

# **The Role of Algeria in African & Global Energy Markets: Challenges & Opportunities for Local Economic Development**

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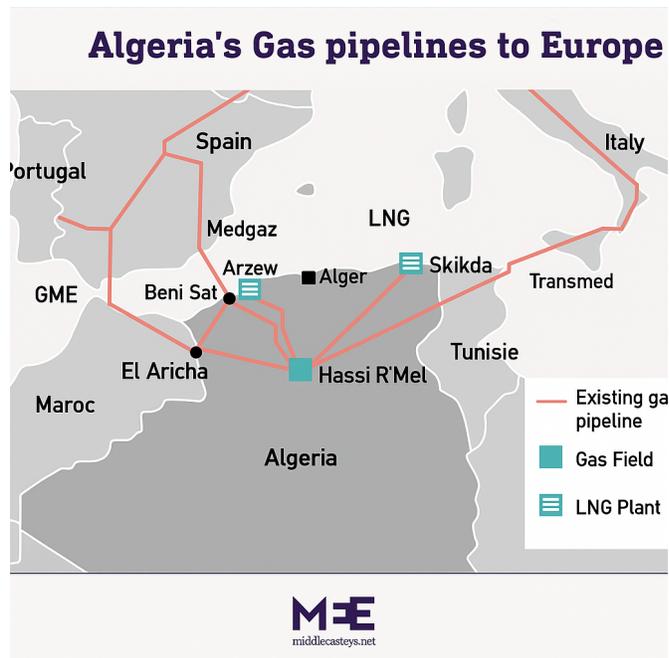
## **Abstract**

Last July during my internship at Schlumberger (SLB), an energy technology company, a local engineer told me: “When the diesel truck arrives to fix the generator, everyone hears it. But when solar panels do their job, no one notices because power flows without anyone noticing. That quiet reliability is how people realize real change has happened”. That is true because when it is that quiet, people realize that something has truly changed for the better! The clean energy not only solves problems but does so in a way that blends into daily life seamlessly and sustainably. When you first hear about Algeria’s energy sector, a vivid image comes to mind: the vast Sahara, its golden sand lying silently above, hiding underground reservoirs of oil and gas, while the sun shines over untapped solar fields stretching across the horizon. A professor from my school once joked: “Our wealth lies under the sand and above it!” referring to Algeria’s traditional oil and gas riches and its enormous solar potential, and this spontaneous remark captures the core challenge and promise facing Algeria today. This paper explores the paradox of immense energy wealth and lack of development, emphasizing on the impact of Algeria's energy sector on its local economic development, exposing the challenges and opportunities arising from its integration into the global energy landscape.

*Keywords:* Algeria, energy market, future scenarios.

## **Introduction**

Algeria has long been one of Africa’s major hydrocarbon exporters after Nigeria (Cadi et al., 2025), with pipelines like the Maghreb-Europe and Trans-Mediterranean routes delivering natural gas to Europe (see Figure 1). On the other hand, the global shifts toward renewable energy and decarbonization mean Algeria must rethink its energy strategy. Its future role in African and global markets will be shaped by how it navigates these changes, and more importantly by how it translates them into jobs and industries, which would lead to local prosperity.



**Figure 1:** A map of major natural gas pipelines linking Algeria to Europe highlighting corridors like Maghreb, Europe and trans mediterranean (source: [Middle east eye](#).)

Historically about half of its gas output has been exported through pipelines like those shown above. This export capacity has given Algeria significant clout in world energy markets: hydrocarbons make up over 90% of its export revenues (Obeid, 2025) and nearly half of government revenue. The gas fields and major pipeline corridors are concentrated in the northern Saharan basins, mainly those of Hassi R'Mel and Berkine, while the renewable potential (especially the solar one) is strongest in the central and southern desert provinces. The map underscores how Algeria's gas reaches Spain, Italy, and beyond. Yet it also hints at a vulnerability: as Europe moves to diversify away from fossil fuels, Algeria's traditional markets may shrink.

To put it simply, the key question is whether Algeria will remain a hydrocarbon rentier, or become a regional renewable and hydrogen hub that spreads benefits more widely across the economy.

## Background and Context

### Geography and strategic position

Algeria, officially “the People's Democratic Republic of Algeria”, is a country in the Maghreb region of North Africa. [Capital: Algiers] ( [Algeria - Wikipedia](#))

As the largest country in Africa by land area, Algeria spans from the Mediterranean coast in the north to the heart of the Sahara Desert in the south.



**Figure 2:** A map that shows where Algeria is located on the World Map. (Source: [Ontheworldmap.com](http://Ontheworldmap.com))

### **Historical evolution of the Energy Sector**

Algeria’s modern energy story begins in mid20th century with oil and gas discoveries (Encyclopaedia Britannica, n.d.). After independence, the government took control of the oil and gas industry and put it under the control of Sonatrach, which became the state’s primary revenue engine (FundingUniverse, n.d.). Decades later Algeria developed pipelines linking its gas to Europe (Trans-Mediterranean, Maghreb-Europe, Medgaz), and built LNG and export infrastructure (U.S. Energy Information Administration [EIA], 2024). Hydrocarbons financed the state development and supported domestic energy consumption, that actually led to overdependence on this source. (EIA, 2024)

The 1990s in Algeria were marked by a violent civil conflict often called the “Black Decade.” This internal war resulted in political instability after the cancellation of elections and had major effects on all sectors of the country, including energy. (Library of Congress, 2024)

Oil and gas infrastructure became targets of violence, forcing Sonatrach to increase security and leading many foreign companies to withdraw or pause investment (Lawler & Payne, 2013). This instability reduced exploration and development -key stages in the well lifecycle- thereby constraining growth in the sector. (Library of Congress, 2024)

As a result, the government began rethinking its energy strategy, eventually moving toward liberalization to attract foreign investment (Library of Congress, 2024). Despite the conflict, hydrocarbon exports remained vital to the economy, highlighting Algeria’s dependence on energy revenues during the crisis. (EIA, 2024)

After the 2000s, global concerns began to be taken seriously (climate policy, European decarbonization ambitions, and increased competition) that pushed Algeria toward diversification (Underwood, 2025). In the 2010s and 2020s the government introduced renewable targets and most recently a National Hydrogen Strategy aiming to convert the excess of renewable energies into hydrogen exports. (Green Hydrogen Organisation, n.d.)

Yet, the existing government systems and financial support from local authorities made the transition slower. (Underwood, 2025).

### Study Method

The study method I used in the making of this paper was a secondary research approach. The research was conducted by reading articles, reports by government and international agencies, as well as market reporting (press and trade).

The approach is qualitative-quantitative: I used descriptive statistics for figures and supplemented them by scenario discussions exploring alternative future developments and policy implications.

### Results

#### Algeria’s resource base and production

Below is a compact set of energy figures used in the paper (most recent available public estimates, 2022-2024 ranges). The numbers that I found online are approximate and referenced.

Indicator	Figure (approx.)	Source
Proven natural gas reserves	~ <b>159 Tcf</b> (trillion cubic feet)	<u>FrontierView</u>
Annual gas production (recent)	~ <b>58 - 100 bcm</b> range (billion cubic meters) [ production & reported variation across 2021-2024]	<u>Algeria gas exports</u>
Share of electricity from gas	~ <b>97%</b> (electricity largely gas-fired)	<u>Algeria - Renewable Energy</u>

Renewable target	<b>15 - 22 GW</b> by <b>2030</b> / <b>27%</b> renewables by <b>2035</b> (government targets vary by source)	<u>Algeria’s Strategic Energy Vision</u>
Hydrogen export ambition	<b>30 - 40 TWh/year</b> hydrogen exports by <b>2040</b> ; <b>\$8-10 billion</b> revenues target	<u>Algeria   Green Hydrogen Organisation</u>

**Table 1:** Algeria’s key Energy figures (Referenced)

### Key players

Sonatrach: the state-owned energy company (dominant in upstream, midstream, and export contracts). FrontierView

OPEC: Algeria has been a member of OPEC and participates in the organization’s deliberations that shape oil market coordination (and also participates in OPEC+ arrangements). Organization of the Petroleum Exporting Countries

International partners: Italy (ENI), Spain (Medgaz/ENAGAS partners), Germany and other EU actors (renewables and hydrogen interest), China (manufacturing and financing), Gulf states (emerging partners in green hydrogen). Algeria’s energy outlook appears dimmer in 2024 | FrontierView

### Algeria’s role in African and global markets

Algeria is one of Africa’s top gas producers and has been a key supplier to Europe and one analysis even calls it “Africa’s leading natural gas producer” (Obeid, 2025). Its network of pipelines (both undersea and overland) once gave it strong influence in the region (Wikimedia Commons, 2021). But things are changing because Europe is using less gas due to climate goals, competition from other gas exporters is growing, and pipeline issues like the Maghreb-Europe suspension add uncertainty (Montel News, 2024).

### OPEC and oil market participation

Algeria is still active in OPEC and OPEC+ and takes part in decisions on oil production that impact global markets (OPEC, 2024). This helps Algeria keep some influence in diplomacy and energy markets, but it doesn’t fix the country’s deeper economic and development problems (Bouznit, 2022).

### Export Fluctuations (oil & gas)

As I mentioned earlier, Algeria is a top African gas producer. The country continues to maintain substantial reserves that support exports to Europe and nearby regions.

However, its gas production and exports have been unstable in recent years. Reports show that drops in output and exports occurred at various points in various years largely because of lower demand and maintenance work, such as the Medgaz pipeline maintenance in 2024. This shows that Algerian gas exports depend on both market conditions and technical factors. (Montel News, 2024; U.S. Department of Commerce, 2023).

### Domestic consumption vs exports

Algeria’s domestic gas use is rising due to industry and household needs. Since most electricity is made using gas, growing domestic demand means less gas is available for export if production doesn’t increase. This creates a tradeoff between meeting local energy needs and earning money from exports (U.S. Department of Commerce, 2023). Recent reports show this has become a challenge, especially after 2020, as the government tries to balance both priorities (Cadi et al., 2025).

### Renewables

Algeria’s use of renewable energy is still very small, even though the country has set big goals for the 2030s. Plans include installing 15 to 22 GW of renewable power and reaching 27% of energy from renewables by 2035. However, progress is slow because of problems with funding and government systems (Chikhi et al., 2022; Climate Analytics, 2023). While the goals are serious and linked to future hydrogen projects, actual progress and installed capacity remain limited (Ghaoues & Kaouane, 2021).

CAP (MW)	Total renewable energies	Hydropower	Wind power	Solar energy
2012	253	228	-	25
2013	253	228	-	25
2014	264	228	10	26
2015	312	228	10	74
2016	482	228	10	244
2017	663	228	10	425
2018	686	228	10	448
2019	686	228	10	448
2020	686	228	10	448
2021	686	228	10	448

MW stands for Megawatt.

**Table 2:** Algeria’s installed renewable energy / power-capacity mix (in MW) over 2012-2021. Data extracted from IRENA (International Renewable Energy Agency) (2022)

### Emerging hydrogen and renewable export hub

Algeria's National Hydrogen Strategy aims to start exporting green hydrogen to Europe, with goals of 30-40 TWh per year by 2040 and billions in expected revenue (GH2, 2024). Several partners, including EU countries such as Germany and Italy, as well as Gulf investors, are showing interest through agreements and project talks (Energy Capital Power, 2025). Thanks to its strong sunlight and large land area, Algeria has good potential to become a major player in green hydrogen (Zemri, 2024).

## **Challenges**

### **Infrastructure gaps**

Algeria needs major investment to upgrade key infrastructure like the power grid (long-distance electricity transmission from the desert) and also building hydrogen transport. While gas pipelines are in place, the electricity grid isn't ready for large-scale desert renewable projects without improvements (Chikhi et al., 2022; U.S. Department of Commerce, 2023). Problems like grid bottlenecks, weak connections, and aging gas systems are well known (Ghaoues & Kaouane, 2021).

### **Governance and institutional issues**

Algeria's state-led system puts most decisions in the hands of the government, which can make rules and processes unclear. Studies show that policies are sometimes inconsistent or poorly carried out, sending mixed signals to foreign investors (Cadi et al., 2025; Chikhi et al., 2022). This slows down projects and makes private companies more cautious. Experts warn that without clear and stable rules, Algeria could miss out on foreign investment in renewables and hydrogen (Obeid, 2025).

### **Over-dependence on hydrocarbons and fiscal vulnerability**

Algeria's economy still depends heavily on oil and gas prices and exports. These revenues have funded government spending for years, but slow progress in diversifying the economy could lead to financial problems if prices or demand drop (Bouznit, 2022). Experts warn that delays in the energy transition could leave assets unused and cause economic instability (Obeid, 2025).

### **Environmental and social issues**

Fossil fuel extraction and gas flaring in Algeria harm the local environment (Bouznit, 2022). Government subsidies encourage people to use energy wastefully, which makes it harder to set fair prices for renewables (Cadi et al., 2025). Big energy projects also need community support but some face pushback especially in desert areas where nomadic or farming communities live (Energy Capital Power, 2025).

### **Opportunities for local development**

#### **Job creation and industrialization**

Big renewable energy and hydrogen projects can create many jobs in building and making equipment. If Algeria adds rules to use local workers and provides training, the job growth could be even bigger (Cadi et al., 2025; Energy Capital Power, 2025).

### **Renewable energy zones and Sahara solar**

The Sahara has very strong sunlight and plenty of space. Special Renewable Energy Zones (REZs) could have large Photovoltaic (PV) and Concentrated Solar Power (CSP) solar plants, along with industrial areas for making electrolyzers and processing hydrogen (Climate Analytics, 2023). These zones could also include training centers and support local businesses (Ghaoues & Kaouane, 2021).

Photovoltaic (PV): Technology that converts sunlight into electricity using semiconductor materials.

Concentrated Solar Power (CSP): Technology that uses mirrors to focus sunlight onto a receiver, producing heat and generating electricity.

### **Skills transfer and Foreign Direct Investment**

Bringing in foreign investment with technology sharing can help Algeria develop its own manufacturing and service skills (Chikhi et al., 2022). The country's talks with European and Gulf investors on hydrogen projects show good potential for local job creation, if everything is clearly agreed on (GH2, 2024).

the country holds exceptional solar resources and is positioning itself for future hydrogen projects, areas that Gulf states, especially those diversifying their energy portfolios, are actively exploring (GH2, 2024).

### **Discussions**

This section interprets the results and provides scenario-based analysis.

#### **Interpreting Algeria's current position**

The results show a paradox: Algeria is highly resource-rich but institutionally constrained. While it remains a significant gas supplier, rising domestic demand and limited production growth narrow the export buffer. Renewables and hydrogen offer strong potential, but slow implementation and governance weaknesses hinder progress.

The issue is not resources but **institutional capability** and **investment climate**.

#### **Future Scenarios (10–20 years)**

I relied on Cadi et al.'s findings.

The paper by Cadi, Boukhatem, and Mokdad (2025) offers a clear and engaging look at Algeria's energy transition. Their work brings out several important themes, and reflecting

on these helps us better understand what's at stake and how policy efforts could respond to the challenges.

Now we can conceptualize three broad pathways for Algeria, each with distinct policy implications:

### **Scenario 1. Status Quo: Gradual Decline of Hydrocarbon Dominance**

Limited reforms, hydrocarbons remain >85% of export revenues.

Gas exports stagnate as domestic consumption rises.

Renewable capacity grows slowly (< 5-7 GW by 2035).

Fiscal pressures intensify, new jobs are few, making social spending harder to sustain.

#### **Policy implications:**

Maintaining the current model risks fiscal instability and lost export opportunities as Europe decarbonizes without diversification, local development remains limited.

### **Scenario 2. Diversification and Energy Transition: Renewables + Hydrogen Expansion**

Major grid upgrades attract international investors.

Renewable deployment surpasses 15–20 GW by 2035 as the government targeted.

Hydrogen hubs emerge in the central/southern Sahara, and local manufacturing of: solar panels, cables, electrolyzers, wind turbines, batteries, desalination components.

Job creation strengthens local economies in desert regions.

#### **Policy implications:**

Requires stable regulation, training programs, competitive power-purchase agreements (PPAs), alongside targeted incentives for local manufacturing and technology transfer to boost Algeria's renewable energy capacity, strengthening the country's long-term energy independence and industrial base. This scenario aligns best with sustainable development goals.

### **Scenario 3. Geopolitical Shifts: Africa-Centric and Global South Energy Partnerships**

Europe reduces gas imports faster than expected.

Algeria pivots to African markets (e.g., West African pipelines, hydrogen exports to emerging Asian markets).

China and Gulf states expand investment in renewables, grid modernization, hydrogen and Electric mobility.

### **Policy implications:**

Algeria must adapt its diplomacy and infrastructure planning to non-European markets. This scenario balances risk but requires strong regional cooperation.

### **Comparing Scenarios (1, 2 and 3)**

Scenario 1 is fiscally risky.

Scenario 2 generates the highest local development impact (jobs, value chains, industrialization, improved living standards).

Scenario 3 provides geopolitical resilience but depends on regional stability.

### **Policy Recommendations**

Grounded in an understanding of Algeria's energy sector, I would like to support this paper with these recommendations aiming for sustainable growth:

#### **Reform regulatory frameworks:**

Publish clear renewable and hydrogen regulations to ensure stable PPAs.

Simplify investor procedures and adopt transparent permitting.

#### **Upgrade infrastructure**

Expand north-south transmission lines (grid) for solar integration.

Modernize gas infrastructure and develop hydrogen corridors.

#### **Create standards to strengthen domestic industry involvement**

Require local employment and training in large energy projects.

Support domestic manufacturing (PV panels, hydrogen components).

#### **Strengthen education and vocational training**

Create specialized renewable-energy institutes in desert regions.

#### **Community integration**

Ensure local benefit-sharing for communities in project areas.

#### **Diversify export strategies**

Develop energy diplomacy with African and Asian partners.

## Conclusion

Algeria is at a turning point. Its oil and gas resources still give it a strong role in Africa and global markets, but its future depends on how it handles the energy transition. The key is to balance government finances with renewable investments, strengthen institutions to attract funding and make sure new industries benefit local people.

Algeria's goals for hydrogen and solar power are plausible and already gaining international interest (GH2, 2024; Energy Capital Power, 2025). But real success will depend more on good governance and involving local communities than just having natural resources (Obeid, 2025; Chikhi et al., 2022). If managed well, Algeria can move from relying on oil and gas to becoming a regional leader in clean energy with development that truly benefits its people.

And in this regard, we ask a very logical question, is energy transition an inevitable necessity for Algeria?

Well sticking with the current system is becoming too risky and unsustainable. The changes are already starting so the real question is not **whether** Algeria will transition but how **quickly** and how **effectively** it can do it to manage to be a role player in the Energy markets globally.

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