

## The importance of energy transition as a strategic option to get rid of oil dependence in Algeria.

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### Abstract:

There is increasing interest in studying the issue of renewable energies as it represents one of the most important sources of energy in the world away from traditional energy, which gives it great importance in achieving sustainable development. Moreover, dependence on traditional energy has made the world today live with continuous threats related to natural disasters that threaten the continuation of life on earth, which is What made the transition towards the exploitation of clean renewable energy a must, and perhaps Algeria is among the countries that suffer from excessive dependence on oxidative energies, which today, in light of all these developments, are seeking to implement the energy transformation strategy, which is what we are trying to highlight through this study by taking note of the content of the transformation strategy, Energy in Algeria and its importance in getting rid of oil dependency to achieve sustainable development.

**Keywords:** Renewable energies, energy transition, sustainable development, oil dependency.

**Jel Classification Codes:** O13, P28, Q01, Q42.

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## **I. INTRODUCTION**

The Algerian economy is considered one of the most prominent rentier economies that depend on hydrocarbons in an absolute manner. Since independence, and specifically since the process of nationalizing hydrocarbons in the early seventies of the last century, the oil wealth contributes to a large extent in forming financial surpluses for the purpose of development goals on the one hand, and in mobilizing financial resources in hard currency on the one hand. On the other hand, since more than 90% of the Algerian state's revenues from hard currency are derived from oil taxation, these numbers may confirm and explain the extent to which the Algerian economy is linked to the prices of this energy wealth in the international market, and perhaps the oil crisis of 1986 proved the excessive dependence of the Algerian economy. For this energy resource, as soon as the oil prices collapsed, the financial revenues declined terribly, as Algeria recorded a terrible financial deficit that revealed all the structural imbalances that the economic structure was suffering from during the planning period, which made it resort to searching for other financial resources that were not available at the local level. This prompted it to borrow from abroad, precisely from international bodies, which were keen to grant it conditional loans, forcing it to adhere to the principles of capitalism. And abandoning the central system in management in the first place, and working to diversify its sources of income and seeking to integrate into the global economy in the second degree, and then the Algerian authorities emerged with the beginning of the nineties the imperative to diversify their financial sources and not leave them subject to a resource whose prices are subject to geopolitical factors, just as the capabilities and resources that Algeria abounds, which made the shift from dependence on oil to diversification of the economy possible.

Today, the world is witnessing transformations in various technological, economic and even environmental fields, as there have emerged intellectual and even political currents defending the need to respect the ecological aspect and not to over-exploit the oxidizing resources of the environment, as the talk today has become about the trend of non-oxidizing economies, as the President of the International Energy Organization has stated IEA that the era of black and white gold has ended in many meetings held by the agency, and many of the managers of international institutions in the field of exploration and exploration of fossil energies expressed that this field will sooner or later find an end to it, as the Director General of the ARCO Exploration Complex stated, "We have supervised Reaching the end of the oil age." In light of all these trends, it has become necessary for Algeria to think about moving to clean renewable energies, especially since it is one of the countries that consumes the most energy, as some

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statistics confirm that with the beginning of 2030 Algeria will face a crisis in energy coverage at all costs. at the local level, if you do not develop a forward-looking strategy to control this, given that demographic growth rates are constantly increasing on the one hand, and the consumption rate is increasing more than It is necessary, and therefore resorting to energy transition is inevitable and as a strategic option that can put an end to Algeria's dependence on the oil resource, and may also guarantee clean renewable energy capable of covering the local need, and from this standpoint we can pose the problem of our research as follows:

**• To what extent can the energy transition contribute to getting rid of Algeria's oil dependence?**

To address the problem of the study, the analytical descriptive approach was relied upon, and this is to clarify the theoretical foundations of concepts related to the energy transition and the impact of renewable energies on the future of energy security in Algeria, sustainable development framework.

**1. A conceptual introduction to renewable energies and the energy transition.**

Renewable energies represent one of the most important sources of energy in the future, as they represent the most important alternatives available to countries to ensure a balanced, harmonious and sustainable development. Therefore, interest has increased in the direction of their exploitation throughout the world, especially the environmental motive, which represents the cornerstone of the issue of energy transition towards renewable energies, which is considered clean energy, by guaranteeing the rights of future generations, including the establishment of sustainable development.

**1.1. The conceptual framework for renewable energies.**

Renewable energies represent a set of currents whose presence in nature is repeated automatically and periodically, and thus they are the opposite of depleted energies that are not renewed, in other words, they are those permanent natural sources that are not depleted and provided in nature in a limited or unlimited way, but they are constantly renewable, and their use does not cause any pollution Environmental because it is clean energies such as solar energy, wind energy, water energy, geothermal heat.

**1.1.1. Definition of renewable energies.**

Renewable energy can be defined as: “energy derived from natural resources that are renewable or that cannot be implemented (sustainable energy), and renewable energy sources are fundamentally different from fossil fuels such as oil, coal, natural gas, or nuclear fuels that are used in nuclear reactors, and do not arise Renewable energy usually produces residues such as carbon dioxide (CO<sub>2</sub>) or harmful gases that increase global warming, as occurs when burning

fossil fuels or harmful atomic waste resulting from nuclear power reactors (Rehman, 2021, p. 04).

This is defined by the International Energy Agency (IEA) as: “The energy generated by nature’s automatic pathways, such as sunlight and wind, which is renewed in nature at a rate higher than the rate of consumption” (IEA, 2020, pp. 01-06).

Accordingly, it can be said that renewable energy is an energy resource that is automatically renewed in nature at a rate equal to or faster than the rate of consumption of this resource.

### **1.1.2. The importance of renewable energies.**

Renewable energies are of great importance in human life, because they are inexhaustible and constantly renewed. It is characterized by cleanliness and guarantees the right of future generations to energy, as its importance is not limited to the economic aspect, but rather goes beyond it to social, political and even environmental importance, below we will point out some of them:

- Renewable energies contribute to reducing poverty and improving the standard of living, because most of the countries that are located today in these crises are unable to exploit their energy stocks of renewable energies, as this energy guarantees continuous financial returns through the continued flow of this energy from nature, and then many models The world, which rushed to exploit this type of energy, was able to improve its annual income, and thus improve the per capita share of this high gross income.
- Interest in investing in the field of renewable energies allows for the creation of permanent job opportunities, as this type of project requires periodic maintenance, which opens the door for employment to accommodate the unemployment crisis.
- The environment is severely affected by the use of traditional energies and the energy of carbon dioxide emission, as these emissions contribute to the generation of biological and natural crises that threaten human existence, and therefore the exploitation of renewable energies contributes to the elimination of many environmental problems such as global warming, for example.
- The use of renewable energies contributes to securing food security, as it allows an increase in agricultural yields thanks to its disposal of chemical and gaseous pollutants (Kuuskraa, 2013, p. 11).
- Countries that enjoy high technology and use new energies have a very

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prominent position in the international economy, which makes them able to easily integrate into the modern world system with all its political, even environmental dimensions.

### **1.1.3. Renewable energy sources.**

The study of the issue of renewable energies, which is considered as one of the most important strategic alternatives to oil, requires identifying the most important types of energy available in nature, and where the most important sources lie, and accordingly we will try to present the most important types according to the source of their existence.

- a. **solar energy:** It is that emitted light and heat from the sun that are used as a source of energy, whether for direct heating or within a process of mechanical conversion of movement or electrical energy.
- b. **Wind Energy:** It is also known as wind energy, and it is one of the least expensive energies compared to the burdens of using other renewable energies, as it is the best in terms of economic feasibility, and therefore it has become the first choice for most countries in the world, and its existence is linked to wind speed, which should not be less than an average of 8 miles per hour, It is produced by large panels installed in high places, as the turbines (engines) with three rotating arms installed above a column convert the kinetic energy of the wind into electrical energy (Natarajan, Sakthi, Rehman, Shiva, & Vasudevan, 2020, pp. 244-252).
- c. **Hydropower:** Water energy falls within the renewable energies in the contemporary concept, and it is of interest to many researchers in trying to develop it with the aim of replacing it with oil energy (Hamouchene & Pérez, 2016, p. 16). The flow of water or its fall or from the crashing of waves in the seas, where all that kinetic energy is converted into electrical energy, for example, the crashing of waves in normal weather conditions produces an energy estimated at between 10 to 100 kilowatts per meter from the beach in areas medium far from the equator.
- d. **Nuclear Energy:** It is the energy that is generated by controlling the reactions of fission or fusion of atomic nuclei. This energy is exploited in the oceans of nuclear electricity generation, to heat water to produce water vapor, which is then used to produce electricity.

### **1.2. Energy transition and its requirements.**

The concept of energy transmission appeared for the first time in Germany in 1980, through its first conference in Berlin, by adopting a strategy of gradual transition from traditional carbon-based energies to energies Clean and renewable.

### **1.2.1. The concept of energy transition.**

The energy transition expresses the state through which the transition is made from the current energy system based on non-renewable materials to the desired system based on renewable energy, which implies the development of alternatives to fossil fuels, which are considered limited and non-renewable resources.

### **1.2.2. Energy transition requirements.**

The energy transition calls for a number of basic requirements, which can be summarized as follows:

- The clear political will that the government must show in gradually abandoning traditional energies in favor of renewable energies.
- Providing the necessary financial liquidity for the energy transition process by searching for financing projects with renewable energies, involving the private sector and encouraging foreign direct investment in this field.
- Conclusion of international agreements and partnerships to develop the renewable energy industry.
- Encouraging scientific and technological research in the field of renewable energies.
- Opening special markets for renewable energies characterized by flexibility and clarity in dealings (Meer AMKhan Rehman & Al-Sulaiman, 2018, p. 467).

### **1.2.3. Energy transition strategy.**

The content of the energy transition strategy can be summarized in three basic steps:

- a. Rationalization of energy consumption: This is done through the following:
  - Work to reduce the energy consumption of the heating process, by isolating buildings and developing heating media ((IEA), 24 February 2022 update).
  - Developing multiple means of transportation through the optimal selection of vehicles that meet the requirements of sustainability, adopting new ways to operate vehicles with alternative energies, and reducing the consumption of materials produced from fossil energies.
  - Achieving electricity savings in all areas of use.

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- b. Considering the energy transition as the main engine of the development process: This means that the state makes this approach one of its most important development goals, so that this must appear within its short, medium, and long-term development program, and the state that desires the success of this transformation must believe in its importance, which increases its will and determination to achieve this.
- c. Planning for the energy transition is essential: Where the planning process takes place by identifying all the available capabilities that can be exploited to reach the post-fossil fuel economy stage, and here the importance of human development and the extent to which all classes of society interact with this transformation, as its success depends on the challenge raised by the social front in the belief that it is a transformation that serves the public interest. without prejudice to the interests of future generations.

#### **1.2.4. Challenges of energy transition.**

The energy transition strategy faces several challenges, which can be summarized as follows:

- The economies of oil-producing countries rely heavily on traditional energy sources, Which in some cases leads to a reduction in the rush towards renewable energy for fear of causing a negative impact on the oil production system ((IEA) t. E., 18 May 2021).
- The high capital needed for renewable energy projects makes countries need to rely on the participation of foreign investment or external grants linked to clean development funds, and that the return on investment needs a longer time than investing in traditional energy sources.
- The large areas that must be allocated for wind and solar energy projects require clear policies and programs for land use and ownership by the state to reduce the costs of renting or purchasing them.
- Many countries, especially developing countries, lack advanced technology to invest in storing energy, especially solar ones.
- The renewable energy industry and the accompanying shift to an economy dependent on electricity require elements such as gallium, titanium, cadmium, and others, which are of course rare elements whose availability still depends on exploration in many parts of the world, and the extraction of these elements from the ground and methods of purifying them from impurities It remains a form of dependence on environmentally oxidizing fossil energy.

### **1.2.5. The energy transition is a bet to achieve energy security.**

The content of the Paris Climate Summit for the year 2015 refers in its first clauses to limiting the rise in the earth's temperature to more than two degrees Celsius, which reflects the importance of the energy transition towards limiting the use of oxidative energies in the ecological environment. To achieve this goal, the energy transformation is a major axis in creating a future environment that guarantees energy efficiency from on the one hand, and guaranteeing the rights of future generations on the other.

## **2. Algeria's experience in the field of energy transition:**

The Algerian economy faces many challenges as a result of falling into the trap of oil dependence, through which oil has been the main energy resource in Algeria for decades, as the hydrocarbon sector contributes 97% to Algerian exports, 40% to the gross domestic product and to the financial revenues of the budget, At a rate of 65%, and in our hard currency revenues at a rate of 90%.

All these indicators prove the extent to which the Algerian economy is dependent on the hydrocarbon sector, as it suffers from the Dutch disease, which makes this sector affect some other sectors that are capable of growth and even compete internationally, especially as the world today is witnessing wide transformations. In various fields, including the energy aspect, as the global trend now is based on clean and renewable energy, as it is an energy that guarantees the rights of future generations, which Algeria had to take into account in the long run, and then the pace of consumption in Algeria for energy is inconsistent. Absolutely rational, as some studies confirm that by the beginning of 2030, Algeria will not be able to export the percentage it is in now. Rather, the volume of production surpluses may decrease to 15% as an export supply of production. The domestic aggregate, which makes its financial revenues derived from exporting this young percentage unable to guarantee financial balances, especially since the population growth rate is rising rapidly, as the number of Algeria's population in 2022 reached more than 45 million people, and in the year 2030 there are predictions that the number will reach To about 80 million percent, which confirms that Algeria may have the next crisis if it does not set its accounts early.

### **2.1.The reality of renewable energy resources in Algeria.**

Algeria has important potentials of energy resources, as it provides it with a great opportunity to employ all these sources to benefit from them in moving the wheel of local development, and Algeria cannot ignore the countries of each of the two energies, oil and gas, as they are fossil resources that have been

financing most of the development plans from independence to Today, however, the problem lies in the tension experienced by the prices of this energy, as well as its depletion in the internal regions of Algeria, where the British Petroleum Corporation confirmed in 2017 that the oil in Algeria is on the verge of depletion, given that oil production has been known to decline due to the lack of oil wells, even with the continuation of the process detection, to move from 86.5 million tons in 2007 to 68.5 million tons in 2016, when the decline rate was estimated at 21%. The latter, Algeria seeks, through the energy model that is based on energy supply, to develop the use of renewable energies as one of the bets for the current period. And below we will present the most important for the energy potential that Algeria has.

### 2.1.1. Solar energy potential in Algeria.

The Arab region enjoys the highest solar radiation in the world, as the intensity of solar radiation reaches 1000 watts/m<sup>2</sup> in the middle of the day, and an average of 250 to 300 watts/m<sup>2</sup> per day , which is equivalent to 6 kWh/m<sup>2</sup> per day, and Algeria is one of the largest of these countries in terms of energy reserves resulting from solar radiation, and this is due to the geographical location that distinguishes it, of which the desert represents two-thirds of its total area, as most of its areas enjoy solar brightness capable of generating energy, which makes it an important mine for solar energy, and below we will try Attach a table to identify the potentials available in this type of energy in Algeria.

**Table (1): Solar energy potential in Algeria.**

| Region                                              | The desert | High plateaus | Coastal region |
|-----------------------------------------------------|------------|---------------|----------------|
| The area - km <sup>2</sup>                          | 86         | 10            | 04             |
| Average duration of solar radiation h/year          | 3500       | 3000          | 2650           |
| Average available energy - KWh/m <sup>2</sup> /year | 2650       | 1900          | 1700           |

**The source: Energy Directory in Arabic, Issued by the Ministry of Energy and Mines, 2017.**

Through the table, we notice that the potential of Algeria in this type of energy is very significant, especially since Algeria sits on three regions of the desert, the high plateaus and the Sahel region, respectively, as we find that the average duration of solar radiation amounted to (3500, 3000, 2650) on Respectively, and through the average energy, we find that the desert region occupies the first place, since the value of the energy generated in it amounted to 2650 kWh / m<sup>2</sup> / year, then followed by the high plateaus and the coastal region in the third place.

### **2.1.2. Wind energy in Algeria.**

Algeria is considered among the countries with the most reserves for this type of energy, due to the topographical diversity and climatic diversity that Algeria abounds in from other countries, as there are good winds from the Mediterranean region, which are usually moist, and there are large amounts of air Continental wind coming from all three directions except the coast, especially the southern winds coming from the desert side, where Algeria records an average annual speed of more than 07 meters per second, especially in the northern regions (Himri, Himri, & Boudghene Stambouli, 2009, p. 29).

"Adrar" is considered one of the most important regions with high winds in the south, as the government intends in the future, within the framework of its energy strategy, to complete the first wind farm with a capacity of 10 megawatts, and other stations in "Ain Amenas" and in the southeast of the desert.

### **2.1.3. Hydropower in Algeria.**

Hydropower is a major source of electricity in the world, but its exploitation is very difficult as a result of the many obstacles that prevent it from investing in it. Circumstances, as for Algeria, it is one of the least producing countries for such energy by virtue of being an energy that requires high technology and equipment, and Algeria's production did not exceed 251 GW/h during the year 2004, which represents only 3% of global production, despite the existence of water reserves. Very significant, as the winter precipitation in Algeria is estimated at about 65 billion m<sup>3</sup> annually, of which Algeria exploits only 5% due to the absence of equipment and structures that collect and exploit it.

### **2.1.4. Geothermal energy in Algeria.**

Steam or hot water in the earth's crust can be used to operate turbines, which operate on a cycle of heating and then cooling the water. Algeria is one of the countries that can benefit from this type of energy. It contains more than 200 thermal sources in the northwest of the country, and the temperature of these sources is about 40 ° C (Abada & Bouharkat, 2020, pp. 1-8). The hottest of them is the "Hammam al-Maskhoutine" (Dabbagh bath) in Algeria, as its temperature reaches 96 ° C and is located in "Guelma". "Biskra" is also one of the most important regions. In which power generation stations are established, relying on geothermal energy (118 ° C), and Algeria also has an aquifer of hot water within the alpine water area, where the temperature reaches 57 ° C, which is bordered to the north by "Biskra", and to the south by "Ain Saleh" and from West "Adrar", extending from the eastern side to the Tunisian border.

## **2.2. A strategy to develop the use of renewable energies in Algeria.**

In this regard, Algeria was guided by the Arab initiative to design a strategy in the field of exploiting renewable energies that serve long-term aspirations, especially in the framework of establishing energy security and

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trying to diversify the national economy. Algeria aims, through this program, to improve energy efficiency (increasing efficiency in energy exploitation) and to ensure security of supplies for the various members of society. This strategy also allows to reduce all negative impacts on the environment, The strategy includes five main axes, namely:

- A huge program to exploit and develop all available renewable energies at the level of Algeria.
- A policy to develop energy efficiency and work to train specialized managers who have the ability to exploit this type of energy in an optimal way (Grein, Nordell, & Al Mathnani, 2007, p. 27).
- Activating research laboratories and think tanks in the energy field in cooperation with leading countries in the field, such as Germany.
- The legal and regulatory framework and procedures stimulating investment in this field.

This strategy includes many projects that flow into the field of clean energies, as the Algerian government is counting on the completion of more than sixty solar stations, in addition to allocating areas for wind energy in the horizons of 2030, and this will take into account all the factors and specificities of each region of the land of Algeria, and it was It is as follows:

- Desert area to hybridize the existing diesel stations and supply distant areas, due to the importance of solar and wind capabilities in this region.
- The plateaus are exploited in the field of wind and even solar energy.
- The coastal area according to the availability of the land container, while exploiting the spaces in which renewable energies are available (Zahraoui, Basir Khan, AlHamrouni, Mekhilef, & Ahmed, 2021, p. 354).

The energy policy pursued by Algeria, especially within the framework of what is known as the new economic model, relies on energy efficiency in particular. The government is trying to develop all sectors while creating links between each of them. All sectors have had a role in this modern energy policy, especially the industrial sector, the construction and public works sector, as well as the transport sector. The government sets a strategic vision within this program, represented in reaching 60 million tons of energy. And the most important of what came as basic steps that the Algerian government and people must take are the following:

### **2.2.1. The need to rely on thermal insulation technology in the field of building, construction and reconstruction.**

The construction and public works sector in Algeria is one of the sectors that have a major role in replacing traditional energy with renewable energy, given the importance that this sector acquires in rationalizing energy use on the one hand and in generating clean energy on the other hand. Reliance on thermal

insulation technology and the use of insulators of all kinds during the construction of buildings would reduce the waste of energy, and most of the countries that relied on this mechanism succeeded in that, and Algeria recently in the context of this modern trend works with these modern techniques in insulation.

#### **2.2.2. Work to spread the culture of dependence on the solar heater.**

Algeria is working today more than ever to spread the culture of clean, inexpensive energy, as it is trying hard to spread energy awareness among most of its population and push them to learn about the advantages of dealing with renewable energies, as in most energy exhibitions in Algeria it was trying to consolidate this mechanism known as solar heating of water instead. It is dependent on gas for that, but the productive sectors must try to pay attention to this modern technological industry to cover the internal demand for these solar heaters.

#### **2.2.3. Encouraging the use of lamps with low energy consumption.**

The goal set by the government in the first phase of this energy strategy is the need to rationalize domestic energy consumption on the grounds that Algerian society is one of the most energy wasting societies, and therefore the government had to direct individuals to use lamps with low energy consumption, as interests and authorities enter here. responsible for controlling foreign trade policy, and accordingly may issue instructions to ban the import of such intense glow lamps.

#### **2.2.4. Rationalization of energy consumption in the public sector.**

Algeria contains approximately 1541 municipalities, all of which are responsible for providing public lighting throughout the year and at specific times per day, which makes Algeria bear high financial costs to ensure full coverage, and therefore the trend towards relying on low-consumption lamps has become very important. Where the mercury lamps were replaced by smart lamps, this program, which is strictly applied, and which was included in the programs for urbanization and neighborhoods (Bouznit, Pablo-Romero, & Sánchez-Braza, 2020, p. 65).

#### **2.2.5. Upgrading energy efficiency in the industrial sector.**

This energy program is keen to involve all national productive projects as a partner that guarantees rationalization in energy consumption on the one hand, and a factor for activating energy substitution in standard conditions on the other hand, given that the industrial sector represents the most energy-consuming sectors, and therefore these productive projects may have to exploit Renewable

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energy, and then the international laws of the global economy call on all international institutions to respect the environmental aspect, which is what made management science take this aspect, so environmental management and green marketing, the environmental management system, and the environmental quality standard appeared, in light of this transformation, productive projects that do not. It is interested in this type of management and access to international markets, which necessitates that it coordinate in this direction in order to catch up with the global community, and to advance the competitiveness of its performance in light of the intensity of international competition.

### **2.3. Ways to activate the energy transformation strategy in Algeria.**

Today, most countries are striving to provide the appropriate environment and conditions for all social classes to adapt to renewable energies in terms of use. This is the role that the government and its institutions play in spreading awareness and even legislative controls in order to pass to a more efficient consumption stage in terms of energy, as most of the leading international models confirm. In the field of exploiting renewable energies, the most important way to develop an energy transformation strategy is the political will and the accompanying good governance and institutional governance, as well as commitment to other ways that have a role in enabling governments to pass to a more stable stage in the energy aspect. Below we will try to include the most important ways available to Algeria. In order to promote clean energy use, namely:

#### **2.3.1. Strong political will.**

It is the most important mechanism for developing the energy transition strategy, and what is confirmed by international theories in the energy field is that the countries whose economies suffer from the Dutch disease will remain weak, if not completely absent, with regard to the issue of energy transition, given that the financial flows resulting from fossil energy always make governments Rentierism shortens the path to development, and Algeria has a rentier economy to the fullest extent and suffers from the Dutch disease, just as the political will is almost discouraged somewhat. All programs were just constructive phrases declared by the government, nothing more, nothing less, as long as all local energy sources are traditional.

#### **2.3.2. Work on developing tax measures that encourage the use of renewable energy.**

According to the leading models in the field of energy transition, we can conclude that the tax system has a major role in influencing the effectiveness of the energy transition strategy. On many types of local oil levy, which it imposes on prospectors and oil companies that are active locally, but moving towards raising the pressures and tax burdens in this field inevitably establishes substitution, as well as another tax mechanism known as the tax on emitted

carbon, which is an addition to the price of fossil fuels with The amount of carbon emitted when burned is a financial tool, of course, directly related to the market, as imposing this type of tax makes the products that use this type of traditional energy more expensive and less profitable.

### **2.3.3. Improving the investment climate and opening the way for private and public investments in renewable energies.**

Improving the local investment environment and working to mobilize all measures related to the legal, financial and diplomatic aspects is a step in the right path, as the legislative and legal stability in this field contributes to the greatest extent. An important and very important role, as investment in this field requires large funds and capital, which makes financing a necessity. In this field, the role of the credit system and the effectiveness of its performance in accompanying, economic feasibility is highlighted by relying on experts and technicians trained in this field, and here the role of the Algerian University stands out. As well as the academic research laboratories in clarifying the most important formulas and capabilities available as a stock at the national level, as wasting the project of the century, which is represented by what was offered to us by the leading German strategic partner in this field, which is the "Deser-tec" project, as wasting it is a step backwards for Algeria, and we add that it is Algeria should also take into account the provision of all privileges related to guaranteeing real estate and lands that are the subject of investment settlement (Arkam & Hattabi, 2008, p. 8). It is a big problem for local or foreign investors, especially since investment in the field of solar energy is dependent on large and suitable areas, which confirms the need for accompaniment and foresight on the part of the Algerian government.

### **2.4.Challenges facing the activation of the energy transition strategy in Algeria.**

- Algeria is considered one of the countries rich in fossil energy, and it is one of the factors that can mitigate the rush of officials towards renewable energy, for fear of causing a negative impact on the oil production system and its prices. The existence of guarantees confirming the existence of shale gas in quantities that cover the costs of production and marketing, in addition to the dire consequences it brings on the environmental and even social aspects, and thus the national economy remains dependent and rentier.
- The high costs of investment in the field of renewable energy in the face of the scarcity of financial resources in Algeria, especially after the 2014 crisis, making access and direction towards this type of energy a matter that does not serve interests in the short term, especially since investment in clean energies has a return in the long term and needs time, then it

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requires Efficient and effective management, which is what Algeria suffers from, which requires Algeria to enter into partnership with foreign investors.

- The large areas of land that must be allocated for wind and solar energy projects, which requires clear policies and programs for land use and ownership of the state. Despite the existence of a huge area for Algeria, this problem still constitutes a stumbling block for many investment projects.
- The limited local manufacturing capabilities of renewable energy production equipment and the inability to compete with international companies, as a result of insufficient national technical human resources, which necessitates the authorities to seek the help of international consulting offices, in addition to the weak financial allocations for scientific research that allow the development of renewable energy.

## **II. Conclusion:**

Energy plays a vital and indispensable role in our contemporary world. Its importance in the development process and its close connection with various fields and dimensions of sustainable development has become clear. This prompted the need to search for environmentally friendly renewable energy resources that reduce environmental pollution on the one hand and reduce the waste and depletion of traditional energies on the one hand. On the other hand, Algeria is one of the countries that paid attention to renewable energies, especially in the face of its limited petroleum capabilities and the reserves currently available, then the current consumption pace resulting from the expansion of the economy on the one hand and in the face of the accelerated demographic growth on the other hand makes Algeria in the future fall into a crisis related to energy security, and therefore Algeria should replace an important part of the traditional energies with renewable and environmentally friendly energy by adopting a green strategy concerned with the energy transition process that obliges all societal groups, the government and institutions to interact with it and ensure its good application, which will achieve future gains for the Algerian economy by raising the rates of domestic product. Gross and even per capita, reduce unemployment, increase economic efficiency and the ability to investigate from oil dependence, especially since Algeria has very significant capabilities that can guarantee it a prominent position among the largest countries that can export this clean energy.

Finally, we will try to present a set of suggestions that may be necessary to activate the energy transformation strategy in Algeria.

- Working with political will and strong determination to activate the

energy transformation strategy in Algeria, because of its importance in enabling the national economy to liberate itself from its dependence on hydrocarbons.

- Activating the Supreme Council of Energy and ensuring its independence to define energy visions and policies and issue directives in various energy fields, as well as reviewing the proposals of experts and those interested.
- Defining and announcing a future vision and making it specific with measurable goals, and moving away from optimistic scenarios in the field of fossil investment that instilled a rent-seeking culture in various management mentalities.
- Work to establish a financial fund that can be called the Energy Transition Fund to cover the costs of transformation within the programmed investments in the field of renewable energies.
- Encouraging local sectors, whether public or private, to enter into investments related to renewable energy, and granting them technical and financial support, as well as providing fiscal incentives to encourage investment in this field.
- Work to attract foreign direct investments, the most important of which is "Desertec", while ensuring the transfer of knowledge and technology in the field of renewable energy exploitation.

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