

## **The impact of the oil crises on the security of the Algerian economy: the oil crisis 2014-2017 as a model**

أثر الازمات النفطية على الامن الاقتصادي الجزائري: الازمة النفطية 2014-2017 نموذجاً

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### **Abstract**

### **ملخص**

This paper studies oil as one of the foundations of Algerian economic security, and proceeds from the fluctuation of oil prices to diagnose the capabilities that the Algerian economy possesses, and the extent of the impact of the decline in its prices on the rest of the economic sectors and on development policies and economic security, to propose in the end a set of solutions and alternatives to the oil economy “energies renewable”.

**Keywords:** oil markets, economic security, renewable energies, oil crises.

تدرس هذه الورقة النفط باعتباره أساس من أسس الأمن الاقتصادي الجزائري، وتتطلق من تذبذب أسعار النفط لتشخيص الإمكانيات التي يمتلكها الاقتصاد الجزائري، ومدى تأثير تراجع أسعاره على بقية القطاعات الاقتصادية وعلى السياسات التنموية وعلى الأمن الاقتصادي، لتقترح في الأخير مجموعة من الحلول والبدائل للاقتصاد النفطي "الطاقات المتجددة".

**الكلمات المفتاحية:** أسواق نفطية، امن اقتصادي، طاقات متجددة؛ الازمات النفطية.

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## 1. INTRODUCTION

Energy is dam the main axis which push of the economic development wheel in many countries, and who follows historical path of the human use of energy finds that each stage has its energy needs, in modern times, oil and Fuels have become one of the most important needs and productions in the world, and depends on it many countries, especially the Arab in building its economic security.

And Algeria is considered one of the countries that rely mainly on petroleum in building its economy and in enhancing its economic security, as Oil is the most important if not the main pillar of the economy and the budget of the state, as well the first product destined for export, and therefore any imbalance in the prices of fuel directly affects the economic balance and development directly.

Through this study, we aim to address the following problem:

**How was the oil crisis and the fluctuation of oil prices affected Algerian economic security?**

To answer this problem, we have asked the following sub-questions:

- What are the factors that affects markets oil and its prices?
- What are Algeria's economic capabilities in the petroleum sector?
- How the Algerian economy is affected by the drop-in oil prices?
- What energy capabilities can be used as an alternative to oil in

Algeria?

In our study of this topic, we have relied on the following **hypotheses**:

➤ If the general budget of a country based on the diversification of economic revenues, the change in oil prices does not affectits economic security.

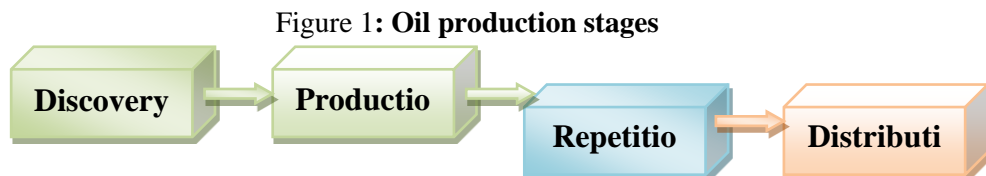
➤ The more the economies of countries are based on a basic product, the more successful these economies will be, and the more profitable the state will be.

➤ If the Algerian economy depends on the oil sector, any move in oil markets and prices will directly affect the Algerian economy as a whole.

➤ If the oil sector is a pillar of the Algerian economy, this indicates that Algeria does not have alternative solutions, and lacks the potential in other sectors.

## 2. The concept of oil markets

Oil is one of the traditional sources of energy and the word oil is in radix Persian means flowability, the word "**PETROLEUM**" is a word Latin origin consisting of two sections, namely "**PETR**" means rock "**OLEUM**" which means oil, and thus means in the whole (oil) rock oil, he is material extracted from the oil rock, the oil is called black gold due to its high prices, it has many uses in daily life, ( Theodore ,2006,p 16.) especially in industrial fields such as road construction, military industries, chemical fertilizers, petrochemical industries of all kinds...., and passes the oil on five stages of productivity are:



Source: Prepared by the researcher

The types of oil vary according to their degree of density and are limited between (0-60) degrees and these types are: ( Kitous, 2016, p 106.)

- ✓ Light oil of a high density of more than 35 degrees.
- ✓ Medium oil with a specific density of 28 to 35 degrees.
- ✓ Heavy oil with a density of less than 28 degrees.

Each of these types is different in price from the other the higher grade oil is higher than the lower grade and vice versa, the price of oil is defined as the monetary value or the cash image of the barrel of crude oil measured in US dollars (42) gallons expressed in the US monetary unit, and that this price is subject to continuous fluctuations because of the nature of the international oil market, which is characterized by dynamism and instability, which reflected on oil prices and make them prices unstable and subject to constant fluctuations.

### 2.1The most important factors affecting oil prices.

effect in determining the price of crude oil many factors, which occupies a lot of specialists and interested who prepare oil as a commodity not subject only to the laws of the market (supply and demand forces),where production is sometimes increased but the price remains

constant, or the price increases and the demand remains constant ... and so on, the factors influencing the determination of oil prices are as follows:( Sayed 2016, p 13.)

- Economic factors.
- Financial factors.
- Productive factors.
- Political factors.
- Environmental factors.

All these factors affect the volatility and pathways of oil prices and often the most volatile and powerful are the political and economic the most, Political factors may have greater effects than other factors because of its strategy and international importance, or what is known as (commodity causation), this would have a significant impact on all political and economic decisions of the oil exporting countries, it also affects as the decisions of oil importing countries, perhaps the most important determinants of oil prices are:

- **Law of Supply and Demand:** The global oil supply is a subject to a number of determinants, the most important of which is demand for oil and its price, there are a number of elements that control the determination of global oil demand: "average per capita income, inverse relationship between price and demand for oil, Structure of national product, climate...."( Theodore ,2006,p 49.)

- **Geopolitical factors and oil crises:** There has exist a consensus among analysts that market fundamentals of demand, supply and inventory levels are insufficient to justify the imbalance in price levels, especially in recent years, oil crises, geopolitical factors and natural disasters have played a key role in influencing oil prices, as the oil price in the global oil market from the 1970s until 2014 was affected by a series of oil shocks distributed according to the following years: 1973, 1979, 1986, 1998, 2004, 2008, 2014.( Kitous, 2016, p 93.)

- **Low dollar exchange rate:** Studies have shown that there is an inverse relationship between the exchange rate of the dollar and demand for oil and reduce its production, leading to higher oil prices, as this decline creates an imaginary amplification of the price of oil, for example, when the price of a barrel in 2008 was estimated at \$ 94.1 per barrel, it was 64.3 euros and 51.3 pounds per barrel. ( Kitous, 2016, p 128.)

**3. Algerian Possibilities in the hydrocarbons sector:** Algeria is an excellence rentier state, where its economy relies heavily on hydrocarbon revenues in the state budget, rentier countries - like Algeria - facing a dilemma that is an Obsession for policy makers; represented in to prepare for the post-oil era, either because of its depletion or because of its declining role as a result of the technical development of alternative energy sources.

It should be noted at the outset that Algeria is not a large energy producer nor has a large global reserve, at the time of while the world's proven oil reserves in 2014 reached 1292.2 billion barrels; Algeria's proven reserves of oil amounted to 12.2 billion barrels, representing 0.94% of the world's total reserves, and the world's proven natural gas reserves in 2014 reached 197.3 trillion cubic meters; while the proven Algerian reserves of this resource amount to 4.5 trillion cubic meters: which viz 2.28% of the total of this global reserve,( Gonzalo , 2016, p 79.) As for the figures of the shale gas are uncertain, but estimates by the US Energy Information Administration that Algeria has about 20 trillion cubic meters, this is clear in the table:

**Table 1: Algeria's proven energy reserves relative to the world reserve**

	Oil proved reserves (billion barrels)			Proved reserves of natural gas (billion m <sup>3</sup> )		
	2014	2015	2016	2014	2015	2016
United Arab Emirates	97,8	97,8	97,8	6091	6091	6091
Bahrain	0,1	0,1	0,1	92	92	92
Tunisia	0,4	0,4	0,4	65	65	65
Algeria	12,2	12,2	12,2	4504	4504	4504
Saudi Arabia	266,6	266,5	266,4	8488	8587	8589
Syria	2,5	2,5	2,5	285	285	285
Iraq	143,1	141,4	143,3	3694	3694	3694
Qatar	25,2	25,1	25,2	24400	24400	24400
Kuwait	101,5	101,5	101,5	1784	1784	1784
Libya	48,4	49,5	49,5	1505	1495	1506
Egypt	3,7	3,5	3,2	2168	2168	2168
Jordan	0,001	0,001	0,001	6	6	6
Suan	1,500	1,400	1,500	85	85	85
Oman	5,151	5,306	5,431	705	705	706
Morocco	0,001	0,001	0,002	1	1	1
Mauritania	0,020	0,023	0,021	28	28	28
Yemen	2,992	3,001	3,001	479	479	479
Other Arab countries	9,5	9,7	9,8	1310	1310	1311
Total Arab Countries	710,6	711,3	712,2	54234	54386	54476
OPAC	1006,1	1006,1	1007,6	95315	95561	95549
Total world	1281,9	1282,3	1285,4	196585	195877	196747

**Source:** Organization of Arab Petroleum Exporting Countries: Annual Report, 2016, pp. 8-11.

The table shows that Algeria does not have a large global reserve of oil and natural gas suppliers, they hardly exceed 1% of the proven global reserves of oil and natural gas, and on this basis, we cannot talk about Algeria from the perspective that it is a large energy force country.

In fact, the GDP of Algeria in 2017 amounted to \$ 220.091 million, while the value of oil exports in the same year amounted to \$ 26.976 million, where most of the Algerian natural gas exports to the European energy market " specifically France, Spain and Italy", through two methods; (Haderer ,2014, p 127.)

-23.73 billion cubic meters through pipelines.

-14.31 billion cubic meters via oil tankers.

Oil and gas in Algeria accounts for 98% of export receipts, 62% of state budget revenues, and about 35% of Algeria's GDP, and the world oil

production in 2016 amounted to 76.224.000 barrels per day of oil, while the production of Algerian oil then the amount of 1,193,000 barrels per day of oil, as Accounting for 1.57% of the world's total oil production, While the world's natural gas production in 2016 amounted to 3566.2 billion cubic meters; while Algeria's natural gas production reached 81.7 billion cubic meters which; 2.29% of the total global production of this resource, Algeria's total energy consumption in the same year was 1,073,000 barrels of oil equivalent per day; Algeria consumed 425,000 barrels of oil equivalent per day, while 641,000 barrels of oil equivalent of gas per day. (Haderer, 2014, p 131.)

**3.1 The development of oil prices in Algeria and the factors of decline:** The oil market during the period 2014 to 2016 was characterized by relative stability, reflecting the modest growth in the performance of the global economy, especially after the sudden change in 2014 with a sharp decline in world oil prices.

Where we note that the average price of Algerian oil exceeded the threshold of \$ 100 a barrel in 2013, as well as the first eight months of 2014, and September saw oil prices fall below the threshold of \$ 97.10 per barrel, the sharp decline in the end of 2014 continued to reach \$62.93 per barrel, this decline is due to the gradual increase in the US dollar exchange rate index for major currencies since 2014.

As for the year 2015, the average price per barrel was \$ 52.79, continuing to fall to its lowest level in 2016 and 2017, with an average price of \$ 44.28 per barrel, this significant drop in world oil prices was driven by a combination of factors. And these factors are: (Al Azri, 2016, p 40.)

➤ **The emergence of rock oil production:** made available by hydraulic crushing technology and horizontal drilling, this new source added about 4.2 million barrels per day to the crude oil market, which has contributed to a glut of global supply.

➤ **Change in strategic behavior of (OPEC):** as considered the Organization of Petroleum Exporting Countries (OPEC), is the largest player and Influential in the global crude oil market, the recent period has seen a change in strategic behavior by focusing on maintaining market share at the expense of prices, as its last meeting, the Organization surprised everyone by taking a decision to increase production despite the excess supply of the world, which led to a new decline in prices, this decision was quite the opposite of what the Organization had done during the period of the global financial crisis (2008-2009) following the collapse of oil prices, where slash production which helped to rebound again.

➤ **The expected increase in Iranian exports:** This follows the lifting of the economic sanctions imposed on it by the west after reaching a nuclear agreement between them, where Iran sought to export 1.26 barrels of oil per day starting in 2016, which means an increase in the global supply glut.

➤ **Decline in global demand:** especially from emerging markets, such as China, which alone consumes two-thirds of the height quotient in global consumption of petroleum, as China has experienced economic difficulties in recent years, with a significant collapse in its exports and investments, which account for two-thirds ( $\frac{2}{3}$ ) of its gross domestic product (GDP), mainly due to the decline in its competitiveness in international markets due to the sharp rise in domestic wage rates in recent years.

➤ **Decreased global consumption:** especially in light of the continued decline in oil consumption in the United States and replace it with other alternatives.

**3.2 The fluctuation of oil prices and their impact on Algerian economic security:**

We can show the negative effects of the collapse of oil prices on the Algerian economy in the following economic indicators: (Gonzalo, 2016, p 86.)

▪ Implications of the collapse of oil prices on the state budget: The close correlation between oil prices and the general budget in Algeria is evident through the provisions of the Finance Act of 2016 which defined a reduction in the volume of public expenditure by 8.8% compared to 2015, with a decrease in the management budget of 3.3%, and the Preparation budget decreased by 16%, however spending control is only part of the fiscal equation in oil-exporting countries, whereas the creation of new sources of revenue is another important fact, during 2015 the budget deficit compared to 2014, reaching more than 16% of the gross domestic product, this is due to the significant decline in oil revenues resulting from the collapse of prices, this is as shown in the table:

**Table 2: Implications of the oil price crisis on the general state budget**

<i>Indicators</i>	2014	2015	2016
<b>The percentage of the petroleum revenue to total public revenues</b>	60%	58%	62%
<b>Total revenue (\$ billion)</b>	33,4	30,1	35,8
<b>Total expenditure (\$ billion)</b>	41,3	46,5	36,7

<b>The balance of the total budget</b>	-8%	-16,4	-0,9%
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Source: [http://www.energy.gov.dz/francais/uploads/2016/Projets\\_du\\_Secteur/Programme\\_EnR\\_2016/Plaqueette\\_PNEREE\\_2016\\_En.pdf](http://www.energy.gov.dz/francais/uploads/2016/Projets_du_Secteur/Programme_EnR_2016/Plaqueette_PNEREE_2016_En.pdf)

▪ Implications of the collapse of oil prices on GDP: Where oil revenues account for 30% of Algeria's GDP, accordingly any collapse in oil prices will have a negative and direct impact on one-third of this output, so the growth rate for the next few years is expected to fall to 3.4%, according to the International Monetary Fund, the trace of oil price collapse on GDP can be traced back to through the table:

Table 3: **Implications of the collapse of oil prices on GDP**

<i>Indicators</i>	2014	2015	2016
<b>Current GDP (\$ billion)</b>	<b>211</b>	<b>208</b>	<b>209</b>
<b>Real GDP growth rate (%)</b>	<b>3,8</b>	<b>3,9</b>	<b>2,8</b>
<b>Hydrocarbon sector share of GDP</b>	<b>30%</b>	<b>29%</b>	<b>30%</b>

Source: Al Azri, 2016, p 46.

▪ Implications of the collapse of oil prices on foreign trade: The dramatic drop in oil prices shows clearly and rapidly to the Algerian trade balance as which accounts for 98% of Algeria's oil revenues, and any shortfall in the trade balance quickly weakens the state's ability to secure its imports at comfortable levels over the next few years, as there has been a sharp rise in the current account deficit in 2015 as a result of the decline in oil exports and this deficit is expected to deepen in the coming years, the table shows this:

Table 4: **Implications of the collapse of oil prices on the foreign trade sector**

<i>Indicators</i>	2014	2015	2016
<b>Share of hydrocarbon exports to total exports</b>	<b>97,5%</b>	<b>98%</b>	<b>98,4%</b>
<b>Total exports (\$ billion)</b>	<b>61,17</b>	<b>35</b>	<b>65,82</b>
<b>al exports of hydrocarbons lion"</b>	<b>58,36</b>	<b>33,08</b>	<b>63,66</b>



<b>Total imports (\$ billion)</b>	58,33	51,64	55
<b>Current account balance as a percentage of GDP</b>	-4,4%	-16,2	0,4%

Source: Gonzalo, 2016, p 83.

▪ Implications of the collapse of oil prices on official reserves of hard currency: Despite the large volume of reserves achieved by the national economy from hard currency a few years ago due to the prices of oil big and high realized, But it began to erode rapidly in light of the continued decline in prices, it decreased by 35 billion dollars in 2016 to reach 143 billion dollars compared to the peak level of 194 billion dollars in 2013, as shown in the table:

Table 5: The implications of the collapse of oil prices on the hard currency reserves

<i>Indicators</i>	2014	2015	2016
<b>Total reserves "\$ billion"</b>	178	143	194
<b>Percentage change(%)</b>	-8,25%	-19,66%	-
<b>Precautions months of imports</b>	33,5	29,8	32,3

Source: Gonzalo, 2016, p 97.

▪ Implications of the collapse of oil prices on foreign indebtedness: The rapid fall in financial reserves is due to a drop in oil revenues, which will force Algeria to increase borrowing to finance the future deficit, this was done through the issuance of domestic debt as a first step, the second step is to return to external debt by applying for a loan from the African Development Bank for \$ 900 million by the end of 2016, which will increase in the future if prices remain at low levels, this is after Algeria recorded a unique precedent in the history of countries by the pre-payment of debt and the elimination of its pests, it is one of the brightest achievements in the tunnel of development failures, the table shows this:

Table 6: Implications of the collapse of oil prices on external indebtedness

<i>Indicators</i>	2014	2015	2016
<b>Total external debt (\$ billion)</b>	3,37	3,021	3,39
<b>External debt ratio of GDP</b>	1,7%	1,8%	1,6%

Source: <http://rcreee.org/news/algeria-renewable-energy-plan-enables-production-12-000-megawatt-2030>

▪ Implications of the collapse of oil prices on the dinar exchange rate and purchasing power: The price of oil is one of the main determinants of the value of the national currency, once the prices collapse the value of the Algerian dinar falls, where it reached 107.13 and 117.05 Algerian dinars against the dollar and euro on average in 2016, after it was equal to 78.15 dinars, and 106.89 dinars against the dollar and the euro respectively in 2014, although this decline may be deliberate by the Central Bank to compensate for the loss of income from hard currency resulting from the collapse of oil prices, however the value of the dinar is expected to decline if oil prices continue to deteriorate as is well known the cheap dinar will raise the prices of imported products offered in the national market, especially consumer staples that are not subsidized by the state, which means the low purchasing power of the consumer, the rise in the annual rates of inflation and the consequences that may result from social unrest unknown consequences. (Gonzalo, 2016, p 88.)

#### **4. Renewable energies as a way out of oil crises and supportive of economic security:**

**4.1 The possibilities available to Algeria in the field of renewable energies:** Algeria has a huge amount of potential that can be an alternative to oil, including:

➤ **Solar capabilities:** Algeria due to its geographical location on the richest solar fields in the world, since the amount of energy contained to the per square meter is estimated at 5 kWh per square meter on most parts of the national territory, and can sometimes reach 7 kWh per square meter, which produces annual solar radiation exceeding 3 thousand kilowatt hours per square meter on an area of 2.381.741 km<sup>2</sup>, this enormous potential allow 60 times to cover the needs of Western Europe, according to the Algerian Energy Ministry, and four times global energy consumption, Adrar remains the country's most sun-exposed area, in addition to Tamanrasset, where solar radiation reaches 2.7kWh/m<sup>2</sup>, the solar energy inherent in Algeria is distributed according to the following geographical distribution; "Coast, plateaus High, Desert", and Algeria receives 169,400 terawatt-hour solar energy, equivalent to 5,000 times the annual national electricity consumption, so Algeria's solar energy is the most effective alternative to its peculiarities, among these characteristics: (Boudries, 2003, p 51. Pdf)

- The geographic characteristics of Algeria, both in terms of large quantities of receiving radiation or the vast expanse of the Great Sahara.
- The abundance of sand used in the solar cell industry.

- Positive environmental effects as they are less polluting than other species.
- Side costs that may have a positive impact on the national economy.

➤ **Wind potential:** Algeria is blowing wind with a lot of wet sea air and large quantities of continental desert air, with an average annual speed of more than 7 m/s especially in coastal areas, and in Adrar-Algeria is considered to be one of the most important areas with strong winds for example; wind turbines at a height of 30 meters at a wind speed of 5.1m/s, can generate energy at 673 watts, which can cover the needs of 1008 homes from energy, whereas Algeria is a country with a very large area characterized by a coastal strip with a high population density, limited to the Mediterranean climate to the north and the climate of the Atlas Desert to the south and south represents 90% of the total area of the Algerian territory, with a dry desert climate and perhaps a low population density makes the cost of energy high in isolated areas wind power generation is therefore one of the best ways to cover energy needs in southern Algeria, and the wind fields in the south are more important than in the north, especially in the south-west: (Timmoun, Ain Salih, Tamanrasset), as wind speed in these areas exceeds 5 m/s, at a height of 10 meters from the surface and exceeds 6 m/s, at an altitude of 30 meters from the surface of the earth, and from it electric power by wind can be produced domestically and without transportation costs by constructing power stations in isolated areas, which addresses the problem of electricity in Algeria, it is also this energy has a direct relationship with the speed of wind increases the amount of electricity produced by the wind turbine, which reduces the cost of energy per kilowatt-hour. (Gaillard, 2015, p 241)

➤ **Geothermal power capabilities:** There are over 200 thermal sources in Algerian , of which limestone is limestone; especially in the north-east and north-west of the country, the temperature of these sources exceeds 40°C, the most important which "Hmam Almskhotin", who is exceeds temperature 98°C, and may reach 118°C a "Biskra" means the possibilities of the establishment of power plants, as well Algeria has significant potential for this energy through artesian wells and hot mineral water sources as more than 12 cubic meters per second of hot water is obtained, which ranges between 22°C and 98°C degrees Celsius, as the use of hot mineral water in Algeria dates back decades ( Home use and irrigation), and was used for the first time in the heating of agricultural plastic houses in 1970, and the most important uses of geothermal energy in Algeria are the

drying of agricultural products and the adaptation of the atmosphere inside the buildings of houses, hotels, shops, etc. in addition to the production of electric power, Algeria is also available on a layer of hot water that sits on an area of many thousands of km<sup>2</sup> called the; "Alpine or continental hubs", it is bordered to the north by Biskra, from the south by Ain Saleh and from the west by Adrar and on the eastern side it extends to the Tunisian border. (Gaillard, 2015, p 244)

➤ **Water capabilities:** The amount of total rainfall that falls on Algeria, are important quantities and estimated at 65 billion cubic meters per year, but it does not take advantage of them only a small percentage is estimated at 5%, and reserves are estimated at  $6 \times 10^{10} \text{ m}^3$  and at different varying depths; "tens of meters in Adrar, hundreds of meters in Ghardaia and Ouargla, and more than 1,700 meters in Touggourt". (Boudries, 2003, p 54. Pdf)

➤ **Bioenergy potentials:** That bioenergy or Known as biomass energy, is the use of organic matter as fuel by certain techniques such as gasification, combustion or digestion, and if biomass is used properly it is important sources of renewable energy, as for Algeria resources of this type of energy are: (Z. Aminand, 2019, p 66.)

- **Forestry resources:** It consisted mainly of tropical forests, which are stationed in the north of the country, which accounted for 10% of the total area, the rest of the area it is considered a barren desert region, the total capacity of this resource is estimated at 37 Mt of oil equivalent per year and a recovery capacity of 3.7 Mt, at a rate of 10% oil equivalent annually.

- **Energy resources from urban and agricultural waste:** Estimated at 5 million tons of oil equivalent (not recycled process), and this resource represents a field capable of accommodating 1.33 million tons of oil equivalent per year.

#### 4.2 Algeria's projects in the exploitation of renewable energies:

Algeria has sought to work in many projects that target renewable energies, the most important of which are:

- **Special Program for the Great Southern** (solar project villages): This project is funded by the state and is dedicated to the southern states such as; "Adrar, Basharr, El Oued Illizi, Tamanrasset, and others", this program allows the provision of drinking water to the inhabitants of these areas (pumping and desalination), as well as the provision of lighting and air cooling inside the buildings in the summer, where the results of the National Program of Electricity highlighted that the real alternative to supplying electricity to the villages of the Algerian

Sahara is solar power, and the statistics of the first trimester of 1994 show that 6,300 centers have 270,000 inhabitants and requires more than 40 thousand kilometers of the network to meet the necessary needs, as this program is concerned with the delivery of electricity to 20 remote villages in the south whose with a harsh living and distance on the network, because of the difficulty of delivering electricity to them by traditional means such as petroleum and these villages are located in the southern states already mentioned, Sonelgaz is the organization considered and responsible for the completion of this program, so it initiated the opening of the field of participation to foreign companies and research and development centers , it started to open the field of participation to foreign companies, as well as research and development centers, as it has priority to engage in the application of technologies that respond to economic technologies and problems related to providing them to remote areas. (Gonzalo, 2016, p 94.)

▪ **Solar and Gas Generation Project in Hassi Al Raml:** Is a project to complete a hybrid station combining the sun and gas, where gas is used as a supplement to the solar energy to ensure access to electricity during the night or when the weather is cloudy, the first of its kind in the world, And the station began to set up in 2010 in Hassi sand "PtlaGmat" state Laghouat, this investment requires an estimated amount of 315.8€ million, and has been assigned a contract style "BOO" , in the sense of design, construction, exploitation and maintenance, has been given to the Spanish company "Abner" which is a global leader in this field, the production period was set at 33 months, and the contractual documents were signed on 16 December 2006, and this station is part of a program to build four other hybrid stations in Algeria, this station sits on 152 hectares and produces 180 MW of electricity, and used giant concave mirrors on an area of 18 hectares with solar panels each of which is 100m<sup>2</sup> for generating electricity, as the station is also attached to a technical pole to study ways to reduce the cost of solar energy, which makes Algeria aspire since the start of the work of this project in 2007 to be a share of 6% of the production of renewable energies in the field of electric production; especially after the launch of a construction project between the National Agency for Renewable Energies "NEAL" and Spanish company "Abner" in February 2008, the project is the construction of a \$ 350 million plant for hybrid production combining natural gas and solar energy near the state of Adrar. (Renewable energies 2016, pdf.)

▪ **Desertic Project:** In July 2009, about 12 German companies signed a protocol for the completion of the € 400 billion Desertic project

consisting of a network of solar plants in North Africa and the Middle East, and the signatory companies are: the German energy giant "Ion" and companies "Argue" "Insurance Institute Munich Re", "Deutsche Bank", the Algerian complex "Sovita", Spanish producers of solar energy, and the entrepreneurs of the Desertic project aspire to cover 15% of the energy requirements of Europe and an important part of the requirements of the producing countries, but this project has been disrupted for several reasons of which: (Gonzalo, 2016, p 127.)

- High cost of the project: where the cost is estimated at 560 million dollars, equivalent to 400 billion euros.

- Massive technological requirements: where the project requires a very sophisticated because is the use of high-quality engine technology.

- **Mostaganem Renewable Energy Factory**: This plant is the third factory in the world after the manufacturers of Dubai in the United Arab Emirates and India, this new achievement will contribute significantly to solving the problem of public lighting, reducing the use of electricity and preserving the environment, not to mention providing jobs for people with scientific qualifications and even ordinary workers specialized in the field of electricity, which undoubtedly allows to absorption part of the unemployment prevalent among young people, if the plant is a new plant for the production of alternative energy from wind energy in The coastal city of Mostaganem in western Algeria; This plant is considered the most important Algerian projects, which were started by the end of 2009 to enter the "post oil", it came the implementation of this plant which will cost €15 million under the program of Algeria to build major projects in the field of renewable energies, to which the Algerian government has allocated a financial casing of at least \$ 1.1 billion, the factory specializes in the production of electric columns operating according to the wind circulation system, which allows heating the batteries connected to them, thus the columns can illuminate for five consecutive days non-stop, with the possibility of 20% energy economy, it can also electronic segments be placed in these columns that are connected to surveillance cameras to adjust anyone trying to sabotage. (Gonzalo, 2016, p 146.)

- **Wind farms for water pumping**: This project includes the state of Djelfa and Mamoura with a happy mandate to cover the water needs of agriculture, where 80 wind turbines with 240 kWh capacity were provided in the framework of the development of the steppe and pastoral areas, as was made available electricity generated from renewable energy (solar and wind) to 3,000 house, and The institution that completed these projects is the High Conservation of Steppe Development (HCDS), also the facilities


established in the southern regions (Illizi) have succeeded in supplying 300 homes (about 2000 people) with wind energy.


▪ **Ouargla project and Touggourt (1993-1997):**The project is to create 18 agricultural plastic houses on an area of 7200 square meters using the class Alpine water, but this experiment has not been circulated contrary to the experience of Tunisia in this area, which started with one hectare in 1986 to reach today more than 104 hectares. (Gonzalo, 2016, p 153.)


## 5. CONCLUSION


It can be said in the end that in the light of all the variables that surround the global oil market, oil prices have become unpredictable to be affected by factors difficult to anticipate, because oil revenues are an important source of income in Algeria, the effects of low and price volatility are the biggest threats to the economy and impact on national economic security, despite the policies and measures undertaken by the State through economic programs and development projects, the economic security in Algeria is linked to and related to energy security and oil prices because it is a rentier economy and suffers from dependence on oil.


We conclude in the last with a series of measures through which economic security in Algeria can be achieved away from direct dependence on the oil sector, among these measures are the following:

 Necessity to existence and embodiment of political will supportive of economic diversification.

 Adopt a policy of economic diversification and investment in human resources and economic competencies.

 Investment in renewable energies as a support for economic security and an alternative to the oil economy in Algeria.

 Necessity to move from exporting crude oil to refining and bringing industrial expertise in this field.

 Establishing a fund to control resources and activate it so that its main task is to saving financial surpluses resulting from petroleum collection.

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