Producing electricity from solar energy in Algeria is a strategic alternative to securing traditional energy supplies.

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Received: 10./01/2024 *Accepted: 24/01/2024* *Published 16./ 03/2024*

Abstract:

Our studyaims to highlight the role of solarenergy in replacingtraditionalenergybecauseitisenvironmentallyfriendly, and does not harm human health, and is subject to development and modernity, and its source is inexhaustible. To answer the problem and test the hypothesis, we relied on the descriptive and analyticalapproach. To be a pioneer in achievingsustainabledevelopment, as it possesses huge capabilities of renewable energies, especially solar ones, and our country enjoys a very high sun exposure of up to 3500 hours annually in Adrar and Ain Salah and 2600 hours annually in the northern regions of the country, and this is what encourages it to invest in it However, this energy is untapped, and therefore we, recommend the necessity of reviewing the laws and legislation that encourage orientation towards this sector, benefiting from pioneering experiences in the field of technology, and energy re-engineering, to meet the challenges.

Keywords:electricity; solar energy; securing; traditional energy; Algeria.

JelClassificationCodes :Q40, Q42, Q01

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1. INTRODUCTION

Algeria, like other countries, paid attention to renewable energies, as it opened promising horizons for investment and development in it. and it has adopted several strategies related to it (renewable energy) that contribute to raising the efficiency of the industrial and agricultural economic sectors ... Etc.) In order to reduce costs and achieve sustainable development in the horizons of 2030, and to achieve this goal, society must adhere to the three restrictions of rational use of depleted resources, and not to exceed the capacity of renewable resources, to renew itself and protect the environment from pollution, otherwise development will not be permanent.

Solar energy is one of the renewable energy sources, with characteristics that are unique to other resources fossils, and therefore it is a clean, inexhaustible and non-polluted resource, and the duration of the sunshine is almost permanent, and this is what is available in Algeria and recommends it to be a pioneer in this field.

As it occupies a great place in achieving economic and social development, To understand the issue, we posed the following problem:

To what extent is Algeria moving towards adopting a solar energy strategy in producing electricity as an alternative option to traditional energies?

To answer our problem, we formulated the **following hypothesis**:

Algeria has high qualifications for solar energy, as it is spread over the entire territory of the country, especially in the desert, and this encourages it to be an ideal alternative to traditional energy, and makes it an international competitor in the production of electricity.

The **importance of the research** lies in showing the positive results that result from investing in solar energy, and the qualifications that are available from it in Algeria, and therefore it is an inevitable trend that Algeria must follow, as solar energy is characterized by having an important balance of it, and is renewable, does not have negative effects on the environment, They are the opposite of traditional resources, as their prices are fluctuating, polluted, and subject to disappearing one day... Etc., and this prompted Algeria to search for alternatives as a solution to the crisis.

In order to understand the subject and answer the problem at hand, we used **the descriptive and analytical method**. We described it in describing and analyzing the information and data that were collected and used to support our study.

And we divided our study into three axes as follows:

The first axis:Solar energy and the benefits of its use.

The second axis: analysis of the Algeria program in the exploitation of solar energy.

The third axis: the actual and tangible achievements related to the 2011/2030 program in Algeria.

2. Solar energy and the benefits of its use:

Solar energy is radiantlight and heat from the Sun that is harnessed using a range of technologies such as solar power to generate electricity, solar thermal energy (including solar water heating), and solar architecture. It is an essential source of renewable energy, and its technologies are broadly characterized as either passive solar or active solar depending on how they capture and distribute solar energy or convert it into solar power. Active solar techniques

include the use of photovoltaic systems, concentrated solar power, and solar water heating to harness the energy. Passive solar techniques include orienting a building to the Sun, selecting materials with favourable thermal mass or light-dispersing properties, and designing spaces that naturally circulate air. " (WikipediA the free encyclopedia, 2023)

Using solar energy has many benefits, all of which are of great importance in human life Solar energy is one of the most important renewable and sustainable energy sources in the world. It depends on exploiting the power of the sun to generate electricity and meet our energy needs. Below we take a look at the importance of solar energy and its role in the future: (Al-Dahiyat, 2023)

- Environmental protection : Solar energy is a clean and green alternative to traditional energy sources such as coal, oil and gas. They do not produce very harmful emissions to the environment and contribute to reducing global warming and air pollution.
- Energy and cost saving: The sun is an infinite and free energy source. When installing solar energy systems in homes and buildings, individuals can generate the electricity needed to power their appliances and save money on high electricity bills.
- Reliability and independence: Solar energy provides reliability and independence in generating electricity. Thanks to solar panel technology, individuals can generate electricity in their homes even in remote areas and areas without electrical connections.
- Technology development: The solar energy sector is witnessing continuous advancement in technology and improvement in the efficiency of solar panels. This development makes solar energy more effective and cost-effective, increasing its appeal and enhancing its use.

3. Analysis of The Algerian Program in The Exploitation of Solar Energy

Renewable energies have become the future of energy in the world and an alternative resource, especially in light of the decline in oil, and this calls for encouraging investment in this resource, and Algeria is a rich country that "can turn into a golden source of the solar system, if its desert is exploited in the required manner, because it is located in the heart of the solar belt, and its exports depend on oil at a rate of 1.1 million barrels per day, and it is exposed every day to an amount of sunlight, equivalent to if it was converted into energy destined for export, about 8 million barrels of oil, i.e. 8 million barrels fall from the sky on our country every day" (thebat , 2016), and Algeria has the potential to become the first "supplier of solar energy in the world, lighting for the whole world, and that only 0.5% of the total area of Algeria is sufficient to provide the needs of the continent of Europe for electricity generated from solar energy" (badr, 2023)

3.1 Qualifications of solar energy in Algeria

Algeria is distinguished by its high energy capabilities, as "the solar capacity is considered the most important in Algeria, but rather the most important in the Mediterranean basin, where the total amount of sunlight falling within the borders of Algerian soil is estimated at 169,440 terawatt hours per year, equivalent to 5000 times Algerian consumption of electricity, 60 times that of the 15 European countries, estimated at 3000 terawatts /hour/year 17" (zwawia, 2013, p. 168), The following table 2 shows the available solar energy capacities in Algeria by region.

Table 1. Distribution of solar energy in Algeria.

Area	Coastal area	High plateaus	Sahara
Area %	4	10	86
Average duration of sunshine(hours/year)	2650	3000	3500
Energy rate obtained (kWh/m^2/year)	1700	1900	2650

Source:(ministry of energy and mines, 2007, p. 39)

"Through the presented table, we can say that the Algerian desert is a large reservoir of solar energy. As its vast desert region receives over 2600 annual hours of sunshine (collection a significant amount of solar energy). The amount of energy extracted daily on a horizontal area of 1 square meter can be calculated to be around 5 kilowatt-hours. In general, the amount of solar energy extracted in most parts of the Algerian territory ranges from approximately 1700 kilowatt-hours per square meter per year in the north to 2263 kilowatt-hours per square meter per year in the south" (aidouni & aiouadj, 2023, p. 65)

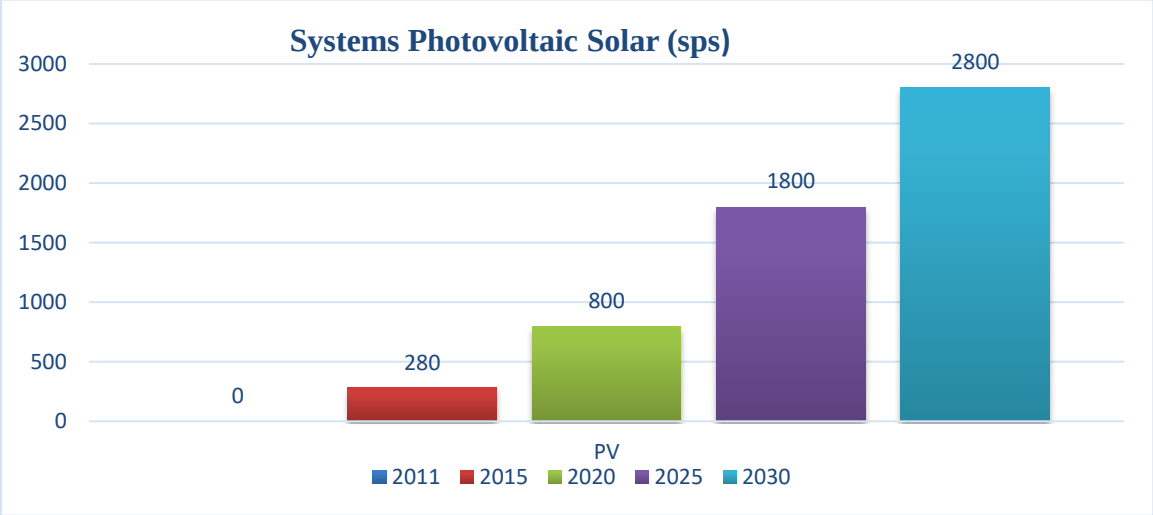
3.2 Solar energy production methods in Algeria

Solar energy" has two main technologies: solar thermal and photovoltaic (or PV). Solar thermaltechnology can provide both heat and electrical energy. About 169,440TWhr/year, which isequivalent to 5000 times the current energy usage in the country, may potentially be harnessed andused to support various application"(zaidi, khouilder, & siagh, 2017, p. 63), The solar energy production process is carried out by following two methods : (secteur des énergies renouvelables, 2013)

3.2.1 Photovoltaic Energy

It refers to the energy recovered and converted directly into electricity from sunlight using panels PV, so that the amount of production is expected to be! The energy will reach more than 37% in a year) of the total national electricity production, reaching 2800 megawatts in 2030 and extending over two periods: an estimated total production of about 800 megawatts /peak until 2020. Production of 200 megawatts / peak during the period What and figure the following shows the percentage of photovoltaic solar energy distributed over the period 2011-2030.

Figure 1. The percentage of solar photovoltaic energy expected from the renewable energy project between (2011-2030).

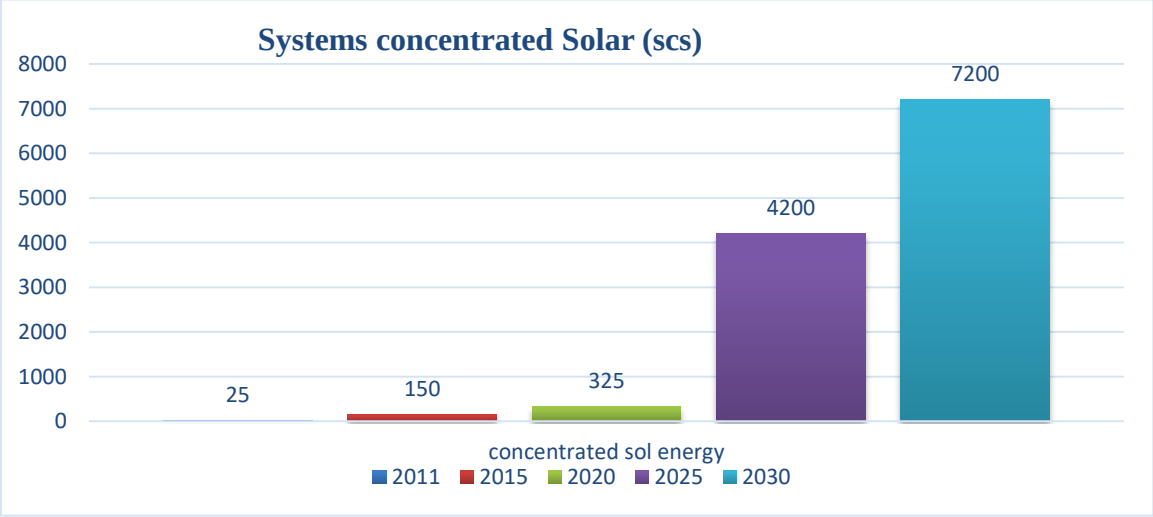


Source: (The Arab Union of Electricity, 2012, p. 64)

3.2.2 Solar thermal energy

It is represented in the conversion of sunlight into thermal energy, this transformation can be used directly to heat the building) or indirectly as the production of water vapor to rotate the turbine generators to obtain electrical energy, and in the year 2030 a total electrical capacity of 7200 megawatts will be installed, distributed over the period 2011- 2030, and the following figure explain that.

Figure 2. The percentage of concentrated solar energy expected from the renewable energy project between (2011-2030).



Source: (The Arab Union of Electricity, 2012, p. 64)

The following table shows the quantity of electrical energy produced (GWH) and the thermal efficiency of production stations (%) in Algeria.

Table 2 . Generated Energy (GWH) and efficience of power stations (%) Between (2011-2021)

the year	Steam	Gas	Combined cycle	Diesel	Hydro	winds	Solar	Othe	Total (GWH)	Efficiency (%)

2011	9.654	22.056	15.701	464	378	/	/	619	48.872	/
2012	9.422	24.077	18.623	614	389	/	/	1.159	54.086	39
2013	9.582	17.400	27.685	227	99	/	0.3	1.115	56.148	42
2014	10.221	20.211	28.444	249	193	01	0.9	1.181	60.501	42
2015	10.227	26.970	26.123	276	145	19	14	889	64.663	42
2016	11.512	24.441	28.898	281	72	19	205	806	66.234	42
2017	9.992	30.752	28.154	314	56	19	505	1.106	70.898	42
2018	10.114	30.764	28.244	312	117	19	603	1.062	71.227	41
2019	7.148	28.091	38.513	319	152	19	615	1.180	76.027	/
2020	4.471	28.175	39.027	277	50	08	600	1.231	73.839	/
2021	3.947	28.365	45.614	277	09	10.5	589	1.091	79.902	/

Source: Prepared by researchers based on Arab Electricity publications from (2011-2021).

From the table, we note that the electrical energy produced **from solar energy** was increasing rapidly, starting in the year 2013, with a production capacity estimated at 0.3 ((GWH), reaching 589 GWH in the year 2021).

As for the electrical energy generated from **wind energy**, it was weak compared to solar energy. The amount of electricity in 2014 was 01 GWH, so that the amount produced in 2015 increased to 19 GWH, and this value remained constant during the years 2016 and 2017, then decreasing to 10, but The amount of electrical energy from it increased in 2014 from 01 GWH, reaching 19 GWH in 2015, and the value remained constant until 2017, and during the years 2018 and 2019 the value of production decreased to 10 GWH, but in the year 2020 the quantity produced reached 8 GWH, and in In 2021, the quantity produced increased to 10.5 GWH.

As for the electrical energy generated **from water**, it was high and then began to gradually decline, reaching 09 GWH in 2021. In 2011, the amount of electricity produced was estimated at 378 GWH, rising to 389 GWH in 2012. However, in 2013, the production value of electricity decreased to 99 GWH. GWH, rising again in 2014 to 193 GWH. After this year, the amount of production decreased during the years 2015, 2016, and 2017, to be estimated respectively as follows: 145, 72, and 56 GWH. However, in the years 2018 and 2019, the produced value of electricity increased to 117, 152 GWH, respectively, while in the years 2020 and 2021, the amount of electricity produced decreased to 50.09 GWH.

What is noted from this table is that Algeria is increasingly interested in moving towards exploiting renewable energy sources as a strategic alternative to traditional energy sources, in order to preserve its resources for future generations, rationalize energy use, and achieve what is known as energy efficiency. In 2012, energy efficiency reached 39%, and it increased in 2013. To 42%, this value remained constant until 2017, but in 2018 it decreased to 41%.

The largest percentage of energy is mainly used for electricity production, then communications, pumping and the rest of the other uses, where solar energy represents 96.89%, while wind represents only 3.11%, and this justifies the huge potential that Algeria has in the field of solar energy.

The following table shows the weight of solar energy as a source of installed electricity production according to the different production technology in megawatts.

Table 3. Installed capacity by technology of generation (MW) Between (2011-2021) for Algeria

the year	**Steam**	**Gas**	**Combined cycle**	**Diesel**	**Hydro**	**winds**	**Solar**	**Othe**	**Total**
2011	2.487	6.352	2.052	272	228	/	/	/	11.390
2012	2.487	6.686	2.252	297	228	/	/	/	12.949
2013	2.435	7.670	4.314	301	228	/	/	150	15.098
2014	2.435	8.494	4.314	325	228	10	01	150	15.957
2015	2.435	9.699	4.314	363	228	10	40	150	17.239
2016	2.435	11.278	4.314	372	228	10	219	150	19.006
2017	2.435	11.611	4.314	382	228	10	344	150	19.474
2018	2.304	11.588	6.079	359	129	10	344	150	20.963
2019	2.304	11.638	7.016	408	129	10	344	150	21.999
2020	2.304	11.582	8.065	394	129	10	344	150	22.978
2021	20.304	11.579	9.614	394	129	10	356	150	24.536

Source: Prepared by the two researchers based on: Publications of the Arab Electricity Union (2011 to 2021)

We note from the table above that solar energy in Algeria began producing electricity from solar energy starting in the year 2014, and the production capacity was estimated at 01 MW, then it continued to rise during the years 2015, 2016, 2017, and the quantity produced was: 40, 219, 344 mw respectively.

This value remained constant until 2020, but in 2021 the amount of production reached 356 mw. This electrical energy is consumed for home consumption, commercial activities, industrial activities, the agricultural sector, government sectors, in addition to other sectors that need electricity. The following table shows us the amount of electricity consumed by GWH sectors during the period 2011-2021.

Table 4. Energy consumption by sectors (GWH) Between (2011-2021)

the year	**Residential**	**Commercial**	**Industrial**	**Agricultural**	**Governmental**	**Other**	**Total (GWH)**
2011	12.722	7.954	16.482	/	/	1.743	38.901
2012	14.764	9.077	17.331	/	/	1.978	43.150
2013	17.181	8.765	17.552	/	/	1.552	45.050
2014	17.579	9.689	19.440	/	/	2.484	49.192
2015	19.672	10.306	20.679	/	/	2.756	53.413
2016	20.211	10.689	21.411	/	/	2.838	55.149
2017	21.776	11.390	23.207	/	/	3.050	59.423
2018	24.726	11.543	23.493	/	/	1.233	60.995
2019	23.987	13.591	26.283	1.836	/	18	65.715
2020	23.102	13.056	26.140	2.177	/	17	64.492
2021	24.944	14.205	27.624	2.507	/	150	69.431

Source: Prepared by researchers based on Arab Electricity publications from (2011-2021).

What is noted from the table is that the first sector consuming electricity is the industrial sector, followed by domestic consumption, then the commercial sector, then the agricultural sector...etc.

As for **the industrial sector**, the amount of electricity consumed continuously increased from 16,482 GWH in 2011 to 27,624 in 2021.

As for **home consumption**, the amount of electricity consumed increased from 14,764 GWH in 2011 to reach 24,944 GWH in 2021.

As for **the commercial sector**, it also witnessed an increase in the amount of electricity consumed in its activities, as the value of consumption in 2011 was estimated at 7,954 GWH, reaching 14,205 GWH in 2021.

As for **the agricultural sector**, it began consuming electricity only in recent years, starting in 2019, and the amount consumed was estimated at 1,836 GWH, with the value increasing in 2021 to 2,507 GWH.

The remaining amount of electricity was consumed in **other activities**, as the amount consumed amounted to 1,743 GWH in 2011, reaching 150 GWH in 2021.

3.3 The framing policy for the orientation towards reliance on renewable energies

The national policy for renewable energies in Algeria has been framed with a set of laws related to the Energy Efficiency Law, the Law for the Promotion of Renewable Energies in the Framework of Sustainable Development, the Electricity and Gas Distribution Law, etc., and this policy is implemented through a set of organizational and institutional structures And the research centers framing this approach, including:

the National Center for the Development of Renewable Energies (CDER), the Solar Equipment Development Unit (UDES), the Applied Research Unit for Renewable Energies in Ghardaïa (URAER), the Renewable Energy Research Unit in Desert Regions (URERMS), the Electricity and Gas Research and Development Center (CREGEG), the Agency for the Promotion and Rationalization of Energy Use 20 (APRUE), and in parallel with this an arsenal of accompanying legislation has been put in place, the Research Unit for Renewable Energy Equipment at the University of Tlemcen (URMER), and the Unit for the Development of Selcium Technologies (UDTS).

3.4 Stages of implementing the renewable energy program:

With regard to the future production expectation, a plan was developed in three stages as follows:(djeddi & djeddi, 2015, p. 05)

- Two model projects for two thermal stations were completed, with a total storage capacity estimated at about 150 megawatts for each one, between 2011 and 2012, and by 2015 a total capacity of approximately 650 megawatts has been established.
- Establishment and operation of four solar thermal stations with storage, with a total capacity of about 1200 megawatts, during the period between 2016 and 2020
-Production of about 500 megawatts in the year 2021/23, then an increase in the quantity to 600 megawatts until the year 2030, and the following table 3 shows that.

Table 5. The planned program for the development of solar energy between (2011-2030).

Energy type	The years are from2011 to 2020	The years from 2021 and 2030

Photovoltaic solar energy	800 MW		200 MW for the year	
Solar thermal energy	2011/2012 Completion of two projects with a capacity of 150 MW	2016/2020 Completion of 4 centers with a capacity of 1200MW	2021/2023 500MW annually	2024/2030 600MW annually

Source: (boufas & blailia, 25 and 26 april 2017, p. 13)

The program includes from 2011 to 2030 the completion of sixty solar photovoltaic and solar thermal stations, wind energy fields and various stations aimed at developing and developing the solar energy industry, accompanied by a training program, gathering knowledge, exploiting local skills, and consolidating actual efficiency at the level of engineering and management. The following table summarizes these stages.

Table 6. the energy produced for the year 2030 and its allocations.

The year	2011/2013	2013/2015	2015/2020	2020/2030
Potential energy capacity installed	110 MW	650MW	2600 MW Designed for the national Market And potential for export approximately 2000MW	1200MW targeted At the national market And 1000 MW for export.

Source: (Makri, 2017)

the table it is clear that there is a great interest in energy, as the period 2011/2013 was devoted to the production of pioneering projects (exemplary for testing the various available technologies), while the period 2013/2015 is characterized by the direct publication of the program, while the period 2015/2030 focused on publishing on a large scale, In terms of the ruling goals, Algeria has set a program that aims in the year 2030 to produce about renewable energy, of which 17% is wind energy and 23% is from photovoltaic solar cells, while 60% of it comes from concentrated solar energy, and this is considered an engine for the development of a sustainable economy and Table 5 . 40 % of whom explain that.

Table 7. Renewable Energy Goals 2030.

The date target	Wind energy (MW)	Photovoltaic Cells (MW)	CSP (MW)	Total (MW)
2013	10	06	24	41
2015	50	182	325	557
2020	270	831	1500	2601
2030	2000	2800	7200	12000

Source: (bouzidi & ben zaid, 2012)

The total production of renewable energy in the year 2030 will reach 12,000 MW, of which 7,200 MW concentrated solar energy, 2,800 megawatts of photovoltaic solar energy, and 2,000 megawatts of wind, and Algeria aspires to reach in 2030 “the production of about electricity from solar photovoltaic and thermal. including 12,000 megawatts directed to the domestic market, and 10,000 megawatts for export.

The following table and figure show the electrical energy exchanged in gwh during the period (2011-2021).

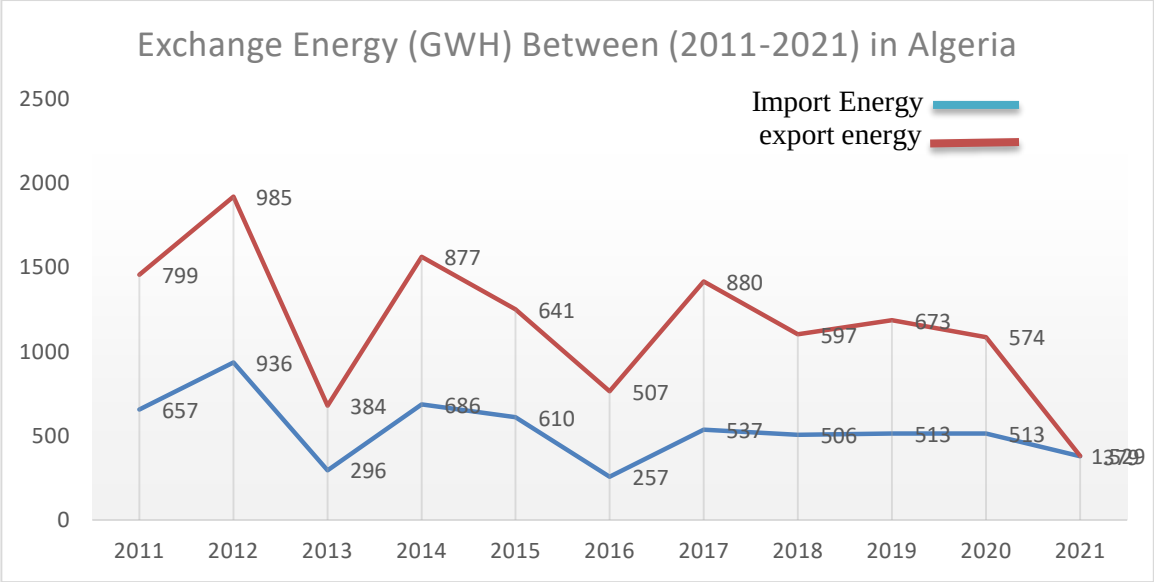
Table 8. Exchange Energy (GWH) Between (2011-2021)

The years	Import Energy	Export Energy
2011	657	799
2012	936	985
2013	296	384
2014	686	877
2015	610	641
2016	257	507
2017	537	880
2018	506	597
2019	513	673
2020	513	574
2021	539	1.529

Source: Prepared by researchers based on Arab Electricity publications from (2011-2021).

To clarify further, these data can be represented as follows:

Figure 3. Exchange Energy (GWH) Between (2011-2021)



Source: Prepared by researchers based on Arab Electricity publications from (2011-2021).

From the figure it appears to us that the exported electrical energy is greater than the imported energy, and that is why Algeria seeks to raise the value of its electricity exports, especially those produced from renewable sources, because it still depends on oil by 98%.

4. The Tangible Actual Achievements Related to the 2011/2030 Program in Algeria

The implementation of the national program for the development of renewable energies and energy efficiency has known the embodiment of a group of projects while other achievements have been initiated, the most important of which are, so we divided this period into two periods as follows:

Table 5. Actual tangible achievements related to the 2011/2030 program during the period 2011- 2020 in Algeria

The year	**Achievements achieved from implementing the national program for developing renewable energies and energy efficiency**
2014	- has been created a solar panel production plant with a production capacity of 140

	megawatts annually. - Supplying 2554 homes with electric current from the source of solar photovoltaic energy in the south and the high plateaus. - the completion of five (05) photovoltaic solar stations with a total capacity of 19 megawatts each in Illizi, Tindouf and Tamanrasset. - three (03) wind farms in the wilayats of Adrar El Beidh and Khenchela, with an estimated production capacity of 10 megawatts for each farm, and a thermal power plant in the wilaya of Guelma, with a capacity of 50 megawatts, starting from Year 2014.
2017	- was established of the Ministry of Environment and Renewable Energies in 2017 for the first time in Algeria. - the publication of the first wind atlas by the Center for the Development and Development of Renewable Energies in 2017, which includes a database on winds for 74 years.
2018	- a solar power plant was completed in Djanet, on an area of 8 hectares, with a capacity of 3 megawatts. -the Renewable Energy Development Center set up an air pollution monitoring station at the level of Mustafa Pasha Hospital, for the continuous and real-time measurement of the concentration of major pollutants in the air in the gaseous state and/or particulate health, the intensity of solar radiation and the production of renewable energies.
2019	- Algeria produced about 86.2 billionm^3, the local market acquired about 52% of it, with an amount of 45.2 billion m^3, and this represents a significant increase from consumption of 26.2 billion then in 2009. - Electricity production is currently 20,000 megawatts, compared to 600 megawatts fifty years ago. The national l certification rate has reached 98%, and natural gas has been delivered to more than 1,300 municipalities out of 1,541 municipalities, bringing the gas coverage rate to 63% now. - In December 2019. Algeria added 27.6 megawatts of new renewable energy installations, recording a growth of 7% by the end of 2021, and the total capacity of renewable energy connected to the grid without counting hydroelectric sources - about 401.3 megawatts, including 12 megawatts of new solar photovoltaic energy that started operating in 2021.

Source: Prepared by the two researchers based on; (Ministry of Environment and Renewable Energy, 2023), (bokheltoum & boughassa, 23 and 24 april 2018, p. 06),

Table 5. Actual tangible achievements related to the 2011/2030 program during the period 2020-end of 2023 in Algeria

The year	**Achievements achieved from implementing the national program for developing renewable energies and energy efficiency**
2020	- the total installed solar energy amounted to about 448 megawatts
2021	- In 2021, the construction of an electric power plant with a capacity of 3 MW has been initiated in Tin Zaouatene, which is located in the far south of Algeria in the wilaya of Tamanrasset and includes about 250 households, and grid-connected power generation has been achieved. In October 2022, and since then, the base of the power station covers an area of 12.5 hectares, provides a steady flow of green and clean energy to the local population and is rich in solar energy resources, as the daytime temperature with the entry of March reached 40 degrees Celsius. - Capacity Renewable energy in Algeria recorded 438.2 megawatts by the end of 332021 during the years 2020 and 2021. - The renewable energy sector in Algeria witnessed the graduation of 1998 graduates, the

	presence of (32 1810 35 megawatts), and a peak that does not exceed 17,000 megawatts ... and with the embodiment of the renewable energy development program, this can be raised holders of a doctoral degree by the end of 2021, and 59 institutions of the Ministry of Training and Vocational Education provide training in the field of renewable energies, thanks to 93 specialized professors, which led to the graduation of 308 new graduates in specializations related to this field
2022	-In June 2022, the Solar panel production plant was inaugurated in Ouargla, with an estimated daily production capacity of 2,400 units, équivalent to 180 megawatts annually. This plant Is included in the state's strategy related to sustainable development and the green Economy. It Will allow meeting 40% of the Needs of the national market and supplying the Solar power plants to bé developed across the wilayas of Ouargla, Toghert, Béchar, El Oued and Laghouat within the frameWorks of the 1000 MW Solar Project. - Algeria provided in 2022 an electricity production capacity of more than 25,000 megawatts, with an average need of 12,000 megawatts, and a peak of no more than 17,000 megawatts, and with the embodiment of the renewable energy's development program, this capacity can be increased by 15,000 megawatts of clean electricity.
2023	- a trial operation was launched for an 8-month trial operation was launched to store solar energy with two new stations with a capacity of 3 and 4 megawatts to be exploited by the Algerian National Company (Sonal Gaz) at the level of Djanet Province with the aim of supplying these areas electric power.

Source: Prepared by the two researchers based on: (al-chaab daily news paper, 2023) , (fettoum, 2023, p. 547), (ammer, 2022).

5. CONCLUSION

From our study, it became clear that Algeria has huge energies of renewable resources, especially solar energy, and this will enable it to cover the deficit that it has recently reached as a result of low oil prices. It can be used several times and for long periods of time if it is well exploited, and is not subjected to excessive use in a manner that leads to its gradual deterioration and diminishing the validity of its use.

From our study, we reached the following **results**:

-Increasing the consumption of traditional energies leads to depletion and demise in the future because their prices fluctuate in the global markets, pollute the environment and harm the health of society, and this encourages interest in renewable energies such as the sun.

-Algeria has high solar energy, which is sufficient to cover the difference in the decline in the size of its conventional energy.

-Algeria has many and varied resources, and this confirms the possibilities of diversifying its renewable energy sources.

- The success of energy programs needs to be guided by pioneering Arab and international experiences to convey their success experiences in order to rationalize exploiting energy, improving the environment for research and development, and qualifying human cadres capable of managing and leading this experiment to achieve the set goals, i.e. to achieve the energy estimated to be achieved within the framework of the implementation of the program.2011-2030

From the previous results, the following **recommendations** can be formulated:

- Encouraging research and development in the exploitation of renewable energy, especially solar energy, with the support of private institutions by framing.
- Opening the way to expand the field of partnership between Algeria and the Arroiacountries, and the rest of the other countries that wish to do so.
- The need for Algeria to adopt a strategy of exploiting solar energy in order to achieve permanent growth, and this allows for improving the standard of living, reducing environmental pollution and reducing health risks, and this is to reach sustainable development
- Encouraging joint work between the government and the private sector in order to study projects for the future development of renewable energy systems Especially solar in light of the energies available in this country.
-Adapting legal texts in the field of energy production and transport, in conjunction with working on training cadres in the field of renewable energy, especially solar energy, and opening majors in the university and training centers that support this.

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