbon activities, the application of fiscal stability clauses, and the prevention of double benefits, thereby increasing transparency and legal certainty in this strategic sector

Law No. 92/2014 "On Value Added Tax in the Republic of Albania".

Likewise, Law No. 92/2014, which has as its objective the imposition and regulation of VAT as a general tax on the consumption of goods and services. This tax is proportional to the price of the goods or services and is applied at every stage of their production and distribution. VAT is implemented as a percentage tax on the price of goods and services and becomes payable after deducting the VAT that directly burdens the cost elements of goods and services.

In point 1, letter k, of Article 53 of the law, it is provided that the supply of services intended solely for the performance of the exploration phase of hydrocarbon operations, carried out by contractors or subcontractors, verified as such by the National Agency of Natural Resources, related to the realization of the exploration phase, as well as the supply of goods made by contractors to one another or by subcontractors to their contractors, imported according to the provisions of this law, are supplies exempt from Value Added Tax (VAT).

Joint Instruction No. 17, dated 12.6.2015, "On the determination of the list of goods and services used in the implementation of the exploration phase of hydrocarbon operations by hydrocarbon exploration companies, which are exempted from VAT payment, as well as the exemption procedures."

This instruction defines the list of goods and services used during the hydrocarbon exploration phase that are exempt from VAT payment in Albania. The exemption applies to goods and services used directly in exploration operations by contractors and subcontractors who have hydrocarbon agreements with Albanian authorities, as well as to the importation of these goods and services.

Supplies of goods and services used in the exploration phase of hydrocarbons by contracting companies and their subcontractors for new oil and gas fields are exempt from Value Added Tax (VAT). This exemption covers services such as geological and geophysical studies, onshore and offshore geophysical works, exploratory well drilling, and technical and technological projects supporting exploration operations. The import of goods and supplies between contractors and subcontractors for exploration purposes is also exempt from VAT.

The exemptions do not include services not directly related to exploration, such as internet, telephone, accommodation, various consulting services, or general construction works.

To benefit from this exemption, contractors and subcontractors must submit the relevant documentation to the National Agency of Natural Resources (AKBN), which verifies the supplies within 30 days and issues a certificate for VAT exemption. In the absence of this certificate, the supplies are considered taxable, and invoice corrections are required.

The tax administration, customs authorities, and AKBN are responsible for enforcing this instruction by controlling and verifying the exempt supplies and taking measures in case of violations. If the exempt goods are not used within the exploration period or are used for other purposes, they become subject to VAT.

4.1.3 Legal Framework with Environmental Impact in the Oil Sector in Albania

Law No. 10431, dated 09.06.2011 "On Environmental Protection", as amended.
Law No. 10431, dated June 9, 2011, "On Environmental Protection", most recently amended by Law No.66/2024, constitutes the primary legal framework for environmental protection in the Republic of Albania. This law has been fully harmonized with Directive 2004/35/EC of the European Parliament and of the Council dated April 21, 2004, "On environmental liability with regard to the prevention and remedying of environmental damage", as amended. The law aims to ensure a high level of environmental protection, focusing on human life and health, quality of life, and sustainable national development.

The purpose of this law is to protect and improve the environment in all its aspects, as well as to ensure a sustainable balance between the needs of current and future generations. Its scope consists of defining the principles, rules, responsibilities, and procedures that guarantee environmental protection. It serves as a framework law and forms the basis for the adoption of numerous subordinate acts regulating the technical aspects of administrative action in the environmental sector.

Article 4 of the law establishes its field of application, emphasizing that environmental protection is a national priority and a duty incumbent upon all citizens, state institutions, legal and natural persons, both domestic and foreign. This provision elevates environmental protection to a societal level, strengthening the legal basis for a comprehensive and inclusive approach to environmental matters.

Chapter II of Law No. 10431, dated 09.06.2011, as amended, sets out a series of environmental protection principles. The main principles established include: the Principle of Sustainable Development (Article 6); the Precautionary Principle and Preventive Measures (Article 7); the Principle of Conservation of Natural Resources (Article 8); the Principle of Substitution and/or Compensation (Article 9); the Integrated Approach Principle (Article 10); the Principle of Shared Responsibility and Cooperation (Article 11); the Polluter Pays Principle (Article 12); the Right to Information and Public Participation (Article 13); and finally, the Principle of Promotion of Environmental Protection Activities (Article 14).

Chapter III (Articles 15–20) addresses the protection of all environmental components. The legislator has explicitly allocated legal provisions for the protection of air, water, soil, nature, and climate change.

Chapter IV of this law is dedicated to environmental protection in the planning process. Article 24, paragraph 1, stipulates that for plans and programs in the fields of agriculture, forestry, fisheries, energy, industry, mining, transport, telecommunications, waste management, water management, spatial planning, as well as national, regional, and local development plans and programs, a Strategic Environmental Assessment (SEA) is required.

Article 44 of Law No. 10431 "On Environmental Protection" sets forth the obligations of economic operators regarding the monitoring of environmental compliance of their activities. Operators are required to monitor discharges resulting from their operations in accordance with environmental permit conditions and applicable legislation. Monitoring must be performed using approved, maintained, and certified equipment or accredited laboratories. Self-monitoring results must be submitted to the competent authorities in compliance with legal requirements and environmental permit conditions.

The hydrocarbon sector (extraction, processing, transportation, and storage of oil, gas, and their by-products) represents one of the most environmentally impactful activities in the Republic of Albania. Accordingly, any entity operating in this sector is typically classified as Category A under Article 29 of this law, due to the hazardous nature and potentially significant environmental impact of its operations. Pursuant to Article 44, every hydrocarbon company or operator is required to undertake continuous self-monitoring of pollution sources. This monitoring must be conducted using accredited and well-maintained equipment or certified external laboratories. In practice, hydrocarbon sector operators are mandated to implement an integrated environmental management system.

Article 25 of this law introduces the concept of Environmental Impact Assessment (EIA), which it defines as the evaluation of significant potential environmental effects of an activity, identifying both direct and indirect impacts on soil, water, sea, air, forests, climate, human health, flora and fauna, natural landscapes, material assets, and cultural heritage, taking into account their interrelationships. The legislator has stipulated that detailed implementation requirements for this article are determined by the law on environmental impact assessment, which will be discussed further below.

Law No. 10 440, dated 07.07.2011 "On Environmental Impact Assessment," amended.

Law No. 10 440, dated 07.07.2011, "On Environmental Impact Assessment" (EIA), is a legal instrument designed to ensure environmental protection through a detailed evaluation process prior to the commencement of projects with potential environmental impacts. This law is fully aligned with Council Directive 85/337/EEC of 27 June 1985, "On the assessment of the effects of certain public and private projects on the environment," as amended.

Article 1 of the law defines its primary objective: to ensure a high level of environmental protection by preventing, minimizing, and compensating for potential damages caused by proposed projects. This proactive approach emphasizes the importance of anticipating environmental impacts, reinforcing the environment as a fundamental element in development processes and economic planning. The legal framework mirrors best international practices, prioritizing damage prevention over remedial measures, thereby ensuring that project development does not compromise environmental integrity. Furthermore, the law underscores the significance of an open and transparent decision-making process. Article 2 sets the scope of the law, limiting its application to projects that cause significant negative impacts on the environment within the Republic of Albania, regardless of whether the projects are public or private. Within this scope, the law establishes specific responsibilities and requirements for the parties involved in the process, creating a clear and detailed regulatory framework for environmental impact assessment. This framework facilitates the harmonization of administrative actions and ensures environmental protection in line with national and international standards, while also promoting sustainable economic and social development.

Article 4 lays down the fundamental principles for conducting the Environmental Impact Assessment (EIA) for proposed projects. It mandates a comprehensive evaluation of both direct and indirect impacts, considering not only the construction and operational phases but also closure and site rehabilitation. The assessment must be based on the current environmental status and include potential risks of accidents. A key requirement is the proposal of measures for preventing, mitigating, or compensating negative impacts and enhancing positive effects during project implementation.

The law recognizes two types of EIA: Preliminary EIA and Comprehensive EIA. Developers are required to engage licensed legal or commercial entities accredited by the National Licensing Commission (NLC), or certified experts appointed by the ministry, for preparing the EIA reports. Reports are accepted only if signed by certified experts or licensed entities, although the developer retains full responsibility for their content.

The EIA procedure comprises an initial screening phase and a subsequent detailed assessment phase. The primary document supporting the EIA process is the Environmental Impact Assessment Report, which, depending on the potential impacts of the project, may be a preliminary EIA report (for projects listed under Annex II) or a comprehensive EIA report (for projects under Annex I).

According to Annex I, point 2 of the law, projects subject to the comprehensive EIA procedure include, among others, crude oil refineries (excluding enterprises producing only lubricants from crude oil) and facilities for gasification or liquefaction of 500 tons or more of coal or bituminous shale per day.

Projects subject to the preliminary EIA procedure, listed in Annex II, point 1, within the extractive industry include quarries, surface mines, peat extraction (projects not included in Annex I); underground mines; extraction of minerals from marine or river sediments; deep drilling activities such as: (a) geothermal drilling; (b) drilling for the disposal of radioactive waste; (c) drilling for water supply (excluding drilling for soil stability studies); and surface industrial installations for extracting coal, oil, natural gas, ores, as well as bituminous shale/clay.

Article 10 of the law requires developers of environmentally impactful projects, which are subject to the EIA law, to submit to the National Licensing Commission (NLC), alongside documentation mandated by Law No. 10 081 dated 23.02.2009 "On Licenses, Authorizations, and Permits in the Republic of Albania," the relevant documentation for the EIA procedure. This includes, for Annex II projects, the preliminary EIA report tailored to the project type, technical project documentation, and proof of payment of the service fee. For Annex I projects, the comprehensive EIA report, a non-technical summary of the report, technical project documentation, public information and consultation details, and payment receipt of the service fee as stipulated in Article 27 of Law No. 10 440 must be submitted.

Upon completion of the preliminary EIA procedure, the National Environment Agency (NEA) decides whether a project listed in Annex II requires the comprehensive EIA procedure. If the decision is negative, the NEA must justify its decision, include opinions from consulted institutions, and describe measures to avoid or mitigate negative environmental impacts. The decision is immediately communicated to the ministry, involved parties, and the NLC, and published on the NEA's official website. For projects requiring comprehensive EIA, the developer must inform and consult with the interested public regarding the environmental impact assessment.

The EIA process involves multiple stakeholders, including the project developer, the responsible ministry and its subordinate structures, sectoral ministries, local government units, the public, non-governmental organizations (NGOs), institutions involved in the EIA process, and neighboring countries in cases of transboundary impacts, in compliance with the Espoo Convention.

During the comprehensive EIA process, the NEA organizes a public hearing involving the public and interested NGOs to incorporate their views into the final decision-making regarding the project. This hearing is conducted in cooperation with the relevant local government unit and the project developer. The local unit is responsible for notifying the public and NGOs about the venue, date, and time of the hearing once these are scheduled. Public and NGO feedback during the hearing constitutes a mandatory criterion in the EIA decision-making process.

Article 21 addresses projects potentially impacting specially protected areas. If, following the EIA procedure, the NEA or ministry finds that a project may cause significant adverse effects on the integrity of a protected area, the competent authority may deny project approval, except in cases where no alternative solutions exist, urgent reasons of overriding public interest exist (including social and economic interests), and compensatory measures are taken to ensure the objectives of the Natura 2000

network are met. For habitats or species of priority concern, such urgent reasons are limited strictly to human health, public safety, or significant positive environmental impacts.

Articles 46 to 49 guarantee public rights to information on environmental matters, access to information, participation in environmental decision-making processes, and legal recourse. Under these provisions, any individual, irrespective of direct or specific interest, may request environmental information from competent authorities as categorized in Article 46. Moreover, the law establishes protective mechanisms for the public, including the right to appeal to the relevant authority and initiate legal proceedings when the environment is perceived to be threatened, polluted, or damaged. These rights aim to enhance transparency, accountability, and civic participation in environmental protection.

Council of Ministers Decision (VKM) No. 247, dated 30.04.2014, "On the determination of rules, requirements, and procedures for informing and involving the public in environmental decision-making".

Through the Council of Ministers Decision No. 247, dated 30.04.2014, "On the determination of rules, requirements, and procedures for informing and involving the public in environmental decision-making," the legislator aims to ensure the broad involvement of the public in being informed and participating during the Environmental Impact Assessment (EIA) process. Decision No. 247 of 30.04.2014 establishes a detailed framework for public information and involvement throughout the EIA process, guaranteeing transparency and broad participation at all stages of the procedure. During the preliminary procedure, the public is informed by the National Environment Agency (NEA) within 5 days from the receipt of the application and has the right to express opinions on the project within 20 days. In the detailed phase, the decision provides for detailed notifications, consultations with the community, organization of public hearings by the developer in cooperation with relevant institutions, as well as consideration of public opinions in drafting the EIA report and approving the Environmental Declaration. Moreover, after project implementation, public involvement is foreseen during the environmental impact monitoring phase, with the possibility to appeal any action or inaction during the process, thus reinforcing the right to a clean environment and sustainable decision-making.

Every plan or program related to the development of oil, gas, and mining sectors must undergo a Strategic Environmental Assessment (SEA). The process of strategic environmental assessment is determined and regulated by Law No. 91/2013 "On Strategic Environmental Assessment," which will be addressed below.

Decision No. 686, dated 29.07.2015, "On the approval of rules, responsibilities, and deadlines for conducting the procedure of environmental impact assessment and the procedure for transferring the decision and environmental declaration," as amended.

In Decision No. 686, dated 29.07.2015, "On the approval of rules, responsibilities, and deadlines for conducting the procedure of environmental impact assessment and the procedure for transferring the decision and environmental declaration," as amended, the rules, responsibilities, and deadlines for conducting the environmental impact assessment procedure are defined, including the preliminary environmental impact assessment procedure and the development of the detailed EIA procedure. The decision defines the procedure for transferring the decision or the environmental declaration, and contains several important annexes: Annex I includes auxiliary criteria for decision-making during the preliminary EIA procedure; Annex II describes the structure and information that the detailed EIA report must contain; Annex III contains auxiliary criteria for reviewing the detailed EIA report and drafting the environmental declaration; Annex IV presents the format of the decision for both the preliminary and detailed EIA; and Annex V offers the format for the environmental declaration.

This legal framework ensures a detailed and clear procedure for environmental impact assessment, guaranteeing transparency and responsibility throughout the process.

Law no. 91/2013 "On Strategic Environmental Assessment", as amended.

This law aims to ensure a high level of environmental protection and sustainable development, by including environmental issues in the processes of drafting, approving, amending, and reviewing plans and programs that may have negative environmental impacts. The law defines the responsible institutions, their duties and rights, as well as the procedures for implementing the Strategic Environmental Assessment (SEA). This process is mandatory for plans and programs in sectors such as agriculture, energy, industry, transport, tourism, waste and water management, territorial planning, and land use, as well as for any changes or reviews thereof. Also, SEA applies in special cases when plans or programs may have significant impacts on protected areas. Thus, in Article 2 of this law, the energy and mining industries are included in the list of sectors required to undergo SEA.

This law has been fully harmonized with Directive 2001/42/EC of the European Parliament and of the Council, dated June 27, 2001, "On the assessment of the effects of certain plans and programs on the environment."

The strategic environmental assessment (SEA) process involves preparing a special report on the environmental effects of a plan or program, conducting consultations with stakeholders, and taking into account the results of the report and consultations in making the final decision on the plan or program, in accordance with the procedures set forth in this law. According to the law, the SEA report is the responsibility of the proposing authority and is prepared by physical or legal entities certified by the ministry and licensed by the National Licensing Center for environmental impact assessment.

Article 7 of this law addresses the phases of the strategic environmental assessment process. The law prescribes mandatory SEA phases that must be followed by any individual or legal entity conducting an economic activity that may have negative environmental impacts. According to this article, the SEA process phases consist of:

1. Notification of the Ministry of Environment by the proposing authority;
2. Consultation with interested actors on issues to be addressed in the SEA Report;
3. Preparation of the preliminary consultative report with interested actors and the public, and preparation of the Preliminary SEA Report;
4. Preparation of the Final SEA Report;
5. Review of the proposal and issuance of the declaration by the Minister of Environment;
6. Decision of the approving authority;
7. Monitoring and reporting of the environmental impacts of the plan or program.

Within the framework of Law no. 91/2013 "On Strategic Environmental Assessment," Decision No. 507, dated 10.6.2015, was also issued, "On the approval of the detailed list of plans or programs with negative environmental impacts, which will be subject to the strategic environmental assessment process." According to this decision, plans or programs with negative environmental impacts subject to the SEA process also include strategies, plans, programs, and other planning documents that are subject to current legislation on hydrocarbons (exploration and production) as provided by the current legal provisions, as foreseen in point 5 of Annex I of this decision.

4.1.4 Regulatory Licensing Legal Framework of the Oil Sector in Albania

Law no. 10 448, dated 14.07.2011 "On Environmental Permits", as amended.

Law no. 10 448, dated 14.7.2011 "On Environmental Permits" aims to establish a legal framework for the prevention, reduction, and control of pollution caused by certain activities, with the purpose of ensuring a high level of protection of the environment, human health, and quality of life. This law defines the rules for permitting the development of activities that impact environmental pollution within the territory of the Republic of Albania, as well as preventive measures against pollution. In cases where prevention is not feasible, the law provides measures to reduce pollutant discharges into air, water, and soil, in gaseous, liquid, or solid forms.

This law is fully harmonized with the European Union legislation, in particular with Directive 2008/1/EC of the European Parliament and Council, dated January 15, 2008, "On Integrated Pollution Prevention and Control", as amended, as well as with Directive 2001/80/EC, dated October 23, 2001, "On the limitation of emissions of certain pollutants into the air from large combustion plants". This alignment aims to ensure a unified environmental standard in accordance with the best European practices for environmental protection and public health.

In accordance with Law no. 10431, dated 9.6.2011 "On Environmental Protection", a three-level system of environmental permits is established, types A, B, and C.
Annex 1 of the law foresees environmental permits of types A, B, and C depending on the threshold production capacity. The legislator has determined that oil exploration and extraction are subject to obtaining a type A permit.

Chapter II of the law defines the legal and procedural framework for type A environmental permits, which apply to category A installations. The National Environment Agency is the responsible body for defining and implementing the Best Available Techniques (BAT), relying on technical, economic, and environmental factors, including references from the European Commission (EU-BREF) and best international practices. BAT documents are prepared in cooperation with technical working groups established by the relevant minister and are approved and published electronically. Every category A installation must be equipped with a corresponding type A permit.

Article 9 establishes the fundamental principles guiding the obligations of the holder of a type A environmental permit. The NEA sets the permit conditions to ensure pollution prevention, particularly through the application of Best Available Techniques (BAT), avoidance of high pollution levels, and waste management according to current legislation. Efficient use of energy and water is also required, as well as measures to prevent accidents and the restoration of the environment to an acceptable state after the activity ends, in accordance with Law no. 10 431, dated 9.6.2011 "On Environmental Protection".

The type A permit contains conditions that guarantee pollution prevention, efficient use of energy and water, waste management, and accident prevention measures. Rehabilitation of the environment after the closure of activities is also required. Permit applications are submitted to the National Licensing Center (NLC), accompanied by relevant documentation and payment of the legal fee.

Regarding the institutional framework, the NLC is the institution where the application is submitted and from which the environmental permit is issued for all types A, B, and C, while the relevant Minister is the authority responsible for signing approval acts for type A and B environmental permits, after these have been reviewed and prepared by the NEA. The NEA is responsible for verifying the accuracy of the

information submitted by the operator in the type A and B permit application and for giving a reasoned opinion to the Minister regarding the granting or refusal of the permit, along with the respective conditions, which are included in the permit issued by the NLC. For type C permits, the competent authority is the regional environmental agency, which verifies the information submitted by the operator and makes the decision to issue or not the permit, also accompanied by detailed conditions included in the final document issued by the NLC. Meanwhile, the Competent State Inspectorate is the authority responsible for monitoring and controlling compliance with the conditions set in the permit after its issuance by the NLC.

Decision of the Council of Ministers (DCM) No. 419, dated 25.06.2014,"On the approval of specific requirements for the examination of applications for environmental permits of types A, B, and C, for the transfer of permits from one entity to another, for the conditions of the respective environmental permits, as well as detailed rules for their examination by competent authorities until the issuance of these permits by the National Licensing Center (NLC)".

DCM No. 419, dated 25.06.2014, "On the approval of specific requirements for the examination of applications for environmental permits of types A, B, and C, for the transfer of permits from one entity to another, for the conditions of the respective environmental permits, as well as detailed rules for their examination by competent authorities until the issuance of these permits by the NLC," as amended, inter alia provides specific provisions regarding the procedures for reviewing applications and setting conditions for type A environmental permits, changes in the operation of type A installations, the revision of existing permit conditions, the information and participation of the public in applications for type A environmental permits, as well as the transfer of type A environmental permits.

The DCM, in its Annex 1, precisely defines the standard format for applications for type A environmental permits, aiming to provide clear and practical support to applicants during the documentation submission process. This format seeks to facilitate and simplify the administrative procedure for reviewing the legally required applications for permit approval, thereby ensuring transparency and efficiency in handling the case files for this type of environmental permits.

According to the DCM, an applicant submitting an application to the National Licensing Center (NLC) for obtaining a type A environmental permit must provide;

a) The information form for obtaining a type A environmental permit, according to Annex 1 of the DCM;
b) The payment receipt for the applicable fee for the type A environmental permit;
c) Any other information that the permit applicant requests to be considered during the application review;
d) A copy of the decision of the National Environment Agency (NEA) regarding the preliminary Environmental Impact Assessment (EIA) or a copy of the Minister's statement on the detailed EIA, accompanied by the preliminary or detailed EIA report, in cases where the installation has undergone the environmental impact assessment procedure;
e) The safety report, in accordance with current legislation on the prevention of major accident hazards, when required;
f) The report regarding the public hearing.

The NEA, within 5 (five) working days from the date of receipt of the type A environmental permit application from the NLC, sends a copy of the application to the technical directorates within the Ministry of Environment, according to the specifics of the installation, the State Inspectorate for Environment, Forests and Water (SIEFW), and the Regional Environmental Agency (REA), which provide their written and electronic opinions within 10 (ten) working days; if they do not express an opinion within this timeframe, the NEA proceeds with the procedure.

The NEA, within 15 (fifteen) working days after verifying the accuracy of the application documentation for the type A environmental permit and collecting opinions from the public and the aforementioned institutions, drafts the act of approval or refusal of the issuance of the type A environmental permit, accompanied by the relevant reasoning, and submits it to the Minister of Environment. The Minister, within 5 working days from receipt, signs the act of approval or refusal of the type A environmental permit or returns the case to the NEA for additions or modifications, accompanied by the relevant reasoning. The approval or refusal decision is published by the NEA in the National Register of Licenses and Permits.

Decision of the Council of Ministers (DCM) No. 551, dated 18.06.2015,
"On the approval of criteria and procedures for the issuance of professional license certificates for study-design and implementation activities related to the exploration, production, processing, transportation, storage, and trade of hydrocarbons".

DCM No. 551, dated 18.06.2015, "On the approval of criteria and procedures for the issuance of professional license certificates for study-design and implementation activities related to the exploration, production, processing, transportation, storage, and trade of hydrocarbons," approves the criteria and procedures for issuing professional license certificates to persons conducting study-design and implementation activities in the hydrocarbons sector, including exploration, production, processing, transportation, storage, and trade. The decision stipulates that specialists intending to carry out study-design and implementation activities in the hydrocarbons field, including consultancy, supervision, commissioning, monitoring, and technical management covering the construction of technological installations and facilities necessary for drilling wells, production, storage, processing, transportation, and trade of such substances must obtain a certificate based on their technical-professional skills and experience in this sector. The certification is granted by the minister responsible for hydrocarbons, based on the evaluation of a commission established within the ministry. Legal entities providing services in this sector must be licensed under the relevant code stipulated in this decision and must employ a certified technical manager.

4.1.5 Legal Framework for Occupational Safety and Protective Mechanisms for Employee Status in the Oil Sector in Albania

Law No. 10 237, dated 18.02.2010, "On Occupational Safety and Health," amended.

Law No. 10 237, dated 18.02.2010, "On Occupational Safety and Health," amended by Law No. 161/2014, aims to establish measures to guarantee the safety and health of employees at the workplace. The primary objective of the law is the prevention of occupational hazards and the elimination of factors causing accidents or health damage. The law also imposes obligations regarding the information, consultation, and training of employees and their representatives, as well as promotes their active participation in workplace safety policies. It sets out general guidelines for health protection across all sectors of work, in accordance with national and international standards. The provisions of this law apply to all private and public sectors of activity.

This law constitutes the fundamental legal framework for occupational safety and health in Albania, defining the responsibilities and obligations of employers and employees to create and maintain a safe and healthy working environment, aiming at the prevention of accidents and occupational diseases.
The employer is obligated to ensure the protection of employees in all aspects related to occupational safety and health, through measures such as risk prevention, information, professional training, provision of equipment, and organization of the workplace. These measures must be updated in accordance with technological developments and changes in the work environment. The employer is guided by the

principles of prevention: avoidance and assessment of risks, addressing risks at the source, adapting work processes to the employee and technological development, substituting hazardous substances, and prioritizing collective protection over individual protection. Additionally, the employer must conduct risk assessments at every stage of the activity and ensure the integration of safety measures at all enterprise levels. The employer must consult with employees on new technologies and ensure that only trained employees enter hazardous areas.

According to Law No. 10 237/2010 on occupational safety and health, the employer has the legal obligation to guarantee the protection of employees in every aspect of their work activity. The employer must assess workplace risks, develop and implement preventive measures against accidents and occupational diseases, and provide training, information, and personal protective equipment to employees. Furthermore, the employer is required to cooperate with the Occupational Safety and Health Council, including employee representatives in every decision related to the improvement of working conditions. This commitment not only enhances safety but also contributes to a healthier and more productive work environment. In the oil sector in Albania, employees must act in accordance with the qualifications and specific training they have received, strictly following employer instructions and workplace safety regulations. They must properly use machinery, equipment, hazardous materials, and personal protective equipment provided to them, to prevent accidents and occupational diseases commonly associated with this industry. It is essential that employees do not interfere with safety mechanisms of equipment and immediately report any hazards or defects that may threaten their own life and health or that of their colleagues. Continuous cooperation with employers and safety specialists is crucial for the implementation of protective measures and to ensure a safe working environment. Moreover, employers in the oil sector are obliged to provide specialized medical services and regular health monitoring for employees, taking into account the specific risks related to this field, in accordance with applicable legislation in Albania.

Council of Ministers Decision No. 562, dated 03.07.2013, "On the Approval of the Regulation Regarding the Minimum Safety and Health Requirements for the Use of Work Equipment at the Workplace".

Council of Ministers Decision No. 562, dated 03.07.2013, "On the Approval of the Regulation Regarding the Minimum Safety and Health Requirements for the Use of Work Equipment at the Workplace," approves the regulation establishing the minimum safety and health requirements for the use of work equipment at the workplace. This regulation applies to all enterprises and workplaces where work activities or professional training are carried out, regardless of ownership type or organizational structure. The regulation sets forth clear obligations for the employer, who is required to ensure that work equipment is suitable, safe, and used in a manner that does not endanger the life and health of employees. Equipment must be installed and maintained under safe conditions, inspected periodically, and operated only by trained and authorized personnel. The regulation includes detailed provisions regarding the installation, operation, and shutdown of equipment, including measures for emergency stoppage, prevention of hazards from moving parts, protection against extreme temperatures, electrical contact, and potential explosions. Furthermore, the employer is obligated to inform and train employees on the safe use of the equipment, as well as to implement measures concerning ergonomics and occupational health protection. The regulation also contains additional requirements for specific equipment, such as mobile or lifting devices, specifying detailed standards for protection against overturning, braking systems, remote control, lighting, and fire protection.

The employer must select the most appropriate equipment for the type and duration of work, ensure its installation and use by trained and competent personnel, and prioritize collective protective measures over individual ones. Additionally, the employer shall take measures to prevent falls, restrict access to unsafe areas, and prohibit work under weather conditions that compromise safety. Specific employee training,

provision of personal protective equipment, and planning of evacuation procedures in emergencies are also essential obligations. Failure to comply with these provisions exposes the employer to legal liabilities and directly endangers the life and health of employees.

Council of Ministers Decision No. 563, dated 03.07.2013, "On the Approval of the Regulation on the Minimum Safety and Health Requirements for the Use of Personal Protective Equipment at the Workplace".
Council of Ministers Decision No. 563, dated 03.07.2013, "On the Approval of the Regulation on the Minimum Safety and Health Requirements for the Use of Personal Protective Equipment at the Workplace," is based on Law No. 10 237, dated 18.02.2010 "On Safety and Health at Work" and aims to protect the life and health of employees in workplaces where risks cannot be eliminated through collective or organizational measures. The regulation obliges employers to assess workplace risks and, when necessary, to provide certified personal protective equipment (PPE) that is suitable for the specific task and guaranteed for safety and comfort. The equipment must comply with EU standards, be clean, functional, and appropriate for individual use.

This regulation requires employers to supply certified personal protective equipment (PPE) free of charge, suitable for working conditions and the characteristics of the employee. The equipment must be ergonomic, hygienic, and not cause additional risks during use. Employers are required to conduct risk assessments for each work activity, prepare a corresponding list of equipment, and inform and train employees on their proper use. Employees, on the other hand, are obliged to use the equipment according to the provided instructions. This regulation represents an important measure for preventing accidents and occupational diseases, as well as strengthening the safety culture in the workplace. The decision also provides a non-exhaustive list of personal protective equipment items and a non-binding guide listing activities and sectors that may require the provision of such equipment. These lists serve as references for employers and employees, illustrating concrete examples of equipment that may be necessary in various workplaces depending on the specific risks present in each sector. This helps ensure more accurate and effective implementation of safety and health measures at work, guaranteeing that employees are protected with suitable and adequate equipment for the risks they face.

Law No. 8/2017, "On the Status of Employees in the Oil and Gas Industry".
Law No. 8/2017 regulates the legal, economic, financial, and social status of current and former employees in the oil and gas industry in Albania. This law aims to address the specific characteristics of this sector, taking into account the unique nature of the work, potential health risks for employees, and the social impact involved.

The law defines the status of former oil workers and current oil workers, designating former oil workers as individuals who have previously been employed in the oil and gas industry in legally specified professions, while current oil workers are those actively employed in the same fields and roles, including technical and mechanical staff involved in drilling, production, processing, and transportation of oil and gas.

The law establishes that the status of oil worker applies to all citizens who have worked or are currently working in the oil and gas industry, including those injured at work, regardless of the duration of their employment. Beneficiaries are issued official identification certificates by a commission within the responsible ministry. The right to obtain this status arises from the date of commencement of employment in the oil industry, for the professions specified by law. To acquire the status, official documentation proving the employment period is required, such as workbooks, certifications from the employer or relevant institutions, while for retired former oil workers, verification is provided by the Social Insurance Institute. Part of the employment period may also include work periods in other countries under recognized social agreements.

The salary of oil workers is determined according to the collective agreement and cannot be less than 150% of the national minimum wage, reflecting the difficult working conditions and health implications. Work seniority is fully recognized for social benefits and awards. Oil workers with over 20 years of service (men) and over 15 years (women), who are unemployed at the time the law comes into effect, receive a financial compensation of no less than 80% of the national minimum wage. Those who remain unemployed due to restructuring have priority in employment and receive financial compensation for the first three years following the termination of employment.

The retirement age is set at 60 years for men and 55 years for women, with at least 30 years of general insurance (*of which 20 years must be employment*) for men, and 25 years (*of which 15 years must be employment*) for women, with a portion of these years spent in the oil industry. For professions with high-risk factors, the retirement age may be lower (55 years for men and 50 years for women). The pension amount is calculated according to the social insurance law, with beneficiaries receiving an additional pension supplement of 1% for each year worked in the oil industry, up to a maximum of 40%. The pension has no statute of limitations and starts either from the date of entitlement or from the date of application submission. During periods when beneficiaries engage in economic activities, they are not entitled to benefits, except for self-employment in agriculture. Unclaimed benefits can be paid retroactively up to three years.

The financing of the status and benefits of oil workers is carried out through additional contributions amounting to 5% of the gross salary (3% from the employer and 2% from the employee), as well as from the state budget to cover financial deficits. Benefit claims are submitted to the Social Insurance Agency with the necessary documentation, while housing support and social benefit measures are approved by the Council of Ministers. Benefits are indexed annually according to pension indexation. Pension calculation and administration are managed by the Social Insurance Institute in accordance with the applicable legal procedures.

Oil workers are entitled to free medical examinations twice a year and free treatment for occupational diseases, whether in public or private institutions. For treatment abroad, funding is provided by the state budget for former oil workers and by companies for current employees. They also benefit from an additional annual leave amounting to 25% above the regular leave days. During privatization processes, oil workers receive benefits based on their length of service and qualifications, while concessionaires are obliged to establish professional pension funds with contributions of at least 10% of employees' gross salaries. Local government authorities are responsible for supporting the employment of beneficiaries in cases of unemployment and for creating suitable living conditions in their residential area.

Council of Ministers Decision No. 425, dated 10.5.2017, "On the Rules for the Organization and Functioning of the Commission for Issuing Status Certificates to Employees of the Oil and Gas Industry, and the Criteria and Procedures for Issuance of the Official Special Certification".

Pursuant to Law No. 8/2017 on the status of employees in the oil and gas industry, Council of Ministers Decision No. 425, dated 10.5.2017, has been enacted. This decision provides for the establishment of a commission under the ministry responsible for the oil and gas industry, with a defined composition. The commission's mandate is to review applications for the issuance of official identification certificates to current and former oil workers who meet the legal requirements. The commission convenes no later than the 10th day of each month and adopts decisions regarding the issuance or refusal of certificates by a majority vote of at least two-thirds of its members. Decisions are documented in minutes, and the official certificates are prepared and signed by the Chairperson of the Commission. The certificate contains personal data, years of service in the oil and gas industry, as well as the certificate number and date of

issuance. Applicants who are denied have the right to appeal the decision in court within 30 days from the date of notification of refusal.

To obtain the certificate, applicants must submit an application, identification document, work or pension booklet, an official certification, and a passport-sized photograph. The special official certification is issued to oil workers who have served in legally specified professions, including those injured at work, and is processed through the enterprises or institutions where they were employed, or, in their absence, by institutions holding the relevant documentation. Retired former oil workers receive certification through the Social Insurance Institute. Employment periods in other countries must be confirmed by the relevant foreign institutions and subsequently validated by Albanian authorities. The Ministry of Energy and Industry, institutions and companies operating in the oil and gas sector, as well as the Social Insurance Institute, are responsible for the implementation of this decision.

Law No. 29/2019, "On the Supplemental Financial Treatment of Employees Who Have Worked in Underground Mining, the Oil and Gas Industry, and Metallurgy".

This law aims to provide supplemental financial treatment to employees who have worked in underground mining, the oil and gas industry, and the metallurgy sector. This additional benefit is granted on top of the entitlements they receive under existing social insurance legislation. The law recognizes the difficult, hazardous, and physically demanding nature of these professions, guaranteeing employees in these sectors special financial benefits. Beneficiaries under this law also include persons employed in professions and roles within the oil and gas industry, which, according to the law, also encompass, among others, engineering and technical personnel who have worked in various sectors of the oil and gas industry (e.g., drilling, exploration, production, seismic, transport, etc.). For the purposes of implementing this law, overall work seniority and insurance periods are assessed and recognized in accordance with the provisions of Law No. 7703, dated 11.5.1993, "On Social Insurance in the Republic of Albania," as amended, and its implementing legal acts.

The types of benefits provided under this law, in addition to those stipulated in Law No. 7703, dated 11.5.1993, "On Social Insurance in the Republic of Albania," include: profession-based pensions, supplements to old-age pensions, and supplements to disability pensions.

According to Article 5, the conditions and pension amounts due to profession for former employees who worked in the oil and gas industry in professions classified in Table No. 1, "Jobs Included in the First Category," Chapters IV, points 2 and 3, and XI, of Decision No. 526, dated 20.12.1958, of the Council of Ministers, "On the Classification of Jobs for Pension Purposes," as amended, set the retirement age at 55 for men and 50 for women, with total insurance periods of 30 years for men and 25 years for women, and work seniority in the first category of 15 years for men and 12.5 years for women.

For former employees who worked in the oil and gas industry in professions listed in Table No. 2, "Jobs Included in the Second Category," Chapter V, of Decision No. 526, dated 20.12.1958, of the Council of Ministers, "On the Classification of Jobs for Pension Purposes," as amended, and engineering and technical personnel who have worked in enterprises within the oil system according to the list approved by a decision of the Council of Ministers, the retirement age is set at 60 for men and 55 for women, with insurance periods of 30 years for men and 25 years for women, and work seniority in the second category of 20 years for men and 15 years for women. Pursuant to Law No. 29/2019, former employees in the oil and gas industry and employees in metallurgy receive a supplement to their old-age pension for each year of insurance period in the profession equal to 0.6% of the old-age pension amount, whereas the supplement amount on disability pensions for beneficiaries is a right to receive a pension supplement equal to 1% for each year of work seniority in the oil industry.

4.2 ENVIRONMENTAL IMPACT

Industrial pollution is one of the main causes of pollution worldwide, as the development of industrial activities continues to grow. These activities are a major source of air, water, and soil pollution. Industrial pollution in our country is subject to national legislation, which is harmonized with European and international legislation, as well as standards that limit emissions into air, water, and soil, minimize waste, and regulate the use of natural resources.

The development of industrial activities in our country contributes significantly to its economic well-being and development. However, on the other hand, industrial activities can become a major source of air, water, and soil pollution. In this context, although the company "Albpetrol" sh.a. has been operating in Albania for years, contributing to the country's economic growth, continuous concerns are reported by citizens regarding the pollution caused by Albpetrol's activities.[36]

Based on analyses conducted by local authorities and reports from the United Nations Environment Programme (UNEP), nine areas in Albania with high industrial pollution have been identified, categorized as "hot spots" for environmental pollution. Three of them are located in the Fier region: the oil-bearing field of Patos-Marinza, the Kuçova area, and the oil refinery in Ballsh.[37]

Environmental Hot Spots in Albania	Potential Quantity of Waste that Can Be Deposited	Description of the Situation
Oil extraction in Ballsh, Kuçova, Patos Marinza	In the Ballsh area, approximately 20,000 tons of oil are extracted annually, impacting the surrounding environment.	In the Patos Marinza area, the surface and groundwater are seriously polluted by the oil wells, with pumps and pipelines causing the release of untreated waste, including sulfur gases and other hydrocarbons. These waters are then discharged into the Gjanica River, which contains toxic substances.

The Ombudsman Institution has also addressed the issues of pollution caused by hydrocarbons in the Gjanica River and the surrounding environment during 2022. This investigation was concluded with the drafting of a recommendation addressed to the Municipality of Fier, the Municipality of Mallakastër, the Ministry of Tourism and Environment, as well as the Ministry of Infrastructure and Energy. The Ombudsman's findings showed that the primary objective outlined in the Environmental Protection Law, which is the protection of life and health, has not been achieved. Among other things, in the responses from the institutions, the lack of preventive measures for untreated wastewater discharge, particularly industrial wastewater and waste, was noted. The implementation of the prevention principle requires a higher level of environmental and health protection. Therefore, institutions must make much greater efforts to achieve effective protection of the right to a healthy life and environmental protection.

Although the responsible institutions accepted the recommendation, informing that they would consider investigating polluted or potentially polluted areas, based on the environmental monitoring results for 2022, it is still evident that pollution levels have reached alarming levels, becoming a vital concern for the residents. The Ombudsman observes that local governance units, in cooperation with central authorities

[36] Ombudsman. (2024). *Recommendation for the immediate measures to protect the health of citizens and the environment from hydrocarbon pollution in the Patos Marinza area and surrounding cities*. Retrieved fromhttps://www.avokatipopullit.gov.al/media/manager/website/media/rekomandim%2011%20dhjetor%20%202024%20albpetorl.pdf, Page 13

[37] National Environment Agency. *Environmental Status Report 2021*. Tirana, p. 156.

responsible for the environment, have failed to manage the situation, continuing to neglect the legal obligations arising from the right to a clean and healthy environment. This institution points out that the specific case represents an ongoing issue over the years, as institutions have formally engaged in improving the environmental legislation and issuing by-laws, yet the standards of the existing environmental protection legislation continue to go unmet year after year.[38]

In light of the above facts, and in the context of the Government's efforts to implement effective interventions for the environmental rehabilitation of the Patos-Marinza oil-bearing field, we observe that this is a historic environmental problem that is in complete contradiction with environmental standards and the country's aspirations in the integration processes. Among other things, it should be emphasized that not only have no effective measures been taken to address the emergency caused by past pollution, but pollution continues and the measures taken are almost nonexistent.[39]

All oil components, when burned, are harmful to the environment. The impurities in sulfur and heavy metals from oil will create toxic smoke containing high amounts of soot. A significant portion of the compounds containing nitrogen leads to relatively high concentrations of nitrogen oxides. The damage caused by the burning of unrefined oil is evident, not only for the environment but also for the equipment used.[40]

4.2.1 Greenhouse Gas Emissions and Air Pollution

The oil industry in Albania is one of the main sources of greenhouse gas emissions and air pollution. Industrial discharges contribute significantly to air pollution. One of the serious pollution problems in Fier and the surrounding oil and gas fields is the dust caused by the oil industry. In the Fier region, data indicate serious problems caused by both the current and past oil industry activities.[41]

In the greenhouse gas emissions from the energy sector, emissions are calculated as resulting from the burning of fuels, as well as accidental emissions resulting from the extraction of solid fuels and from the transmission and distribution of liquid and gaseous fuels. Emissions are categorized as follows: energy industries, manufacturing and construction industries, transportation, other sectors (commercial/institutional sector, residential sector, and agriculture/forestry/fisheries sector), and unspecified emissions. Accidental emissions from lignite extraction and activities related to oil refining have also been calculated.[42]

The Patos Marinza oil field is one of the largest in Europe in terms of oil reserves within the continent. The oil industry in the area has not been managed according to environmental standards, placing the

[38] Ombudsman. (2024). *Recommendation for the immediate measures to protect the health of citizens and the environment from hydrocarbon pollution in the Patos Marinza area and surrounding cities*. Retrieved fromhttps://www.avokatipopullit.gov.al/media/manager/website/media/rekomandim%2011%20dhjetor%20%202024%20albpetorl.pdf, Page 6-7.

[39] Ombudsman. (2024). *Recommendation for the immediate measures to protect the health of citizens and the environment from hydrocarbon pollution in the Patos Marinza area and surrounding cities*. Retrieved fromhttps://www.avokatipopullit.gov.al/media/manager/website/media/rekomandim%2011%20dhjetor%20%202024%20albpetorl.pdf, Page 7.

[40] National Environment Agency. *Environmental Status Report 2023*. Tirana, pg. 30.

[41] Ibid.

[42] National Environment Agency. *Environmental Status Report 2023*. Tirana, pg. 35

region alongside the network of environmental hot spots. In the area, there is also a significant air load of volatile hydrocarbons, hydrogen sulfide, and sulfur oxides.[43]

4.2.1.1 Categories of Air Pollutants

Air quality is one of the most critical environmental issues of concern to the population. Until a few years ago, air pollution could be considered a problem confined to larger urban centers. However, now it seems to be perceived as a widespread problem by residents of large cities, due to the high levels of pollutants occurring both during the winter months (fine particulate matter, nitrogen oxides) and high levels of ozone, especially in the summer, when atmospheric reactions are catalyzed more efficiently.

Based on environmental legislation and the National Environmental Monitoring Program, approved by the Ministry of Tourism and Environment (MTM) for 2023, the National Environment Agency (NEA) has conducted air quality monitoring in major urban centers in the country, such as Tirana, Durrës, Shkodër, Elbasan, as well as in Fier and Korçë, for key urban air quality indicators such as PM10, PM2.5, NO2, SO2, O3, CO, and BTEX.[44]

For 2023, PM2.5 monitoring was carried out in 6 monitoring stations: in Tirana (MTM and NEA), Durrës, Shkodër, as well as in the cities of Fier and Korçë. According to the results, there is no exceedance of the annual PM2.5 standard in any of the monitored stations.[45]

All combustion processes in the air produce nitrogen oxides (NOx). Nitrogen dioxide (NO_2) and nitric oxide (NO) are both nitrogen oxides and are collectively referred to as NOx. Road transport is the primary source, followed by the industrial sector. NOx can cause inflammation in the airways and problems with lung function. It is also involved in the formation of PM and ozone. Long-term exposure effects are less certain than short-term exposure effects. It contributes to acidification and eutrophication of soil and aquatic ecosystems, damaging habitats and leading to biodiversity loss.

NO2 monitoring for 2023 was conducted in the Tirana Sauk, Tirana ASHR, Durrës, Elbasan, Fier, Korçë, and Shkodër stations. Based on the monitored data, there is no exceedance of the annual limit value at any of the monitored stations for 2023. However, at the Tirana ASHR station, the monitored value is very close to the EU annual standard. NO2 is a pollutant emitted into the air as a result of fuel combustion in industrial processes and road transport.

Assessment of the situation for SO2 (Sulfur Dioxide): The main source of particulate matter originates from the burning of fuels containing sulfur, such as coal and heavy oils from refineries. It can cause inflammation in the airways and problems with lung function. It is also involved in the formation of PM. SO2 contributes to the acidification and eutrophication of soil and aquatic ecosystems, damaging habitats and leading to biodiversity loss. SO2 monitoring for 2023 was carried out at the Tirana Sauk, Tirana ASHR, Durrës, Fier, Shkodër, Korçë, and Elbasan stations. Based on the monitored data, no exceedance of the daily or hourly limit values for SO2 was observed at any of the stations.[46]

[43] National Environment Agency. (2015). *Pollution from hydrocarbons*. Tirana. Retrieved from https://akm.gov.al/wp-content/uploads/2020/07/ndotjetet-qe-vijne-nga-hidrokarburet.-prill-2015.pdf
[44] National Environment Agency. *Environmental Status Report 2023*. Tirana, page 10.
[45] National Environment Agency. *Environmental Status Report 2023*. Tirana, page 14.
[46] National Environment Agency. *Environmental Status Report 2023*. Tirana, page 15.

4.2.1.2 Categories of Pollutant Particles

The oil industry in the Fier region is a major source of air pollution, contributing significantly to the degradation of environmental quality. Industrial discharges resulting from the extraction, processing, and transportation of oil and gas include a wide range of pollutants, such as exhaust fumes from drilling rigs, crude oil vapors, natural gases, and flaring emissions. These discharges lead to the formation of fine particulate matter, smoke, haze, and aerosols that persist in the atmosphere.

One of the main pollutants in the Fier region is SO2 (sulfur dioxide), which is primarily emitted into the air from oil extraction and processing activities. Many "oil ponds" in the Fier area contribute to a significant emission of hydrocarbons. In the vicinity of large industrial sites, there may be issues with CAM (Critical Air Management), but monitoring a single source is not an effective tool for mitigation or reduction strategies. Proper monitoring of discharges should be integrated into the control of emissions from point sources. The vapors and deposits created by previous industrial activities may also contribute to discharges and the formation of particulate matter.[47]

In the Patos-Marinza area, there is also an air burden of volatile hydrocarbons, hydrogen sulfide, and sulfur oxides.[48]

4.2.1.3 Combustion. Air Pollution.

The combustion of oil or gas at extraction points is a major source of air pollution. Additives and combustion products of oil, VOCs, NOx, SOx, CO, CO2, PM-10, PM-2.5, and Pb have numerous environmental impacts, including significant health effects on humans. Chemical and particulate air pollution is linked to heart and lung diseases (chronic obstructive pulmonary disease and asthma) and premature death. NOx and VOCs combine to form ground-level ozone (O3) or photochemical smog. This reaction depends on temperature; thus, heating increases the formation of photochemical smog. Studies on the relationship between oil fields and human health show that even the allowed levels of many pollutants result in significant negative health effects.

The production and use of halogenated aliphatic hydrocarbons involves serious health problems, including:

1. Cancer – Some halogenated aliphatic hydrocarbons also exhibit mutagenic and teratogenic properties.
2. Central nervous system depression – Depression is the most prominent effect of many halogenated aliphatic hydrocarbons. Intoxication and stimulation leading to anesthesia are typical responses, and for this reason, many of these chemicals have been used as anesthetics. In cases of acute exposure, there is always a risk of cardiac arrest because halogenated aliphatic hydrocarbons make the heart more sensitive to "catecholamines."
3. Skin irritations – Some of these substances, such as 1,2-dibromoethane and 1,3-dichloropropane, are definitely irritating and harmful to the skin, causing redness, roughness,

[47] National Environment Agency. *Environmental Status Report 2023*. Tirana, p. 26.

[48] Ombudsman. (2024). *Recommendation for the immediate measures to protect the health of citizens and the environment from hydrocarbon pollution in the Patos Marinza area and surrounding cities*. Retrieved from https://www.avokatipopullit.gov.al/media/manager/website/media/rekomandim%2011%20dhjetor%20%202024%20albpetorl.pdf, Page 13.

and necrosis even with very short contact. Being good solvents, all these chemicals can damage the skin by corroding it and making it dry, sensitive, cracked, and chapped, especially with repeated contact. There are also other damages that come from oil. Simply by smelling oil, a series of complications may appear in our health, which can be short-term or long-term. Among the short-term effects we can mention: hallucinations, dizziness, coughing, vomiting, aggressiveness, slow reflexes, etc. These effects may last about an hour or more if we are exposed for a long time under the smell of oil. Among the long-term effects we mention: the poisonous chemicals of oil gradually damage: the heart, the brain, the lungs, the immune system, the skeletal system, etc. [49]

A monitoring report prepared by the Institute of Public Health (ISHP) after the P29A well blowout reveals that the residents of the village of Marinza suffer from a range of health issues caused by pollution from the hydrocarbon industry in this area.

According to the Public Health Institute's report for the village of Marinza, conducted during the period when the well blowouts occurred in the area, the negative health impacts of the oil sector are highlighted. According to families in the area, exposure to air pollutants mainly emitted by hydrocarbon compounds leads to the development of respiratory symptoms (19% of families report that they have members with confirmed bronchial asthma and are being treated by specialists). In the families involved in the study, a total of 22 cases of bronchial asthma were reported, and 51% of the families report occasional pulmonary problems. In addition to pulmonary problems, another concern is skin issues (allergic reactions, itching, dermatitis, eczema, and even melanoma). Additionally, according to the interviewed participants, ISHP reports that only 8% of families in the study have children with anomalies, and 14% of families report giving birth to children with low birth weight. Other problems identified by interviewees include eye irritation, hypertension, headaches, dizziness, stomach pain, dry mouth, drowsiness, breathing difficulties, sore throat, coughing, and even malignant diseases. According to the ISHP report, the highest number of people seeking medical assistance during the natural gas blowout was female.[50]

4.2.1.4 Water Pollution and Flaring

The monitoring of surface water quality in Albania for physical-chemical, biological, and trophic parameters is carried out by the National Environment Agency (NEA) with a frequency of 4 times per year at 38 stations on the country's major rivers: Drin, Bunë, Mat, Ishëm, Erzen, Seman, Shkumbin, and Vjosë. Additionally, 3 stations are located on the tributaries of Lake Ohrid, and 10 stations monitor natural lakes: Ohrid, Shkodër, Prespa, and Small Prespa. Radioactive pollution (alpha-beta total) in surface waters and atmospheric precipitation (fallout) is monitored by the Institute of Applied Nuclear Physics on rivers and lakes. Furthermore, the Institute of Geosciences has monitored the discharge in surface waters throughout 2023 in the rivers Buna, Drin, Mat, Ishëm, Erzen, Shkumbin, Seman, Vjosë, and Bistricë.[51]

[49] National Environment Agency. (2015). Pollution from hydrocarbons. Tirana. Retrieved from https://akm.gov.al/wp-content/uploads/2020/07/ndotjetet-qe-vijne-nga-hidrokarburet.-prill-2015.pdf
[50] Ministry of Health, Institute of Public Health. *Report from ISHP for the village of Marinza.*
[51] National Environment Agency. *Environmental Status Report 2023*. Tirana, p. 109-110.

No.	Parameter	Value	Unit
1	Dissolved Oxygen	9.8	mg/l
2	pH	7.62	—
3	BOD5 (Biochemical Oxygen Demand)	12	mg/l
4	Ammonium (NH_4^+)	0.46	mg/l
5	Nitrite (NO_2^-)	0.005	mg/l
6	Nitrate (NO_3^-)	0.67	mg/l
7	Phosphate (PO_4^{3-})	0.018	mg/l
8	Total Phosphorus	0.021	mg/l

Table 23. Measurements taken at monitoring point Gj4 - Gjanica, City Bridge, Fier.[52]

Surface water pollution is estimated to affect approximately 117 km of water bodies contaminated by substances/polymers from oil, including the waters of the Gjanica River, Seman River, and streams in the region. This water quality condition poses a direct risk to the agricultural food chain due to the use of contaminated water for irrigation.[53]

The waters are oxygen-saturated. Biochemical Oxygen Demand (BOD5) is important for assessing the quality of river waters as an indicator of the level of pollution. The Gj4 station – City Bridge, shows a high BOD5 content, classifying this station in Class IV - Poor Condition. Based on average ammonia values, the Gj4 station – City Bridge, Fier, is classified in Class III - Moderate Condition. The content of nitrites, nitrates, and total phosphorus classifies the stations in Class I - High Condition. Based on ortho-phosphate content, these stations are classified in Class II - Good Condition.

The Seman Basin is classified in Class IV - Poor Condition with confirmed pollution at the Gj4 station (Gjanica Monitoring Station) – City Bridge, Fier, where the impact of urban and industrial discharges is high.

Hydrologically, the oil industry has caused severe pollution in the Gjanica and Seman rivers, through the discharge of decantation waters from the Ballsh refinery and continuous leakage from oil wells.

The early extraction and processing of oil in the area around Fier (Seman River) has led to considerable contamination of the land and surface water with hydrocarbons. Since 2012, coordinated efforts have been made to improve processing methods and rehabilitate areas contaminated with hydrocarbons. As a direct result of these efforts, the water system has responded positively, but pollution remains significant.[54]

According to INSTAT, the water quality of the Seman rivers (Gjanica, Mbrostar, Mujalli) for the years 2014-2023 is presented as follows:

[52] National Environment Agency. *Environmental Status Report 2023*. Tirana, p. 109-110.
[53] Ombudsman. (2024). *Recommendation for the immediate measures to protect the health of citizens and the environment from hydrocarbon pollution in the Patos Marinza area and surrounding cities*. Retrieved from https://www.avokatipopullit.gov.al/media/manager/website/media/rekomandim%2011%20dhjetor%20%202024%20albpetorl.pdf, Page 12.
[54] National Strategy for Development and European Integration 2022-2030. (2023). Retrieved from https://konsultimipublik.gov.al/documents/RENJK_538_Draft-Strategjia-Kombetare-per-Zhvillim-dhe-Integrim-2021--2030-.pdf, Page 135

Water Quality Monitoring Results for the Seman River:

Reference	Water Content	Water Quality of the Rivers	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Seman: Gjanica	pH	4	4	..	..	3	1	2	2	..	2	2
	O_2	4	5	..	..	4	1	1	1	..	1	1
	BOD5	..	2	..	..	2	4	5	4	..	4	
	NH_4	5	4	..	..	5	5	5	4	..	3	4
	NO_2	4	1	..	..	4	4	1	2	..	1	3
	NO_3	1	2	..	..	2	2	1	1	..	1	1
	P-total	4	1	..	..	2	2	3	2	..	1	1
	PO_4	5	2	..	..	3	2	3	2	..	1	1
Seman: Mbrostar	pH	1	1	1	1	1	1	2	2	2	2	2
	O_2	3	3	4	3	3	1	1	1	1	1	1
	BOD5	..	2	..	..	2	4	3	3	2	3	3
	NH_4	3	2	2	2	4	3	1	1	2	2	2
	NO_2	1	2	2	2	1	1	1	1	1	1	1
	NO_3	1	1	1	1	1	1	1	1	2	1	1
	P-total	1	1	1	1	1	2	1	1	1	1	1
	PO_4	3	2	4	3	2	3	1	1	2	1	1
Seman: Mujalli	pH	1	1	..	..	1	1	1	2	2	2	2
	O_2	4	3	4	4	3	1	1	1	1	1	1
	BOD5	..	2	..	..	2	4	4	3	3	3	3
	NH_4	2	2	2	2	2	4	4	3	3	1	1
	NO_2	1	1	2	1	2	2	1	1	1	1	1
	NO_3	1	2	1	1	2	2	1	1	1	1	1
	P-total	1	1	1	1	1	1	1	1	1	1	1
	PO_4	4	1	4	3	2	1	1	1	1	1	1

Source: Ministry of Tourism and Environment / National Environment Agency

Comparison Standards for River Water Quality according to UNEC:

- Class 1: Dissolved oxygen >7, BOD5 <2, NH_4 <0.05, NO_2 <0.01, NO_3 <0.8, PO_4 <0.05, P-total <0.1
- Class 2: Dissolved oxygen >6, BOD5 <3.5, pH (acidic) >6.5, pH (alkaline) <8.5, NH_4 <0.3, NO_2 <0.06, NO_3 <2, PO_4 <0.10, P-total <0.20
- Class 3: Dissolved oxygen >5, BOD5 <7, NH_4 <0.6, NO_2 <0.12, NO_3 <4, PO_4 <0.2, P-total <0.4
- Class 4: Dissolved oxygen >4, BOD5 <18, NH_4 <1.5, NO_2 <0.3, NO_3 <10, PO_4 <0.5, P-total <1
- Class 5: Dissolved oxygen <3, BOD5 >18, pH (acidic) and pH (alkaline), NH_4 >1.5, NO_2 >0.3, NO_3 >10, PO_4 >0.5, P-total >1[55]

[55] Water Quality of Albanian Rivers 2024 - Ref-2023. Retrieved from https://www.instat.gov.al/ .

Karavasta Lagoon is under pressure from the deposits of the Shkumbin and Seman rivers and agricultural activities in the surrounding area. The Narta Lagoon is impacted by the deposits from the Vjosa River and agricultural activities. The origin of metals (Cd, Pb, and in some cases Cu) for the Karavasta Lagoon may be linked to the historical impact of polluted waters from the Shkumbin River. Industrial discharges in the Elbasan area before 1990 and the subsequent deposition of waste and discharge of polluted urban waters into the Shkumbin River have contributed to this. Cd and Pb are two elements that are associated with the oil extraction and processing industry. Historical discharges of Seman into the Adriatic Sea and their discharge into the Karavasta Lagoon water could be the cause of water contamination.[56]

Lagoon	Location	As	Cd	Cu	Pb	Hg
Karavasta Lagoon	Lagoon	0	104	57	948	0
	Sea – Lagoon Inflow	0	92	79	928	0
Narta Lagoon	Ura e Manastirit	0	25	98	1779	0
	Sea – Lagoon Inflow	0	53	—	99	0

Table 24. Metal content in lagoon water for 2023.[57]

The issue arises with the content of Cd and Pb in the waters of the Karavasta, Narta, and Butrint lagoons, classifying their waters with poor quality. The tendency for high concentrations of Cd and Pb is consistent across all three seasons: Spring, Summer, and Fall.

Human exposure to environmental risk (high levels of Cd and Pb) can only occur through the consumption of products from these lagoons.[58]

4.2.1.5 Impact on Natural Habitats and Biodiversity

As for biodiversity, it is estimated that by degrading the physical-chemical conditions of natural resources, especially surface waters, the biological values of the area have been negatively impacted. On the other hand, there is a noticeable deterioration in the health condition of the residents, influenced by the environmental condition of the area, primarily the quality of air and drinking water. Regarding economic damages, environmental and health conditions directly affect the economic production system in the area, reducing agricultural productivity and increasing healthcare costs. Meanwhile, oil spills into the sea are particularly problematic for the Fier region, where pollution from oil industries, both processing and extraction, is significant.[59]

Extractive industry projects may have negative impacts on biodiversity (flora and fauna). Generally, oil and gas projects are spread across relatively small exploration areas, either within a region or extending over a large surface area, thus reducing the impact of vegetation removal and large-scale habitat fragmentation. However, this can vary from one case to another depending on the type of project.

Extractive industry projects may cause both direct and indirect impacts on flora and fauna. Direct impacts may include the destruction of vegetation and loss of natural habitat. Indirect impacts may involve

[56] National Environment Agency. *Environmental Status Report 2023*. Tirana, pg. 90-91
[57] National Environment Agency. *Environmental Status Report 2023*. Tirana, pg. 90-91
[58] Ibid.
[59] Ombudsman. (2024). *Recommendation for the immediate measures to protect the health of citizens and the environment from hydrocarbon pollution in the Patos Marinza area and surrounding cities*. Retrieved from https://www.avokatipopullit.gov.al/media/manager/website/media/rekomandim%2011%20dhjetor%20%202024%20albpetorl.pdf, Page 13.

disturbances to fauna species due to excavation, noise generation, vibrations, and air pollutants, primarily dust.

In the oil and gas industry, hydraulic fracturing has created problems due to vibrations. This technique is used to extract hydrocarbons by injecting water (and chemicals) under pressure to break rocks and allow the release of oil and gas to the surface. This technique may cause movement in the underground layers of soil and rocks, which can result in ground disturbances, shifting layers, vibrations, and even earthquakes. In addition to the potential environmental impacts, vibrations caused by hydraulic fracturing can have significant social effects on local communities near oil and gas extraction areas.[60]

Some impacts are short-term and localized to the project area, while others may have long-term effects. The size and severity of the impacts depend on the approach taken by the permit holder. If the permit holder commits to implementing the appropriate mitigation and management measures during exploration and extraction activities, the impact will be minimized to an acceptable level in accordance with legal requirements.

In the oil and gas industry, rehabilitation of affected areas/habitats may be more challenging due to long-term usage/exploitation of the areas. However, in such cases, the permit holder must commit to restoring and returning all affected areas to their previous state during the exploration phase and minimizing impacts on habitats and biodiversity, restricting them to the operational zones where exploitation occurs.[61]

Impacts from this category of projects are generally lower than those from quarries and mines. However, during the exploitation phase, there may be considerable impacts on geology and soil quality due to drilling and hydraulic fracturing processes. Hydraulic fracturing can have significant impacts on geology due to the injection of water for hydrocarbon extraction. Depending on the most favorable zones for hydrocarbon extraction, project areas may be located in a wide variety of terrain types, including near populated areas, hilly/mountainous regions, and agricultural lands. In the case of agricultural land, the area will be transformed from cultivated land into an industrial zone, which, as a result of the project activities, may be contaminated (spills) and/or degraded due to various extraction processes. Regarding landscape impacts, these may be lower in oil and gas projects compared to quarries and mining projects. However, visual impacts may be long-term due to the extended period of hydrocarbon exploitation. Extraction equipment and machinery can create visual disturbances in local communities and among visitors. These types of impacts can be reduced through various mitigation and management measures if good practices are followed at all times.[62]

Today, the living heritage of the Vjosa River valley remains in its many communities. The Vjosa River basin is rich in non-metallic resources, such as clay, aggregates, gypsum, phosphates, limestone, dolomite, and energy resources like oil, gas, and coal.[63] The environmental diversity of the Vjosa River valley faces several challenges from existing and potential activities in the region that stem from communities relying on the river as a resource. The extraction of limestone, gravel, and bitumen from

[60] EITI. (2021). *Final Scoping Study Report on Environmental Issues for Extractive Industries*. Retrieved from https://www.albeiti.org/site/wp-content/uploads/2021/07/al-ab-ba1-albania-eiti-environment-scoping-study-final-report-shqip-firmosur.pdf, Page 64.
[61] EITI. (2021). *Final Scoping Study Report on Environmental Issues for Extractive Industries*. Retrieved from https://www.albeiti.org/site/wp-content/uploads/2021/07/al-ab-ba1-albania-eiti-environment-scoping-study-final-report-shqip-firmosur.pdf, Page 60
[62] Ibid.
[63] National Agency of Protected Areas. (2020). *Business Plan for the Vjosa Wild River National Park (2024-2034)*. Retrieved from https://akzm.gov.al/wp-content/uploads/2020/07/Kapitulli-E.-Plani-i-Biznesit.pdf, Page 20.

mines and quarries has historically disrupted riverbeds, while oil and gas extraction mainly occurs in the lower Vjosa region.[64]

Industrial activity also exerts continuous pressure on the Vjosa river basin resources. The three districts of Vjosa (Gjirokastra, Fier, and Vlora) have inherited industrial pollution from the past and are currently facing serious problems, despite pollution being primarily concentrated in the lower Vjosa region, where the largest mining activity, oil, and gas production occurs. Often, discharges from oil activities and water separation from the oil industry go directly into the Vjosa River and its branches, or are reinjected underground, risking contamination of groundwater.[65]

4.2.1.6 Impact on Air Quality

Air pollution remains one of the most concerning environmental issues in extractive industries. Emissions to the air can occur during each phase of the extractive industry project cycle, especially during exploration, preparatory activities, exploitation, and operational activities. The major sources of air pollution in the operation of extractive industries are:

- Particulate matter in the air (primarily PM2.5 and PM10) as a result of excavation, explosions (e.g., quarries), material transport, wind erosion (more common in open-pit mines), dust dispersed from industrial waste sites, reserves, waste disposal areas, and road traffic;
- Emissions from mobile sources (vehicles, trucks, heavy machinery/equipment) can also contribute to the increased levels of particulate matter in the air, as well as the release of gaseous emissions (NOx, SOx, CO, etc.);
- Dust emissions from mineral and hydrocarbon processing and traffic movement, particularly on unpaved roads;
- Gas emissions from fuel combustion in both stationary and mobile sources, from explosions, and the processing of minerals and hydrocarbons. Once pollutants are released into the atmosphere, they undergo physical and chemical changes before reaching a receptor. These pollutants can have serious negative effects on human health and the environment, particularly on biodiversity (fauna and flora). Large-scale mining and/or oil and gas activities have the potential to significantly contribute to air pollution, particularly during the operational or exploitation phase. The most problematic cases are thought to be extractive activities operating near communities and/or within residential areas. The most concerning air pollutants from various types of extractive industries are: Oil and Gas – the most troubling air pollutants relate to gas emissions, particularly SOx, NOx, CO, CO2, etc., during operational activities. During exploration activities, drilling operations may generate particulate pollutants in the air. Dust generation can also occur due to traffic movement; however, this is considered a less significant issue in these types of activities.[66]

[64] Ministry of Tourism and Environment. (2024). Retrieved from https://turizmi.gov.al/wp-content/uploads/2024/10/Kapitulli-F.-Masterplani-per-Turizmin.pdf, Page 9.
[65] National Agency of Protected Areas. (2020). *Business Plan for the Vjosa Wild River National Park (2024-2034)*. Retrieved from https://akzm.gov.al/wp-content/uploads/2020/07/Kapitulli-E.-Plani-i-Biznesit.pdf, Page 21.
[66] EITI. (2021). *Final Scoping Study Report on Environmental Issues for Extractive Industries*. Retrieved from https://www.albeiti.org/site/wp-content/uploads/2021/07/al-ab-ba1-albania-eiti-environment-scoping-study-final-report-shqip-firmosur.pdf, Page 62

4.2.2 Accidental Oil Spills

Albania has not registered major offshore oil spills during the period 2014–2024, but there have been many cases of chronic and accidental land pollution. Old wells, unsealed deposits, the lack of maintenance of transport pipelines, and leaks from refineries are among the most common sources of pollution. In areas such as Zharrëz, Marinza, and Ballsh, residents have consistently reported uncontrolled spills of industrial water and oil waste on surrounding lands, often near residential areas or agricultural land.

Accidental spills can have significant environmental impacts. Land polluted with hydrocarbons is considered hazardous waste and must be managed and disposed of properly in accordance with legal requirements in designated disposal areas or landfills. Other hazardous materials, such as old equipment, machinery, storage tanks, and other substances, are also considered hazardous waste. Generally, these wastes can be contaminated with hydrocarbons and other chemicals. In Albania, there are many "hot spots" such as Marinza, Ballsh, Kuçova, etc., that present environmental and social risks due to the old hydrocarbon drilling equipment left in the area, hydrocarbon spills, and/or other types of hazardous materials abandoned from previous extractive industrial activities. Often, these materials and hazardous substances pose major concerns for the local community due to the potential release of odors, contamination of water and soil resources, especially during the summer period. License holders must fully comply with legislative requirements and ensure the best practices for the disposal, treatment, and reuse of waste generated from their activities.[67]

From the inspection carried out by specialists at the Visokë oil field, it was found that the fluid produced from the field is collected in groups and then transported by tanker trucks or pumped to decantation. In the groups, there is environmental pollution due to the discharge of technological H2O and oil leaks during the filling of tanker trucks for transporting water and oil. It was found that there is technological water and hydrocarbon waste in the environment, and from there, these are spread in the surrounding channels. These actions are in violation of the hydrocarbon agreements for the development and production of hydrocarbons at the Visokë oil field.[68]

4.3 EFFECTIVENESS OF PROTECTIVE MEASURES

4.3.1 Technical Process for the Treatment of Sulfates and H_2S in Wastewater Polluted by the Oil Industry

Due to the presence of high levels of pollutants, it is essential to integrate a treatment plant into the technological scheme of the refinery, which is positioned at the inlet of the main wastewater collectors. This plant is intended to remove petroleum products and mechanical residues using various wastewater treatment technologies.

Main Methods for the Treatment of Oil-Contaminated Wastewater:

- Activated Carbon Treatment – Activated carbon is used to adsorb petroleum-based organic compounds, ensuring efficient cleaning of polluted waters.
- Biological Treatment Method – In this method, bacteria play a key role. More than 100 types of specialized bacteria feed on petroleum hydrocarbons and carry out their biological degradation.

[67] EITI. (2021). *Final Scoping Study Report on Environmental Issues for Extractive Industries*. Retrieved from https://www.albeiti.org/site/wp-content/uploads/2021/07/al-ab-ba1-albania-eiti-environment-scoping-study-final-report-shqip-firmosur.pdf, Page 65

[68] High State Control. (2023). *Final Audit Report on Compliance Exercised at Albpetrol sh.a Patos*. Tirana, p. 293.

Colonization of these microorganisms occurs on the thin oil film at the water surface, where the breakdown of pollutants is completed within 2–3 months.

- Oxidation via Thermal Treatment – This process involves the oxidation of contaminated compounds at high temperatures to reduce the sulfate and H_2S content in the water.

4.3.2 Biological Treatment of Oil-Contaminated Water

Bakteriet Bacteria metabolize hydrocarbons through a natural process that takes place in the upper layer of the water and requires 1 to 2 weeks for colonization, and several months for complete degradation.

A. FLOTATION METHOD

Water containing oil in emulsion form is treated through flotation, which is based on the adhesion of oil droplets to the interface between water and air bubbles. Air is diffused into the water, creating bubbles that carry the oil to the surface, forming a foam layer saturated with oil. To increase efficiency, chemical agents such as sodium sulfate are used. For separation of the oil film, sand or straw filters can be employed, where oil adheres to the particles and is then extracted using hot water at 60–70°C.

B. PRINCIPAL TECHNOLOGICAL SCHEME FOR OIL TREATMENT

- Oil and water collected from well basins and hydraulic channels are directed to a storage reservoir.
- In the reservoir, preliminary thermal separation (decantation) is carried out.
- The mixture is then transferred to the flotation reactor, where air is used to separate the oil and water phases.
- The oil from the reactor's surface is transferred to the first dehydrator, where oil without water is extracted.
- The residue, containing up to 70% water and 30% oil, is transferred to the second dehydrator for final separation.
- The resulting sludge passes through a sludge collector and then to a filter press to separate water from clays and soil, which are then transported to designated disposal locations.
- To accelerate flotation, chemical reagents such as aluminum sulfate and saline solution are added to the process.
- The process temperature is monitored and maintained at 75–80°C for optimal effectiveness.

4.4 EMERGENCY RESPONSE PLAN

Oil companies, as part of their operations, are required to plan, organize, and implement—at their own and the state's expense—civil emergency services in the areas where their activities take place. The companies are responsible for the following

A. IMPLEMENTATION OF REAL-TIME MONITORING SYSTEMS

- Installation of sensors and surveillance cameras for continuous monitoring of critical zones such as fuel storage, electrical equipment areas, and extraction wells.
- Use of automatic alarm systems for fire hazards, chemical leaks, or changes in environmental parameters (pressure, temperature, oxygen levels).
- Integration of these systems with the central command center to enable rapid response.

B. ADVANCED TRAINING AND EMERGENCY SIMULATIONS

- Organization of periodic training not only for basic knowledge but also realistic simulations of emergency scenarios (fires, floods, gas leaks, explosions).
- Use of virtual reality tools to prepare staff for high-risk situations.
- Involvement of external emergency teams in joint drills to improve coordination.

C. MANAGEMENT SYSTEM FOR BIOLOGICAL AND CHEMICAL RISKS

- Development of a detailed protocol for the safe storage and handling of hazardous chemicals and toxic substances.
- Regular updates to the hazardous substances list and provision of appropriate personal protective equipment (PPE), including respiratory protection and specialized suits.
- Continuous monitoring and control of airborne toxic substances.

D. STRENGTHENING INFRASTRUCTURE TO PREVENT FLOODING

- Construction of barriers and drainage systems for effective water removal in case of floods.
- Design of erosion control systems and planting of deep-rooted vegetation to stabilize soil.
- Development of specific evacuation plans for flood situations with designated gathering points and safe exit routes.

E. EFFECTIVE WASTE MANAGEMENT AND RECYCLING

- Implementation of improved procedures for the collection, storage, and transport of hazardous and non-hazardous waste, using selective recycling systems.
- Training of workers on waste separation and handling in accordance with environmental standards.
- Collaboration with authorized operators for the treatment of industrial waste.

F. IMPROVED COMMUNICATION AND COORDINATION WITH LOCAL AUTHORITIES

- Establishment of a clear communication protocol with civil emergency authorities and other relevant services (firefighters, police, healthcare).
- Use of digital platforms for fast notifications and emergency coordination.
- Participation in joint meetings and training sessions with authorities to improve emergency response capabilities.

G. PLANNING TO REDUCE ENVIRONMENTAL IMPACT DURING OPERATIONS

- Application of best available techniques to reduce noise and air pollution during operations, such as low-noise equipment and emission control.
- Periodic inspection and maintenance of machinery and equipment to prevent leaks and vapor emissions of harmful substances.
- Use of renewable energy sources and promotion of energy efficiency in industrial plants.

H. ENHANCING EMERGENCY SIGNAGE AND LIGHTING SYSTEMS

- Installation of reflective and weather-resistant signage to ensure maximum visibility even in darkness or fog.
- Backup lighting systems powered by batteries or alternative sources to ensure safe evacuation during power outages.

I. HEALTH MONITORING

Assessment of each employee's health condition based on their exposure to chemical substances in the workplace;

Risk assessment procedures include.

- In the risk assessment process, the employer shall preliminarily identify the potential presence of hazardous chemical substances in the workplace and assess the possible risks to the safety and health of employees caused by such presence, taking into particular account the following:

- In cases of work activities that involve exposure to multiple hazardous chemical substances, the potential risks must be assessed based on the combined risk posed by the interaction of all such substances.
- The supplier or manufacturer of chemical substances must provide the purchasing employer with all necessary information for a comprehensive assessment of potential risks.
- In the case of a new activity that introduces hazardous chemical substances, the risk assessment and implementation of preventive measures must be planned in advance. The new activity may only commence once the risk assessment has been completed and preventive measures have been implemented.
- Where the nature of the work activity does not allow for the prevention of the presence of dangerous concentrations of flammable substances or hazardous quantities of chemically unstable substances in the workplace, the employer must, in particular, avoid the presence of ignition sources that may cause fires or explosions, or the existence of unfavorable conditions that could trigger harmful physical effects due to such substances or mixtures thereof. Furthermore, the employer must reduce, through procedural and organizational measures as provided by the applicable legislation, the hazardous effects on workers' health and safety in the event of fires or explosions caused by chemically unstable substances or mixtures.

Fire or Emergency Measures.

- The employer, in order to protect the health and safety of workers from the consequences of accidents or emergencies caused by the presence of hazardous chemical substances in the workplace, has established appropriate intervention procedures to be implemented in such cases.
- These measures include regular safety drills and the provision of adequate means for first aid and emergency response.
- In the event of fire or emergency, the employer has taken direct measures to mitigate the effects, including assistance for evacuation, removal, and informing of the employees.
- The employer shall take appropriate actions to restore normal conditions as soon as possible.
- The employer shall adopt the necessary measures to set up an alarm system and other communication systems required to immediately signal an accident or emergency.
- The emergency measures included in the plan contain preliminary information on hazardous activities, on dangerous chemical substances, on risk identification and preventive measures and procedures, so that the competent emergency services can immediately determine the appropriate procedures and preventive measures; as well as any other relevant information on potential hazards arising or that may arise from accidents or emergency situations, including information on the procedures followed under this article.
- In the event of fire or emergency, unprotected individuals must immediately evacuate the area.

Employee Information and Training

- The employer ensures that employees or their representatives have access to risk assessment data and other relevant information whenever significant changes in the workplace lead to changes in such data;
- The employer provides information on the hazardous chemical substances present in the workplace, including the nature of the substance, potential risks to safety and health, the relevant occupational exposure limit values, and other regulatory provisions applicable to such chemicals;
- The employer ensures training and information on preventive measures and appropriate actions to be implemented to protect both the employees themselves and others in the workplace;
- The employer guarantees consultation of each safety data sheet made available by suppliers.
- The employer ensures that the information provided is consistent with the results of the risk assessment.

These pieces of information may consist of verbal communication or training courses and individual practice integrated with written materials, depending on the nature and level of potential risk identified during the assessment; they must be updated in accordance with any changes in conditions.

4.5 ECOSYSTEM SERVICES

4.5.1 Water Treatment.

One of the most significant impacts of extractive industry projects is their effect on water quality and the availability of water resources within the project area. The main uncertainties are whether surface and groundwater resources will remain undisturbed, uncontaminated, and/or suitable for human consumption (e.g., groundwater), and whether the quality of surface water in the project area will remain suitable to support local aquatic life and terrestrial wildlife. Depending on the type of extractive activities, there are different impacts on both surface and groundwater resources.

Oil and Gas – the impacts on water resources in the oil and gas sector can also vary depending on the extraction processes and technology used. Oil and gas drilling activities can lead to concerns, loss of groundwater resources, and deterioration of water quality. Exploration activities may include the injection of water underground. There are instances where the injected water used in the process is salty or brackish. This technique can lead to negative impacts on groundwater quality by causing the inflow of saline or brackish water. Techniques have been developed that use potable or treated water for underground injection. As for potential impacts on surface waters, spills during exploration and exploitation processes can lead to surface water pollution and cause negative impacts on aquatic biodiversity and the environment in general. Other impacts on surface water resources from the oil and gas sector are related to the poor management of hydrocarbon waste.[69]

To understand how oil activity contributes to pollution of water systems, for example, one of the rivers such as the Gjanica and Vijën e Ngalës, where hydrocarbon waste is discharged. The CEE indicator is another standard for drinking water performance according to the European Economic Commission Directive 60EC 2000. This indicator for the Gjanica River, based on the results obtained in 2022, ranged from 2.9 to 10.4, clearly showing the phenomenon of a drastic decrease in water quality immediately after the river leaves the area of the town of Ballsh, with only a slight improvement at the confluence of the Gjanica River with the Seman River.

The waters are oxygen-saturated. Biochemical Oxygen Demand (BOD5) is important for assessing the water quality of rivers as an indicator of the pollution level. The Gj4 station – City Bridge, Fier has a high BOD5 content, classifying this station in Class IV – Poor Condition. Referring to average ammonia values, pollution at the Gj4 station – City Bridge, Fier is classified in Class III – Moderate Condition. The content of nitrites, nitrates, and total phosphorus classifies the stations in Class I – High Condition. Based on the content of ortho-phosphates, these stations are classified in Class II – Good Condition.

We assess that the Seman Basin is classified in Class IV – Poor Condition with established pollution at the Gj4 station – City Bridge, Fier, where the impact of urban and industrial discharges is high. The average concentration values of metals in the Seman River water body show that the water quality of the Seman River is good based on the limit values of the Council of Ministers Decision (VKM), but issues

[69] EITI. (2021). *Final Scoping Study Report on Environmental Issues for Extractive Industries*. Retrieved from https://www.albeiti.org/site/wp-content/uploads/2021/07/al-ab-ba1-albania-eiti-environment-scoping-study-final-report-shqip-firmosur.pdf, Page 63

are present regarding the content of Cd and Pb in the Gjanica River. Metal values exceed the recommended limits by the DKU. Dissolved oxygen, pH, BOD5, NH4, NO2, NO3, PO4, and P-total are all above acceptable limits for drinking water according to both Albanian standards and EU regulations. The Pishë Poro station has water of poor quality, with excessive content of NO2, NO3, NH4, Cl, Na, and Mg—substances that are far above the norms, classifying it as non-potable water due to the intrusion of hydrocarbon discharges near this aquifer.

The water from the separator, together with the decantation processing fluids, flows into an open channel and is discharged directly into the Gjanica River. The separator, through which these waters pass, is operational but occasionally needs cleaning to increase its effectiveness.[70]

Soil Fertility

Various studies show that soil contamination can occur during routine oil and gas drilling, extraction, transport, or processing operations for example, improper disposal of drilling waste or emissions from gas flaring procedures. However, many investigations over the years concluded that soil contamination is mainly caused by accidental spills (large or small) or abandoned industrial facilities.

The Patos Marinza oil field is one of the largest in Europe in terms of oil reserves within the continent. The oil industry in the area has not been managed according to environmental standards, placing the region alongside the network of environmental hot spots that require intervention and rehabilitation. In this area, land pollution is present, with approximately 1,480 oil sludge ponds spread over an area of about 95 hectares, posing an open exposure of the local population to this pollution.[71]

4.5.2 Volume of Oil Penetration in Soil by Lithological Type

Oil infiltrates soil under the influence of gravity and capillary action. The volume retained by soils (filling of pore spaces) is approximately 15 to 40 L/m³, depending on the structure of the lithological layer through which it penetrates. The penetration rate depends on both the oil type and soil texture. In practice, crude oils, especially asphaltic-resinous oils typical of domestic crude, do not penetrate deeply.

Subsurface migration of oil pollutants can lead to exposure of local populations to contaminants such as:

a) Unstable hydrocarbons emitted from oil: BTEX compounds;
b) Volatile Organic Compounds (VOCs; e.g., benzene, toluene, ethylbenzene, xylene)—which may migrate toward inhabited areas, penetrate dwellings, and be inhaled by residents.

This migration of oil and hydrocarbons into inhabited areas with horticultural activities can result in contaminant accumulation in garden vegetables and plants consumed by humans. During drilling and exploitation/upscaling processes, the risk of soil contamination is lower. Concentrated drilling reduces the surface area required, though accidents during drilling—as occurred at Marinëz—can cause significant environmental pollution. Industrial wastes that include hydrocarbons may degrade depending on temperature, pressure, and the composition of soil, air, and water.

[70] National Environment Agency. *Environmental Status Report 2023*. Tirana.
[71] Ombudsman. (2024). *Recommendation for the immediate measures to protect the health of citizens and the environment from hydrocarbon pollution in the Patos Marinza area and surrounding cities*. Retrieved from https://www.avokatipopullit.gov.al/media/manager/website/media/rekomandim%2011%20dhjetor%20%202024%20albpetorl.pdf, Page 12.

4.5.3 Determination of Natural Soil Fertility

Hydrocarbon residues rank among the most hazardous to biota in agricultural areas. Field records and analytical results show higher contamination levels near clusters of wells compared to individual well sites. Soil near wells shows contamination over a smaller area and shallower depth; soils around decantation stations are contaminated over a wider area and to greater depths.

4.5.3.1 Determination of Agricultural Soil Pollution Level

A. ASSESSMENT OF AGRICULTURAL SOILS IN THE OIL EXTRACTION AREA

The oil and gas fields present significant issues. These lands are under pressure from oil exploitation. Albpetrol sh.a Patos, in order to continue its hydrocarbon activities normally during 2022, encountered difficulties and had to take agricultural land from various farmers. These lands were used for drilling sites (where there were new wells) and access roads to wells or various assets where the need arose.

For the needs of Albpetrol sh.a Patos and to enable the normal operation of Oil Production Centers for 2022, 15 contracts were concluded and implemented for the temporary use of agricultural land from various farmers. 12 Orders were issued for settlements for 2022, with a total value of 1,595,318 lek, according to Annex 2.3.1 attached to the Audit Report Draft.

During 2022, agricultural compensation procedures were carried out due to various accidents that occurred in the Q.P.N. and QASHNG, in accordance with the Agricultural Compensation Regulation we have, under Law No. 9244, dated 17.6.2004 "On the Protection of Agricultural Land" and Law No. 10431, dated 09.06.2011 "On the Protection of the Environment."

Based on calculations in the report, the estimates for lost agricultural profit for this year resulted in 12 Orders for 35 farmers, with a total cost of 2,912,444 lek, from the 8,000,000 lek planned for 2022. This total amount spent for 2022 also includes damages to agricultural land caused by accidents that occurred at the end of 2021.

Specifically, for financial compensation for land and agricultural crops for 2021, 3 orders were issued in the first half of 2022 to liquidate compensation for 5 farmers with a total of 385,622 lek. Meanwhile, for agricultural compensation due to accidents that occurred in 2022, 9 orders were issued to compensate 30 farmers with an amount of 2,526,822 lek, according to Annex 2.3.2 attached to the Audit Report Draft. The main factors dictating these agricultural compensation expenses were primarily accidents caused by cracks in the oil main pipeline, especially during the winter period for various technological reasons, leaks from emergency pits and separators, the release of gas during decantation, and partial replacement of oil transport pipelines. Additionally, soil slippage due to hilly terrain caused displacement and detachment of oil and gas pipelines, along with aging and corrosion of the oil transport pipelines.

The completion of accident elimination processes required the passage of heavy machinery from the centers, which caused damage to land, agricultural crops, and fruit trees of the farmers. It should be strongly emphasized that the most problematic production center in terms of accidents caused and the financial damages to the Albpetrol company is the QPN Fier, and more specifically, the Cakran-Mollaj sector. The causes of these damages stem from significant aging of the fluid transport lines from centers No. 38, No. 59, and No. 29, towards Center No. 17, where the fluid from this oil field is collected. Additionally, the fluid transport line from Center No. 17 to the Usojë decantation remains a permanent

concern. It should be noted that partial replacements have not solved the situation, resulting in fluid loss, additional costs for compensating farmers, and penalties imposed by ISHPMUT Fier.[72]

The current fertility of these lands has been consistently declining. One of the factors contributing to this degradation is the exploitation of oil on more than 33,000 hectares. These lands show high variability in pH values, ranging from (7.2 to 8.50), classifying them as neutral to alkaline.

Additionally, the Ni content in all these lands is relatively high. Its content ranges from 215.9 to 284 mg/kg, indicating toxic levels of this element in the soil. The content of lead (Pb) is found to be at considerable levels, but it does not reach high values accepted by the EU. Regarding the hydrocarbon content in the soil, it is found to be at high levels, ranging from 117.2 to 454.3 mg per 100g.

We believe that the high content of heavy metals (Ni, Vn, and Pb) in the oil-bearing region contributes to soil contamination. Moreover, the analysis of hydrocarbons in this area, which shows high concentration, further strengthens the conclusion about the influence of oil extraction activities on soil pollution in this zone.

B. PEDOLOGICAL AND AGRONOMIC ASSESSMENT OF SOILS IN THE STUDY AREA

Soils in the Patos–Marinëz source area, where pedological and agronomic assessment was conducted, extend east-west starting near Roskovec and ending at the coast, while north-south these soils start at the Patos-Visok border and end in the area between the two banks of the Seman and Vjosë rivers. The mentioned land area is a zone where the main industrial activity is oil and gas extraction, including impacts from previous nitrogen fertilizer production plants and currently the Fier thermal power plant. The area covers approximately 50,000 ha, of which about 23,000 ha are under direct influence of oil deposits. Each well occupies a limited area between 800 and 900 m², while an oil collection group covers from 3,000 m² to 5,000 m² of land.

Within the boundary of this zone, the areas of cultivated agricultural land have steadily decreased. This phenomenon is not only a result of the effect and influence of oil exploitation activities but also the limiting effect of salinity in soils near the coast and beyond. To give a clear idea of soil characterization in this zone, it is important to conduct a general assessment of pedological, agronomic characteristics including physical and water-related indicators

Environment*:* These soils are included in the Central Mediterranean plain climatic zone and have flat relief, where vegetation is diverse and represented by grasses and shrubs.
Profile construction. The profile is of A-C type. For example, in *Roskovec*, the stratification is: Horizon Ap from 0 to 31 cm, Horizon Cg1 from 31 to 53 cm, Horizon Cg2 from 53 to 63 cm, Horizon Cg3 from 63 to 72 cm, Horizon Cg4 from 72 to 102 cm.
In *Marinëz*, the profile is of A-C type: Horizon Ap from 0 to 20 cm, Horizon C1 from 20 to 41 cm, Horizon C2 from 41 to 58 cm, Horizon C3 from 58 to 86 cm, Horizon Cg4 from 86 to 130 cm.

Hydrological characteristics: These soils exhibit average water permeability. Hydraulic conductivity has average values and depends on the layers. They have medium water holding capacity and release water easily; therefore, irrigation of plants during dry periods is necessary. Field water capacity ranges from 21 to 31%, productive moisture is 12.7 to 16.4%, and permeability varies from 1.25 to 0.26 mm/min.

[72] High State Control. (2023). *Final Compliance Audit Report for Albpetrol sh.a Patos*. Tirana, p. 109-110.

***Physical characteristics*:** These soils are sensitive to compaction, and at various depths of the profile, cemented, impermeable layers are encountered. This phenomenon is found in almost all soils. Generally, these are soils with porosity varying widely, dominated by micropores. They are moderately aerated.
Sand fractions range from 74% in the upper horizons down to 44% in the lowest horizon; silt ranges from 29% to 37%; clay from 60% down to 18%.
In *Marinëz* – sand fractions range from 46% in upper horizons to 45% in lower horizons; silt ranges from 33% to 32%; clay ranges from 27% in upper horizons to 36% in lower horizons.

A scheme reflecting the progression of cadmium content according to measurements conducted on 14.01.2022 shows that this element reaches values 4 to 10 times higher than the pollution threshold in soils near oil activities.

4.6 IMPACT ON CLIMATE CHANGE

The oil sector has a significant impact on climate change due to greenhouse gas emissions associated with oil extraction, processing, and usage. During oil extraction, methane leaks often occur, a greenhouse gas with a much stronger warming effect than carbon dioxide, contributing to global warming. Furthermore, refining and processing operations are sources of various atmospheric pollutant emissions. In areas where oil activities take place, air quality is often degraded due to the presence of fine particulate matter PM10 and PM2.5, as well as volatile organic compounds, benzene, and nitrogen oxides. These pollutants are harmful to residents' health and contribute to the formation of tropospheric ozone, which during periods of high solar radiation, such as in summer, reaches concerning levels in the air. Additionally, sulfur dioxide (SO2) emissions in these areas cause the formation of sulfate particles, which affect not only air pollution but also climatic processes by reflecting solar radiation and influencing atmospheric temperature.

To minimize the negative impact of the oil sector, strict measures are needed for monitoring and reducing emissions, including the use of methane capture technologies, continuous air quality controls, and high environmental standards for refineries and oil extraction activities. Informing and raising awareness among local communities is also an important part of strategies to protect health and the environment. In summary, activities in the oil zone are among the main sources of greenhouse gas emissions and atmospheric pollutants, contributing to climate change and air quality deterioration, requiring continuous attention for their management and mitigation.

4.6.1 Assessment of Oil Projects' Compliance with National and International Climate Commitments.

Oil projects, as a significant energy source, face serious challenges in aligning with national and international objectives for reducing greenhouse gas emissions and combating climate change. Within the framework of national commitments and under the Paris Agreement and mechanisms of the Intergovernmental Panel on Climate Change (IPCC), Albania has set targets for emission reductions and the promotion of clean energy sources.

In this context, oil activities must be strictly regulated and monitored to reduce emissions of gases such as CO2 and methane, which are primary drivers of climate change. Without careful management and the use of advanced technologies to minimize emissions, oil projects may be in conflict with these commitments.

On the other hand, forests play a key role in the country's climate balance by functioning as natural carbon sequestrators. According to the 2023 Environmental Status Report, our forests store approximately 100.9 million tons of carbon, of which 80% is retained in forest soils and 20% in forest biomass. Coniferous forests are more efficient at carbon capture, with broadleaf forests contributing 51% of this stock and halophytic forests 27%. This demonstrates that protecting and expanding forest areas is an important strategy for fulfilling climate commitments.

Therefore, to achieve climate goals, it is essential that oil projects integrate policies promoting forest conservation and expansion as a natural way to balance greenhouse gas emissions. A comprehensive approach combining emission reductions from the oil sector with ecosystem conservation can help Albania effectively meet its national and international climate obligations.

4.6.2 Local Water Resources

Assessment of the impact of oil extraction and processing on local water resources – Oil extraction and processing have a significant negative impact on the quality and quantity of water resources in areas where these activities take place. Based on hydrological studies and measurements in the oil and gas fields of the studied region, it has been found that the movement of groundwater corresponds with that of surface water, flowing primarily from east to west. This direction is also linked to the slope of the geological layers, influenced by tectonic and neotectonic forces.

Pollution of groundwater and surface water – Industrial processes and waste discharges from oil extraction and processing activities, especially in the industrial complex of Fier, have caused serious contamination of groundwater and rivers passing through these areas. In the aquifers and rivers Vjosa and the Ngjallë Canal, high concentrations of toxic substances such as phenol, boron, and surfactants with toxic properties (separol, propalit, servo) have been identified, which negatively affect water quality and the natural self-purification of rivers.

Impact on aquatic environments and residents' health – The presence of toxic substances in water has harmed aquatic fauna and flora, causing significant ecological consequences. Furthermore, contaminated water is used for irrigation in agriculture and for watering animals, posing risks to both human and animal health. Evidence shows that pollution has also penetrated into shallow groundwater. It is estimated that around 117 km of water bodies are contaminated with oil substances/polymers, with direct consequences for drinking water quality in the surrounding areas. These include the waters of the Gjanica River, Seman River, and streams in the area. This condition of the water poses a direct risk to the agricultural food chain due to the use of water for irrigation.[73]

Pollution in the Adriatic Sea – Pollution of rivers spreads to the Adriatic Sea, where oil layers on the water surface and beach sand present a serious concern for tourism and the marine ecosystem. The situation has worsened by the presence of dead fish on the shore, reflecting the high level of pollution and the toxic impact of oil compounds on marine habitats. Cd and Pb are two elements commonly associated with the oil extraction and processing industry. Historical discharges from Seman into the Adriatic Sea and their penetration into the waters of Karavasta Lagoon may be a cause of water contamination. [74]

[73] Ombudsman. (2024). *Recommendation for the immediate measures to protect the health of citizens and the environment from hydrocarbon pollution in the Patos Marinza area and surrounding cities*. Retrieved from https://www.avokatipopullit.gov.al/media/manager/website/media/rekomandim%2011%20dhjetor%20%202024%20albpetorl.pdf, Page 12.

[74] National Environment Agency. *Environmental Status Report 2023*. Tirana.

4.7 SOCIAL IMPACT

The oil industry has a significant impact on the social dynamics of the areas where its activities are conducted. In terms of employment, it provides numerous job opportunities, including for technical staff, engineers, and support personnel, thereby contributing to the economic development of local communities. However, working conditions are often hazardous to workers' health due to exposure to toxic pollutants such as hydrogen sulfide and hydrocarbons, which can cause chronic diseases that impair work capacity and reduce quality of life.

Community relations frequently face challenges due to environmental pollution, which directly affects the health and well-being of nearby residents. Health issues such as respiratory illnesses, nervous system disorders, and skin conditions are widespread, placing additional pressure on healthcare services and lowering the overall quality of life within the community. In the absence of meaningful dialogue and the inclusion of residents in decision-making processes, social tensions may rise, and trust in companies and institutions may erode.

The long-term effects of pollution pose serious threats to the health of both workers and local populations, with conditions such as toxic encephalopathy, chronic respiratory diseases, hearing loss, and occupational dermatitis being reported. These health problems not only affect workers but also extend to their families and communities, often accompanied by psychosocial stress and broader social implications.

To mitigate these negative social impacts, it is essential to implement robust protective measures, ensure continuous health monitoring of workers, and enhance community engagement in decision-making. A well-designed environmental and social impact assessment can assist in identifying and minimizing risks, contributing to sustainable development and long-term well-being for all stakeholders involved.

4.7.1 Employment and Local Job Opportunities

The oil industry in Albania has historically served as a major source of employment for thousands of residents in rural and peripheral areas, particularly in Patos-Marinza, Ballsh, Kuçova, and other oil-producing zones. Between 2014 and 2024, the sector experienced persistent employment fluctuations, driven by changes in company ownership, declining production levels, and broader economic challenges.

Statistical data for the period 2014–2023 indicate a significant and sustained decline in the number of employees in the oil sector in Albania. From 3,746 registered workers in 2014, this number dropped to 2,462 in 2023, reflecting a contraction of over 34%. This is one of the strongest negative employment trends among industrial sectors in Albania and serves as an indicator of the transformations that the oil industry in the country is undergoing.

The continuous decline in employment in Albania's oil sector over the last decade is the result of a series of structural factors and both internal and external developments. Firstly, one of the fundamental causes has been the natural depletion of several oil fields, which has led to a gradual reduction in the intensity of extraction operations. Consequently, there has been a significant decrease in the demand for labor, particularly in the basic levels of operational activity.

Secondly, the lack of new investments, especially in exploration and discovery activities of new fields, has substantially affected the narrowing of opportunities for employment growth. After 2016, capital investments in the oil sector declined significantly, stalling new projects and preventing the creation of new jobs.

Another factor with a direct impact is the development of technology and the spread of automation in oil extraction and processing processes. These developments, although increasing efficiency and safety, have considerably reduced the need for manual or operational labor, thus negatively affecting overall employment levels.

Furthermore, changes in public policy approaches, which have increasingly oriented towards sectors with lower environmental impact, such as renewable energy, have led the oil sector to lose its priority in development strategies and in public or international financing. This reorientation has reduced interest and support for the long-term development of the traditional hydrocarbon industry.

Finally, the withdrawal or reduction of the presence of some foreign companies, which have historically been the largest contributors to employment and investment, has left a major gap in the sector, which has not been adequately replaced by domestic capital or new projects. This has resulted not only in a reduction of operational activities but also in direct job losses, particularly in areas where these companies had significant economic and social impact.

In order to address the decline in employment in the oil sector and to ensure a sustainable transition in the labor market, it is recommended that specific policies be developed to support existing workers. These policies should include training and professional reskilling schemes, which would enable their transition toward alternative sectors with higher employment potential.

Additionally, investments that include strong social components should be encouraged, where local employment is one of the priority criteria for the granting of licenses or the benefit of fiscal incentives. In this context, the creation of mechanisms for the continuous monitoring of the labor market in the oil industry is essential, in order to identify real-time trends, needs, and structural gaps. This would help in the formulation of proactive policies and effective interventions that support not only the preservation of existing jobs but also the adaptation to long-term developments in the energy and economic sectors.

Figure 16. Graph Total Number of Employees in the Oil Sector in Albania (2014–2023) Based on Data from INSTAT.

Year	Total employees (avg. annual number)
2014	3,746
2015	3,705
2016	3,385
2017	3,514
2018	3,121
2019	2,655
2020	2,561
2021	2,545
2022	2,438
2023	2,462

Table 25. Total number of employees in the oil sector in Albania (2014–2023), based on data obtained from INSTAT.

COMPARATIVE ANALYSIS OF EMPLOYMENT BY GENDER IN THE OIL AND GAS SECTOR (2019–2023) (ALBPETROL)

During the five-year period 2019–2023, employment data in the oil and gas sector in Albania reveal a dominant presence of male workers compared to females. The sector has maintained an employment structure in which men make up an average of approximately 86.6% of the workforce, while women represent only 13.2%. This gender imbalance is a strong indicator of the traditionally male-dominated nature of the hydrocarbon industry, which has historically been less attractive and less accessible to women due to its technical nature, physically demanding work environments, and an organizational culture built around more conventional gender roles.

The total number of employees has experienced moderate fluctuations during this period, but the gender structure remains nearly unchanged. For example, in 2019, there were 2,610 total employees, of whom 87.1% were men and 12.8% women. In 2023, although the total number of employees slightly increased to 2,471, the gender ratio remained almost the same, with 86.5% men and 13.5% women. This suggests that there has been no significant improvement in terms of gender equality in this sector.

The limited inclusion of women in this industry may be linked to several key factors:

- Gender segregation in education: Professions related to the oil industry (such as geological, mechanical, and petroleum engineering) are more frequently pursued by men, directly influencing recruitment structures.
- Challenging working conditions: Many positions require fieldwork in remote areas or under harsh climatic and logistical conditions, which often limits women's participation.
- Organizational culture and lack of gender-supportive policies: The absence of internal mechanisms that promote the inclusion of women in technical and managerial roles has contributed to the sector's failure to achieve gender balance.

There are concrete and achievable opportunities to promote broader inclusion of women in the oil industry sector. Increasing their participation can be achieved through well-structured policies aimed at gender empowerment. Interventions should first focus on encouraging girls and women to pursue

education in technical and engineering fields by offering dedicated scholarships and developing awareness campaigns to break gender stereotypes.

Another essential tool is the implementation of gender quotas, especially in recruitment processes or decision-making positions, to ensure fairer representation. Equally important is the creation of suitable working conditions for women in the field, as well as support through social and family policies that directly affect the balance between professional and personal life. These measures represent a necessary step toward building a more inclusive, fair, and socially sustainable sector.

Improved gender equality in the oil and gas sector is not only a matter of social justice but also an opportunity to benefit from a more diverse and innovative workforce, which is vital for the long-term and sustainable development of the industry.

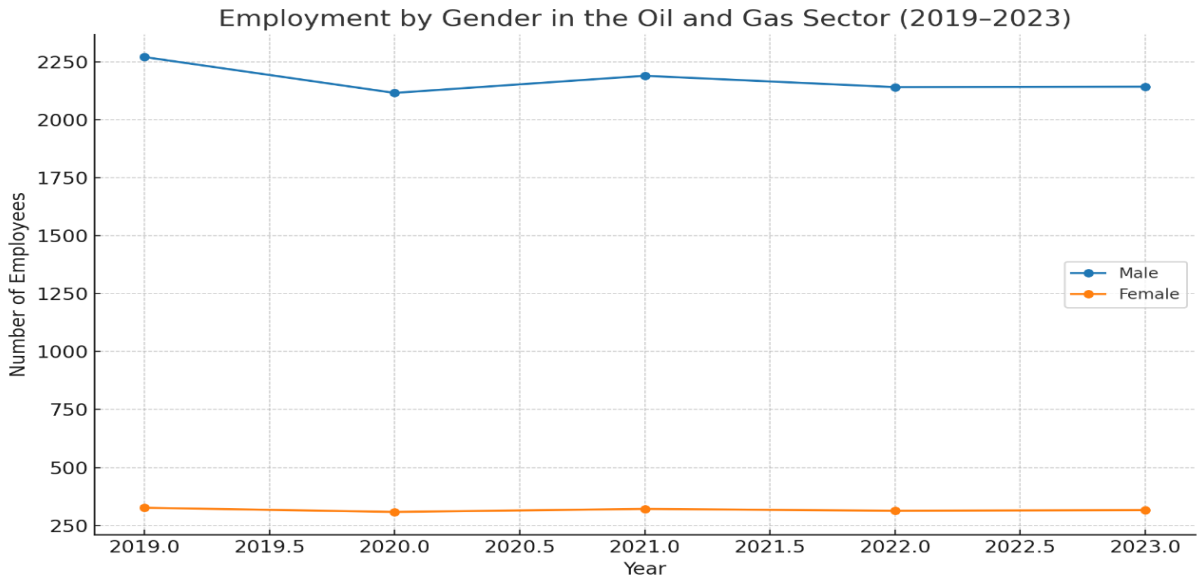

Figure 17. Graph. Employment by Gender in the Oil and Gas Sector (2019–2023), based on data from the GDT (General Directorate of Taxes).

Year	Men	Woman	Total	% Woman
2019	2,275	335	2,610	12.8%
2020	2,096	316	2,412	13.1%
2021	2,182	333	2,515	13.2%
2022	2,134	326	2,460	13.3%
2023	2,138	333	2,471	13.5%

Table 26. Employment by gender in the oil and gas sector in Albania (2019–2023), based on data obtained from the General Tax Directorate (GTD).

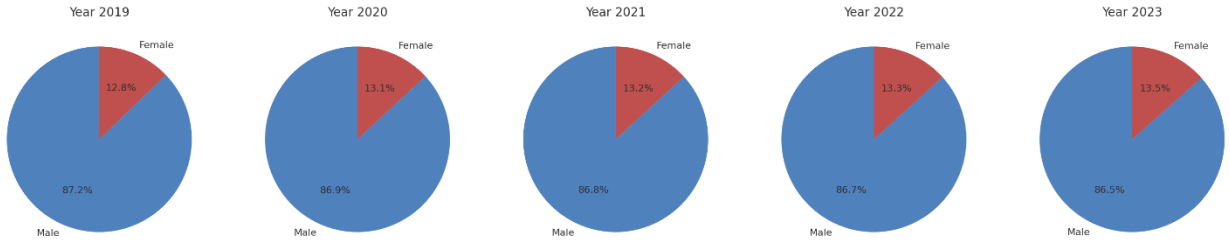

Figure 18. Percentage of female and male employees in the oil and gas sector over the years (2019–2023).

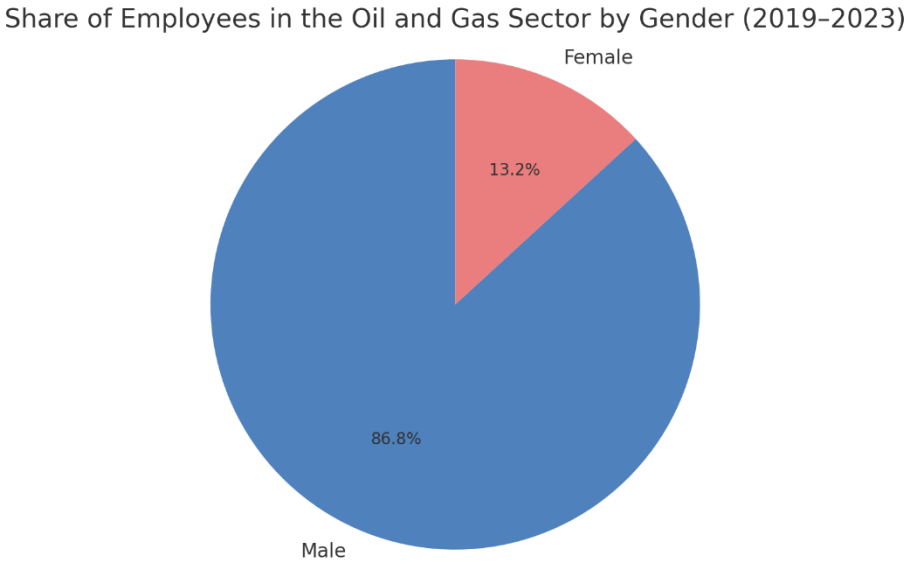

Figure 19. Percentage of female and male employees in the oil and gas sector over the years 2019-2023 (total).

4.7.2 Work Practices in the Oil Sector

Work practices in the oil sector encompass a range of measures and regulations aimed at ensuring worker safety, health, and environmental protection, in line with current legislation. Based on Law No. 53/2020 and other amendments to environmental protection laws and environmental permitting, companies operating under environmental permits of categories A and B are required to prepare and submit risk management reports for the sites where they conduct oil and gas exploration and extraction activities. These reports are part of self-monitoring obligations and contribute to maintaining a safe and sustainable working environment.

In the context of workplace safety, the term “work site” includes all activities carried out during hydrocarbon exploration and extraction. The coordinator responsible for the execution of works is tasked with monitoring and verifying the implementation of safety and health regulations, as well as the proper application of work procedures according to the safety and coordination plan. This plan is a supplementary and detailed document to the safety report regulation and must be regularly updated and verified to ensure compliance with legal requirements.

To guarantee a safe working environment, Occupational Health and Safety Council meetings are held every three months, along with emergency meetings in the event of accidents or crises. These meetings

facilitate cooperation between employees and management in coordinating activities and sharing information. Employers are responsible for monitoring the use of work equipment and personal protective gear, as well as providing appropriate working and hygienic conditions at the site.

An important aspect is operational safety planning, which involves selecting the location of work positions, determining circulation routes, and managing the storage of materials, particularly hazardous substances. Maintenance and inspection of equipment are carried out regularly and before work begins, in order to eliminate any defects that might endanger worker safety.

As part of accident prevention and emergency management, oil companies subcontract specialized experts to design emergency management plans for potential incidents during the operation of their equipment. The main objective of these plans is to protect the environment and human life while creating optimal conditions for operational continuity. Experts develop various emergency and failure scenarios, defining necessary measures and identifying responsible groups for response, recovery, and site restoration.

The main characteristics of these emergencies may be linked to technological, natural, or combined factors, such as seismic events, landslides, or floods. Given the high risk these situations pose to the environment and the population, preventive and responsive actions must be prompt and accurate to protect lives and minimize damages. Additionally, surface-level operations are planned to have minimal impact on surface and underground waters, and the development of facilities is limited in scale to reduce potential risks.

Overall, practices in the oil sector must fully comply with Albanian laws and regulations and ensure not only a safe working environment for employees but also the protection of the environment and the sustainable development of the industry.

4.7.3 Workplace Safety Standards

The oil industry in Albania, concentrated primarily in the regions of Patos-Marinza, Ballsh, and Kuçova, has historically been among the most hazardous sectors for workers. This is due to outdated technologies, insufficient risk management, and a lack of investment in technical safety measures and continuous staff training.

During the 2014–2024 period, workplace safety standards have evolved slowly and inconsistently. Although, on paper, Albania has aligned its legislation with European Union directives on occupational health and safety, in practice, enforcement and regular monitoring have been lacking. According to data from the Institute for Occupational Safety and Health, the energy and mining sectors are among the most problematic in the country. Work in oil extraction fields involves risks such as explosions, falls into open wells, exposure to toxic gases (such as H_2S), and severe environmental pollution, all of which pose serious threats to worker health.

During 2022, there were 4 workplace accidents, where Albpetrol through its Directorate and respective specialists followed all legal procedures and carried out detailed analyses for each accident case. In these accidents, one resulted in a fatality, while in the other three, employees were sent for specialized medical treatment.[75]

[75] High State Control. (2023). *Final Compliance Audit Report for Albpetrol sh.a Patos*. Tirana, p. 108

Improvement efforts have intensified, especially after 2019, with the establishment of more internal control structures within oil-producing companies. However, there is still no effective system for safety reporting and auditing. Furthermore, independent inspections are infrequent, and companies often evade responsibility for accidents by failing to provide full compensation to affected workers.

Albpetrol sh.a Patos, along with the relevant specialists, continuously worked on ensuring the smooth operation of tasks and compliance with technical safety regulations, health protection, and environmental safeguarding. The focus in this year was on the following key areas:

- Environmental inspections were carried out to determine environmental hot spots and identify issues related to workplace safety.
- Inspections were conducted in centers and dependent units to ensure compliance with technical safety regulations, health preservation, and environmental protection.
- The implementation of the life insurance contract for workplace accidents was followed up, along with medical examinations for employees covered by the insurance policy.
- Employee training on recognizing and implementing safety regulations, fire protection, and environmental conservation was carried out (for each profession), based on internal regulations and applicable legislation.
- Efforts were made towards the evaluation of risk documents to reduce risks at work and prevent various incidents, with all employees being briefed on them.
- Inspections conducted by state authorities on workplace safety and environmental protection were followed, and continuous communication was maintained with these authorities or institutions regarding the information they requested.[76]

4.7.4 Local Procurement and Development of Domestic Businesses

The oil industry, due to its technologically complex and capital-intensive nature, holds significant potential to generate multiplier effects in the local economy by stimulating demand for auxiliary goods and services such as equipment maintenance, transportation, catering, protective gear, information technologies, and more. However, in practice, the impact of this industry on the development of local businesses has proven to be limited for several key reasons. First, the concentration of contracts in the hands of international operators with closed supply chains and the use of foreign subcontractors has significantly reduced opportunities for the involvement of local enterprises. Second, most domestic businesses fail to meet the technical, safety, and quality standards required by the oil industry, due to a lack of certifications and specialized capacities. Lastly, institutional intervention and support for integrating small and medium-sized enterprises (SMEs) into value chains have been minimal, characterized by unclear policies, the absence of transparent procurement databases, and a lack of intermediary platforms that would facilitate connections between local actors and large companies in the energy sector.

4.7.5 Infrastructure development

The oil extraction sector in Albania has partially contributed to infrastructure development in the producing areas; however, these investments have primarily been driven by the technical needs of the industry and have had a limited impact on improving the overall quality of life in host communities. Since 2014, the company has made significant investments in building industrial roads, waste treatment systems, steam injection plants, and environmental improvements, made possible also through support from international institutions such as the EBRD and IFC. Nevertheless, these investments have remained

[76] High State Control. (2023). *Final Compliance Audit Report for Albpetrol sh.a Patos*. Tirana, p. 110.

confined within the perimeter of operations and have not produced transformative effects on broader public infrastructure, such as local roads, water supply systems, or energy services for residents.

The roads that have been constructed or maintained in the Patos-Marinza area have been primarily used for internal industrial transport, while the road infrastructure for community use has remained deteriorated. In terms of energy and water supply, some interventions have been carried out by the operators to support their technical operations, but without an integrated approach or community involvement in decision-making. Regarding processing capacities, the Ballsh refinery has experienced a sharp decline in operations during this period due to financial crises, lack of investments, and outdated technology, reducing the regional economic impact it once had.

At a broader strategic level, the construction of the Trans Adriatic Pipeline (TAP) between 2016 and 2020 constitutes the most significant infrastructural intervention in the energy sector, with the segment passing through Albania bringing temporary improvements in the road and energy network, as well as new opportunities for gas network development in the country. Since 2021, initial steps have been taken for the construction of gas distribution infrastructure in cities such as Korça, Pogradec, and Erseka, including cooperation between Albgaz and SOCAR. However, by the end of 2024, many of these projects remain in the implementation or planning phase, while the actual impact on domestic infrastructure remains limited compared to its potential.

4.7.6 Population displacement

From a social and demographic perspective, although no institutionalized, permanent population displacements have been officially documented, reports from local communities and recorded incidents indicate cases of forced economic migration and informal movements caused by deteriorating living conditions in areas surrounding oil wells. Environmental degradation, groundwater pollution, soil erosion, and deep drilling activities have produced direct physical impacts on residential structures and civil infrastructure. The most severe case occurred in Zharrëz, where over 2,700 micro-earthquakes were recorded during 2016–2017, potentially linked to fracking activities. This phenomenon caused structural damage to homes, social insecurity, and sparked waves of protests, including hunger strikes. Nevertheless, no formal resettlement mechanism or housing support program was activated.

In contrast, the Trans-Adriatic Pipeline (TAP) project, constructed between 2016 and 2020, followed EU standards for planned resettlement and structured compensation. This included community consultations, reconstruction of residential infrastructure, and formalized relocation processes. This comparison highlights the absence of a robust institutional framework in Albania for addressing the social impacts and displacement caused by domestic hydrocarbon industry activities, especially when compared to internationally standardized projects.

Environmental experts and civil society organizations have raised concerns over the lack of a clear mechanism for assessing social risk. Furthermore, there is no functional inter-institutional structure for managing technological emergencies, compensating affected residents, or monitoring long-term environmental and health impacts.

4.7.7 Community Engagement in Decision-Making

The participation of local communities in decision-making processes related to the oil extraction industry in Albania remains significantly limited and predominantly formalistic. Although certain public consultations have been conducted in accordance with legal requirements or as part of Environmental

Impact Assessment (EIA) reports, these are often carried out in a symbolic manner, with low attendance and without meaningful involvement of local stakeholders. The lack of community access to clear and comprehensive information regarding their rights, the environmental and social impacts of operations, or the long-term development plans of the industry has significantly weakened their ability to exert influence or engage in local policy-making.

Furthermore, there are no institutionalized mechanisms in place for addressing grievances, reporting incidents from the community, or involving the public in the monitoring or social auditing of company activities. The absence of a clear framework for fiscal transparency and benefit-sharing further exacerbates the disconnect between the industry and host communities. Currently, revenues generated from the oil industry (e.g., royalties, taxes, or concession fees) are not systematically directed toward local development, nor does a dedicated fund for social investment exist—unlike international best practices in natural resource governance. This situation has fostered the perception that communities are bearing the environmental and social burdens of the industry without receiving fair compensation in the form of economic benefits or investments in local infrastructure and public services.

4.7.8 Investments by Oil Companies in Surrounding Areas

On 19 January 2023, Anio Oil & Gas carried out three significant social investments in the Municipality of Mallakastër, aimed at improving living conditions and enhancing public infrastructure in key sectors such as health, education, and public safety.

As part of this initiative, the detention rooms at the Mallakastër Police Station were reconstructed to meet human rights standards, ensuring separate spaces for men and women. Another key intervention involved the full rehabilitation of the epidemiology laboratory at the Local Health Care Unit, bringing it back into full operation for conducting essential tests, including COVID-19 diagnostics. In addition, the indoor facilities of Kindergarten No. 2 and the nursery in the “28 Nëntori” neighborhood were improved, creating safer and more suitable environments for the community’s youngest members.

These investments highlight Anio Oil & Gas’s ongoing commitment to supporting social development and improving the quality of life for residents in Mallakastër.

Together, these actions reflect the companies’ long-term dedication to cooperating with local authorities, providing dignified public services, and fostering a more responsible and community-oriented energy industry.

4.7.9 Environmental and Social Management Plan

Attributes	Potential Impact	Management Action	Monitoring Action	Responsible Entity
Impacts on Biodiversity	Hydrocarbon exploration projects are distributed across relatively small exploration areas, thereby reducing the extent of vegetation clearance and large-scale habitat fragmentation. Habitat fragmentation: Faunal species that require large forested areas may disappear or be forced to travel long distances in search of suitable living habitats.	The magnitude and severity of the impacts will depend on the actions taken by the license holder. If the license holder commits to implementing appropriate mitigation and management measures during exploration and prospecting activities, the impact will be minimized to an acceptable level in accordance with specific legal requirements.	Monitoring of Habitat Use	ARM (Regional Environmental Agency)
Geology, Soil Quality, Land Use, and Landscape Impacts	During the exploitation phase, there may be significant impacts on geology and soil quality due to drilling and hydraulic fracturing processes. Hydraulic fracturing can have considerable effects on geological formations as a result of water injection used for hydrocarbon extraction. Regarding agricultural land, the area may be transformed from cultivated land into an industrial zone, which, as a result of project activities, may become contaminated (spills) or degraded due to various extraction processes. As for landscape impacts, they are expected to be low in oil and gas projects	As for landscape impacts, the magnitude may be lower in oil and gas projects. These types of impacts can be reduced through various mitigation and management measures, provided that good practices are followed at all times and technology is periodically updated.	Monitoring land use and technological waste discharges. Updates on drilling and production technology upgrades.	ARM Operating Company
Air Quality Impacts	Air emissions occur during every phase of the extractive industry project cycle, particularly during exploration, site preparation, exploitation, and operational activities. Particulate matter in the air (mainly PM2.5 and PM10) arises from site clearing, material transportation, dust dispersed from industrial waste facilities, waste disposal sites, and road traffic; Emissions from mobile sources (vehicles, trucks, heavy machinery/equipment) may also contribute to increased particulate levels in the air, as well as the release of gaseous emissions (NOx, SOx, CO,	Once pollutants are released into the atmosphere, they undergo physical and chemical transformations before reaching a receptor. These pollutants can cause serious adverse effects on human health and the environment, particularly on biodiversity (both fauna and flora). Oil and gas exploitation activities have the potential to significantly contribute to air pollution	Atmospheric emissions monitoring. Technology updates for gas absorption systems.	ARM Operating Company.

	etc.); Dust emissions from hydrocarbon processing and traffic movement, particularly on unpaved roads; and Gaseous emissions from the combustion of fuels in both stationary and mobile sources, as well as from hydrocarbon processing. The most concerning air pollutants from oil activities are gaseous emissions, particularly SOx, NOx, CO, CO_2, and others			
Surface and Groundwater Impacts	Among the most significant impacts of extractive industry projects are their effects on water quality and the availability of water resources within the project area. The main concerns lie in whether surface and groundwater resources will remain undisturbed, uncontaminated, and suitable for human consumption (in the case of groundwater), and whether the quality of surface waters in the project area will remain adequate to support local aquatic life and terrestrial wildlife.	Oil and gas drilling activities can lead to the depletion of groundwater resources and the deterioration of water quality. Exploration activities may involve the injection of water underground, and in some cases, the injected water used in the process is saline or brackish. This technique can result in negative impacts on groundwater quality by causing the migration or intrusion of saline or brackish water.	The injected water used in the fracturing process may be brackish. This technique should aim to preserve the quality of groundwater and control the parameters related to the migration of brackish water. Water treatment plants should be used prior to discharging waters into watercourses.	ARM; Basin Management Agency; Operating Company.
Noise and Vibration Impacts	Noise-related concerns can cause significant disturbances to human receptors and wildlife. In extractive industries, the hydraulic fracturing process (oil and gas) is a primary source of vibrations. Hydraulic fracturing has raised issues due to induced vibrations. The equipment and machinery used during exploration and exploitation activities may also generate vibrations. Some continuous noise sources may occur, such as drilling operations, which can create ongoing noise, but this is generally kept under control through soundproofing measures. The hydraulic fracturing technique may cause the movement of	There is a distinction between continuous and permanent noise due to their different origins and the creation of different types of impacts/disturbances. Typical continuous noises are those generated by vehicle traffic along the main roads in the project area. The noise usually produced by oil and gas activities is generally intermittent or sporadic. Since this low-level continuous noise is part of the prevailing background noise, the impact is usually minor and tolerable. Intermittent noise is produced by specific work processes, mainly the daily ignition of engines.	Best practice requires that major noise-generating processes should not be carried out simultaneously, but as separate operations, and should be conducted during working hours at an appropriate time of day (usually not during lunch hours or at night). To prevent and	ARM; National Agency of Natural Resources (AKBN); Operating Company

	underground soil layers and rock formations, which in turn can lead to ground disturbances, layer shifts, vibrations, and even earthquakes. Vibrations caused by hydraulic fracturing can result in serious social impacts and disturbances for local communities located near oil and gas exploitation zones. Such vibrations have affected the stability of local infrastructure, homes, buildings, and recreational activities situated close to oil and gas industry operations.	If it does not follow a regular cycle or when the period is long, it may be considered sporadic noise. The technique of hydraulic fracturing may cause the movement of underground layers of soil and rocks, which can consequently lead to ground disturbances, layer shifts, vibrations, and earthquakes. Vibrations from hydraulic fracturing can cause disturbances and serious social impacts on local communities near oil and gas operation zones.	control noise pollution from oil industry activities, specific mitigation measures should be in place in the area, along with a management plan (Noise Reduction Plan). Therefore, it is very important that these activities are properly planned and managed	
Impacts from Waste Generation	Hydrocarbon substances are considered hazardous materials due to their composition and toxic properties, which can cause environmental damage or pollution (to water resources, biodiversity) and pose risks to human health. Soil contaminated with hydrocarbon substances is classified as hazardous waste and must be properly managed and disposed of in accordance with legal requirements in designated disposal areas. Other hazardous materials, such as outdated equipment, machinery, storage tanks, and various substances, are also classified as hazardous waste.	There are many "hotspots" such as Marinza, Ballsh, Kuçova, etc., that pose environmental and social risks due to old hydrocarbon drilling equipment abandoned in the area, spills of hydrocarbons, and/or other types of hazardous materials left behind from previous extractive industrial activities. These hazardous materials and substances raise concerns for the local community due to odor emissions, contamination of water sources and soil, particularly during the summer months.	Companies holding environmental permits must be fully compliant with legislative requirements and ensure best practice management for the disposal, treatment, and reuse of waste generated by their activities	ARM; National Agency of Natural Resources (AKBN); Operating Company
Ndikimet në Infrastrukturë dhe Trafik	Oil and gas projects can lead to the construction of new infrastructure such as roads and bridges, or to the improvement of existing road infrastructure. Companies operating in the oil and gas industries are often engaged in improving local infrastructure and investing in the project area (new constructions or renovation of health centers, schools, water supply networks, etc.). Increased traffic poses a problem in oil extractive industry project areas.	There are cases when the company does not provide local investments in the area, but instead utilizes the existing local infrastructure. In such cases, the local infrastructure is at risk of deteriorating more rapidly over time due to the increased traffic flow.	The preparation of an investment plan in infrastructure and traffic management is considered best practice to ensure transport safety for employees, the community, and visitors, and to avoid potential disturbances	ARM; AKBN; Local Authorities; Operating Company

	Traffic-related concerns arise due to the higher volume of vehicles, trucks, and the transportation of hydrocarbons for processing		during the implementation of the project.	
Impacts on the Local Community	Social impacts on local communities where oil and gas projects are located are often contentious and complex. Oil industry projects can create new jobs, roads, schools, promote business initiatives, and increase demand for goods and services in remote or impoverished areas, but the benefits and costs are often distributed unequally.	Communities should be treated equally and fairly, in accordance with applicable laws. However, if communities feel they are being treated unfairly or inadequately compensated, oil industry projects may generate social tension and, in extreme cases, violent conflict.	The balance between positive and negative impacts on local communities depends on the extent to which the licensed company fulfills its mandatory and voluntary environmental and social commitments.	ARM; AKBN; Local Authorities; Operating Company

Table 27. Environmental and Social Management Plan.

5. TECHNOLOGICAL AND INFRASTRUCTURAL ASSESSMENT

5.1 Technological Assessment

The use of modern technologies in the oil industry has fundamentally transformed the way companies operate, bringing significant benefits in production efficiency, safety, and the overall sustainability of the sector. Technological innovations—from smart sensors and process automation to the use of big data analytics and artificial intelligence—enable the optimization of operations at every stage, from exploration and drilling to refining and oil distribution.

In the exploration phase, the use of advanced geophysical and geological technologies helps in more accurate and faster identification of reserves, reducing both risk and costs. Additionally, directional drilling technologies and robotics contribute to increasing precision and safety during field operations, while minimizing human intervention in high-risk areas. In production and processing activities, system automation and real-time monitoring allow for better control of operational parameters, defect prevention, and improved resource management.

Moreover, next-generation technologies help reduce the environmental impact of the oil industry. The use of emission control systems, air and water quality monitoring, as well as technologies for waste management and recycling, contribute to enhancing the sustainability of operations. Furthermore, the application of renewable energy sources for powering oil infrastructure is a growing trend aimed at reducing reliance on fossil fuels during production.

The integration of modern technologies in the oil industry leads to a substantial increase in operational efficiency, cost reduction, and safety improvement, while also contributing to meeting environmental protection requirements and supporting the transition toward sustainable energy. This constitutes a

competitive advantage for companies investing in innovation and technology, helping them face the challenges of an increasingly complex sector with rising environmental standards.

5.1.1 Artificial Intelligence (AI) and Digitalization

In an effort to modernize and optimize its operations, Albpetrol has successfully integrated artificial intelligence (AI) technologies into several key processes of the oil industry. The use of AI in seismic analysis has enabled faster and more accurate interpretation of geophysical data, assisting in the identification of new drilling and exploration prospects. Reservoir modeling, a complex process that requires the analysis of various geological and technical parameters, is significantly improved with the help of AI, allowing for more accurate predictions of reservoir behavior and the optimization of production. This increases the overall efficiency of operations and helps reduce operational costs, as it enables more informed decision-making and prevents costly errors.

On the other hand, the company Alban Oil Plc has introduced innovation in data management and the digitalization of operational processes through its proprietary platforms, Cognite and Aureka. These platforms provide real-time collection and analysis of data from various sensors and logistical systems, enabling continuous monitoring and efficient management of field operations. The Cognite platform allows for the simple and integrated visualization of complex data, while the Aureka system assists in processing and organizing information to improve decision-making processes and management effectiveness.

Through these advanced technologies, Alban Oil Plc is transforming the operational landscape of the oil industry, making it more efficient, safer, and more sustainable in line with contemporary demands for green technology and modern management.

5.1.2 Enhanced Oil Recovery (EOR) Technologies

In Albania, in the Patos Marinza field, advanced and innovative approaches have been adopted to increase the oil recovery rate, by implementing advanced Enhanced Oil Recovery (EOR) technologies.Through techniques such as horizontal drilling, polymer flooding, and steam injection, a significant increase in extraction efficiency is being achieved, maximizing the use of existing resources and extending the lifespan of the production field. These innovative technologies not only improve oil recovery rates by 5–15% during the period 2025–2029 but also deliver notable economic and environmental benefits by reducing the need for new wells and minimizing negative environmental impact.

Horizontal drilling is a technique that allows access to wider areas of the reservoir, increasing the contact surface with oil-bearing layers and enhancing production compared to traditional vertical drilling. This method enables more efficient utilization of existing resources and reduces environmental impact due to the reduced need for additional drilling wells.

Polymer flooding is a technique that involves injecting polymers into the reservoir to increase the viscosity of the injected water and improve the flow of oil toward the production wells. This method enhances extraction efficiency by minimizing unwanted water channeling and increasing the recovery of residual oil.

Steam injection, on the other hand, is a technique that uses heated steam to reduce the viscosity of heavy oil in the reservoir, making it easier to extract to the surface. This method is particularly effective in fields with high-viscosity oil and has significantly improved production outcomes.

This process has been strongly supported by the European Bank for Reconstruction and Development (EBRD) and the International Finance Corporation (IFC), which have contributed to the implementation of these technologies as part of a comprehensive program for the rehabilitation and modernization of the Patos-Marinza field. Through this collaboration, substantial technical investments have been secured, and the transfer of knowledge and modern expertise to the local oil sector has been accelerated, helping to build capacities and strengthen the sustainability of operations.

In this way, the application of EOR technologies not only improves the technical and economic performance of the Patos-Marinza field but also contributes to the development of a more sustainable and innovative oil industry, aligned with international standards of efficiency and environmental protection.

The implementation of these modern EOR methods in Patos-Marinza is a concrete example of Albania's efforts to enhance the sustainability and efficiency of its oil sector by integrating advanced technologies that comply with the highest international standards. This initiative aims not only to maximize production but also to contribute to the development of a more innovative, environmentally friendly, and economically sustainable industry, positioning Albania as an important player in the regional energy landscape.

5.1.3 Predictive Maintenance and Automation Enabled by Artificial Intelligence (AI)

One of the most important aspects for the efficient and sustainable operation of the oil industry is the maintenance of infrastructure and technical equipment. In this regard, artificial intelligence (AI) technologies are playing a key role in the development of predictive maintenance systems, which have revolutionized the way maintenance is managed and planned in this sector.

AI systems use advanced algorithms to analyze real-time data collected from numerous sensors installed on equipment and critical infrastructure, such as pumps, compressors, pipelines, oil treatment systems, and drilling equipment. By analyzing this data, AI is able to identify patterns and anomalies that may signal the emergence of problems or defects before they become visibly apparent.

This early prediction of failures allows for the scheduling of preventive maintenance at the most appropriate time, avoiding unexpected operational interruptions that often result in significant economic losses and risks to worker and environmental safety. For example, the timely detection of an issue in a pump can prevent an oil leak that could cause major environmental pollution and financial damage.

The automation of maintenance processes is also a major benefit brought by the use of AI. Intelligent systems can automatically schedule and direct maintenance operations, including coordinating the technical team and ensuring the availability of required spare parts. This reduces response time and improves resource management, ensuring that maintenance is carried out with maximum efficiency and reduced costs.

Furthermore, predictive maintenance helps extend the lifespan of equipment and infrastructure by delaying the need for frequent replacements and costly investments in new machinery. This contributes to the economic sustainability of operations and reduces the environmental impact of the oil industry by lowering waste and encouraging more responsible resource consumption.

5.2 Infrastructure Assessment

Analysis of the condition of existing infrastructure, including pipelines, refineries, and storage facilities.

5.2.1 Refineries and Storage

The oil refining industry in Albania holds strategic importance for the country's economy and energy sector, with several key facilities that have ensured stable and high-quality supply for the domestic and regional markets. The company ARMO has been one of the leaders in this sector, successfully managing the refineries in Ballsh and Fierzë-Center. The Ballsh refinery, with its capacity of approximately 1 million tons per year, has contributed to the processing of oil-based products to high standards, supporting industrial development and job creation. Meanwhile, the refinery in Fierzë-Center, with a capacity of 0.5 million tons per year, has offered specialized services, expanding the range of products available on the market.

Although the refining sector has faced challenging periods, these have also created significant opportunities for modernization and improvement of the technologies used. Planned investments for the renovation of facilities and the integration of more advanced technologies are now a priority, aiming to increase efficiency, reduce environmental impact, and meet international safety and quality standards. This transformation of the refineries will strengthen the industry in the long term and create a more sustainable foundation for the country's economic development.

In the field of storage and logistics, Albania's infrastructure consists of modern and well-maintained terminals, which play a key role in ensuring the continuous supply of fuels and oil products to the market. The Porto Romano MBM terminal in Durrës is one of the country's most important assets, with large storage capacities (over 75,000 cubic meters), enabling the efficient storage of raw materials and refined products. This terminal, connected to the 24" and 12" pipeline networks, provides advanced logistical management that facilitates the circulation of goods and guarantees uninterrupted market supply. Likewise, the PIA terminal in Vlorë is another key component in the fuel distribution chain in southern Albania, enhancing regional infrastructure and offering high-standard services for the storage and distribution of oil and gas products

These capacities and infrastructure investments not only support the economy and the growth of the energy sector, but also contribute to job creation and social development in the respective communities. With a focus on innovation and continuous improvement, the refining and storage sector in Albania has the potential to play a key role in the country's energy transition and in strengthening energy independence.

5.2.2 Pipeline Network and Industrial Roads

Albania possesses a significant energy infrastructure, which provides a solid foundation for the modernization and further development of the oil and gas sector. The pipeline connecting the oil fields to the Port of Vlora, with a length of approximately 188 km, represents a strategic asset that, although currently out of service, offers exceptional opportunities for rehabilitation and reactivation. If modernized, this existing network would lead to a considerable reduction in transportation costs, increased operational safety, and significantly lower environmental impact by replacing road transport with more sustainable solutions.

In parallel with the existing infrastructure, the TAP (Trans Adriatic Pipeline) project represents one of the most significant infrastructural achievements in the energy sector for Albania. With around 215 km of pipeline running through Albanian territory, TAP has established a modern energy corridor that not only enables the entry of natural gas into the country but also creates real opportunities for the development of a domestic gas distribution network. This means expanded access for cities, industries, and the public sector to a cleaner and more economical energy source, supporting the transition to green energy. Moreover, TAP has brought tangible benefits to local infrastructure: new technological roads, construction of metering stations, and improved access to rural and industrial areas. This infrastructure is

becoming a functional foundation for local economic development, increased investments, and stronger integration of Albania into regional energy markets.

In the long term, the combination of the oil pipeline network and the modern TAP gas infrastructure creates a competitive advantage for Albania, positioning the country as an energy hub with potential for export, transit, and regional distribution. This is a clear example of how the strategic use of existing infrastructure and the construction of new corridors can contribute to economic development, energy security, and the fulfillment of sustainability objectives.

5.2.3 Future Initiatives and Modernizations

Albania is entering a new phase of energy development through a series of ambitious projects aimed at enhancing efficiency, safety, and the country's regional positioning in the oil and gas sector. One of the most promising initiatives is the TAP/IAP/AMBO project, which aims to establish a strategic connection between Albania's oil-bearing zones and key Adriatic ports such as Vlora and Durrës. These pipelines—currently in planning or prototype stages—are expected to serve as new transportation corridors, increasing the country's capacity for hydrocarbon exports and facilitating the structural storage of energy through safer and more sustainable infrastructure.

Another strategically important project is the development of natural gas storage in the Dumre geological structure, one of the most suitable underground storage locations in the region. The objective of this project is to establish a gas storage hub with a capacity of up to 800 million cubic meters, which would serve not only Albania's domestic needs but also support regional supply and system security in cases of emergencies or disruptions in global energy markets. This initiative positions the country as a stable gasification node in the Western Balkans, creating high supply flexibility and economic stability during uncertain periods.

These projects represent a significant step toward the modernization of Albania's energy network, as well as a strategic shift toward increased utilization of natural gas—a cleaner and more flexible resource compared to traditional fuels. In addition to their economic and logistical impact, these investments provide direct environmental benefits by contributing to the reduction of greenhouse gas emissions and supporting the country's green energy transition.

5.3 Risk Assessment

In Albania, the identification and management of risks in the hydrocarbon sector is being addressed by the Albanian authorities, who are approaching this process with determination and full institutional commitment. While risks remain present, there are also concrete and progressive efforts by state authorities to address them with seriousness and courage.

Firstly, operational risks such as H_2S gas explosions, toxic leaks, and equipment failures remain real challenges, but there has been noticeable progress in their analysis and evaluation. State institutions and private operators are increasingly implementing improved risk identification methods and management strategies aimed at reducing the impact on workplace safety and the surrounding environment.

Secondly, although the traditional monitoring system in some areas is still outdated and the absence of a comprehensive safety culture represents a risk, the Albanian state is moving forward with technological improvements and the strengthening of institutional capacities. This includes efforts to integrate new monitoring centers and public-private cooperation standards for raising awareness and training technical staff.

On the other hand, regarding the technical and logistical readiness to respond to industrial accidents, although there are still evident shortcomings such as incomplete emergency plans and insufficient equipment, the National Civil Protection Agency (NCPA) has initiated the development of coordinated schemes of responsibility and emergency interventions. Progress is being made in inter-institutional cooperation, joint training sessions, and emergency simulations aimed at gradually building a national response and protection system. This represents a positive and significant shift toward enhancing collective preparedness.

Moreover, cyber risks, in light of increasing digitalization and the use of SCADA/IIoT systems, are being treated seriously in Albania. Authorities are beginning to implement cybersecurity protocols and protective mechanisms, while awareness is growing within both the oil industry and state institutions regarding the importance of safeguarding digital infrastructure. While there is still work to be done, this shift positions the country toward a higher level of technological security in alignment with international best practices.
While the sector faces numerous risks, the engagement of Albanian state institutions indicates that action is not passive. Through policy reforms, improvements in monitoring technologies, continuous training, and institutional awareness, Albania is building a more resilient and integrated risk management framework. This represents a strong indicator of the sector's professionalization and commitment to safety, operational quality, and environmental protection.

The achievement of the objectives of the Risk Management Strategy is carried out through several key actions. These include:

1. Familiarizing all employees, especially the institution's managers, with risk management concepts.
2. Emphasizing the necessity of risk assessment and raising managers' awareness of their responsibility in implementing risk management to keep it at non-damaging levels.
3. Promoting risk management as a daily management tool that, among other things, ensures effective financial management, optimal resource utilization, and avoidance of corruption.
4. Sustained monitoring of risk areas to ensure they remain under control.
5. Taking measures to eliminate or reduce risk to an acceptable level.

The main challenge in risk management is the initial identification of risk, its analysis, and the development of the risk management process. Continuous reviews and ongoing improvement are essential for successful risk management.

In developing the Albpetrol sh.a. risk management strategy document, a structured procedure and methodology were followed as below:

1. Creation of a dedicated team, which takes into account all company operations and activities to identify the risks associated with them.
2. Self-assessment of risk, where each structure of the company contributes to identifying the risks it faces.

The risk management scheme outlines the steps to be followed to ensure that risk is managed effectively:

Figure 20. Risk management scheme according to Albpetrol sh.a..

Institutional risk management is carried out by the entire staff of Albpetrol sh.a., from the technical level to the managerial level. This process is closely linked to the overall operations of the company. Every employee must understand their role in the framework of institutional objectives and the function they serve.

The risk management structure includes:

- The Titleholder (Administrator), who is responsible for formulating policies, approving, and monitoring the risk management strategy within the company, as well as for approving the risk tolerance level.
- The Strategic Management Group, which acts as a structure where measures for key issues related to risk management are discussed. This group must verify if risks have been managed in accordance with an overall annual report.
- The Director of the Administrative Department and the Director of the Technical Department, who are risk coordinators, responsible for cooperating in activities related to identifying and assessing risks, ensuring they do not hinder the achievement of objectives, and establishing the risk management system.[77]

6. ASSESSMENT OF SUSTAINABILITY AND ENERGY TRANSITION

The global energy transition is one of the greatest and most urgent challenges of the 21st century. It entails a profound and sustainable transformation of the current system of energy production, distribution, and consumption—from fossil fuels such as oil, natural gas, and coal, toward renewable sources such as solar, wind, biomass, and hydropower. The primary objective of this transition is to reduce greenhouse gas (GHG) emissions, prevent global warming from exceeding the critical threshold of 1.5°C, and ensure a secure, clean, and economically sustainable energy system for future generations.

[77] Albpetrol. (2024). Order No. 208, dated 21.06.2024, for the "Approval of the Risk Management Strategy of the company 'Albpetrol' Sh.a., 2024. Retrieved from https://albpetrol.al/wp-content/uploads/2024/06/208-Strategjia-e-Menaxhimit-te-Riskut.pdf

The almost exclusive reliance on hydropower creates a high dependency on climatic conditions and poses a risk to energy security during droughts or seasonal changes. This makes the need to diversify energy sources urgent, through the development of other renewable sectors such as solar, wind, and biomass energy, but also through the careful management of fossil resources that still form part of the national economy, including the oil and natural gas sector. International decarbonization objectives, as defined in the Paris Agreement and the Green Agenda for the Western Balkans, foresee a significant reduction in the use of fossil fuels by 2050

The oil sector in Albania has a long and significant economic history, particularly in the southern and western regions of the country such as Patos-Marinza, Ballsh, and Kuçova. In the past, this sector has made substantial contributions to employment, budget revenues, and exports, but it currently faces major challenges due to declining production, a lack of new investments, and growing international pressure for decarbonization. For this reason, it is essential to assess the role that this sector can play within the framework of the national energy transition, and to analyze the opportunities to gradually transform it from a traditional fossil fuel sector into a supportive actor in clean and sustainable energy.

6.1 Potential for Energy Transition in the Oil Sector

6.1.1 Gasification and a Gradual Transition

One of the most effective pathways to gradually reduce oil usage in Albania is the expansion of natural gas utilization as a less polluting alternative. The Trans Adriatic Pipeline (TAP), which became operational at the end of 2020, creates favorable conditions for the partial gasification of the Albanian energy market. This new infrastructure not only enhances energy security through broader access to new resources, but also enables the gradual replacement of more polluting fuels such as crude oil, fuel oil, or coal. TAP also offers potential to serve as an import channel for liquefied natural gas (LNG), which would support a more flexible and resilient energy supply system for the country. In this way, natural gas can be used as a transitional fuel, capable of supporting the shift from fossil fuels to renewable energy without causing major disruptions to the economic or industrial system.

6.1.2 Transformation of Existing Operators

Another critical aspect of the energy transition in the oil sector relates to the transformative role of existing companies in this industry. Key entities such as Albpetrol, and other licensed operators in extraction fields possess a wide range of assets, infrastructure, and expertise that can be leveraged to support investments in renewable energy. These companies can utilize currently exploited areas to install photovoltaic capacities or wind turbines, converting old extraction sites into clean energy production centers. Moreover, the human resources trained in this industry can be re-skilled for new energy technologies. Thus, through the diversification of their portfolio, these companies can transition from a traditional role as oil extractors to active players in the sustainable energy sector.

6.1.3 Reducing Emissions from Extraction

While the process of transitioning to renewable energy may take time, it is both possible and necessary to significantly reduce emissions from existing oil extraction operations. This includes the use of clean energy (such as solar or green grid electricity) to power equipment and pumping systems, thereby significantly lowering internal fuel consumption. Another important measure is the integration of operators into carbon trading schemes, which act as economic instruments that incentivize pollution reduction through market mechanisms. Furthermore, the use of technologies for capturing and recycling residual gases—which are typically flared or vented into the atmosphere—represents an important step toward improving the environmental performance of the industry. These measures are not only necessary

in the context of climate objectives but also strategic for maintaining the licensing and social legitimacy of the industry in the future.

6.1.4 Leveraging Revenues for the Energy Transition

The use of revenues for the energy transition should be one of the strategic priorities of public policies, especially in a global context where countries are accelerating the shift to sustainable energy sources. The current revenues from the hydrocarbon sector – including rents, taxes, dividends, and other fiscal contributions – represent a significant opportunity to finance investments that enable and accelerate the green transition. These funds should be directed toward concrete projects in areas such as renewable energy (solar and wind), the electrification of public and private transport, improving energy efficiency in buildings and industries, and promoting sustainable rural development through clean technologies and climate-smart agriculture. If these revenues are not timely directed towards building a more sustainable and resilient economy, there is a real risk that Albania will be left with outdated infrastructure, prolonged dependence on fossil fuels, and an economic structure unprepared for the challenges of the post-fossil fuel era. The energy transition is not only an environmental necessity but also a developmental opportunity that requires political will, careful planning, and the strategic use of existing financial resources.

Albania's main energy supply is dominated by oil, hydropower plants, and biomass. The country's energy sector heavily relies on imports of oil, coal, and electricity. In recent years, the evolution has been toward a moderate increase in primary energy supply since 2012, with no significant changes in the relative shares of different energy vectors. The variation in hydropower seems to be mainly compensated by increased oil imports and its products.

Transportation trends (source: INSTAT data): the number of road vehicles has steadily increased, while public transport has lost more than 50% of its passengers in the last two decades. The visible increase in the number of road vehicles has been accompanied by a rise in transport activity and a marked increase in fuel consumption, primarily oil and gasoline.

Emissions from the transport sector are projected to be reduced by more than 60% below 1990 levels by 2050. In the short term, most progress can be found in efficient gasoline and diesel engines. In the medium term, hybrid and electric vehicles will enable significant reductions in emissions. Biofuels will increasingly be used in aviation and road transport, as not all heavy vehicles for goods transport will run on electricity in the future. This strategy calls for policies that promote a sustainable business climate and low-carbon investments that should be made as quickly as possible.[78]

[78] Climate Change Strategy and Action Plans. (2019). Retrieved from https://turizmi.gov.al/wp-content/uploads/2021/10/2.-Strategjia-e-Ndryshimeve-Klimatike-dhe-Planet-e-Veprimit_Qershor-2019_-1.pdf

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