

We are IntechOpen, the world's leading publisher of Open Access books Built by scientists, for scientists

6,900

Open access books available

186,000

International authors and editors

200M

Downloads

Our authors are among the

154

Countries delivered to

TOP 1%

most cited scientists

12.2%

Contributors from top 500 universities



WEB OF SCIENCE™

Selection of our books indexed in the Book Citation Index
in Web of Science™ Core Collection (BKCI)

Interested in publishing with us?
Contact book.department@intechopen.com

Numbers displayed above are based on latest data collected.
For more information visit www.intechopen.com



Beyond the Hydrocarbon Economy: The Case of Algeria

Cecilia Camporeale, Roberto Del Ciello and Mario Jorizzo

Abstract

The energy sector is vital to efforts to combat climate change as well as achieve economic development. The economy of many Middle East and North African (MENA) countries, such as Algeria, Iran, Qatar, Saudi Arabia, is completely based on hydrocarbons which represent the main source of the state revenue. Investing in renewable energy and efficiency is a winner strategy, allowing both to ensure the necessary availability of energy to cover the country's domestic energy demand and to make more resources available for export to guarantee the state earnings. Renewable sources can be a solution for a transition to a more sustainable economy and a response to the economic stability of these countries affected by the volatility of oil prices. Such a strategy is reflected in improving the attractiveness of foreign investment in the renewable energy sector. Focusing on Algeria, in this article, we analyze the link between the Algerian economy and energy, underlining the current weakness. This work is partially based on the research financed by the meetMED project (WP 3.1) on barriers for domestic and international investors in the energy sector of Algeria.

Keywords: Algeria, barrier to investment, renewable energy, energy efficiency, energy sector, meetMED

1. Introduction

The fossil fuel price fluctuations have large impacts on the economy and often with implications for political stability both for importer countries [1, 2] and for exporter countries, as Middle East and North African (MENA) countries¹, because of its predominance of state revenues. In 2017, the GDP of MENA countries has been more less of 4% [3] of World GDP, while in terms of hydrocarbon production, they accounted the 30% of total world production of oil and natural gas [4]. According to WTO [5], the total merchandise exports of MENA countries are only 6% of total world export, but this amount rises to 26% in terms of world fuel export, with difference among the countries (see **Figure 1**). In Algeria, Iraq, and Kuwait, for example, more than 90% of export is linked to the fuel (respectively, 96%, 94%, and 90%), while in Egypt and in the United Arab Emirates, the percentage falls to 20%, and only in some cases (Israel, Morocco, the Lebanese Republic, and Jordan) the contribution to the fuel export is very residual.

According to Arent et al. [2], many developing countries—particularly MENA countries—may possess an inherent comparative advantage due to the availability

¹ The MENA Countries are composed by Algeria, Bahrain, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Syria, Tunisia, United Arab Emirates and Yemen.

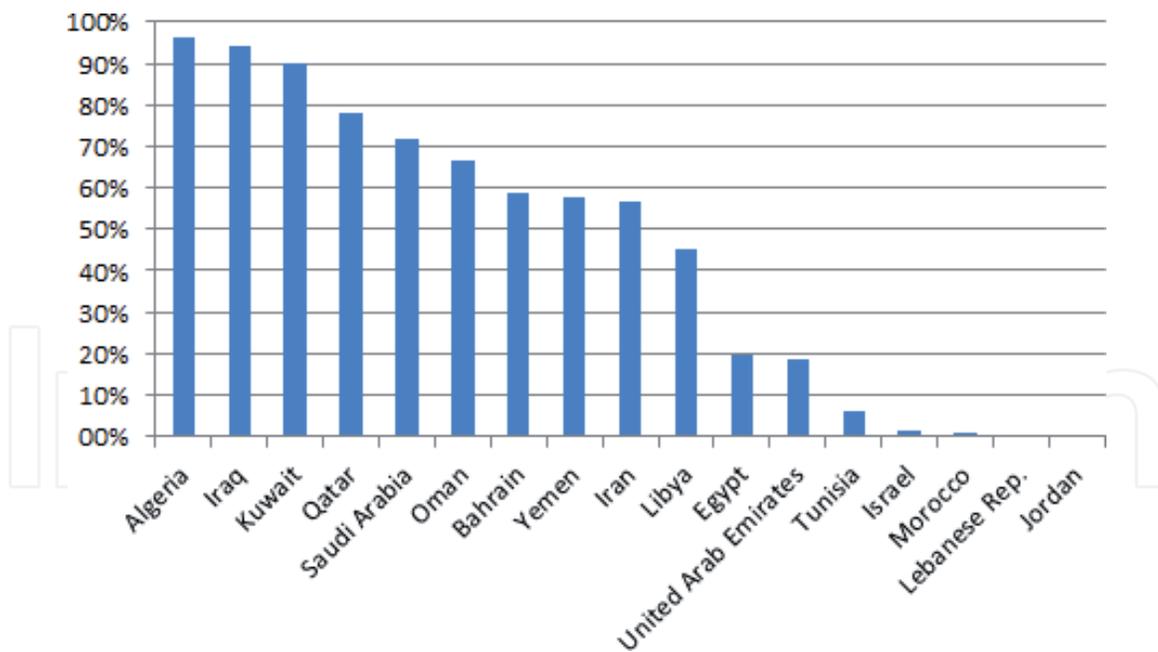


Figure 1. Percentage of fuel export on total merchandise export in MENA countries, 2017. Source: our elaboration on [5].

of significant renewable energy sources (solar, wind, geothermal, bioenergy, etc.), and taking into consideration the nature of renewable energy particularly relevant for rural and isolated area, it will provide unprecedented opportunity to guarantee electricity access to the poorest citizens. Betting on the renewable sources means obtaining double benefits: on one hand, to assure an economic growth to the citizens [2] and on the other hand, to make fossil resources available for export before to realize a full clean energy transition. Moreover, investing in renewable energy is necessary to achieve the commitments under Paris Agreement on climate change, in general, in order to reduce GHG emissions linked to the use of fossil fuel. This transition toward clean energy boosts the debate on stranded asset, where assets suffer from unanticipated or premature write-offs, downward revaluations, or conversion to liabilities [6], and renewable and energy efficiency investments can be considered a mitigation strategy versus stranded asset risks related to hydrocarbon core business.

A variety of factors could lead to assets becoming stranded: new government regulations that limit the use of fossil fuels (like carbon pricing), boom in more cost-effective (economically, environmentally, and socially) alternatives, a change in demand, and, of course, growing unpopularity with the public opinion [6, 7].

The competitiveness of fossil fuel companies is rapidly losing its attractiveness at an accelerated rate, causing serious problems especially for those countries whose state balance is based on these assets.

In particular, the developing countries are:

- Highly exposed to a decline in fossil fuel demand, consequently to a fall in fossil fuel prices;
- Less able to diversify away from this risk;
- Themselves under pressures to implement policies that may expose them to further risk [8];

The world economy is gradually “decarbonizing” with a continued trend and a deep change in the financial world. Now, many institutions, sovereign wealth funds,

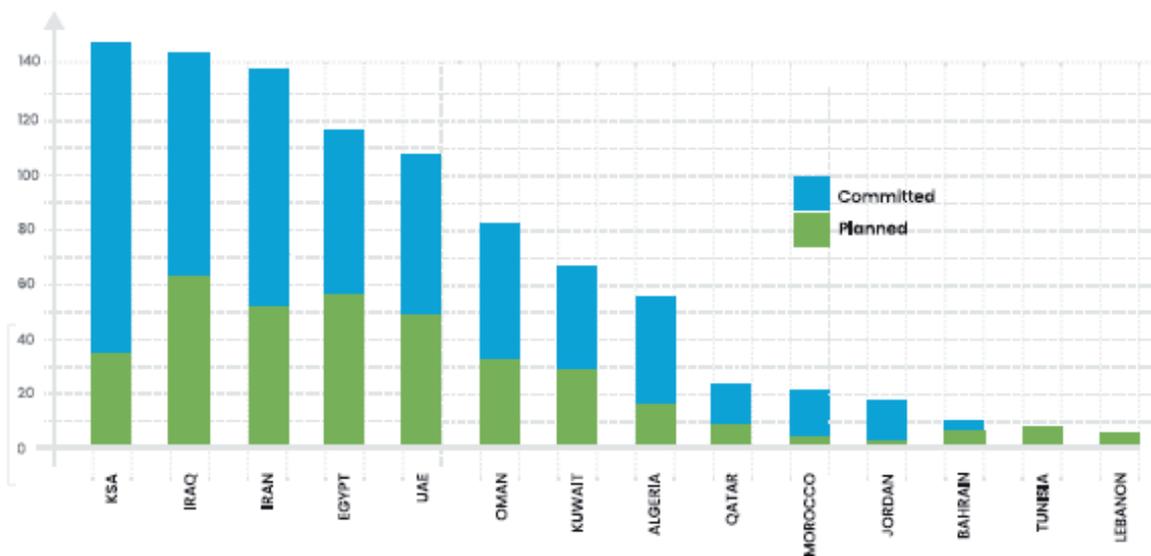


Figure 2.
 Total planned and committed MENA energy investment 2019–23 (USD billion). Source: [9].

banks, global asset managers and insurance companies, cities, pension funds, healthcare organizations, universities, faith groups, and foundations have committed to ban fossil fuel investments².

According to APIC [9], MENA region will maintain upstream investments with total investment for 2019–2023 near one trillion dollars (see **Figure 2**) even if the 5-year GDP growth forecast has declined. Raising capital is one of the major challenges for regional governments, and recent efforts to attract foreign investment have seen signs of caution from investors, especially taking into consideration the economic performance, solvency, and political reliability of some countries. All these considerations mean that the risk of stranded assets for fossil fuel companies is growing [8].

This work is partially based on the research financed by the meetMED project (WP 3.1) on barriers for domestic and international investors in the energy sector of Algeria.

2. The case study of Algeria

Algeria, officially the People’s Democratic Republic of Algeria, is a country in the Maghreb region of North Africa that, with its 2,381,741 square kilometers, is the 11th largest country in the world and the largest in Africa [10].

The country is a semi-presidential republic consisting of 48 provinces and 1541 communes (counties) where the legal system is based on a mix of French civil law and Islamic law. In fact, after more than a century of rule by France, Algerians fought through much of the 1950s to achieve independence in 1962.

Algeria’s economy remains dominated by the state, through its state-owned companies which manage the rich fossil fuel resources of the country. Recently, the Algerian government has suspended the process of privatization of state-owned

² For example: Norway’s sovereign wealth fund, the Catholic Bishops’ Conference of the Philippine, the Rockefeller Brothers Fund, the British Medical Association, Amundi Asset Management, Caisse des Dépôts (the French public financial institution), New York City, the City of Cape Town, KfW Group (Germany’s development bank), Stockholm University, the Tate museums in the U.K. The National Trust and Allianz insurance, and St Mary’s Episcopal Cathedral, Edinburgh—the first cathedral in the world to divest. Recently, also the EIB plans to cut all funding for fossil fuel projects by 2020 in order to focus on long-term investments that must be aligned with the Paris Agreement and, of course, cut greenhouse gas emissions.

industries and companies, imposing restriction on imports and on the participation of foreigners in its economy [10]. In this way, a very explicit import substitution policy has been realized to support the economy of the country and to reduce the uncontrolled exposure to the foreign interference.

The hard core of Algerian economy has long been the hydrocarbons which account for broadly 30% of GDP, 60% of budget revenues, and nearly 95% of export earnings. Hydrocarbon exports enabled Algeria to maintain macroeconomic stability, amass large foreign currency reserves, and maintain low external debt while global oil prices were high.

Since 2014, the Algerian economy has to face the crisis linked to the lower oil prices. In fact, the national foreign exchange reserves were halved and the oil stabilization fund collapsed sharply, reaching its legal minimum value of \$7 billion in 2017, compared to a much higher value of \$20 billion in 2013, and the large subsidies for the population has fallen under stress [10].

Due to the declining oil prices, the government has been under pressure to reduce spending; therefore, it has reduced its ability to distribute rents and fund generous public subsidies.

3. Economic situation and performance

According to the African Development Bank (AfDB) [11], in many African countries, energy subsidies constitute a considerable fiscal burden, and its contribution to GDP has remained substantially relevant in the time despite the trend of international oil prices. In particular, among oil-exporting economies, there are countries (i.e., Angola, Cameroon, and Nigeria) in which the share of energy subsidies on GDP has the same both in the pre-peak period (2013–2014) and in the post-peak period (2015–2017) but in some others (i.e. Libya, Algeria, and the Congo) where the share increased (**Figure 3**).

The AfDB suggests that subsidy reforms must be geared toward more-efficient and better targeted social safety nets for the most vulnerable. This could improve public finance management, create more fiscal space for much needed public investments in infrastructure, and improve the debt situation.

Over the past 3 years, the Algerian government has enacted incremental increases in some taxes, especially in value-added tax, resulting in modest increases

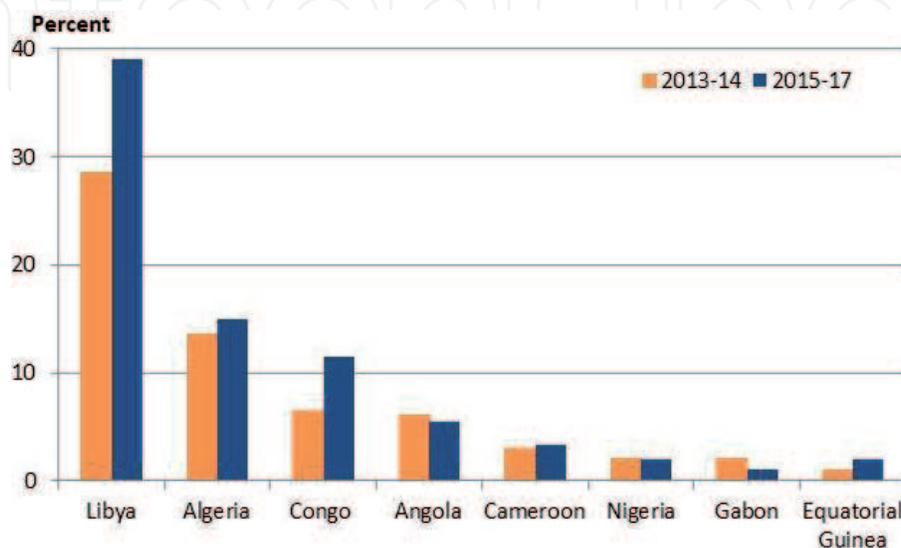


Figure 3. Energy subsidies as a share of nominal GDP (African oil exporters, 2013–2014 and 2015–2017). Source: [11].

in prices for gasoline and certain imported goods. However, the government is not disposed to reduce subsidies because these subsidies represent measures to assure benefits to poorest people of the country financing some essential services as education, healthcare, and housing programs.

Since 2015, Algeria has strengthened protectionist measures to limit its import bill and encourage greater contribution on GDP of domestic production from non-hydrocarbon industries but also impose additional restrictions on access to foreign exchange for imports.

In 2016, Algerian GDP has increased by 3.8% as the previous year but with different drivers. In fact, the good performance is referred to the recovery in hydrocarbon production, which grew by 3.6% (compared with +0.4% in 2015), more than offsetting the slowdown in growth in the non-hydrocarbon sector, which rose from +5% in 2015 to +3.9 in 2016. The performance of the non-hydrocarbon sector was heavily affected by the slowdown in agriculture due to particularly unfavorable weather conditions, in energy due to the high weight of hidden subsidies, in water, and in other residual industrial sectors [12].

In 2017, the slight decline of hydrocarbon production together with the light growth of non-hydrocarbon sector performance has exerted pressure on the Algerian economy.

Real GDP has grown of only 2.1% rather than 3.3% of the previous year due mainly to the modest production of hydrocarbon sectors. In fact, the hydrocarbon production decreased by 1.4% while the non-hydrocarbon sectors slightly increased to 2.5% (against 2.3% of 2016) due to the inversion of fiscal consolidation happened in second middle of 2017. Inflation remains high although lower than in 2016 (5.5% in 2017 against 6.4% in 2016) [13].

Growth is expected to recover sharply in 2018 as fiscal expansion takes hold. As new public investments announced in the 2018 budget are carried out, headline growth and inflation will increase. As a result, GDP growth will have difficulty to exceed the 2% threshold for 2019–2020, which is a very limited growth for a middle-income country with a high youth population. So, for the next years, many analysts agree to affirm that while the production by new oil wells will boost the economy growth, the progressive increment of contribution to the GDP of non-hydrocarbon sectors could permit to support the fiscal consolidation. In fact, the international oil price fluctuations have underlined the weakness and the fragility of the Algerian economic model and the need to rethinking to a deep structural transformation in which reduce the dependency from hydrocarbon sectors [13].

Public spending decreased by less than expected due to difficulties in pursuing the 2017 budget target. In fact, since the end of the 1990s, Algeria has made massive investments in health and education in response to the pressing needs of its people, while also working to close large infrastructure gaps. In the current fiscal framework (2018–2020), adopted in the 2018 Budget Law, public spending will remain very high and will not be offset by a potential increase of government revenues due to an expected pickup in oil price and production [13].

Public investment has been about 20% of non-hydrocarbon GDP on average since 2000, much larger than in comparator countries. Reflecting the country's policy priorities, Algeria allocated on average about 70% of public investment to economic (i.e., roads, ports, rails, airports, and power and energy) and social infrastructure (such as housing, health, education) [14].

Although imports increased slightly, by 2.7% in 2017, exports have increased significantly, by 16.5%. As a result of continued deficits and limited capital inflows, the country's international reserves declined sharply. Nonetheless, external debt remains very low [13].

In Algerian economy, the role of the state is predominant. Consequently, the public investments are essential to boost the economy. For example, in 2015, the state alone invested the 49% of total gross accumulation of fixed funds. At the same time, the public employment engaged mainly on the labor force in the country: by 2017, the central government employment alone absorbed about 20% of total formal employment. Considering the whole public employment, around 40% of total formal employment is more or less connected to the public staff [14]. The unemployment rate is particularly high (around 12), reflecting the sluggish non-hydrocarbon growth with women participation lower.

4. The challenges of Algerian economy

The Algerian economy is characterized by a strong dependence on the international price of oil, which is the main source of revenue for the state budget. The oil and gas sector is the backbone of the economy, accounting for about 20% of the gross domestic product, and 85% of total exports [15].

Although Algeria remains a relatively closed economy, the government needs to diversify its economy away from hydrocarbons especially since oil prices started falling dramatically in 2014 [16]. So, a range of import restrictions have also been introduced in recent years, as the government attempted to boost domestic production capacity and reduce imbalances in the external accounts.

Oil and gas accounted two thirds of state revenues and, consequently, when financial incentives such as generous subsidies and free housing proved insufficient in stifling popular dissent, these revenues helped the security apparatus acquire the coercive means to repress it [16].

Algeria's high vulnerability to volatile international oil prices exposes it to a high risk of a prolonged economic slowdown. In fact, the predominantly state and nontransparent economic system creates a mistrustful environment for foreign investment, in which state contracts are based on personal knowledge rather than on merit or efficiency, and ends up supporting industries that are not competitive at the international level.

These inefficiencies have also affected the energy sector, which has led to a further economic slowdown. As a result, Algeria became the only OPEC member to pump below the allowed quota as its production decreased, despite efforts to attract new investment.

The budget deficit was significantly reduced in percent of GDP, due to lower spending and higher revenue, but the decline in non-hydrocarbon deficit was more moderate, and deficits were financed largely by drawing on savings in the oil fund, which was depleted in 2017 [17].

In addition to a particularly weak economy, Algeria must also address the threats posed by the climate change that is taking place: most of the country is arid or semiarid; the yearly average rainfall declined by more than 30% over the past decades; more than 50 million of hectares face highly deteriorated conditions; the exodus of rural population toward large cities; and the decline in water resources [18].

So, taking into account the international commitment due to the Paris Agreement and its goals, even underlining limited responsibility in terms of accumulation of GHG as a developing country, the Algerian government declared its willingness to make its contribution as condition of new financial resources, to be combined with traditional partners, and/or of transfer of clean technologies under favorable conditions.

In 2016, the government published details of its "new growth model" to face the significant drop in oil prices, recognizing that its vast system of government

subsidies is unsustainable and needs to be revised and the need to boost non-hydrocarbon industries.

Algeria has not financed its deficit through increased external debt, which remains negligible at less than 2% of GDP. Likewise, government debt, consisting mainly of domestic debt, is limited to 40% of GDP.

The volatility of oil prices, the weakness of its economy, the decline in non-oil industrial productivity, and the fueling unemployment bring the government to rethink its vision. This context led authorities in 2016 to adopt the New Economic Growth Model 2016–2030 [19], aimed at structural transformation to reduce the state's role while enhancing that of the private sector and limiting dependency on hydrocarbon revenues. The main reforms relate to improving the business climate and replacing direct and indirect subsidies with targeted social protection for low-income population [11]. All have faced resistance from entrenched economic interests and institutional inertia, which forced them to backpedal on reform [16].

According to the document, subsidies must to be rethought: in all sectors of the public service (electricity, gas, water, rail transport, telecommunications), tariffs are kept at levels lower than the cost of operations for more than a decade for social considerations.

The document proposes to diversify the economy with a focus on renewable energy, agriculture, and industry. Algeria has long aimed to diversify its largely state-controlled economy, but investment has been hampered by state bureaucracy and inertia.

In addition, the “New Economic Growth Model” aims to promote, among other points, some structural reforms, such as the energy subsidy reform. According to this new vision of economy, the Algerian government, together with the World Bank, has analyzed a strong reform mainly to help vulnerable people of the country. Meanwhile, the government is studying a structural reform plan to modernize the entire system (i.e., simplify business regulations, improve governance and transparency, reform the pension system, and modernize the financial sector). This is a further signal to enhance the country's business climate, which also includes opening up the maritime and airfreight transport sector to the private sector [17].

Algeria aims to reconcile the energy transition and the fight against climate change with the objective of ensuring the right level of well-being for the population, especially the youngest.

5. Energy supply and consumption

Algeria, a country severely affected by desertification, is—like other countries in Africa and in the south of the Mediterranean—particularly vulnerable to the multiform effects of climate change that threaten to undermine its economic and social development [18].

At the same time, the Algerian hydrocarbon energy sector has the main pillar of country's economy both for state balance thanks to export revenues and for the availability of fossil fuel sources.

Algeria's economic performance is highly dependent on the trend in the international price of hydrocarbons, and this has prompted former President Bouteflika to announce—in autumn 2017—Algeria's intention to actively engage in the development of its unconventional energy resources. Algeria has thus committed itself to developing non-hydrocarbon industries, on the one hand tackling the problems associated with heavy regulation and on the other the high emphasis on the growth that the state fears. Algeria has not increased its hydrocarbon exports in this way, but they have decreased due to the progressive exhaustion of deposits and the simultaneous increase in domestic demand [10].

Algeria has the 10th largest reserves of natural gas in the world—including the 3rd largest reserves of shale gas—and is the 9th largest gas producer; it ranks 7th largest gas exporter, 3rd largest gas liquefaction capacity [20, 21], and the 7th largest natural gas liquids producer but also 16th in proven oil reserves [10].

In the recent years, Algeria has begun to diversify its energy sector through solar energy in order to increase its energy independence. Despite a considerable potential, the share of renewable energies in the energy balance is still low especially in the production of electricity. According to Ghezloun et al. [22], the only condition that the energy mix of Algeria will grow potential of renewable energy is the policy support and encouragement to the introduction of hybrid possibilities, including electricity generation by the private sector.

However, the government aims to develop a photovoltaic industry and, more generally, the renewable energy sector, in order to achieve a win-win strategy in which, on the one hand, a greater share of gas is released for export, thus ensuring the stability of its balance sheet and, on the other hand, the energy necessary for the development of the country's production structure is guaranteed. From the latter point of view, in addition to aiming at a diversification of the source of energy supply, the diversification of the production structure also moves toward the development of sectors and industrial sectors other than the traditional sectors based on hydrocarbons [23].

The energy demand of Algeria is completely covered by its own production, which is almost fully based on fossil fuels. Natural gas is the primary source of power generation contributing to over 93% of installed power capacity. The share of renewable energies in the energy mix is only around 3.4% and until recently was largely dominated by hydropower.

Looking to the Algerian energy flows (**Figure 4**), in 2017, the primary energy production was 165.6 Mtoe with an increasing gas production covering the light decline of liquids (oil and LPG) due to the OPEC agreement of reducing oil supply. The contribution of primary electricity was double compared to 2016 thanks to new renewable energy capacity: 5 new PV plants, equal to a 125 MW total. The natural gas remained the main source followed by oil. The same breakdown is seen for final energy consumption (see **Table 1**), provided by Ministère de l'Énergie [24–28] where natural gas remains the main source used to cover 37% of final energy consumption in 2017, followed by electricity (30%).

Algeria is moving toward renewable energy direction, having announced a substantial 20-year plan for solar development, which calls for 5% renewable energy installed capacity by 2017, and 20% by 2030, of which 70% would be CSP, 20% PV, and the remaining 10% wind power [23]. Hosting one of the world's first Integrated Solar Combined Cycle (ISCC) plants (the ISCC Hassi R'mel is a 150-MWe combined cycle hybridized with a 25-MWe equivalent CSP solar field. It was the first ISCC plant in the world to start construction although Morocco's ISCC Ain Beni Mathar was the first operating plant of this type in the world [29]), Algeria also has gained a valuable insight into the development, construction, and operation of this type of plant.

Approximately 6.2% of gas production was oriented to the production of electricity (17.5 Mtoe vs 16.5 Mtoe in 2016).

The export volume was equal to 108.3 Mtoe, in reduction of –2.2% compared with 2016. This decline affected almost all products except LNG and electricity, which recorded increases of 5.7% and 71.2%, respectively. Imports, 4.2 Mtoe, were mainly linked to a derived energy (3.9 Mtoe) due to imports of coke and electricity, which offset the decline in imports of petroleum products (–3.4%), but while remaining a net exporter (104.1 Mtoe).

National final energy consumption (including losses) reached 59.6 Mtoe in 2017, mainly driven by final consumption (+4.1%). Conversely, non-energy

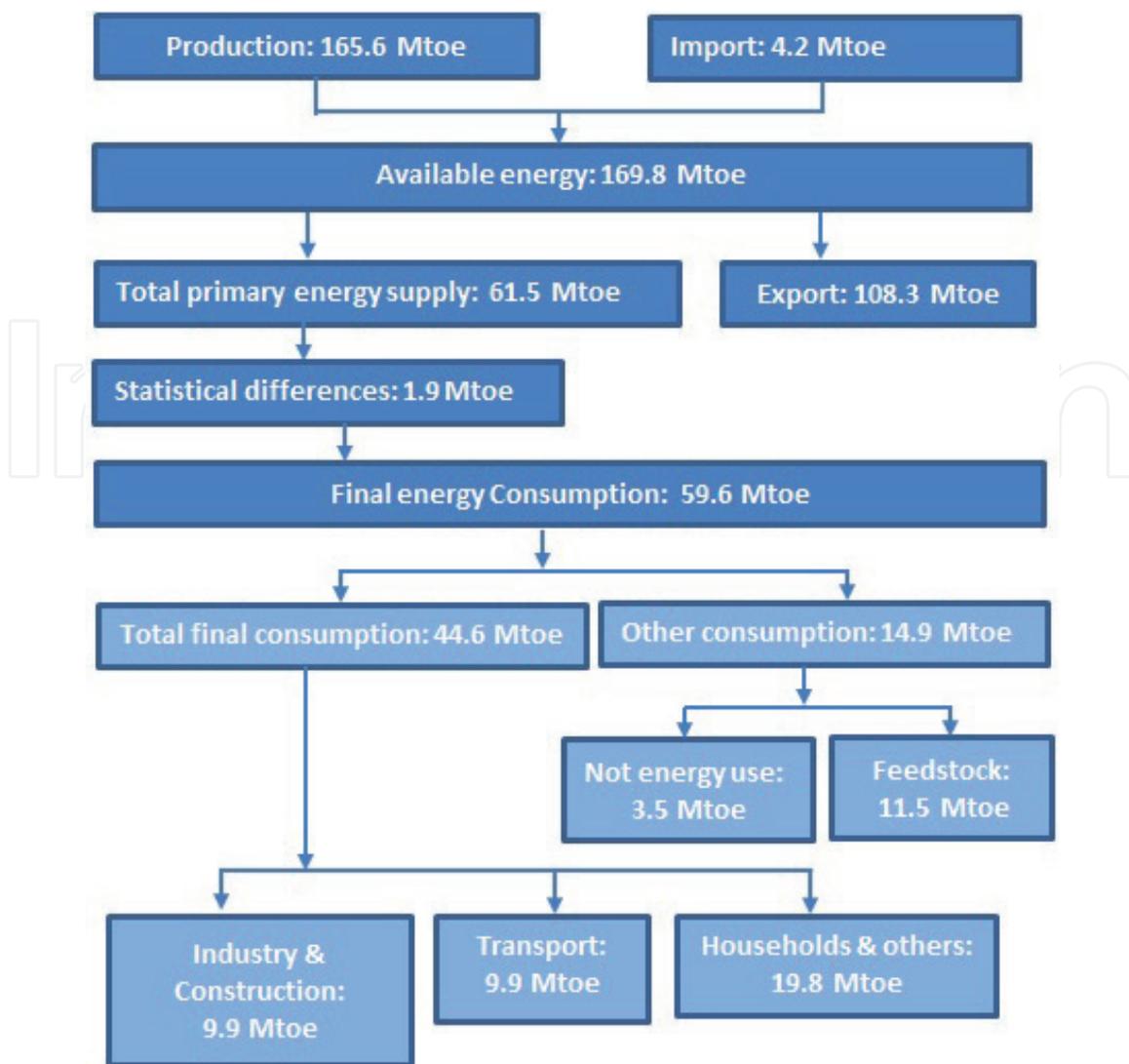


Figure 4.
 Synthesis of energy flows (Mtoe) in 2017. Source: [28].

Mtoe	2005	2010	2015	2016	2017
Natural gas	13.14	14.46	21.35	21.73	22.03
Oil and oil products	10.54	13.27	17.88	17.18	16.97
Electricity	9.75	12.20	16.41	16.88	17.81
Others	2.83	2.68	2.63	2.55	2.77
Total energy consumption	36.19	43.82	58.27	58.34	59.58

Source: Elaboration on [24–28].

Table 1.
 Algeria: national final energy consumption by fuels.

consumption, which refers to the quantities consumed as raw material in the petrochemical and other industries, fell by -19.5% , followed by the consumption reduction of energy industries (-5.1%).

5.1 Current energy plan of the country

The general approach and strategy intended by the Algerian Ministry of Energy and Mines is constituted by decree no. 07-266, dating on 9 September 2007

describing the function and role of the Ministry with respect to the intentions of the Algerian government.

In particular, in Art. 1, the Ministry commits to the elaboration of political and strategic research; the production and valorization of hydrocarbon, mineral, and energetic resources; and the embedment of the respective industry in this sector, while in Art. 5 it furthermore commits to the necessary studies and research and the promotion of sources of renewable energy.

Algeria has embarked on renewable energies in order to provide both global and sustainable solutions to environmental challenges and fossil fuel resource conservation. To achieve these two targets, Algeria has launched an ambitious programme for the development of renewable energy which was adopted by the Government in February 2011 (Renewable Energy and Energy Efficiency Development Plan 2011–2030) and revised in May 2015 in terms of some adjustment of the renewable targets.

Some energy policies to support the implementation of renewable energy sources were made since 2004 (Law on Renewable Energy Promotion, see **Table 2**, data provided by IEA [30]), before as studies of technologies (research program) and regulatory instruments than as economic instrument to promote renewable energy resource through incentives (feed-in tariffs, premiums, or direct incentives).

According to the revised strategy, new ambitious program for the development of renewable energy 2015–2030 aims to reach a contribution of renewable energy sources in term of power capacity of 37% (22 GW) by 2030 with more than 4.5 GW to be realized before 2020. The share of renewable energy in electricity generation should thereby reach 27% (previously 20%) by 2030. These targets have been included in the nationally determined contribution, which Algeria has sent to the UNFCCC secretariat as a contribution to attain the Paris Agreement (**Table 3**).

To make this, Algeria should be supported by CTCN (Climate Technology Centre and Network) intervention. The CTCN will help the photovoltaic market in Algeria with a specific project on the design and construction of a ground base's 1 MW photovoltaic plant and with a project still in its implementation phase focused on the establishment of a laboratory for accreditation and quality control of photovoltaic

Title	Year	Policy type
Renewable Energy and Energy Efficiency Development Plan 2015–2030	2015	<i>Policy support: strategic planning</i>
Feed-in tariff for solar PV installations	Apr 2014	<i>Economic instruments: fiscal/financial incentives</i>
Renewable Energy and Energy Efficiency Development Plan 2011–2030	Feb 2011	<i>Policy support: strategic planning</i>
Renewable Energy National Fund	2009	<i>Policy support: institutional creation. Economic instruments: fiscal/financial incentives</i>
Law 04-92 on the Diversification of Power Generation Costs (REFIT)	2004	<i>Economic instruments: fiscal/financial incentives</i>
Law 04-90 on Renewable Energy Promotion in the Framework of Sustainable Development	2004	<i>Regulatory instruments: codes and standards Policy support: institutional creation Research, development, and deployment (RD&D): research program, technology deployment, and diffusion</i>
Law 99-09 on the Management of Energy	1999	<i>Policy support: strategic planning, institutional creation</i>

Source: Elaboration on [30].

Table 2.
Algerian energy policy in force.

	1° step: 2015–2020	2° step: 2021–2030	Total
Photovoltaic	3000	10,575	13,575
Wind	1010	4000	5010
CSP	-	2000	2000
Cogeneration	150	250	400
Biomass	360	640	1000
Geothermal	5	10	15
Total	4525	17,475	22,000

Table 3.
Algerian renewable energy programme 2015–2030 (MW).

modules [31, 32]. In this way, Algeria could achieve its renewable energy target, reinforce the national know-how, and build specific competence in the sector.

6. The foreign investor flows

Since 2008, foreign investors have been restricted to a maximum stake of 49% in a company. This policy has, more probably, the reason because the foreign direct investment (FDI) flows to Algeria have diminished in recent years.

In 2015, Algeria registered its first negative foreign trade balance since 1994, and despite falling revenues, Algeria—which has the largest defense budget in Africa—opted not to cut military spending.

In 2016, Algeria launched a new operation of financing economic investments and major infrastructure projects called “National Bond Issue for Economic Growth,” raising \$5.2 billion to finance its domestic debt market. Previously reluctant to borrow on international markets, the government obtained a \$1 billion loan from the African Development Bank [33]. Through this instrument, the Algerian Ministry of Finance invited his nationals living abroad to subscribe to this national bond issue, open to public subscription since April 2016, and participate in the economic development of the country.

However, according to the United Nations Conference on Trade and Development (UNCTAD) [34], the foreign investments in Algeria fell slightly in 2016–2017, due to the strong dependence of Algerian economy by fossil fuels in which prices fell in 2017, but they should be recovered in the next years thanks to the reform on investment laws, proved by the heavy investments made by China and Turkey in this last years.

The main obstacles to the boost of investments in the country are identified in the protectionism measures, as well as corruption, bureaucracy, a weak financial sector, and legal insecurity in terms of intellectual property rights.

According to IMF [35], fiscal risks in Algeria are multiple and interrelated due to the dominant role played by the state in economic activity through government programs as well as through commercial activities carried out by public institutions and state-owned enterprises.

Other sources of fiscal risk include volatile hydrocarbon revenues, natural disasters, and the financial situation of social safety net programs. According to some estimates, in 2016, economic losses linked to the country’s climate, which was not fully conducive to investment, were quantified at around 8.9% of GDP. This loss reflects, on the one hand, the government’s purchase of the debt of a public service company held vis-à-vis a bank that is also public and, on the other hand, the issue of

bonds by the state-owned oil company to compensate for losses resulting from the sale of imported refined fuels on the domestic market at preferential prices [35].

However, Algeria is seeking more trade and foreign investment. For example, in April 2005, the hydrocarbons law was designed to encourage foreign investment in energy exploration, or in 2016 the “revised investment law” (Law 16-09) and the 2016 Finance Law aimed to replace most provisions of the current investment legislation. The Revised Investment Law of 2016 eased restrictions on transferring invested capital, dividends, and disposal proceeds out of the country.

The main challenge of the new framework is to remove the obligation for foreign investors to generate a foreign exchange surplus for the benefit of Algeria over the lifetime of a given investment. In practice, before the new investment framework, foreign investors were constrained to repatriate dividends and profits from their activities in Algeria. Today, with the new reform, on condition of a corporate structure in which the foreign investors are co-owners of an Algerian company, they are free to repatriate the profits that they obtain from such an investment. The clear objective of this reform is, therefore, to make the country more attractive, thus stimulating and gathering more foreign investment.

In addition, the Algerian government is working on a draft law that could also abolish the requirement to involve local partners in the participation of foreign contractors in public tenders; the draft law is expected to be drafted in later 2019. These are measures to remove the protectionist regime that has characterized Algeria up to now.

Although the investments in Algeria are complex, those in renewable energy are highly risky both in global level and in the Algerian context.

7. Conclusion

In 2014, for the first time in history, the amount of new renewable generation capacity surpassed that of new fossil fuel-based systems on a global basis [36].

The availability of technology is not in itself sufficient to accelerate a change in energy system to assure a clean energy transition; public policy and regulation, market reforms, private sector engagement, stranded asset risk management, and strong analytical tools and data remain important factors [2].

As hydrocarbon revenues in MENA countries make up a significant portion of the government budget and contribute greatly to GDP, the fluctuation of oil price, the need to diversify revenues compared to oil and gas exports, and the need to assure energy for the country’s development should expose them to a deep economic and financial crisis.

Generally, the four main factors to decide the investment in renewable energy sources are the following: (i) production, productivity and costs of production factors; (ii) demand, expected internal and external demand for solar components; (iii) risk and stability, real and perceived risks; and (iv) business support, specific support and enabling environment [23].

According to Watts [37], the perception of financial risk is particularly significant in renewable energy projects because they are often capital-intensive and are typically highly leveraged, with up to 70–80% of the project total being financed through debt, but nevertheless there are the possibility to manage the risks by means of risk mitigation and risk transfer. In this way, it is possible to overcome the political and regulatory risks, weather-related volume risk, and other risks.

The difficulties of making an investment, in particular an investment in renewable sources, are becoming particularly acute in Algeria. In fact, focusing on renewable sources would allow the country, on the one hand, to have a cleaner, cheaper, and more sustainable energy system, be able to meet the challenges of a

growing energy demand, and, on the other hand, be able to allocate more resources to exports.

However, investing in renewables, in a country with an economy so strongly linked to fossil fuels, is highly challenging.

Although the country can count on two major national competitors with over 20 years of experience in the field of energy, it is true that it is mainly linked to the exploration, development, and exploitation of renewable sources.

The Algerian government has launched several projects to increase production from renewable sources, but precisely because of the investments and the change of pace that they require, they are still limited despite their strong potential.

Local companies have difficulties in making high-calibre investments and, above all, lack the technical knowledge to do so.

The objective of attracting foreign investments to the country is highly resisted by the strong presence of the state in the economy, only marginally encouraged by a large openness abroad.

However, it will be necessary to wait until the next few years before the first effects on the country's economy might be felt through a large opening up to investment in low-carbon technologies and understand whether the path towards sustainable development has really been taken.

Notes

The document is the first step of a working progress country report that will be carried out within the framework of WP 3.1 of the wider MeetMED project in which it is intended to analyze, also through specific interviews (step 2), the main barriers that domestic and international operators face to invest in a renewable energy sources and energy efficiency in Algeria.

In this first step, we have collected the main information relating to the country, analyzing the context in which we find ourselves operating, with particular emphasis on the strong link between economy-state and fossil sources.

In fact, the project foresees in a second step the ad hoc realization of special interviews with institutions, local companies and foreign companies, in order to identify the elements that most block the realization of such investments.

The aim is to produce a country report that can suggest possible lines of action to the policy-maker to improve the confidence and attractiveness of the investments, given the economic convenience.

Author details

Cecilia Camporeale*, Roberto Del Ciello and Mario Jorizzo
ENEA SSPT, C.R. Casaccia, Roma, Italy

*Address all correspondence to: cecilia.camporeale@enea.it

IntechOpen

© 2020 The Author(s). Licensee IntechOpen. Distributed under the terms of the Creative Commons Attribution - NonCommercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>), which permits use, distribution and reproduction for non-commercial purposes, provided the original is properly cited. 

References

- [1] Arndt C, Hussain MA, Jones ES, Nhate V, Tarp F, Thurlow J. Explaining the evolution of poverty: The case of Mozambique. *American Journal of Agricultural Economics*. 2012;**94**(4):854-872
- [2] Arent D, Arndt C, Miller M, Tarp F, Zinaman O. *The Political Economy of Clean Energy Transitions*, A study prepared by the United Nations University World Institute for Development Economics Research (UNU-WIDER). Oxford University Press; 2017. DOI: 10.1093/oso/9780198802242.001.0001
- [3] World Bank Databank. Available from: <https://databank.worldbank.org/home>
- [4] BP. *Statistical Review of World Energy 2019*. 2019. Available from: <https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2019-full-report.pdf>
- [5] WTO Data. Available from: <https://data.wto.org/>
- [6] Ansar A, Caldecott BL, Tilbury J. *Stranded Assets and The Fossil Fuel Divestment Campaign: What Does Divestment Mean for the Valuation of Fossil Fuel Assets?* Smith School of Enterprise and the Environment, University of Oxford; 2013
- [7] Generation Foundation. *Stranded Carbon Assets Why and How Carbon Risks Should Be Incorporated in Investment Analysis*. Generation Foundation; 2013. Available from: <https://www.genfound.org/media/1374/pdf-generation-foundation-stranded-carbon-assets-v1.pdf>
- [8] Manley D, Cust J, Cecchinato G. *Stranded nations? The climate policy implications for fossil fuel-rich developing countries*. In: *OxCarre Policy Paper 34*. Department of Economics, Oxford Centre for the Analysis of Resource Rich Economies (OxCarre), University of Oxford; 2017
- [9] APIC. *MENA Annual Energy Investment Outlook 2019*. Arab Petroleum Investments Corporation; April 2019
- [10] CIA. *Country Comparison: Area*. CIA World Factbook; 20 March 2019. 2018
- [11] AfDB. *African Economic Outlook (AEO)*. African Development Bank; 2019. Available from: <https://www.afdb.org/en/countries/north-africa/algeria/algeria-economic-outlook/>
- [12] World Bank. *Algeria's Economic Outlook—April 2017*. 2018
- [13] World Bank. *Algeria's Economic Outlook—April 2018*. 2019
- [14] IMF. *IMF Country Report No. 18/169. Algeria: International Monetary Fund*; 2018
- [15] OPEC. *Algeria facts and figures*. 2018. Available from: https://www.opec.org/opec_web/en/about_us/146.htm
- [16] International Crisis Group. *Breaking Algeria's Economic Paralysis*, Middle East and North Africa Report N. 192. Released 19 November 2018. 2018
- [17] IMF. *Algeria—Staff Report for the 2018 Article IV Consultation*. International Monetary Fund; 2018
- [18] République Algérienne Démocratique et Populaire. *Contribution Prévue Déterminée au niveau National CPDN—ALGERIE (called "INDC-Algeria")*; 2015
- [19] Ministère des Finances. *Le Nouveau Modèle de Croissance—Synthese*. République Algérienne Démocratique et Populaire. 2016

- [20] ENI. World Oil Review 2018—Vol. 1, Scenarios. Strategic Options and Investor Relations Department; 2018
- [21] ENI. World Gas and Renewables Review 2018—Vol. 2, Scenarios. Strategic Options and Investor Relations Department; 2018
- [22] Ghezloun A, Chergui S, Oucher N. Algerian energy strategy in the context of sustainable development (legal framework). *Energy Procedia*. 2011;6:319-324
- [23] International Bank for Reconstruction and Development/ The World Bank. Competitiveness Assessment of MENA Countries to Develop a Local Solar Industry. MENA ENERGY SERIES—REPORT NO. 94834-MNA; 2015
- [24] Ministère de l’Energie et des Mines. Bilan Energétique National de l’année 2005. Edition 2006
- [25] Ministère de l’Energie et des Mines. Bilan Energétique National de l’année 2010. Edition 2011
- [26] Ministère de l’Energie. Bilan Energétique National—Année 2015. Edition 2016
- [27] Ministère de l’Energie. Bilan Energétique National—Année 2016. Edition 2017
- [28] Ministère de l’Energie. Bilan Energétique National—Année 2017. Edition 2018
- [29] National Renewable Energy Laboratory (NREL). Concentrating Solar Power Projects by Technology: Parabolic Trough Projects. 2013. [Online]. Available from: www.nrel.gov/csp/solarpaces/parabolic_trough.cfm
- [30] IEA/OECD/IRENA. Policy and measures. 2018. Available from: <https://www.iea.org/policiesandmeasures/renewableenergy/?country=ALGERIA>
- [31] Grin J, Rotmans J, Schot J. Transition to sustainable development: New direction in the study of long term transformative change. In: *Routledge Study in Sustainability Transformation*. NY/London: Routledge; 2010
- [32] Kemp R. Technology and the transition to environmental sustainability: The problem of technology regime shift. *Futures*. 1994;26:1023-1046
- [33] Pera JR. Transformation of Algeria’s oil-based Economy is unlikely. *IDA Africa Watch*. 2017;15
- [34] UNCTA. World Investment Report 2018. 2018. Available from: <https://worldinvestmentreport.unctad.org/world-investment-report-2018/#key-messages>
- [35] IMF. Algeria—Staff Report for the 2017 Article IV consultation. In: *IMF Country Report No. 17/141*. International Monetary Fund; 2017
- [36] Sawin JL, Sverrisson F, Rickerson W, Lins C, Williamson LE, Adib R, et al. *Renewables 2015 Global Status Report: Annual Reporting on Renewables: Ten Years of Excellence*. Paris: REN Secretariat; 2015
- [37] Watts C. *Managing the Risk in Renewable Energy*. Swiss Re: The Economist Intelligence Unit Limited; 2011