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North African Energy Market Analysis: Algeria

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Comprehensive report on the outlook of the Algerian energy market and the political risks involved

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Executive Summary

Frank Stengs

With the war in Ukraine, Algeria has become a more important energy supplier to Europe – specifically in the field of natural gas. In light of the conflict, Algeria has increased its natural gas exports and signalled its interest to further increase output. The country also increased cooperation with a number of countries and made use of its additional energy revenues. Thus, the war has put Algeria in the spotlights again.

The Algerian energy market, however, is by no means risk-free. This report, therefore, serves as an overview of the risks – mainly political, economic, social – in the Algerian energy market. It will look at natural gas, as well as crude oil and green energy. The report is also part of a broader series of analyses on North African energy markets.

The report is outlined as follows: 1) country overview, 2) political developments, 3) crude oil, 4) natural gas, 5) green energy. The country overview provides demographic and economic info, as well as an overall picture of the Algerian energy market, key institutions, and the government's strategy on energy and climate. The political developments section gives an overview of the economic challenges and the risks involved with the current economic and fiscal strategy. It also provides analysis on social stability (domestic), and energy relations, international relations, and regional disputes (international). The crude oil, natural gas, and green energy sections each cover their respective information on infrastructure, production, consumption, exports, and stakeholders.

The main findings are as follows:

Crude Oil

- Economic risks: declining crude oil production and increasing economic insecurity may have a negative impact on investment.
- Domestic risks: increases in domestic consumption paired with declining output may have a negative impact on investment.
- Political risks: Domestic unrest, terrorism, and corruption hamper growth and may have a negative impact on investment.

Natural gas

- Demand-side risk: reliance on Italy and Spain as export markets has long-term risks considering the shift toward carbon neutrality.
- Bilateral Relations risk: Algeria's relations with Russia and stance on the Western Sahara conflict constitute significant risks to the export flows of natural gas.
- Domestic consumption risk: increases in domestic consumption paired with declining output may have a negative impact on investment.
- Political risk: Corruption and terrorism constitute risks to the investment and operations of natural gas.

Green Energy

- Domestic demand risk: rising domestic electricity demand presents a major risk to Algeria's ambitions to export clean hydrogen.
- Lack of infrastructure: Algeria currently lacks sufficient infrastructure to utilise its renewable energy capacity.
- Hydrogen exports: 1) The production of green hydrogen involves significant increases in demand for water which is at risk from the increasing levels of water scarcity. 2) The possibility of blue hydrogen as an export option remains highly uncertain, due to unclear international demand, the development of CO2 storage facilities, and concerns related to the feasibility of carbon capture, usage and storage (CCUS) technologies.
- Domestic political & economic risks: Within Algeria, there is political and economic resistance to change and a lack of adherence to the necessity of an energy transition. The Algerian government is anxious about the prospect of transitioning away from historically reliable sources of revenue in favour of unfamiliar new renewable ones.

1. Algeria: Country Overview

Ellen Cameron

Demographics and Economy

Algeria is Africa's largest country and is commonly seen as a gateway between the continent and Europe. The country has large reserves of oil and gas, which are the main contributors to their economic growth, specifically through export revenues. Algeria has a population of 46.6 million people, with the majority having settled in the coastal area in the North. Algeria has a majority young population with 28.5 years being the median age.

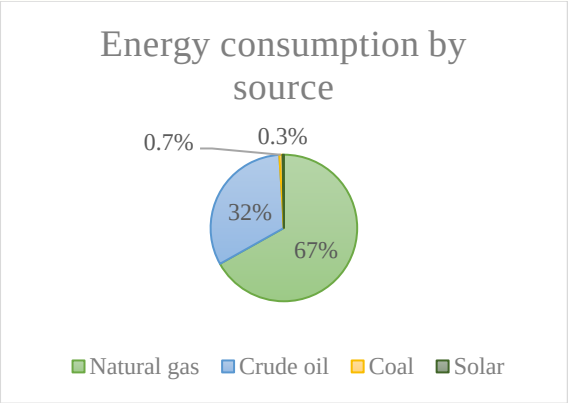
The official estimate for Algeria's GDP was $502 billion at the end of 2022. Following a decline in the GDP in 2020 at US$ 145.01 billion and GDP per capita of US$ 3873.51, Algeria was able to achieve an annual GDP growth of 2.9 per cent in 2022 promoted by their increase in oil and gas exports. Despite stagnant GDP growth prior to 2021, 2022 presented its prospects for future economic growth in Algeria. As a result in 2021 overall budget deficit has decreased from 12 per cent to 7.2 per cent of GDP, this is largely attributed to rise in price of hydrocarbons, a slight spending increase and a surge of Bank of Algeria dividends. The current account deficit of GDP, looking at the Algerian imports relative to Algerian exports of the total GDP in 2021 also had a large decrease from 14.1 per cent to 2.9 per cent, which in large part is due to the surge in Algerian exports associated with the higher hydrocarbon prices.

Energy Production, Supply, and Demand

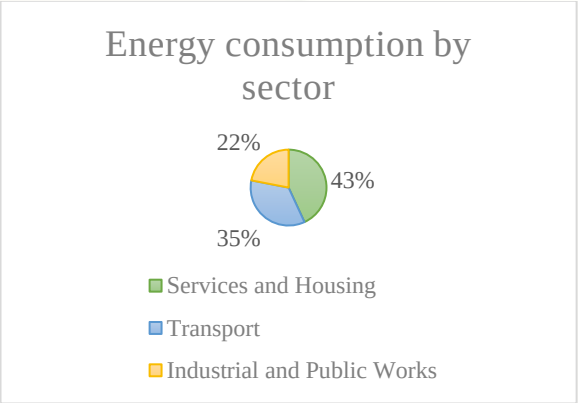
Thanks to a wealth of natural resources, Algeria is a major energy exporter, specifically of oil and natural gas. Italy, Spain, the U.S., and France are the largest export markets for Algeria.

In 2021, total energy production (7023PJ) - mainly natural gas and petroleum - was more than double the country's total primary energy consumption (2723PJ). Algeria is the tenth-largest natural gas producer in the world. In 2021, natural gas production was almost 2.2 times higher than the country's needs. Between 2011-2021, Algeria has increased its natural gas production by roughly 2.4 per cent per year. Natural gas exports, on the other hand, increased by only 0.4 per cent per year in that same period. Rising production, therefore, was mainly due to rising consumption, which accounted for a 5.5 per cent increase per year. Algeria also produces a significant amount of crude oil, which more than 3.3 times covered the country's needs in 2021.

Algeria's energy consumption is largely dependent on fossil fuels, covering 99.3 per cent of total energy consumption in 2021. Natural gas accounts for 66.8 per cent of energy consumption, followed by oil (32.1 per cent), coal (0.7 per cent), and solar (0.3 per cent). The services and housing sector are the largest sectors for energy consumption (43.2 per cent, between the period 2010-2019), followed by transport (35 per cent) and industrial and public works (22 per cent).



Source: Based on data compiled by the BP Statistical Review of World Energy, 2022.



Source: Algerian Ministry of Energy

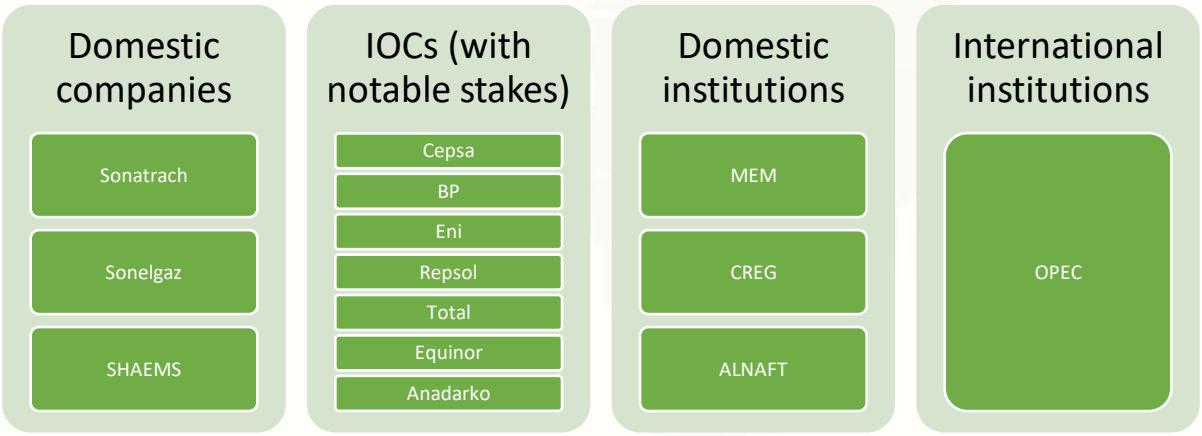
Due to the large value of natural oil and gas production, Algeria is able to meet its total demand for energy consumption. There has been a steady 5 per cent growth of the energy consumption in Algeria from the period 2010 to 2019, it continues to grow at a slower rate. In perspective, 24.4857 ktoe of natural gas (including hydrocarbons) was produced in 2019, 109.156 ktoe of this went to exports leaving the final consumption to 63.158 ktoe. The total final consumption was attributed most to households at a value of 28.765 ktoe. The rest of the share was split between industry, transport, commercial and public services and agriculture, forestry and fishing.

Key Institutions

Sonatrach the Algerian state oil company is a key institution as it controls 80 per cent of hydrocarbon production. Other domestic companies include Sonelgaz, which is responsible for distribution of electricity and natural gas, and SHAEMS, which is responsible for renewables. The remaining 20 per cent of hydrocarbon production is controlled by international oil companies (IOCs). The energy market in Algeria is moderately consolidated, meaning that there are a relatively small range of players who dominate the production market. Roughly two dozen IOCs operate in Algeria and IOCs with notable stakes in oil and natural gas fields are Cepsa (Spain), BP (United Kingdom), Eni (Italy), Repsol (Spain), Total (France), Equinor (Norway), and Anadarko (United States).

Another key aspect to the energy sector is the governing body, in Algeria this is managed by Algerian Energy Regulatory Commision (CREG) working on protecting the energy market, and the Ministry of Energy and Mines (MEM), responsible for energy policy and regulation in Algeria. Considering the need for Algeria to promote investment within the energy sector, an important key institution whose central role to do this is The National Agency for the Valorization of Hydrocarbon Resources (ALNAFT).

An important institution to acknowledge for the Algerian oil sector is OPEC, becoming a member in 1969 much of their oil output is agreed about with set quotas.



Climate and Energy Strategy

Investment potential in the Algerian sector is massive, while hydrocarbon production has dominated, there is major potential to harness the renewable energy market, as Algeria is working towards. Algeria has set an aim to increase renewable energy production to 27 per cent by 2035 while it currently stands at only 2 per cent this is in order to meet their 7-22 per cent goal of cutting greenhouse gases as per the Paris Agreement.

Algeria has the world's largest untapped resource of solar power energy, with other renewables energies wind and photovoltaic (PV) energy another potential mass market. As Algerian and EU cooperation is already strong, tapping into their renewable energy market can open further cooperation and investment with the EU, as the EU has stated their commitments to focusing on renewable energy projects.

While not a clean source of energy, is much less detrimental to the environment, LNG gas is another part of Algeria's move towards cleaner energy. Algeria have invested into constructing a new LNG storing facility and have recently been announced as the top African exporter of LNG. The move towards cleaner energy has begun and there is large potential for investment with the EU brought along by the increased demand as a result of the Russian-Ukraine war and the EUs commitment to investing in renewable energies.

Algeria is lacking investment in the upstream production as reflected in the vast declines of production of the years. In order to increase foreign investment into their energy production, the Algerian government formulated a new law on hydrocarbons, allowing for the reduction of taxes across upstream activities while also eradicating difficulties associated with legal and contractual procedures. Algeria has only recently upped their efforts in order to increase investment in order to increase production, announcing in the first quarter of 2023 there will be an auction of minimum 10 exploration blocks, the first time this is being done since 2014.

2. Political developments

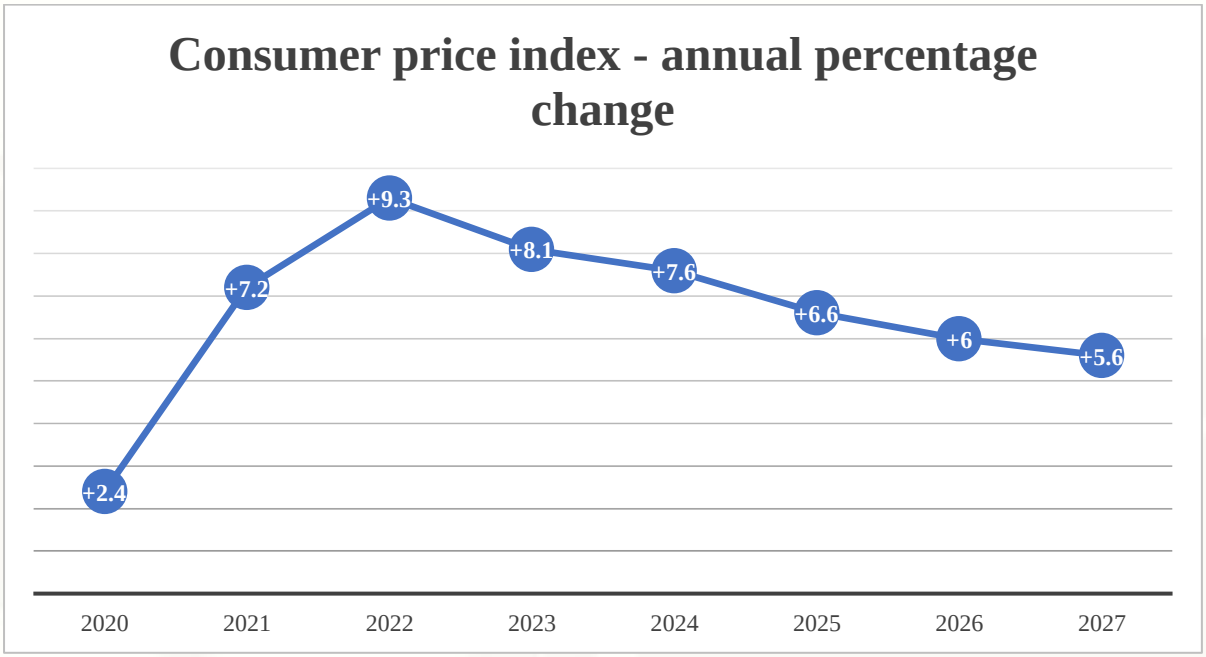
Frank Stengs

Algeria faces several political and economic developments that could influence its energy markets both directly and indirectly. Inflation and unemployment are economic risks that are currently offset by the country's fiscal policy, which is significantly dependent upon international hydrocarbon prices and therefore constitutes its own risks. Domestic political risks include potential social instability, opposition, and terrorism. External political developments such as the war in Ukraine, the country's regional and international ambitions, and its relations with other countries also influence the Algerian energy markets.

Domestic Politics and Developments

Economic developments

According to the IMF, the rise in inflation constitutes a major challenge to the country. This challenge consists of curbing inflation and protecting fiscal sustainability, while supporting growth and purchasing power. Headline inflation constituted a 26-year high in 2022 at 9.3 percent and while it is projected to decelerate in 2023, it will remain elevated over the medium term (+/- 5 years). Soaring inflation is the result of a confluence of global and domestic factors, including the rising international commodity prices, drought in 2021, a loose monetary policy stance, wage increases in 2022, and tightening import regulation. Volatile fresh food products contributed around 60 percent of this acceleration.



Source: IMF

Another economic challenge to the country is high unemployment. It was recorded at roughly 11.5 per cent in 2022 - 3.3 million people - which is a marked increase compared to the pre-pandemic 10.5 per cent unemployment in 2019. The World Bank argues that the marked

decline compared to the pre-pandemic situation can be explained by the continued fall in job offers in the building, public works, and hydraulics sector and an only partial restoration of job offers in the industrial sector. At the same time, jobs in the services sector have increased to pre-pandemic levels, and job offerings in the volatile agricultural sector even increased compared to pre-pandemic levels.

Both challenges (inflation & unemployment) for now are partially upset by the upswing in hydrocarbon prices. That upswing has led to increased energy revenues for the state, and in 2023 led to the largest state budget in Algeria's history - worth US$98 billion and marking a 25 per cent increase compared to the 2022 budget. More than 40 per cent of that budget was allocated to wage increases, unemployment allowances, and popular social welfare policies, including subsidies.

The current economic strategy, however, carries significant risks. For starters, it reflects the inability of the current government to create a sustainable job market. This means that the state will (once again) assume the burden of ensuring social peace. It also reveals the economy's vulnerability to fluctuations in international hydrocarbon prices. As such, current economic stability is based on a boom-cycle in commodity prices, which does not offer a long-term vision to create added value, facilitate growth, or shift the economy to a more dynamic footing.

Political developments

Social stability is another challenge to Algeria, and Algerian protests – Hirak movement - that took place in 2019-2021 is seen as an example of the country's vulnerability to social instability. These protests, which were based on the widespread disapproval of the former government, led to the ousting of (former) president Bouteflika, and they are one of the main drivers of current government policy. This government policy, on the one hand, is characterised by the current economic strategy and, on the other hand, by increased repression and the tightening of media control to ensure social peace. The latter was amplified by the Covid-19 pandemic, which was used as an excuse to crack down on civil society and human rights defenders. Even in 2023, however, beyond the pandemic, the state moved against political parties, youth associations, and journalists.

External Politics and Developments

The Energy Supplier

With the war in Ukraine, countries in Europe have been trying to decrease their dependence on Russian natural gas, and hence have been searching for alternative gas suppliers. Closely located to the European continent, and endowed with massive reserves, Algeria has become a very important as a natural gas supplier to the (South-)European gas market. As a consequence of the war, 1) Algerian gas exports to the EU increased, as did export revenues for the government and Sonatrach, 2) the country has seen increased energy and political collaboration with European countries, and 3) the country aims to further increase its energy exports to the continent.

International Alignment & Ambitions

With the potential development of a multi-polar world, Algeria is reaffirming its affiliations and defining its strategic and geo-economic areas of interest yet remains committed to its positions of non-alignment. This means that Algerian foreign relations cannot be characterized as pro- or anti-Western, but rather are marked by self-determination, multilateralism, and commercial ties.

The country, for example, has extensive relations with Russia. Its relation encompasses military cooperation, including joint military exercises and weapons purchases. Algeria is the 6th largest importer of weapons in the world and roughly 70 per cent of Algeria's weapons are sourced from Russia. In 2023, its largest budget draft ever included a rough 130 per cent or US$13.5 billion rise in military expenditure and, in November, plans were announced to dramatically increase its acquisition of Russian military equipment in 2023, including stealth aircraft, bombers and fighter jets, and new air defence systems.

Algeria also has international ambitions, which are embodied by its application to join BRICS, which was submitted in November 2022. If successful, Algeria would become the second African country to join BRICS. The move was welcomed by Russia and China, and, according to Russia, Algeria would be a leading contender to join BRICs. Nevertheless, president Tebboune hinted at first joining BRICS as an observer state.

Joining BRICS would strengthen Algeria's international and regional position, make it stronger economically, increase the country's net borrowing capacity, and allow Algeria to engage in technological transfers. Critics, however, point to the lack of economic integration, political friction, and unequal power balance between member states.

Regional disputes

Algeria has a complicated relationship with Morocco, which according to Algiers, 'occupies' the Western Sahara. Algeria maintains that the Western Sahara is a sovereign territory, and as a result backs the Polisario movement that seeks independence. The Polisario separatists took up arms in the 1970s and have continued to demand an independence referendum on the basis of a 1991 deal that included a ceasefire.

In 2021, this row had a significant impact on Algerian energy flows and resulted in the suspension of the GME pipeline, which runs through Morocco. While Spanish imports through the Medgaz pipeline increased from 8 bcm to 9 bcm in 2022, the closure of the GME pipeline resulted in an overall decrease of exports to Spain by more than 35 per cent. By using gas (revenues) as a tool of statecraft, Algeria also managed to convince Tunisia in countering Morocco, after handing it economic aid. In March 2023, Algerian president Tebboune argued that relations with Morocco reached a point of no return.

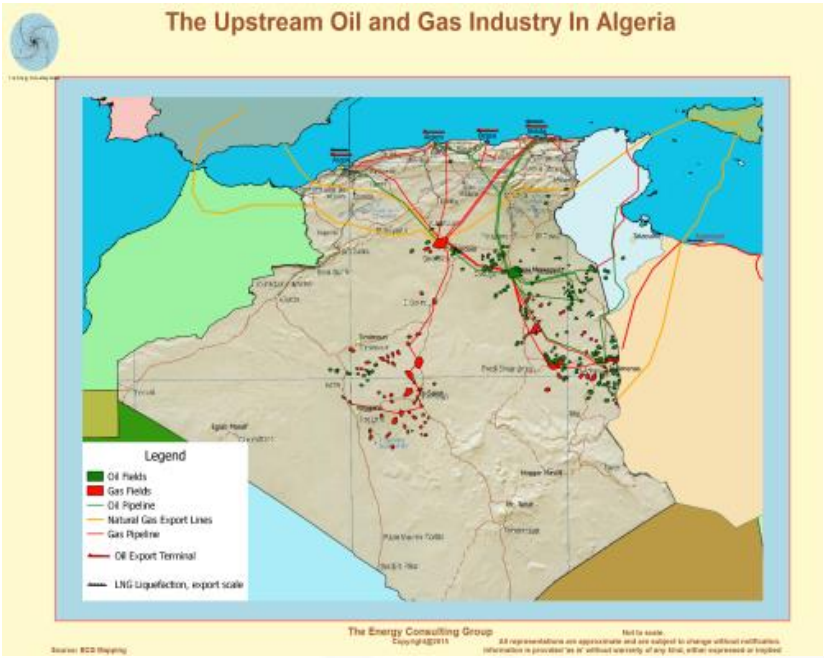
3. Crude oil

Viddhi Thakker

Overview

Algeria is among the leading oil producers and exporters globally and is the second-largest producer of crude oil in Africa, producing high quality light crude oil with a low sulphur content. With crude oil production of about 1.4 million barrels per day and export of about 440 thousand barrels per day, Algeria is ranked the 20th largest exporter of crude petroleum in the world, exporting about 37 per cent of its total production. Algeria's oil exports and production makes the main source of the country, accounting for nearly 25 per cent of the GDP or about US$ 23 billion in 2021. All of the country's oil resources are on-shore and about two-thirds of the country's territory remains unexplored, providing scope for greater resource discovery.

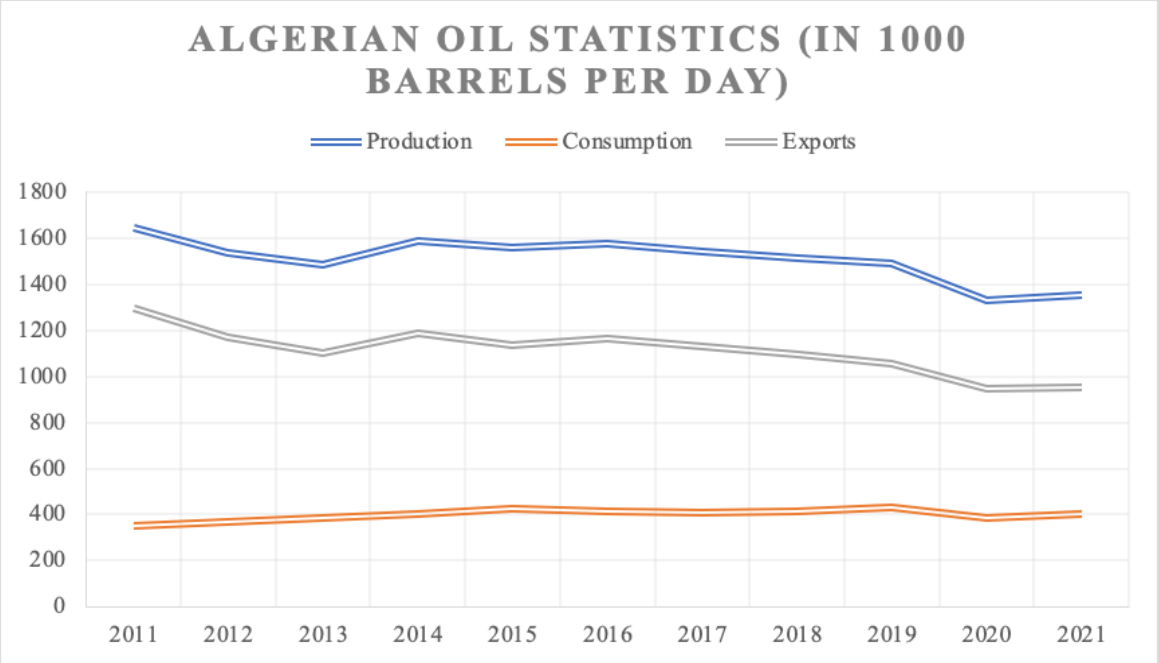
Currently, Algeria has 25 oil rigs - the highest number of active oil rigs in Africa - and has operational refineries in Adrar, Algiers, Arzew, Hassi Messaoud and Skikda. Oil and other petroleum products are mainly transported through roads, pipelines and cabotages between oil ports. While the Adrar refinery is a joint venture between CPECC and Sonatrach, the remaining are owned by Sonatrach. In recent years, the Algerian government has been undertaking projects for expansion of its refineries. Since 2016, CPECC has been working with Sonatrach as part of a US$410 million deal to refurbish the Sidi Rezine refinery in Baraki, Algeria. The following year, the creation of another refinery in Biskra was announced, with a production capacity of 5 million tonnes of crude oil per annum and is expected to be completed by 2030. In 2020, the creation of a new oil refinery in the Sahara Desert at Hassi Messaoud under collaboration of Sonatrach, Spain's Tecnicas Reunidas and Korean Samsung Engineering was announced.



Source: Energy Consulting Group

Historical Overview of Oil Production

Algeria benefited greatly from the oil super-cycle between 2008 and 2014, where the price of a barrel crossed US$100. At the time, Algeria gathered abundant foreign reserves. However, in 2014, the oil prices crashed significantly, eroding Algeria's foreign reserves and disrupting its trade balance. The economic condition of the country worsened further during the pandemic and the subsequent price war between Russia and Saudi Arabia, and has witnessed a positive turn with the recent increase in demand from Europe.



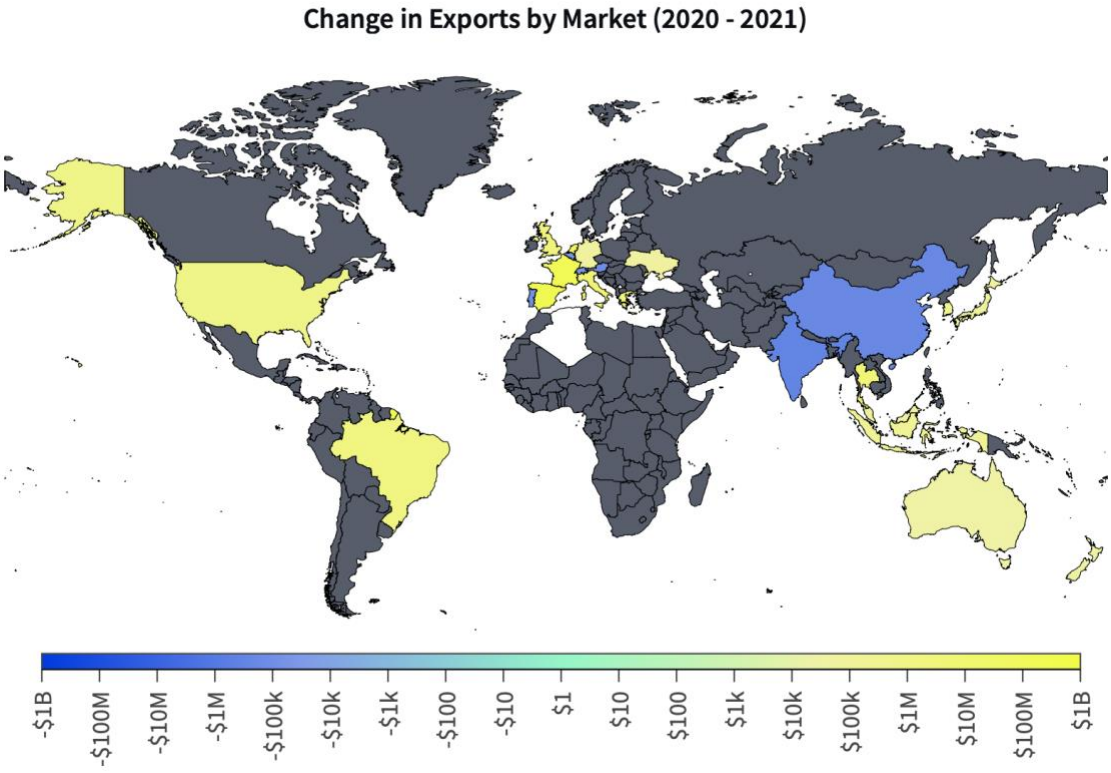
Source: Based on data compiled by the BP Statistical Review of World Energy, 2022.

Stakeholders – Supply side

Algeria is territorially the largest member state of the Organization for Petroleum Exporting Countries (OPEC), an influential stakeholder that plays a determining role in regulation of petroleum exporting policies and prices. Since the nationalisation of oil in Algeria, Sonatrach has continued to be the biggest stakeholder in oil production and distribution within the country, accounting for about 80 per cent of the stake. Composing the remaining statistics are foreign firms, with the most influential stakeholder being the Chinese state-owned China Petroleum Engineering Construction (CPECC). CPECC has invested heavily in projects across spheres of development, including oil exploration, infrastructure and healthcare, with investments amounting to US$ 23 billion between 2005 and 2020. The French company Total Energies signed a US$ 1.5 billion petrochemical deal with Sonatrach in 2018 alone and has been increasing investments in the country. While other international companies continue to be involved within Algeria, enhanced cooperation has been witnessed between Sonatrach and CPECC, symbolising greater Chinese involvement in the region.

Stakeholders – Demand side

Hydrocarbons constitute about 96 per cent of Algeria's total exports, and oil is exported primarily to European countries, which include France ($ 1.9 billion), Italy , Spain (US$ 1.2 billion), Netherlands (US $1.15 billion), Greece (US$ 950 million) and the United Kingdom (US$ 862 million). Between 2021-2022, the fastest growing crude export markets for Algeria were Spain (206 per cent), Netherlands (143 per cent) and France (69.7 per cent), as witnessed in the illustration below. Since the onset of the Russia-Ukraine war, rising oil prices have proved to be an opportunity for Algeria to save its faltering economy. Since the war has also bolstered the European Union's shift away from Russia for its energy supply needs, Algeria has increased its production and export.



Source: Based on data gathered by OEC

In addition to high production and exports, Algeria also has a high domestic consumption pattern, with about 60 per cent of its total output being used domestically and ranks 35th in the world for oil consumption. Due to heavy subsidies on energy in the country, consumption of oil is high and is used primarily for generation of electricity, as fuel for transportation and working of machinery in industries.

Foreseeable changes

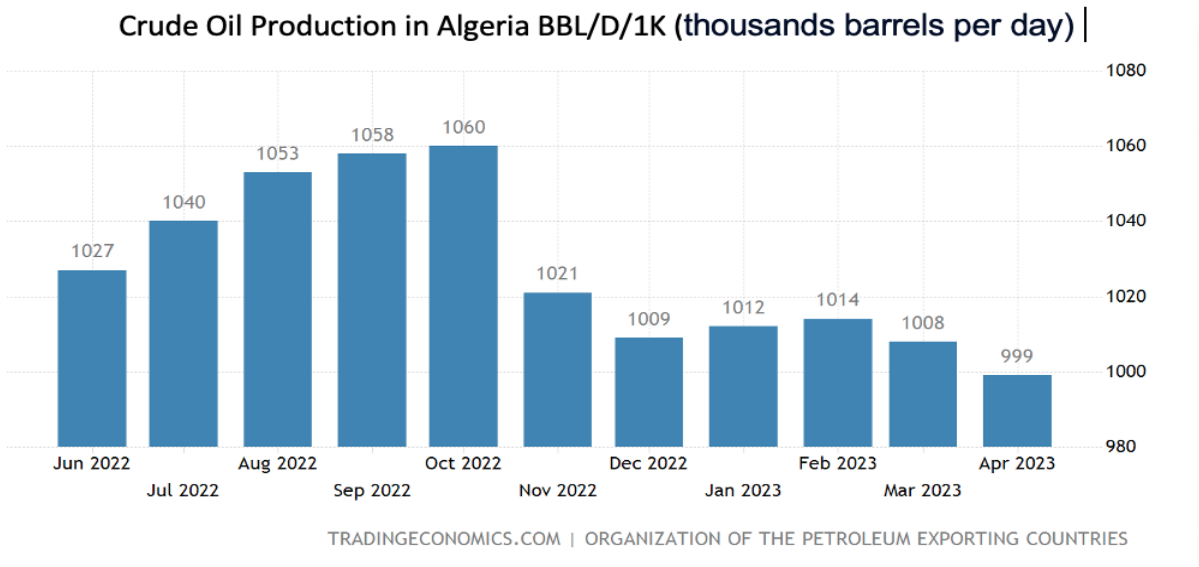
The recent discovery of oil reserves in Algeria as announced by Sonatrach in 2018, 2022 and April of 2023 and the various projects establishing and refurbishing oil refineries within the country may increase production capacity by about 10,400 barrels per day of crude oil and 4,25,000 cubic metres of gas in 2023 alone. This may be advantageous and lead to potential

for increased investment in the oil sector, particularly in light of meeting the increased European demand. However, this driven up price of oil and demand cannot be seen as a long-term measure and is temporary due to heavy dependence of European states on Russian energy. While Algeria may be benefitting from the same, it currently lacks the production capacity to meet this demand primarily as a result of structural incapability and a lack of investment. In order to ensure economic stability in the country through hydrocarbon exports, it is crucial that the country enhances its production capability. The 2019 hydrocarbon law attracting investment from foreign firms is one such step which can help enhance the oil export capacity of the country. This engagement coupled with the discovery of new oil reserves may prove to be a boon for the Algerian economy.

Economic risks

One of the most pressing challenges facing the country is its faltering economic state, which worsened in light of the recent pandemic. With gradual depletion of its once-abundant foreign reserves, the economic insecurity in the country is worsening and is exacerbated by a gradual decrease in crude oil production. The graph below depicts the decrease in oil production within the country over the past year. As a result, even though the rising hydrocarbon demand mitigated economic problems with a trade surplus in 2022, the public debt in the country continues to rise, and is expected to exceed 70 per cent in 2023. The depleting crude oil production and increasing economic insecurity within the country can have an impact on investment, production and export of oil, which is a crucial backbone of the country's GDP.

In addition to the declining production, Algeria's oil and petroleum pricing is heavily influenced by its OPEC membership. These fluctuations, most recently in light of the price wars between Russia and Saudi Arabia during establishment of the OPEC+ alliance, resulted in a 65 per cent fall in quarterly oil prices. Such major fluctuations in export prices can further weaken economic conditions in Algeria due to reduced exports and investments.



Source: Based on data collected by OPEC

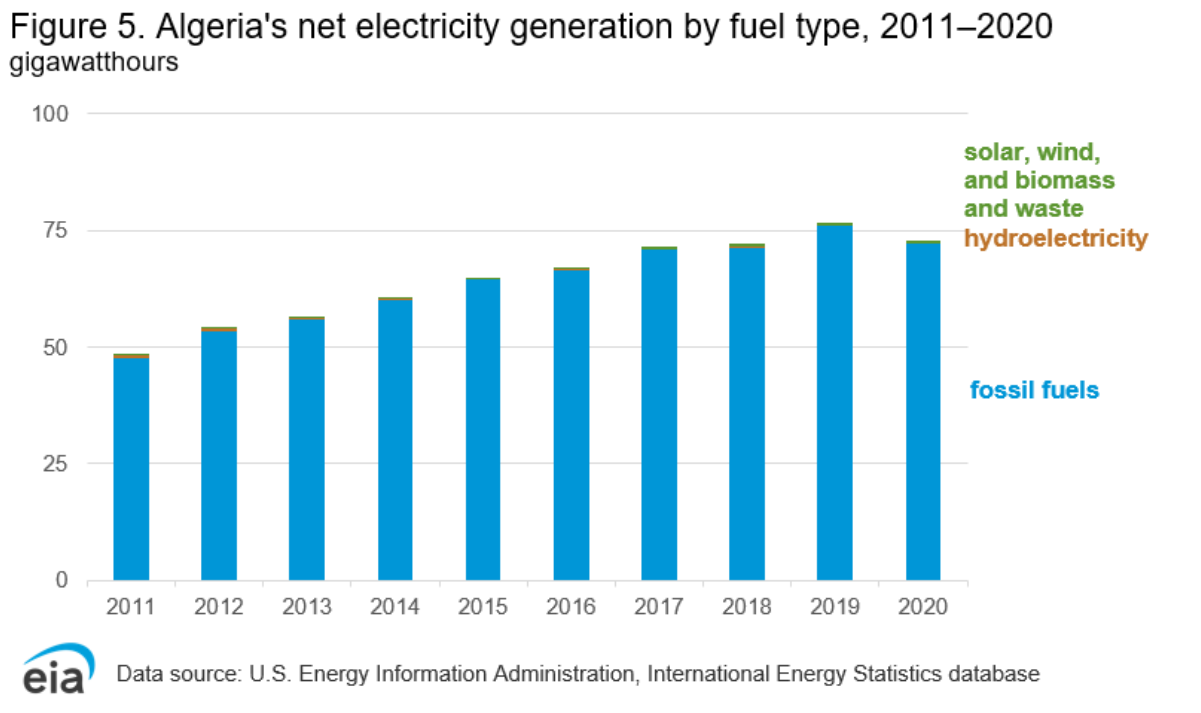
Demand-side risks

In addition to the temporary increase in demand by European states, it is also crucial to keep in mind that the EU has decided to go completely carbon-neutral by 2050. Since Algeria's economy is heavily dependent on European demand and has recently announced efforts to improve its production process, this move by the EU can result in stranded assets for Algeria and a long-term decline in oil export revenues.

Domestic Risks

1. Large domestic consumption

While Algeria produces and exports oil to countries globally, one of the greatest risks impacting investment in the country is the rate of high domestic consumption, mainly used for production of electricity and transportation as seen below. Since the government provides heavy subsidies on prices of oil and gas, its consumption is extremely high. As of 2022, about 60 percent of its output was consumed in the domestic market and if this consumption continues to remain high, it can have a negative effect on investments in the long term, resulting in diminishing export capacities for the country.

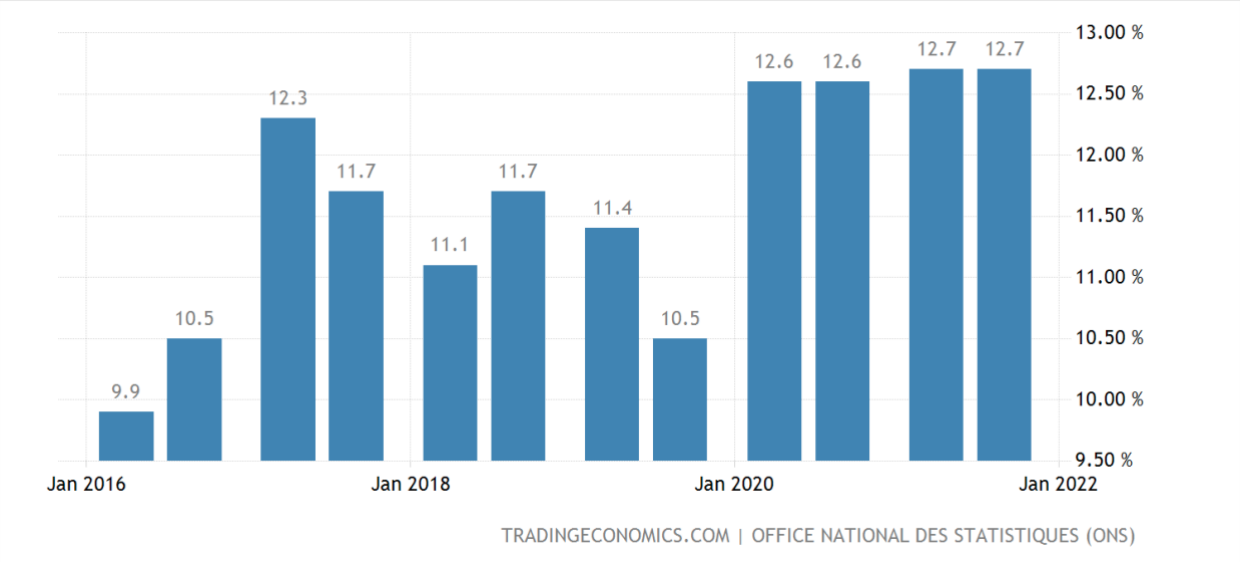


Source: Based on data collected by EIA

2. Domestic unrest and unemployment

Algeria has witnessed domestic unrest in recent years characterised mainly by high inflation and unemployment, as witnessed in the graph below. At the same time, a rapidly rising population has put greater strain on domestic resources, particularly on energy consumption which has already been subsidised by the government. In 2019-2020, such domestic turmoil

resulted in a series of anti-government protests that further created instability in the country. Prolonged instability could have a negative impact on the energy markets, since strikes and protests could stall oil production and exports. Due to lack of diversification of its exports, the unemployment rates may worsen if oil export plummets negatively, thereby leading to even greater domestic unrest.



Source: Growing unemployment rates in Algeria based on data collected from ONS

3. Terrorism

Surrounded by countries in the Sahel, Algeria's security heavily depends upon that of its neighbours. Over the years, violent extremism and terrorism has worsened, spilling over conflict into Algerian borders, particularly through the presence of non-state actors such as Al Qaeda in the Islamic Maghreb and the Islamic State (IS). While Algeria has undertaken greater measures to combat terrorism through law enforcement and active participation in counter-terrorist activities, the threat continues to persist.

4. Corruption

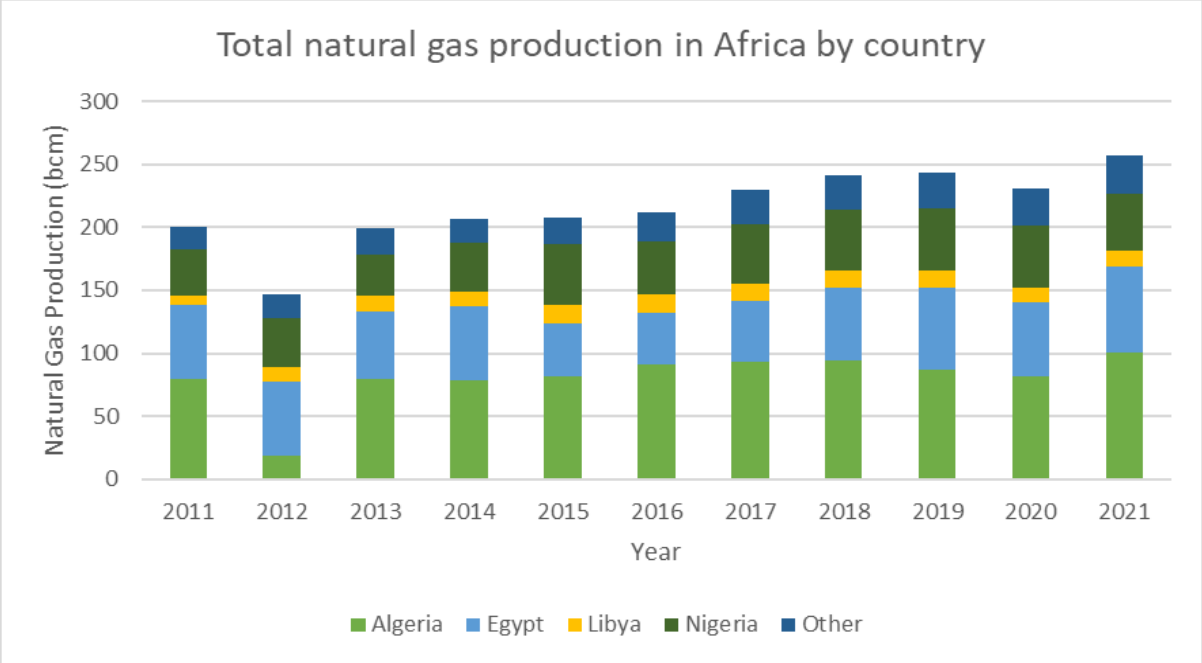
Worsening the structural deficiencies is the growing rate of corruption in the country which has stagnated the production process and delayed the development of new refineries. This has been discovered primarily of Sonatrach, the Algerian state company that handles the majority of the oil and gas exploration, production and distribution. As recently as 2020 Sonatrach was involved in two corruption cases in relation to wrongful use of public funds. This has also limited investment from foreign firms.

4. Natural gas

Vinicius Paulinelli

Overview

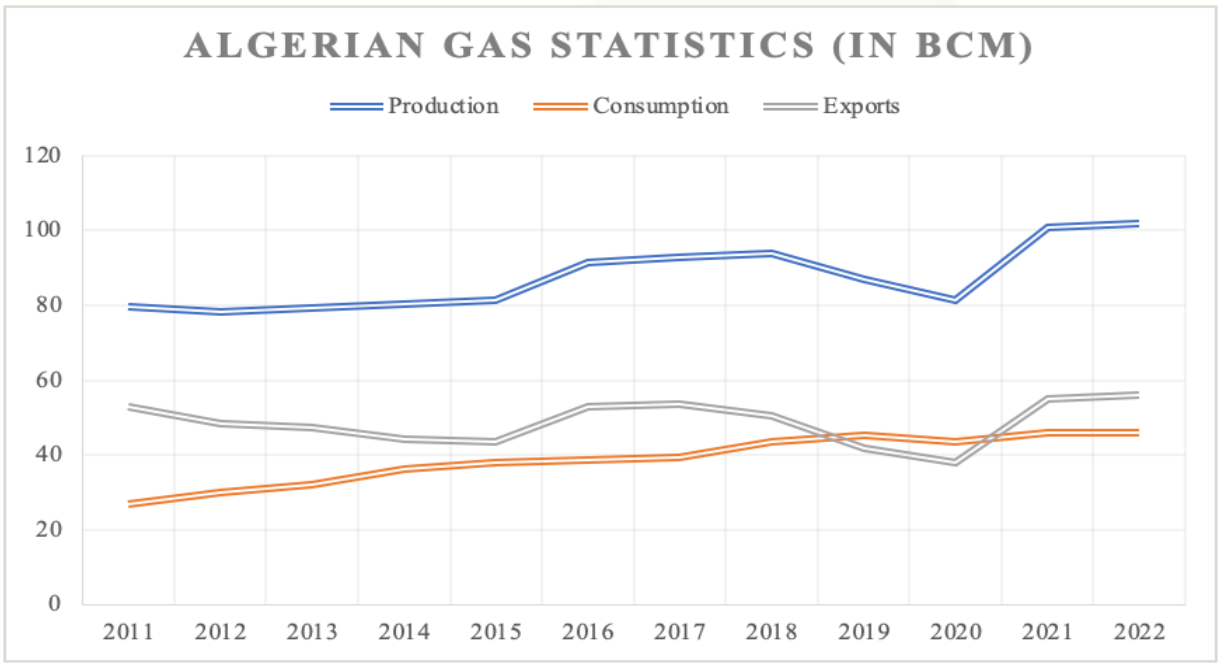
Total natural gas production in Algeria remained stalled from 2016 to 2018, only to suffer a sharp drop in 2020 and rebound in 2021. In spite of the production roller-coaster, Algeria managed to remain a leading player of the natural gas market in Africa.



Source: Based on data compiled by the BP Statistical Review of World Energy, 2022.

It accounted for the highest yearly average (36 per cent) of the region's total production for the last decade or 2 per cent of the global gas output. Likewise, its export output has been in expansion since at least 2021 and reached a record high of 56 billion cubic meters (bcm) in 2022. This is also reflected on the growing importance of natural gas exports for the Algerian economy, particularly for the last 3 years.

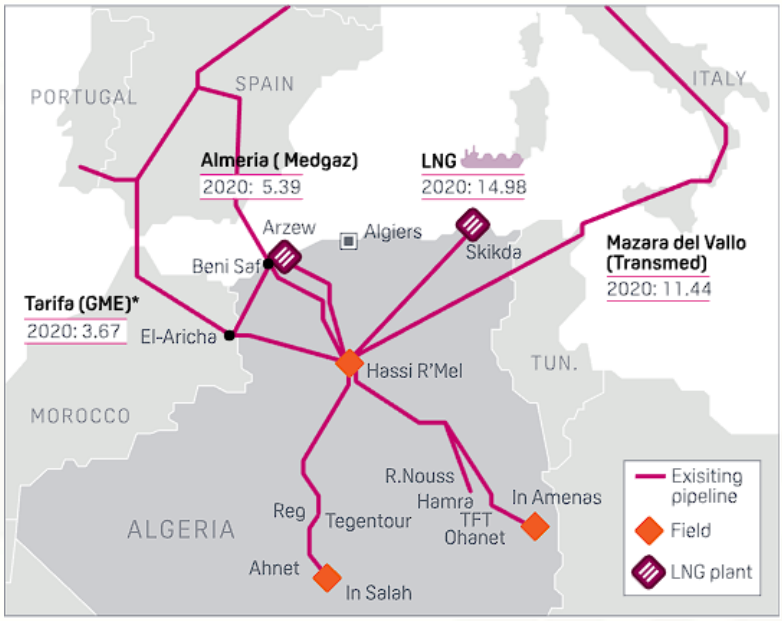
Italy is the leading destination for Algerian gas, accounting for 66 per cent of the total exports followed by Spain (31 per cent) and Morocco (2.21 per cent) in 2021. Even though data indicate that Algeria's participation in Europe's imports suffered reductions in recent years (namely 2019 and 2020), the EU's necessity to shift away from Russian supply could prompt other continental powers to seek a rapprochement with Algeria in order to access its market. In that sense, positioning over the Western Saharan conflict and strategic choices of favouring either Morocco or Algeria are likely to remain pivotal in determining the degree of success in securing gas supplies.



Source: Based on data compiled by the BP Statistical Review of World Energy, 2022.

Infrastructure

Natural gas is mainly processed in the Hassi R'Mel National Gas Dispatching Centre and flows through 23 pipelines scattered over a 21.189 kilometres network that finds its way into Europe through 2 main routes: The TransMed pipeline links Algeria to Italy via Tunisia while the Medgaz line heads to Spain.



Source*:* Herman Wang, Manish Parashar, "As Europe seeks alternatives to Russian gas, Algeria has pipeline capacity to spare". S&P Global Commodity Insight, 1 January 2022.

Together, Transmed and Medgaz have a combined transport capacity of 43 bcm per year. Transmed concentrates the bulk of such capacity, with estimates placings it between 32 and 34

bcm per year (roughly 60 per cent of the total exports of 2022) and is set to be expanded by Italian energy company Eni throughout 2023 and 2024. An additional route was used to transport gas to Morocco via the Tarifa (GME) pipeline, but it was deactivated in November 2022 allegedly due to rising tensions with Morocco over military activity in the Maghreb.

Key Stakeholders

The Algerian government aims to boost production and pledged to reach a total exporting capacity of 100 bcm in 2023, mainly by enhancing exploration and transportation capacities. The state-owned energy company Sonatrach takes the forefront of this initiative by partnering with foreign companies under Law 19-13 of 2019, commonly known as the Hydrocarbons Law. The legal device is the core framework governing oil and gas activities in the country and provides foreign entities with three contract possibilities, each one with varying licensing and local content requirements: (I) Participation Agreements (PA), (II) Product Sharing Agreements (PSA), and (III) Risk Service Agreements (RSA).

The Hydrocarbon Law is regarded as a significant improvement for the sector as it substituted outdated bureaucratic structures, reformed taxing systems, and fairly opened the market to foreign competitors (e.g. PSA contracts were not allowed in a 2005 iteration of the Law). The first initiative signed under the guise of the reformed law occurred in October of 2022 and involved a US$ 9 billion sharing agreement for oil and gas exploration in the Berkine basin between Sonatrach, Eni, Occidental, and Total Energies. Repsol is also reportedly present in Algeria with contracts in 6 gas fields and varying shares or participation, although it has not signed any new contracts under the guise of the Law by the time this report was written.
Eni has been the spearhead of Italy's Piano Mattei, a new foreign policy strategy aimed at reducing Italy's dependency on Russian gas by projecting influence on the Mediterranean (with details previously covered by other London Politica works). Due to Eni's pivotal importance for Italian foreign policy and its 50-decades-long experience in Algeria, the company is likely to continue to remain competitive and capture larger shares of the gas market, even if the more business-friendly law will most likely continue to invite competition, possibly from Chinese companies.

Forecasted Risk: Demand-side

Since Algeria's main exporting markets for gas are Italy and Spain and more broadly the EU, there is a long-term risk that a shift towards carbon neutrality and alternative sources in those markets would reduce demand for Algerian gas. Since both Italy's and Spain's shares of renewables consumption is growing, the pace of investments in installed capacity and production could also be observed to improve risk projections for the long term.

Forecasted Risks: Supply-side

1. Bilateral Relations Risk

Spain has been restoring ties with Morocco and opposed the Algerian-supported Polisario Front presence in the Western Sahara conflict, indicating that deteriorating of relations between Madrid and Algiers would remain a risk in the medium-term. Since the exports have been

shifting further away from Spain towards Italy, worsening relations increase the chances of a halt of supply occurring again in the Medgaz pipeline or even hindering Repsol's competitive capacity in Algeria. As for Italy, the incumbent government of Giorgia Meloni has veiledly thrown support behind the Polisario Front and retains historically good relations with Algiers, besides having one of the most accentuated dependencies on Algerian gas. This indicates that further appeasement initiatives between Rome and Algiers will likely continue and have good chances of success.

Algeria's broader relations with the EU are also often poised by human rights concerns and close military ties with Russia, further complicated after Ukraine's invasion. On 11 May, the European Parliament has sanctioned Algeria over arbitrary arrests targeting journalists and opposition figures, while a bi-partisan group in the US Congress made requests to sanction Algeria due to its arms trade with Moscow. Nevertheless, EU authorities seem to be interested in retaining long-term partnership with Algeria, and the continent is still considerably depend on Algerian gas imports, indicating a low probability of major disruptions.

2. Domestic Consumption Risk

Algeria's domestic consumption still captures half of the 100 bcm annual output, as natural gas corresponds to roughly 57 per cent of the country's total energy production in 2021. Likewise, a 2019 forecast compiled by The Oxford Institute for Energy Studies predicted that total domestic gas demand will grow and reach nearly 70 bcm by 2028. Thus, Algeria's' necessity to prioritise domestic gas demand could pose a risk for consumers that depend on imports for the medium-term.

The effectiveness of the aforementioned initiatives and other capacity-boosting projects in guaranteeing supply for both markets is open to question and remains to be seen, but counting with their success would be a risky bet on an structurally uncertain political and regulatory environment.

3. Corruption

As Sonatrach leads oil & gas enterprises in the country, there is also risk of corruption involving state entities and foreign companies. To the best of our knowledge, there is not registered corruption case specifically involving gas extraction or transportation, but corruption inside Sonatrach seems to reach even the top positions inside the companies hierarchic structures and could easily spill from oil to gas, as the two sector are often intertwined.

4. Terrorism

On January 13, Al Qaeda attacked the Tigantourine gas facility in Amenas which producing 10 per cent of Algeria's natural gas and proved to be one such grave incident where the terrorist group took hundreds of individuals hostage and killed about 38 foreigners. Such incidents, while reduced in frequency, continue to act as grave threats to the energy markets within the country, impacting the labour force, export and manufacturing of energy.

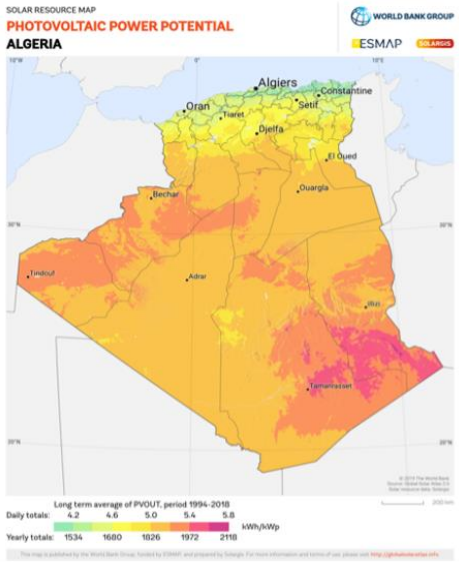
No significant attacks against pipelines were reported over the last decade, as the last one of them occurred in 1997 and halted the Transmed gas supply for 5 days. Even so, insurgent groups continue to be active near the border with Libya and Tunisia border and in the southern part of Algeria were important pipelines and facilities are located, representing a perennial risk for their installations and personnel.

5. Green energy

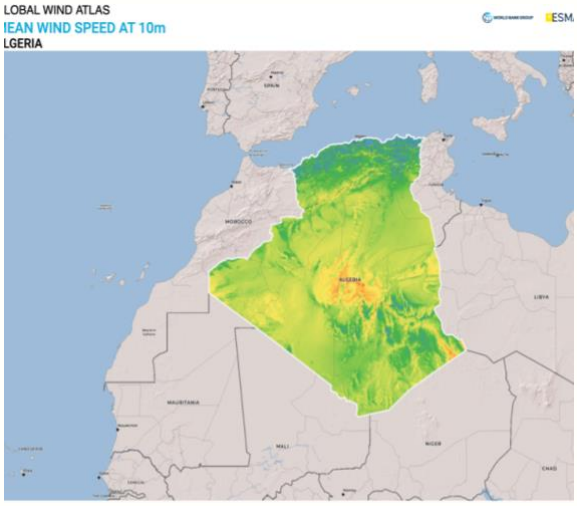
James Murphy

Overview

Algeria is endowed with an abundance of natural renewable energy resources, and the government has made the development of renewables a national priority, aiming for renewable energy to reach 27 per cent of total power generation by 2030. Yet, Algeria is currently not on track to meet this target as it generates a small amount of its electricity from renewable sources, accounting for just 3 per cent of its overall supply. Because of its geographical location in the Sahara Desert, Algeria has one of the highest solar power potentials in the world, estimated to be capable of producing 14 TWh/year. Equally, Algeria has an enormous wind power potential, with wind speeds of more than 7 m/s in the South-Western region, and is forecast to be able to produce 35 TWh/year.



Source: Global Solar Atlas, 2019.



Source: Global Wind Atlas, 2021.

Algeria's lack of progress in renewables is largely due to its unstable trajectory of renewable energy policies and strict regulations. The short-lived Ministry of Energy Transition and Renewable Energy (METRE) exemplifies its volatile renewable energy policies. The METRE was established in June 2020 to manage Algeria's energy transition plan and introduced a 1,000 MW solar tender in December 2021 as part of the government-led competitive renewable energy procurement program to develop 15,000 MW of solar power. However, in September 2022, President Abdelmadjid Tebboune terminated the METRE and energy minister Mohamed Arkab took control. The growth of renewable projects has also been severely constrained by government regulations. Algerian companies could not contract bank loans abroad, until 2015, unless they had government authorisation. In addition, Foreign Direct Investment (FDI) in Algeria was constrained by the "49%-51% rule" whereby foreign investors were obliged to set up an Algerian company with a share capital held at least at 51 per cent by one or more Algerian

nationals residing in Algeria, thus limiting foreign investment in renewables to 49 per cent of its share capital.

Stakeholders

There are several authorities and companies that play a major role in the renewable energy landscape in Algeria. Government entities such as the Ministry of Energy and Mines (MEM) and the Electricity and Gas Regulation Commission (CREG) are responsible for energy policy and regulation in Algeria. At the same time, state-owned companies dominate Algeria's renewable energy sector. Prominent players include Sonatrach and Sonelgaz. Both these state-owned enterprises jointly own the Algerian Renewable Energy Company (SHAEMS) which aims to help the development of the national renewable energy program, search for international partners for renewable energy projects, and promote the integration of more renewable energies in Algeria. Upcoming tenders for renewable energy projects will include Sonelgaz, Sonatrach, or SHAEMS as the main domestic party in the agreement. Many international energy companies from Germany, China, Italy, Egypt, Spain, and the UK are also active in renewable energy projects in Algeria. The EU is also a major player in renewables and supported the Algerian energy ministry's renewables initiatives through Taka Nadifa, a four-year technical assistance programme that ended in April 2023.

Infrastructure

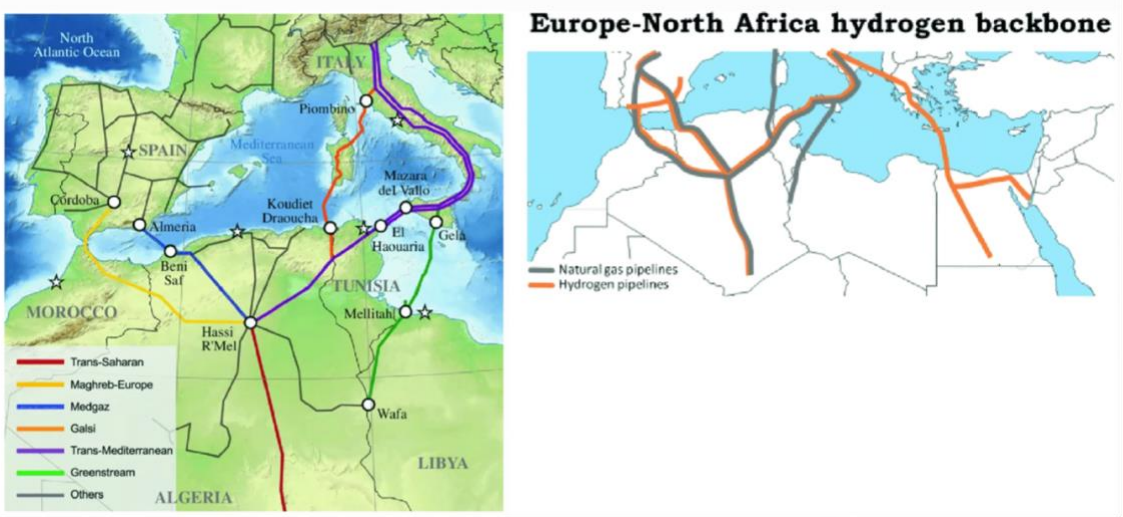
Algeria has already begun investing in improving its renewable infrastructure in line with its aim to reach 15,000 MW of renewable electricity generation by 2035. These investments have been heavily focused on solar projects, which have resulted in the development of three operational solar panel production facilities totalling 260 MW. In contrast, Algeria's first and only wind farm was constructed in 2014 in Adrar, with a generation capacity of 10 MW. Additionally, Algeria has five active hydropower plants, with the largest hydropower project capable of producing 100 MW. To facilitate the additional power generated from renewable energy, many of which will be remotely located, Algeria is planning to upgrade its existing transmission lines and develop new ones. Sonalgaz has estimated that 34,441 km of transmission lines are planned to be implemented from 2017 to 2027 to enable increased use of renewable energy sources.

Supply and Demand Markets

Algeria has the potential to export its renewable energy as well as decarbonising its own grid. In light of the War in Ukraine and heightened decarbonisation agendas, Algeria has the potential to greatly benefit from satisfying the EU's and many European nations' increased demand for cleaner energy sources. Mohamed Arkab, Algeria's Energy Minister, has recently announced plans to build solar energy power plants for exporting electricity to European countries. In order to mitigate potential lost hydrocarbon revenues, Algeria plans to increase its exports of hydrogen over the next two decades, particularly to European markets. In March 2023, Algeria announced its national hydrogen roadmap which unveiled ambitious aims to supply Europe with 10 per cent of its green hydrogen requirements by 2040.

Foreseeable Changes

A major change on the horizon for the Algerian renewable landscape in Algeria is dependent upon the growth of European hydrogen demand. Many European nations have already expressed interest in investing in hydrogen in Algeria, with Germany, Italy, and the EU all having made agreements to support the development of renewable infrastructure in the country. In order to export large quantities of hydrogen to Europe, the existing gas infrastructure from Algeria to Spain and Italy may be converted to support hydrogen exports (grey-orange lines on the map below). Algeria's national hydrogen roadmap is divided into three phases: start-up (2023-30); expansion and market creation (2030-40); and industrialisation and market competitiveness (2040-50), it is likely that such conversions will not occur until 2030 at the earliest. The demand for hydrogen reached an estimated 87 million metric tons (MT) in 2020, and the IEA forecasts demand to grow to 500–680 million MT by 2050. From 2020 to 2021, the hydrogen production market was valued at $130 billion and is estimated to grow up to 9.2 per cent per year through 2030.



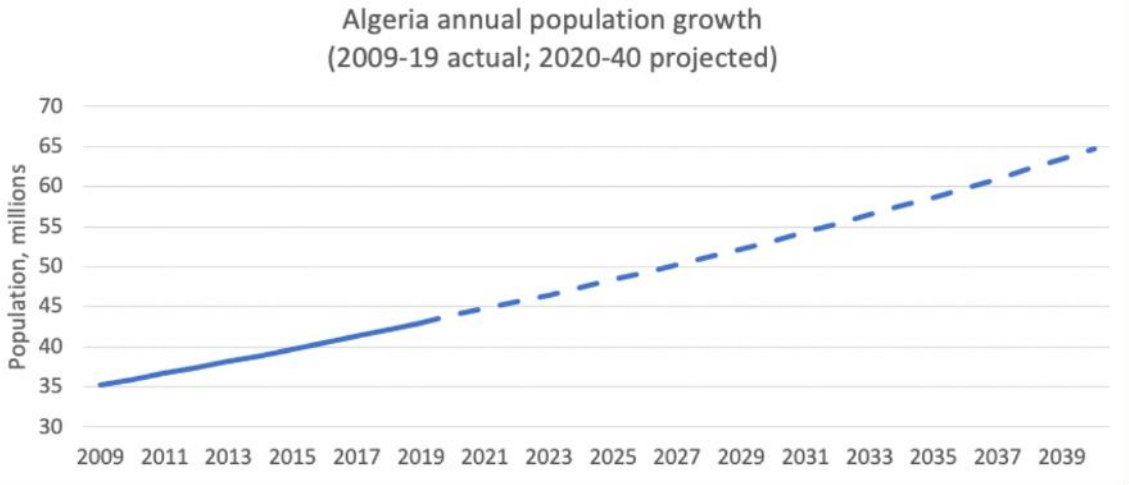
Source: Hydrogen–The Bridge Between Africa and Europe, Ad van Wijk & Frank Wouters, 2021.

Other foreseeable changes are related to increased international investment in renewable energy in Algeria as a result of the forthcoming law on renewable energies. This will help set up a legal framework to spur investment in sustainable energy sources and promote decarbonisation. Additionally, with the removal of the '51/49' rule in 2019 which required Algerian businesses to own a majority stake in projects, there may soon be increased FDI into renewable energy projects. However, as SHAEMS is still permitted to own up to a 25 per cent stake of tendered projects, this may deter international investors, who may prefer greater ownership of the projects. To truly open the market to international investors, the government may implement further reforms to reduce Sonelgaz's monopoly power over renewable energy development and improve upon the regulatory framework to comply with international IPP/PPA bankability standards. Such improvements are a watch-out for stakeholders as such reforms may attract further international investment and increase competition in renewable energy tenders.

Forecasted Risks

1. Growing domestic power demand

Despite Algeria's ambitions to export clean hydrogen to Europe, rising domestic electricity demand presents a major risk to these plans. In the last decade, Algeria's population grew by nearly 18 per cent, at an average annualised rate of approximately 2 per cent per year. Consequently, electricity generation increased by more than 5 per cent annually in the 2015 to 2019 period, from 64,663 GWh to 76,229 GWh and natural gas exports have been significantly decreased to meet the rapidly growing domestic electricity demand. Continuing with this trend, Algeria's population is growing rapidly and is forecast to have a population of 53 million by 2030 and 65 million by 2040. Such population growth through the remainder of the decade would apply further pressure on electricity demand and may force Algeria to shift its plans away from building solar energy power plants for hydrogen exports to Europe and towards using it to meet domestic demand.



Source: Algeria charts a path for renewable energy sector development, MEI, 2020.

2. Lack of infrastructure

Algeria currently lacks sufficient infrastructure to utilise its renewable energy capacity, particularly for its solar capacity. For it to succeed in exporting renewable energy to Europe in the form of hydrogen, it must first overcome distance issues between demand centres and supply hubs. Demand centres are primarily situated in the north of the country, where high urban density impedes the development of large renewable projects. Whereas, the supply side is located in the south of the country, in the Sahara, where there is a low population density, high direct normal irradiance and abundant geographical space. As a result of both the remoteness and harsh climatic conditions in the Sahara, the cost of building solar PV installations is 30 per cent higher in Algeria than the global average.

3. Hydrogen exports

There are also specific risks associated with the development of hydrogen exports to Europe. The production of green hydrogen involves significant increases in demand for water which is at risk from the increasing levels of water scarcity across Africa—especially in the northern

and the Sahel regions. Similarly, the possibility of blue hydrogen as an export option remains highly uncertain, due to unclear international demand, the development of CO2 storage facilities, and concerns related to the feasibility of carbon capture, usage and storage (CCUS) technologies.

4. Domestic political and economic risks

Within Algeria, there is political and economic resistance to change and a lack of adherence to the necessity of an energy transition. Economically, the Algerian government is anxious about the prospect of transitioning away from historically reliable sources of revenue in favour of unfamiliar new renewable ones. The boom in oil and gas prices in 2022 caused by the War in Ukraine has increased Algeria's reluctance to venture into the unknown due to economic uncertainties. Politically, there have been concerns related to who will benefit from Algeria's green energy transition. Given Algeria's increasing dependence upon European financing for its renewable projects, there are sceptics who perceive the increasing European influence in Algeria's renewable landscape as green neo-colonialism. They argue that the green transition in Europe is centred upon the ongoing extraction of exploitation of resources in Algeria. Such fears of neo-colonial exploitation were widely expressed by the large political mobilisations growing out of the 2019 Hirak movement in response to the removal of the '51-49' rule. Hence, there are risks associated with such protests reappearing in retaliation to further European support for Algerian renewable energy projects which would impede the development of renewable energy projects.