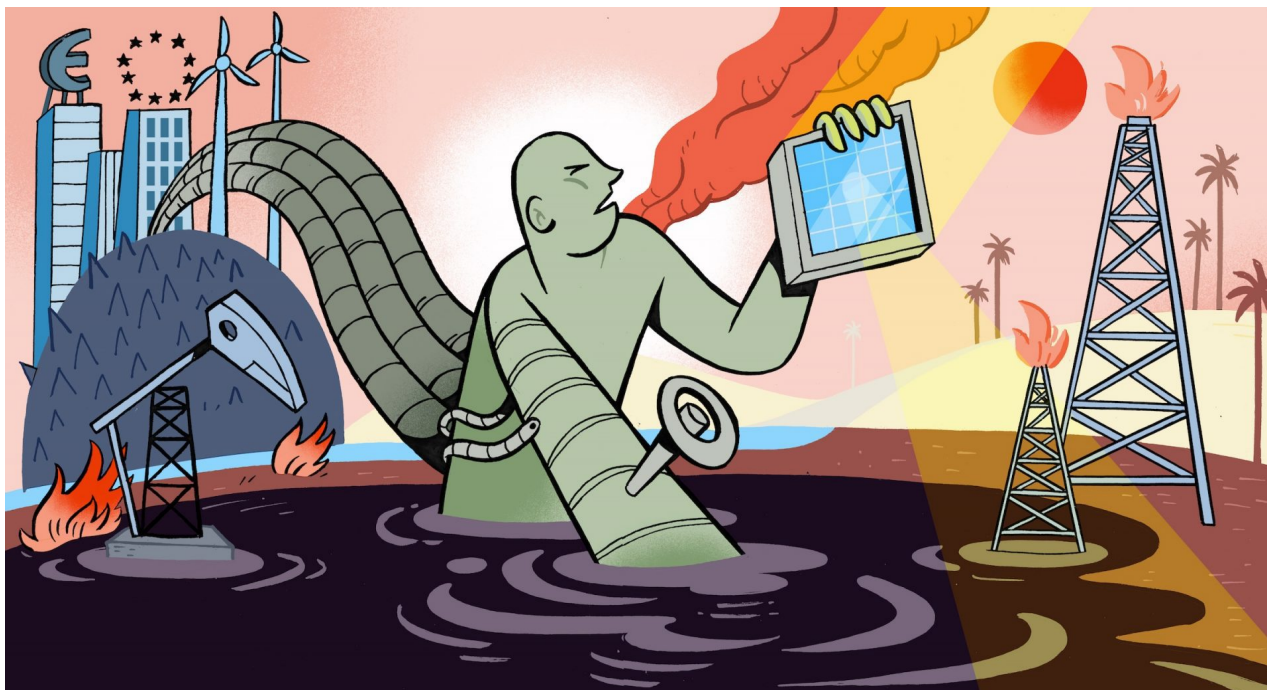


The challenges of the energy transition in fossil-fuel-exporting countries

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The case of Algeria

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The need for an energy transition in Algeria

Fossil fuel extraction in oil-rich countries is a principal contributor to greenhouse gas (GHG) emissions. After South Africa and Egypt, Algeria has the third highest GHG emissions in Africa.¹ However, in 2020 Africa accounted for only 3.8 per cent of global carbon dioxide (CO₂) emissions, the smallest share of any world region.² Most of the fuel produced in Algeria is exported and burned elsewhere, producing additional CO₂. According to the Intergovernmental Panel on Climate Change (IPCC) Special Report on Global Warming, achieving emissions reductions that can limit warming to 1.5°C requires rapid and far-reaching transitions in energy systems.³

Algeria is Africa's largest country by area, and has a population of over 44 million people. It extends south from the Mediterranean coast, where the majority of the country's inhabitants live, to the Sahara Desert (which has the world's warmest surface temperatures), which covers more than four-fifths of the country's land area.⁴ Until 1962, when the country gained independence, the economy was primarily rural and based on agriculture, with Algeria's production sent to France, the former colonial power, to supplement production there. However, major oil and gas resources were discovered in

Algeria's Sahara in the late 1950s. Thereafter, the Evian Accords (1962) and the Franco-Algerian Agreement (1965) provided a framework for Algerian–French energy cooperation and management up until the nationalization of hydrocarbon resources in 1971, when Algeria gained control of its hydrocarbon industry.⁵

Nationalization was viewed as 'a significant act of political liberty' (as stated in 'La Charte Nationale Algérienne' of 1986) and Algeria's oil and gas resources are now seen as part of its national wealth, which should be shared among the people, in the form of providing the funding for social services, such as free healthcare and education.⁶

Hydrocarbon exports have long played an important role in both Algerian politics and in the country's economy. Increased hydrocarbon exports financed President Boumediene's industrialization agenda (1965–1978). Then, following liberalization and the shift to a market economy (from the early 1980s onwards), as manufacturing expertise was undermined and Algeria's industrial potential was ultimately destroyed, the country found itself confined to being a relatively basic oil and gas exporter. Oil and gas now represent 93.6 per cent of the total national export revenue and about 50 per cent of the national budget.⁷

Looking at the economic picture more broadly, since the early 1980s, under the influence of the liberalization and privatization agenda⁸, Algeria's food production has fallen far short of self-sufficiency levels.⁹ Nevertheless, living standards have risen to a level commensurate with middle-income country status and Algeria's gross domestic product (GDP) per capita reached \$3,815.25 in 2020,¹⁰ making it one of the five richest countries in Africa.

In regard to energy use, Algeria has engaged in enormous efforts to provide cheap and reliable electricity to its population, achieving a 99.8 per cent electricity access rate in 2020.¹¹ However, the country currently faces a triple challenge in its energy sector: economic dependence on hydrocarbon revenues, growing domestic electricity demand, and long-term fossil fuel export agreements that the country is bound to honour in order to avoid sanctions, court cases and fines. At the same time, since Algeria's population is growing rapidly, at an average increase of 2 per cent per year, with 53 million predicted by 2030,¹² to meet the rapidly growing domestic electricity demand, natural gas exports have been significantly decreased.¹³

In light of this urgent situation, Algeria is faced with the need to rapidly transform its energy sector, and to do so while maintaining a core focus on social justice. However, oil export revenues are a major obstacle to a just energy transition. Oil and gas revenues have played, and continue to play, a critical role in meeting the basic needs of people in Algeria, from food to healthcare and education, and in providing them with a standard of living that exceeds that of many countries in the region. A transition which undermines people's rights to food, health, education, livelihoods and development cannot be considered 'just'. At the same time, powerful political actors capture a large share of the oil and gas rent and benefit disproportionately from the present extractivist economy.¹⁴ Thus, there are major socioeconomic, institutional, political and policy obstacles to an

energy transition in Algeria, and moving away from an economy that is centred on fossil fuel exports will require a dramatic social and economic transformation. The present article highlights the opportunities, challenges and potential injustices involved in a green energy transition in Algeria.

In fossil fuel-dependent countries in the Global South, reducing GHG emissions has not yet taken priority over socioeconomic development, and Algeria is no exception to this rule. From a justice perspective, Global South countries (due largely to colonialism) did not benefit much from industrial development and historically have not been responsible for causing the climate crisis, yet they are the most affected when it comes to the impacts of climate change, alongside the ongoing effects of different forms of predatory extractivism into which they have been locked. Where their economies have been built around the export of primary commodities, such as fossil fuels, as in Algeria, they face a double burden from the direct impacts of climate change, on the one hand, and the need to reduce and ultimately eliminate fossil fuel extraction, on the other.

Key actors within the Algerian government and energy sector are advocating a diversification of the energy system, but their motivation is economic rather than arising from environmental concerns. In particular, the transition promoted by these Algerian elites is primarily motivated by a desire for economic diversification to free the country from dependence on fossil fuel rents and to protect the national economy from the volatile fossil fuel market. At the same time, green energy development has so far been motivated by a desire to sustain the current rentier system by replacing fossil fuels with returns from renewable energy exports.

During the last decades, and in spite of the several crises that have faced the country in this period, Algeria has been able to build a reputation as a reliable and large-scale exporter of gas to Europe, ranking third after Russia and Norway. In response to the Ukraine crisis, Algeria offered to increase its gas exports to Europe, as a form of support to the continent. For instance, a contract was signed by Sonatrach and Eni, the Italian oil and gas company, to begin pumping an additional 9 billion cubic metres of gas in 2023–2024.¹⁵ In this particular moment, as Algeria's current gas reserves cannot meet European demand during the conflict in Ukraine, there may be pressure on the government to develop and export unconventional gas resources, or, at the very least, to drill more gas wells. However, since the European Union is preparing to become carbon neutral by 2050, this rise in gas demand will not last long and thus if the country invests in new oil and gas discoveries to meet the expanding gas demand from Europe there is a significant risk of lock-in and of stranded assets.¹⁶

At the same time, the situation in Algeria as regards internal consumption of gas is challenged by fast-growing domestic demand and a stagnant – or possibly even declining – output.¹⁷ In this context, the ruling classes in Algeria are looking to control domestic gas usage in order to protect future export capacity, with national development of renewable energies seen as a way to reduce national gas consumption.

Increasing the share of renewable energies in the energy mix, while saving gas for exports, would also be an appealing scenario for those who currently profit from the rentier system. In the short or medium term, this would ensure a continuous source of rents, and consequently socioeconomic and political stability. However, it is not a realistic option in the long run: a growing number of scholars and experts recognize that addressing the climate crisis will require leaving a significant proportion of known coal, oil and gas reserves in the ground, and with Europe aiming for carbon neutrality in the coming decades, and enforcing carbon taxation, Algerian hydrocarbons will not receive lucrative returns. Furthermore, establishing an energy transition with the goal of saving gas for exports will merely perpetuate the country's rentier and extractivist economic model, which has failed to deliver the progress to which the country aspires. At the same time, it would contribute to further deepening the climate crisis, which is already likely to threaten the region's very existence.

Rather than this elite vision of an energy transition, the transition to a sustainable energy system must instead be accompanied by long-term economic, social and environmental changes, and it must be founded on the principles of social and economic justice. For instance, workers and their families' quality of life should be improved by providing fair compensation, respecting their work/life balance, and creating a healthy working environment. A just redistribution of Algeria's national resources will be an important tenet of such a transition – today, many Algerians are simply not benefiting from the country's current wealth. In addition, democratization and the empowerment of citizens to decide their own energy future is a much-needed form of energy democracy and should form part of the transition.

To summarize, a just transition in Algeria should be developed with the goal of lowering emissions, protecting the environment, respecting the rights of people to resources and to a liveable environment, and preserving natural resources (including water and land) for future generations, while also improving Algerians' quality of life by promoting social and economic justice, a fair distribution of wealth, and energy democracy, rather than simply generating revenues from renewable energy exports. To this end, proposals for an energy transition should explore the questions of what energy is used for, and who it is used by, not only the question of its source.

Algeria's climate and energy policy

In 1993 Algeria ratified the United Nations Framework Convention on Climate Change (UNFCCC) and in 2005 the country signed the Kyoto Protocol. Since then, all of the country's socioeconomic plans have included climate change mitigation and adaptation measures.¹⁸ The Algerian government currently plans to reduce its emissions by 7 per cent unconditionally, or by 22 per cent with support from the international community, by 2030.¹⁹

Developing a strategic plan for action to tackle global climate change and to promote the sustainable development of the country can mobilize international financial support for Algeria, which has so far been lacking compared with the support given to neighbouring countries.²⁰ However, the issue of funding climate action in Algeria goes beyond the technical questions involved in developing a plan to access funds. It is uncertain whether Algeria will abandon its oil and gas industry in the absence of firm national and international decisions to finance an energy transition. But if global climate action requires that Algerian oil not be extracted and exported, and if we agree that the Algerian people should not be required to pay for global climate action, how will current export earnings from oil and gas be replaced, and who will pay for this?

Furthermore, despite its existing international commitments, climate policies have so far received little institutional support or attention in Algeria. Indeed, while the National Agency for Climate Change (ANCC) was established in 2009, till today it remains understaffed and institutionally weak. At the same time, there have been changes in the regime and regular re-shuffling of departments and ministries, which has caused confusion and has interrupted longer-term programmes of work. For example, in May 2015, a partial change of government led to the termination of the tasks related to sustainable planning and the protection of environment then being undertaken by the Ministry of Land Use Planning, Environment, and Tourism. The environmental question was subsequently associated with the Ministry of Water Resources. Two years later, the Ministry of Environment and Renewable Energies was created, dedicated to the environment and directly associated with the issue of renewable energy.²¹ Then, in 2019, a separation was made between the issue of renewable energy and the environment, with the creation of a new Ministry of Energy Transition and Renewable Energies solely dedicated to the energy transition. In the same year, the ministry in charge of the environment launched its first project relating to a climate law, with support from the German International Cooperation Agency (GIZ).

After years of unsuccessfully implementing policies on renewable energy sources within the context of sustainable development, the Algerian government has now realized the significance of incorporating state-owned oil, gas and electricity companies in this process. Without the financial resources of the national oil company (the National Company for Research, Production, Transport, Processing and Marketing of Hydrocarbons (Sonatrach)) and the state-owned utility (the National Company for Electricity and Gas (Sonelgaz)), as well as technical and managerial expertise in the domain of energy, the Renewable Energy and Energy Efficiency Programme (2015–2030) faces the risk of failure. Cognisant of this fact, in 2020 the Ministry of Energy and Mines launched a new Renewable Energy Programme (2020–2030).

Algeria primarily uses petroleum, petroleum products and natural gas to meet around 98 per cent of its domestic energy demand. Algeria does not have any nuclear capacity, nor does it have any substantial hydroelectric, coal-fired or installed renewable capacity. However, in a bid to meet the increasing domestic demand and to diversify its energy mix, the country is slowly moving towards integrating more solar and wind-based generation.²²

Total: 157.4 million tonnes of oil equivalent (Toe). (%)

Figure 1 : Algeria primary energy production 2019²³

Total: 50.4 million Toe (%)

Figure 2: Algeria final energy consumption by product 2019.²⁴

Total: 61.7 M Toe (%)

Figure 3: Algeria primary energy exports 2019.²⁵

The renewable energy sector in Algeria

Algeria is well positioned, in terms of its geography and climate, to take advantage of opportunities for renewable generation. The country enjoys 2,000–3,000 hours of sunshine each year in its desert, which covers 80 per cent of the country's surface area. This whole land area therefore has the potential to generate more than 169,400 terawatts per hour, which is 5,000 times the yearly national electricity consumption.²⁶ Due to Algeria's proximity to European energy import centres, geographical vastness, and reputation as a reliable energy exporter, export scenarios for renewable energy are also quite viable. Solar and wind power dominate the National Renewable Energy and Energy Efficiency Programme, accounting for 85 per cent of the total projected capacity by 2028.²⁷ The *Algerian Renewable Energy Resource Atlas*, produced by the Centre for the Development of Renewable Energy (CDER), was released for the first time in 2019. It features a set of geographical representations that showcase Algeria's energy potential, which includes solar, wind, geothermal, and bioenergy.

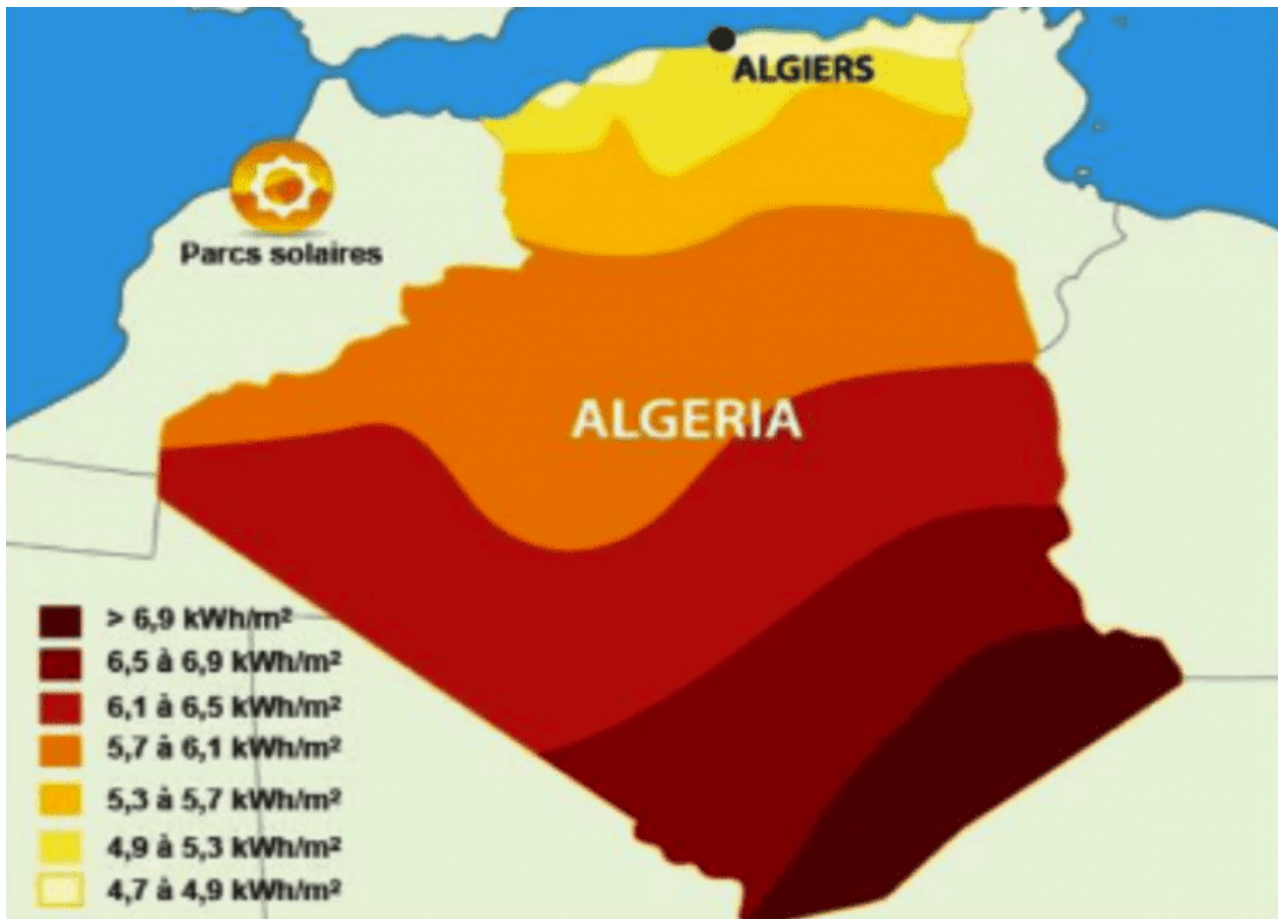


Figure 4: Algeria solar map²⁸

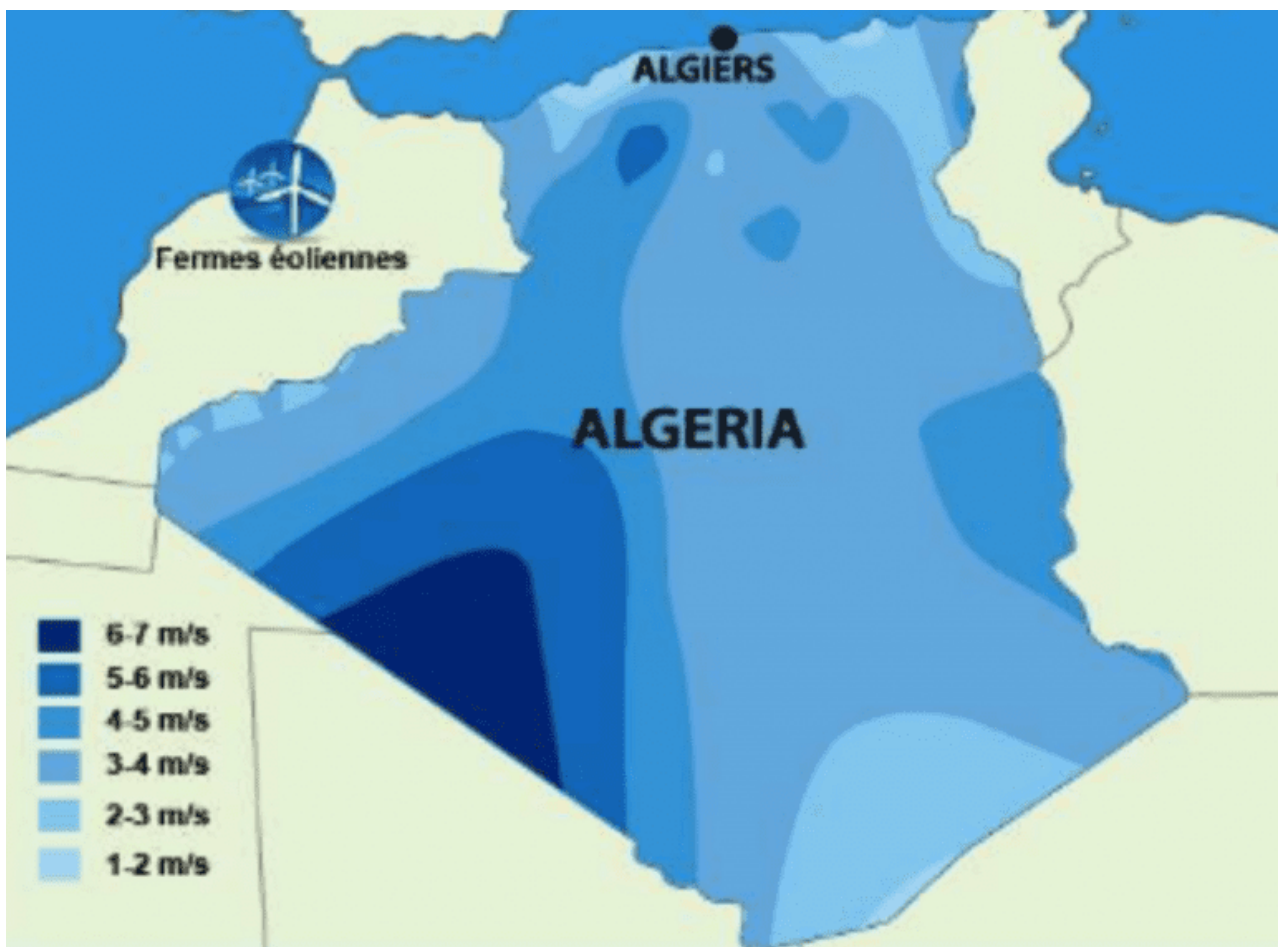


Figure 5: Algeria wind map²⁹

The national renewable energy programmes

The National Programme for the Development of Renewable Energy and Energy Efficiency (PNEREE) 2011

Algeria has established a number of renewable energy programmes since 2011, but renewables still make only a small contribution to meeting domestic energy needs. On 3 February 2011 Algeria's government approved the first national programme dedicated to the development and promotion of renewable energy and energy efficiency: PNEREE. The programme aimed to achieve a renewable electricity production capacity of 22,000 megawatts (MW) by 2030, with 10,000 MW committed to export, in order to achieve 40 per cent renewable energy out of the total electricity mix.³⁰

The 2015 update of the PNEREE was primarily driven by significant reductions in investment costs for electricity production from diverse renewable sources, especially solar photovoltaic (PV), as illustrated in Figure 6. As a result, the concentrated solar power (CSP) portion was reduced to less than a third of what had originally been planned in the earlier version of the programme (from 7,200 MW to 2,000 MW). Regarding solar PV, its share was increased by nearly five times (from 2,800 MW to 13,575 MW).³¹

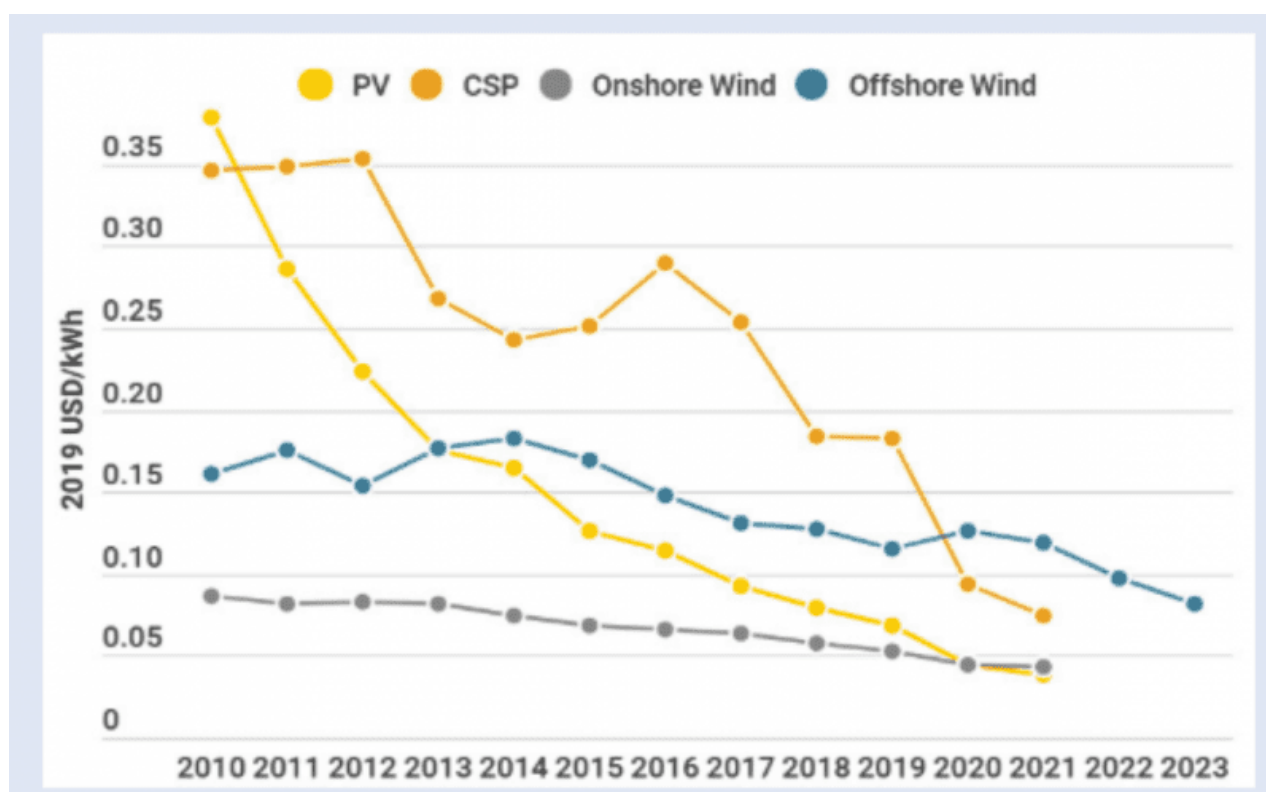


Figure 6: The evolution of the costs of producing electricity from renewable energies³²

However, neither the 2011 programme nor its 2015 update have actually been implemented to any significant degree: Algeria has so far installed only around 425 MW solar capacity, which is very far from the programme target of 4,500 MW by 2020.

Source	Target in 2020 (MW)	Installed by 2020 (MW)	Achievement (%)
PV	3000	400	13.33

Source	Target in 2020 (MW)	Installed by 2020 (MW)	Achievement (%)
Wind	1,010	50	5
Bio-power	360	0	0
Geothermal	5	0	0
CSP	–	25	–
TOTAL	4,375	475	10.7

Table 1: Achievement status of the renewable energy programme in Algeria in 2020³³

The accomplishment of the intended capacity has been hampered by a lack of coordination in the execution of the PNEREE, including the latest edition of 2015, a lack of monitoring and evaluation, and, most importantly, a lack of serious political commitment to the energy transition.

National Energy Transition Programme 2020

In the face of this lack of action on achieving the goals of the 2015–2030 programme, in 2019 the government underlined its determination to catch up in the renewable energy sector. It developed a new programme, the National Energy Transition Programme 2020, with a revised target of achieving a capacity of 16,000 MW by 2035, based on solar PV. According to the Ministry of Energy, this target is a crucial plank of Algeria's energy transition. It is planned that solar power plants connected to the national grid will generate 15,000 MW by 2035, with the first tranche of 4,000 MW expected to be finished by 2024 and the remaining 11,000 MW expected to be deployed by 2030. To concretize these plans, the 'Tafouk I' project was announced in May 2020, with the goal of generating 4,000 MW of solar PV capacity.³⁴

Recent developments in the renewable energy sector

Algeria's plan, approved in 2020, to reach 15,000 MW of renewable energy generation capacity by 2035 was initiated in December 2021. The new Société Algérienne des Énergies Renouvelables Spa (SHAEMS), a joint venture shared between the two public companies Sonatrach and Sonelgaz, has been tasked by the Minister of Energy Transition and Renewable Energies with processing the call for tenders. SHAEMS will also make an investment in each project company, either on its own or in partnership with other public and/or private entities. If the bid is successful, it will result in a 25-year power purchase deal.³⁵ An industrial local content component is not required in this bid, but the use of locally produced equipment is incentivized. Moreover, the 51/49 rule, which limits the part of foreign investment in any project to 49 per cent, has also been dropped for the renewable energy sector, confirming the neoliberal orientation of the current Algerian government (see more on this below).

Challenges of and barriers to the energy transition in Algeria

The first obstacle facing the exploitation of Algeria's massive solar capacity is the distance between demand centres and supply hubs. Demand centres are located in the north, where urban density precludes the creation of huge projects. However, the supply side lies in the Sahara, in the country's southern half, where sun irradiation and geographical space are abundant. Added to the issue of remoteness, climatic conditions (among other considerations) mean that the cost of building solar PV installations is 30 per cent higher in Algeria than the global average.³⁶

Beyond governance barriers and towards energy democracy

The lack of a long-term energy strategy is a main governance hurdle in regard to the energy transition: renewable energy initiatives are inefficient, fragmented and lack coordination. Algeria's energy sector has been slow to adapt to the world's critical need for renewable energy, driven by climate change. As summarized earlier, Algeria has announced ambitious plans, but little has been accomplished due to poor management, the lack of a unified energy strategy, and insufficient political will. While energy policies and regulations in the sector are either inspired by those in foreign jurisdictions or generated domestically, in each case their implementation is impeded by bureaucracy and corruption.

The energy sector is centralized in Algiers and is led by the energy and mining ministries and by the oil/gas/electricity monopolies Sonatrach and Sonelgaz. In this top-down and highly authoritarian centralized governance system, ideas from the grassroots are unlikely to be heard and accepted. Added to this, Algeria adopts a republican governance model, which means that the elected body is the sole decision-making authority. The president appoints provincial governors, exhibiting a top-down organization in which policy innovations at the local level remain uncommon. Because civil society is weak and fragmented, with little interest in climate and energy issues, the fossil fuel industry's agenda is largely unaffected by the influence of popular action. There is thus a need to adopt a more flexible, participatory and transparent policy approach, so that Algerians can participate in discussions of, and offer solutions for, the country's energy problems. Furthermore, including individuals in energy decision-making would boost their sense of ownership of public energy assets, which could lead to a shift in the population's behaviour towards more responsible and solution-oriented attitudes. Rebuilding confidence between the government and the population by increasing openness, accountability, and, most importantly, respecting citizens' decisions, would be a first step towards energy democracy in Algeria. More decentralized alternatives might offer people the power to choose how they generate, consume, and exchange energy, while maintaining the state's critical role as manager, controller and legislator.

Algeria suffers from acute water scarcity, which threatens the country's food security, among other consequences, such as risking the collapse of agriculture and the displacement of local communities. For example, in August 2021 huge wildfires burned tens of thousands of hectares of woodland in the north of the country, killing at least 90 people. However, despite the obvious catastrophic impacts of climate change on the

country in recent years, climate change is rarely addressed in the country's energy plans, in part due to the institutional weakness of the Ministry of the Environment. It is therefore urgent to include the climate variable in future energy policies and scenarios.³⁷

Financing the energy transition

Despite the falling cost of solar and wind technologies, renewable energy projects remain capital-intensive. Financing the transition is thus a huge challenge for Algeria. Three national funding options seem to be available: public funds, domestic private funds, and foreign direct investment.

In the current context of economic crisis, public funds are increasingly solicited to address what are considered to be more pressing socioeconomic grievances, and thus can only offer a limited support for the transition in the short term. However, a thorough examination of the country's economic position during the last two decades reveals there has been massive waste and poor management of public finances, in addition to entrenched corruption. For any meaningful and just energy transition in Algeria, the state needs to be democratized and the endemic corruption must be halted. The state should also play a bigger role in the transition, should commit more public funds, and should argue for significant climate finance on the international stage. Additionally, it is important to remember that when oil prices rise (as they are doing now) it offers the possibility of establishing sovereign funds that can enable national funding for the modernization of energy systems.

Further important financing avenues, such as climate reparation funds and the payment of ecological debt by the Global North, could be effective in helping to achieve a fair energy transition for Global South oil-dependent economies such as Algeria. However, there remain doubts about whether such actions are likely to occur. For example, while an \$8.5 billion pledge to support South Africa's phase-out of coal was made at the COP26 international climate summit,³⁸ this has unfortunately not yet materialized. Yet we cannot talk about a just energy transition without raising the question of the payment of climate debts and reparations by the rich Global North to countries in the Global South – not as new loans but rather as transfers of wealth. This is not just an ethical or moral imperative, it is also a historical responsibility. The industrialized West must pay its fair share in aiding poorer countries that are less responsible for climate change, and that are often also more vulnerable, with their adaptation plans and green transitions. Unfortunately, current processes do not allow for such assistance for middle-income and oil-producing countries like Algeria, as countries with more complicated energy issues, such as problems with accessing clean energy, are prioritized. This reflects how international climate policies are still trapped in an 'aid and development' framework, and do not reckon at all with the real need to leave existing gas and oil reserves in the ground – and what that entails in terms of significant loss of revenues. Halting extraction will require global redistributive policies that directly address the needs of oil-exporting countries, including middle-income ones like Algeria.

Turning to the domestic situation, it is evident that political will to finance the energy transition is currently lacking in Algeria. For instance, a special fund was established in 2015 to finance renewable energy programmes, but this has not been effectively utilized due to the lack of an executive decree outlining a legal measure on using this fund. Sovereign policies in the country ban foreign debt and limit international financing in vital and strategic sectors, such as energy, to 49 per cent, as compared to 51 per cent for Algerian partners. However, due to pressure from the local and global capitalist energy lobby, which argues that Algeria's 'insecure' and 'rigid' regulatory framework discourages foreign investment, the minimum sovereign criterion of 49/51 per cent has been dropped for renewable energy projects. The private investor class in Algeria, which is mainly constituted of family funds, prefers to participate in quick profit-generating projects where they can recoup their capital fast, unlike renewable energy projects, where they will have to wait a long period to repay their investment. Furthermore, after a decade of empty promises and unmet commitments, investors in Algeria have lost confidence in the country's renewable energy schemes. Nevertheless, since the PNEREE was announced in 2011, some private investors have been working to establish a solar PV value chain to assist the programme.

Despite all of the big announcements made by the political elites in Algeria about the deployment of renewable energy, very little has been accomplished in terms of raising finances for the energy transition from the three sources discussed above. At the same time, Algeria wasted the crucial opportunity offered by the 2004–2014 oil bonanza, when oil and gas prices were very high, to use the significant revenues generated to industrialize, diversify its economy, embark on a solid energy transition and create green jobs. Instead, the super-profits made during this period were siphoned off by a predatory and corrupt elite.³⁹

Finally in this discussion of financing the energy transition, one worthwhile avenue that Algeria can pursue is strategies to encourage citizens to invest in community-based small-scale renewable energy projects, and powering integrated communal projects. This form of direct energy democracy can offer an opportunity for job creation and community empowerment.

Expertise and technology barriers

In contrast to its historical experience with oil and gas technologies, Algeria lacks expertise in green technologies. This is mostly due to the lack of political interest that has been shown in green technologies in recent years, as well as the Algerian economy's de-industrialization since neoliberal reforms began in the 1980s. The process of liberalization and the transition to the market economy was accompanied by the elimination of both theoretical and practical knowledge in industry, culminating in the liquidation of institutes specializing in crucial areas such as the energy, steel and textile industries. Following a campaign against technical secondary education, technical industrial branches that had contributed to the training of engineers and senior technicians for decades were liquidated.⁴⁰ The number of experts available to support the energy transition programme, particularly in terms of renewable energy, energy efficiency, and all economic and

industrial activities related to it, is still far below the critical mass required.⁴¹ There is thus a need for more applied research and practical training. Algeria needs to receive technology transfers and managerial expertise from nations that have managed the transition effectively. Such cooperation should aim to achieve human and material capacity building in Algeria. This will require overcoming the current monopolized technological boundaries and the intellectual property regime enforced by free trade agreements and the international financial institutions.

One of the most difficult aspects of any energy transition in the Global South is establishing control over technology (technology transfer) and industrialization: this is required in order to achieve the level of economic integration needed for the development of a thriving green economy with green jobs. This necessitates a paradigm shift away from neoliberalism and towards greater state involvement and investment, as well as some climate funding from the most developed countries. A local content requirement (a policy imposed by the government that requires firms to use domestically manufactured goods or domestically supplied services in order to operate in the economy) is crucial to the development of a solid and autonomous renewable energy sector in Algeria. The bidders who are chosen for developing renewable energy projects must play their part in an industrial strategy whereby solar energy components are developed locally. Such a strategy should aim to create a local solar energy economy while also lowering project costs by avoiding the costs of imported materials.⁴² Although such a strategy would benefit the local economy, and particularly the job market, it will be extremely challenging to implement in Algeria because the local industrial value chain is still not fully formed: it is currently in its infancy, and much local production does not meet international standards. In this context, foreign investors are currently lobbying for the abolition of the local content requirement because they see it as an investment barrier that hinders the generation of lucrative profits for themselves. However, while abandoning such measures would perhaps attract more funds and boost the energy sector, it would not benefit the Algerian economy, Algerian industry and the Algerian job market. As such, it is crucial to look at effective solutions for creating and enhancing technology and expertise, by going beyond the Western-enforced intellectual property rights regime and technology monopolies, through entering into win-win partnerships with countries in the Global South, such as China.

Access to energy and the matter of subsidies

Algeria's energy market is still dominated by the government. However, the state-owned utility's unsustainable economic model and its mismanagement have given rise to calls for privatization and the end of subsidies. In order to adapt to the current drastic changes in the energy landscape, the Algerian utility Sonelgaz needs to adopt technical, managerial and financial reforms to make it economically viable, as well as more accountable and transparent. Moreover, a progressive subsidy reform is also imperative.

Electricity is currently heavily subsidized in Algeria: households pay the equivalent of \$0.038 per kilowatt hour (KWh) for electricity (1/7th of price paid in the United Kingdom). Businesses pay \$0.033.⁴³ These low prices, which are well below the cost of production

(amounting to around one-third of the production cost), are made possible by subsidies.

There are also additional indirect subsidies, through subsidies to fossil fuels, which are relevant here given that the country's electricity comes primarily from fossil fuels.

Unfortunately, these subsidies, alongside Algeria's regressive tax system, do not benefit the needy classes as much as they enrich business and capital owners in the country. A just subsidy reform is thus a political and economic imperative. This reform needs to be progressive in terms of which sections of society are subsidized: this should not include the richest classes and capitalist groups (who thereby increase their profits); rather, it should seek to lessen the plight of the most vulnerable in society.⁴⁴

Algeria is currently facing a double socioeconomic and political crisis. The mass-protest movement (Hirak) that started in February 2019 and lasted for more than a year was a serious political challenge to the Algerian regime. This, in combination with the very negative economic repercussions of Covid-19, makes any blanket removal of energy subsidies in the near future politically untenable – as well as unjust for the millions of Algerians that have been pauperized over the last few years. For example, in response to the global fall in oil prices in 2020, with the economy shrinking by 6 per cent according to the IMF and the country's foreign reserves declining from \$62 billion to \$47 billion by the end of 2020,⁴⁵ the government limited its commitment on social spending: with a 30 per cent cut in such spending. Nevertheless, the country saw a significant budget deficit, reaching 18.4 per cent of GDP in 2021.⁴⁶ On top of increased poverty levels, hundreds of thousands of jobs have been lost, including in the precarious informal sector. According to government data, 500,000 jobs were lost in 2020 alone.^{47,48} At the time of writing, the Algerian economy is still under stress, though the war in Ukraine might prove to be a blessing to Algeria's rulers, as oil and gas prices are once again soaring.

Integrating renewable electricity in the governmental subsidy schemes may be an option for promoting the deployment of renewable energy. However, the existing global neoliberal climate policy paradigm has proven inefficient in dis-incentivizing fossil fuels through a carbon pricing model and through encouraging low-carbon investment through subsidies and favoured contractual structures. This policy paradigm sees governments as protectors of private players' capital, which prohibits them from addressing social and environmental challenges. With its massive investment deficit and technological inefficiency, privatization market approaches have so far failed to bring about the energy transition that is so essential in Algeria.⁴⁹ Thus, there is a need for strong political commitment towards the energy transition within the Algerian public energy sector, with the controlled inclusion of private sector actors, alongside more participative, transparent and democratic governance of the state-owned companies.

Algeria's urgent need for a just energy transition

The oil boom of the 2000s enhanced the country's fiscal balance and allowed for massive investments, but the sharp drop in oil prices since June 2014, including during the Covid pandemic (though now reversed due to Russia's invasion of Ukraine), has cast doubt on

the country's economic and energy strategy. Export income only covered 67 per cent of total imports in 2015, while the revenue regulation fund and foreign exchange reserves have been steadily declining, from \$121.9 billion in October 2016 to \$42 billion by March 2021.⁵⁰

The Algerian economy is vulnerable to fluctuations in international markets, due to its excessive reliance on hydrocarbon revenues, which cannot be a solid foundation on which to build long-term economic plans. This instability is underlined by recent economic performance, which has been marked by downturns and upswings. The Covid pandemic exacerbated the previously existing economic crisis in the country and has been an additional threat to Algerian policymakers in terms of building a diversified economy and implementing an energy transition, leading to a growing budgetary deficit, economic contraction, and a reduction in public spending, all of which have resulted in difficulties in finding money to finance the energy transition. However, after these travails, oil prices soared in the fourth quarter of 2021, following the global post-Covid economic upswing: Brent crude prices averaged \$71 per barrel in 2021 (peaking at \$86), having started the year at \$50 per barrel. Hydrocarbon export revenues increased from \$20 billion to \$34.5 billion during this period. Thereafter, the invasion of Ukraine drove up oil prices even further, briefly surpassing \$123 per barrel for Brent crude at the start of the war.⁵¹

While this may appear to be good news (at least for Algeria's rulers), such high prices may be a hindrance to a green energy transition as they may entrench the extractivist and rentier mentality, and may provoke a push for more drilling for fossil fuels, especially in the current context, in which the EU is seeking to end its reliance on Russian gas by diversifying its sources.⁵² There are some worrying signs that this is the direction that is indeed being taken by the Algerian ruling classes: they have agreed to pump more gas to Italy, and are now considering exploring and exploiting new fields, with the help of European countries and companies.⁵³

The country's long-term needs necessitate a quick transformation, and a double transition – both an economic and an energy transition. The economic transition involves moving away from a mainly fossil fuel-based economy and towards a more diversified economy based on sustainable industrial and agricultural activities, as well as transitioning from being a net importer of products to being an industrialized producer. The energy transition, on the other hand, involves a shift away from the burning of fossil fuels to the use of more sustainable energy carriers via the deployment of green technologies, and an examination of how and by whom energy should be used to maximize social justice and human well-being.

According to the International Energy Agency's net zero 2050 roadmap, decarbonization in alignment with the Paris Agreement does not allow for investment in new oil and gas fields. As things currently stand, by 2030 it is predicted that countries will have surpassed by more than 20 per cent the maximum emissions possible if the Paris Agreement's 1.5°C goal is to be sustained. Furthermore, oil firms control trillions of dollars in assets that, according to the IPCC, they will never be able to burn if humans are to continue to survive on this planet. Numerous hidden risks in the oil business are now increasingly

becoming apparent to private investors and public financial institutions. Stabilizing prices, phasing out production and seeking more alternative commodities, such as blue and green hydrogen, are thus top imperatives for hydrocarbon producers.

The urgency of the climate crisis necessitates the participation of the oil and gas industry, governments, financial institutions (although in quite different ways), as well as the active involvement of workers and trade unions, in making firm decisions – and a strong commitment to turning them into action. The development of and support to the hydrocarbon sector must come to an end, with a fast but equitable strategy to phase out existing and planned oil production while assisting oil-dependent countries, communities and workers around the world in a smooth transition.⁵⁴

Unfortunately, it is not clear that Algeria is planning to phase out oil production in the near future. As indicated above, due to the rising demand from Europe, Algeria is currently seeking to develop further its oil and gas industry by attracting investors to explore new oil and gas fields. This strategy enhances the risk of lock-in and stranded assets in the country, and entails the risk that a chaotic fall in oil demand will lead to economic collapse for Algeria, due to its complete reliance on fossil fuel exports. Such a collapse would involve a loss of government support for public services, a fall in subsidized essential products, a weakening (if not outright collapse) of national firms, and hence privatization, which would be a conduit for neoliberal capitalism and neocolonialism. Few Algerians could afford to live decently in the face of such extreme effects.

The current opportunity presented by the oil price increase (due to Russia's war in Ukraine) offers a good moment to commit significant funding to Algeria's renewable energy deployment and to the energy transition. The Algerian government should immediately prioritize energy transition and economic diversification, in order to protect national sovereignty and to provide a secure future for Algerians in the long run. This needs to be accompanied by climate grants from the Global North, as part of a climate repair effort, to help Algeria to adapt to climate change impacts and to transition to renewable energy. Looking further ahead, exporting green hydrogen (or other renewable energies) could allow the country to maintain its position as a reliable energy exporter in the post-hydrocarbon age. However, this scenario will only be viable if renewables become a much bigger portion of the country's energy mix. Otherwise, the growth of infrastructure exclusively dedicated to producing hydrogen for export purposes, for example, will impede the country's transformation, exacerbate its energy problems and perpetuate its subordinate position within the global economy.

Several policy instruments can be adopted to manage a fair phase-out of oil and gas in Algeria.⁵⁵ The Algerian government should develop bottom-up policy tools to protect workers, their families, and the communities that will be impacted by the decommissioning of oil and gas industries. To this end, a commission/body should be formed to identify oil and gas workers and communities who will be directly harmed by the transition. Financial assistance, re-qualification, and re-entry into the green energy market are all required. In this vein, green skills programmes are needed, to enable affected workers to access new opportunities in the job market.

Protecting communities from any negative effects of the energy transition requires democratic governance, and more bottom-up and participatory mechanisms. Educating the public about the dangers of climate change and the need for an energy transition, through schools, mosques and various educative and religious channels, would be useful in instilling a more responsible attitude towards the world. Youth should be mobilized and solidarity should be built with Algerian communities resisting and adapting to climate change through the international global climate justice movement. Setting up grassroots commissions and a dedicated ministry (or at least a division within it) to manage the just transition could be an effective strategy. Learning from other experiences across the world will be vital: the ongoing coal phase-out in numerous nations provides valuable lessons on managing just oil and gas phase-outs.⁵⁶ These experiences show the importance of the following:

- Setting ambitious targets that are consistent with the Paris Agreement through a clear process, with different funding, implementation and energy cooperation mechanisms, and making clear the needed timeframe for enacting the recommendations in legislation.
- Adopting an inclusive approach, with the representation of women, youth and underrepresented minorities.
- Maintaining a balance of power among various actors, and recognizing the centrality of human rights claims, including people's right to energy, decent livelihoods and a liveable environment, but also the rights to land or other resources of communities that may be impacted by renewable projects.
- Guaranteeing transparent decision-making structures and institutional processes while providing opportunities for confidential deliberation.
- Considering structural changes, rather than having only a narrow focus on economic implications. It is important to identify and engage the affected communities and to consider the so far neglected gender implications of a phase-out of oil and gas.
- Stressing the significance of the government's ambitious climate policies and commitment to achieving a just transition by assisting affected regions and communities.
- Mobilizing international financial, technical and managerial assistance to support a just transition that leaves no one behind.

Finally, to ensure the long-term viability of its business, the state-owned oil corporation Sonatrach should conduct a thorough risk analysis of any future oil investment, and should seriously consider renewable energy business opportunities.

Conclusion

Algeria's situation and concerns mirror those of several other oil and gas-rich countries when faced with the needed global energy transition. Algeria has wasted numerous opportunities to embark on an energy transition, owing to the ruling elite's unwillingness to prioritize this until recently. In the current global economic crisis, the country will struggle

to finance an energy transition while simultaneously avoiding a degradation of socioeconomic conditions (including through maintaining the subsidized electricity supply to the population). Indeed, social peace depends on low-cost energy.

In addition to these domestic issues, the global energy transition may put extra strain on the country. Apart from the direct impact on the national oil and gas company, its employees and their families, a global energy transformation may lead to a fall in oil export returns, economic collapse, and destitution for many Algerians.

Global neocolonial energy transition trends, particularly EU-centric green export policies, are primarily focused on supporting a green transition at the European level, at the expense of low-cost resources and undervalued labour in the Global South. Prioritizing the export of renewable energies and green hydrogen (for example) would impede Algeria's transition since an export-oriented strategy would then take precedence over addressing local energy and economic challenges. If the limited funds allocated to Algeria's energy transition are used to build and/or renovate infrastructure for export, this will hamper the country's ability to meet its local energy transformation demands. Rather than focusing on exports, it would be more logical and just to prioritize the local energy transition needs, as opposed (for example) to exporting green hydrogen and consuming fossil fuels at home.

A just transition requires going beyond a switch to green energy technologies, to also include ensuring the protection of oil and gas employees and their families, as well as the provision of necessary skills for their integration into the green labour market. It also requires ensuring affordable and reliable energy access for everyone, and a recovery from all of extractivism's negative consequences on the economy, society, politics and the environment. Most importantly, to avoid the transition being merely a transition from fossil 'brown' extractivism to renewable 'green' extractivism, there is a need to protect the land and resource rights of communities living near renewable energy sites.

While the public sector's involvement in the energy transition needs to be consolidated, public sector institutions must also be managed better, and must be more transparent and accountable. Ultimately, there is a need for better policies and mechanisms as regards evenly distributing the national wealth and closing the gap between social classes, as well as a more democratized energy sector that allows Algerians to actively participate in determining their own future and finding genuine solutions to their energy problems. First and foremost, Algeria should commit to climate initiatives and should set high-level emissions reduction goals, and should reject any future investments that are not in accordance with the Paris Agreement. Thereafter, the next step must be the thorough preparation of the fossil fuel phase-out and a progressive decarbonization of the energy sector. To avert a dramatic collapse of Algeria's economy, a planned and fair phase-out of the fossil fuel industry will require international cooperation. Last, but not least, effective public communication regarding current and future energy issues, as well as the economic risks facing the oil and gas sector, is needed, to promote Algerian working people's readiness to accept and cooperate in the necessary measures to alleviate the economic hazards involved in the energy transition.

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