Al-Qadisiyah Journal for Administrative and Economic Sciences ISSN$_{Online}$: 2312-9883
QJAE, Volume 25, Issue 4 (2023) ISSN$_{Print}$: 1816-9171

Conversion to renewable energy uses, concepts, sources and motives for the period from 2003-2021 (An analytical study)

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Abstract : Today, the use of renewable energy has become a priority in global and regional concerns, after the emergence of many environmental problems and risks and their repercussions on human life. Renewable energy meets the requirements of humanity and the inductive approach was relied upon (moving from the general to the specific, coupled with a descriptive analysis of the nature of those sources. On the emerging energy, we conclude that the diversity of reasons for resorting to the use of traditional energy alternatives (crude oil, natural gas, coal, including environmental motives resulting from the extraction and refining of traditional sources as a result of the formation of land, water and air, including political motives that fall under the so-called necessary to find alternative energy sources.

Keywords: renewable energy, energy sources, technology, motives

Introduction:

Technology in the field of alternative energy at the present time is one of the most important pillars on which the foundations of industrialized countries, or what is called developed countries, stand. It was accompanied by huge expenses in this regard, and this, of course, led to the presence of some negative repercussions embodied in the occurrence of a large technological gap between the developed countries that own technology and monopolize it, and the developing countries that are in dire need of such technology, and thus only a few countries dominated. On the means of knowledge and technology, which resulted in these countries controlling the fate of the entire world in this field, and there is no doubt that it has developed technology used in the process of producing renewable energies in various forms has an important impact on the times.

Current Renewable energy technologies provide many services to meet basic human needs, represented by electricity, lighting, cooling, heating, mechanical energy, mobility and communication. Renewable energy engines are classified | (benefits) in several different ways For example, the Intergovernmental Panel on Climate Change (IPCC) Special Report on Renewable Energy Sources and Climate Change Mitigation (SRREN) categorized the drivers, opportunities, and key benefits of renewable energy in the environment Climate change mitigation as well Reducing health and environmental impacts.

Research importance:

The issue of finding renewable energy sources receives priority in global and regional concerns after the emergence of many environmental risks and problems and their repercussions on the life of all mankind, and that prompted the countries of the world to search for alternatives to traditional energy.

Research objectives:

The main objective of the research is to stand on the various concepts and sources of renewable energy due to the importance of making world societies aware of the seriousness of the global environmental deterioration on the present and future of those societies and the next generations.

Research problem:

The problem with the research is that finding alternative sources of traditional fossil energy is not easy, as it requires a kind of modern technology compared to traditional sources, which is not available in poor developing countries that possess their natural ingredients, but they cannot find them without technological innovations and finding it is a global issue.

Research hypothetical:

The research stems from the hypothesis that finding alternative energy sources represents a strategic choice for all mankind in light of the pollution of the global environment.

Research Methodology:

The inductive approach was adopted (moving from the general to the specific because the issue of finding alternative energy sources stems from seeking to provide alternatives through the development of global and national capabilities, coupled with analysis descriptive to the nature of those sources.

Search division:

The research was divided as follows:

The first topic: concepts and sources

The second topic: the nature and type of technology and alternative energy sources.

The third topic: the motives for resorting to renewable energy policies.

The first topic: concepts and sources.

First: The concept

The umbrella term for renewable energy describes a wide range of energy sources that are not exhausted Usage including solar, wind, tidal and bioenergy **(wright,2011:22)**. Renewable energy is defined as energy derived from natural resources that cannot be renewed or that cannot be renewed that (sustainable energy) exhausts any form of solar, geophysical, or biological energy resource that is resupplied by natural processes at a rate equal to or greater than its utilization rate(**Koçak and Kuşkaya,2017:830)**, and is thereby Substantial damage from fossil fuels from petroleum, coal and natural gas, so it can be defined as those resources that you get through energy streams that recur in nature periodically(**Destek,2015:570)**. There are other restrictions on international bodies for renewable energy, including the following:

1) The International Energy Agency (IRA) defines renewable energy sources to include combustible renewable waste (CRW), hydro, geothermal, solar, wind and tidal power Islands and wave energy **(US Energy Information Administration,2002)**.
2) The United Nations Environmental Protection Program (UNEP) defines it as an energy whose source is not a fixed and limited stock in nature, but rather is renewed periodically faster than its consumption rate, and appears in the following five forms: biomass, sunlight, wind, hydroelectric power, And the energy of the earth's interior **(Khathir et al,2021:15).**
3) The Intergovernmental Panel on Climate Change (IPCC) defines renewable energy as any energy whose source is geophysical or biological from the sun, which is renewed in nature at a rate equivalent to or greater than its use rates and is generated from successive and continuous currents in nature such as biomass energy, solar energy, underground energy Earth, water movement, ocean tidal energy and wind energy **(Munawwar& Hamo,2010:133)**.

Second: The Sources

There is a fundamental difference between renewable energy sources and fossil fuels such as oil, coal, or natural gas of nuclear fuel used in nuclear reactors **(Al-Juraidi,2012:3)**.

1) solar energy: Solar energy is defined as heat and light emanating from the sun **(Onar,2010:2)**, and solar energy is considered one of the clean and inexhaustible renewable energies as long as the sun exists, just as all energy sources on Earth originated first from this energy, and the use of the sun's thermal energy has been known since Thousands of years in hot regions, where it was used to heat water and dry some crops to save them from damage, but at present, research and experiments are based on trying to exploit the sun's energy in the production of electric energy, heating, air conditioning, smelting metals, and others," according to the statistics of the International Energy Agency. At the end of 2008, the installed photovoltaic energy in the world reached about 3425 megawatts, while it reached (180396) megawatts in 2014. Germany topped the countries of the world, as the total cumulative installed photovoltaic capacities reached (9677) megawatts, and the growth rate of this energy reached (64.7%), followed by Spain, Japan and the United States of America **(Kasuri and others,2017:186).**

It is noted from Table No (1) that the global production of photovoltaic solar energy is increasing worldwide for the period from 2011 to 2021, as the total production in 2011 reached about (72.2) gig watts and increased at a modest rate in years 2016 and 2017 to reach (295.2) and (390.2) gig watts, with a growth rate of (32.26) and (32.18) gig watts, respectively. However, since 2018, production has begun to rise at an increasing pace, reaching (483.0) gig watts, with a growth rate of (23.78%), and this upward trend continues in the production of photovoltaic energy. Until 2021, as the total global production reached (1-843) megawatts, with a growth rate of (18.70%). In 2011, solar energy witnessed a double increase in the rate of investments in its technologies, as new investments every year since 2012 have increased at an increasing rate, and this is linked to the increase in savings. The economy provided by solar energy, as well as issues of global awareness of the necessity of activating the available renewable energies, to meet

the growing demand for energy on the one hand, And to seek to diversify energy sources on the other hand, and that these developments in the production of solar energy have made it an important position in the global energy markets.

(Table (1) Total global production of photovoltaic solar energy for the period 2010-2021)
(Thousand megawatts)

Years	Global Production	Growth rate per annum(%)
2011	72.2	.....
2012	101.7	40.86
2013	137.2	34.91
2014	175.6	27.99
2015	223.2	27.11
2016	295.2	32.26
2017	390.2	32.18
2018	483.0	23.78
2019	584.7	21.06
2020	710.3	21.48
2021	843.1	18.70
Growth rate 2011-2021 (%)	0.28	

It was prepared based on:

Source: bp, Statistical Review of World Energy 2022, p46.

2) Hydropower Energy: The use of water energy dates back thousands of years, but its use declined due to the increasing demand for fossil fuels, especially at the beginning of the twentieth century. Countries began to pay attention to water energy again in the seventies of the last century, due to the increase in oil prices as well as interest in environmental issues. Hydroelectricity is associated with low unit costs produced from it, as the cost of a kilowatt is approximately (10) cents $, which makes it a strong competitor compared to traditional energy sources, despite these advantages of hydropower, but the establishment of hydropower plants requires high capital costs, in addition to the fact that these stations must be near water sources**(Jabbar,2016:58).**

The potential energy in the world's hydropower resources is about (3) million megawatts, about a quarter of which is found in Africa, (20%) in South America, (16%) in Southeast Asia, and 16% in China and the (former) Soviet Union. The rest is distributed in North America, Europe and other regions. On the other hand, the volume of energy exploited from these sources is about (150) million megawatts, which is equivalent to about (15) of the total potential energy. One of the reasons for this low rate of exploitation of hydropower resources is attributed to the high cost of establishing power stations (12). Water energy is one of the most important and cheapest sources of energy production. It is clean energy that is obtained from the oceans. This energy exists in several forms:

a) Hydropower: Hydroelectric power is distinguished, among other renewable sources, in its ability to generate huge and concentrated quantities of electricity, in addition to the low percentage of operational costs and the lack of problems such as periodic outages. to enable it to dispense with traditional sources of electricity generation **(Raafat and others,1988:148)**, In addition, hydroelectric energy has a unique advantage over other renewable sources, which is represented by the pumping and hydroelectric storage (PH) technology. The form of potential energy of water that is pumped to high levels of water, and according to the Electric Energy Research Institute (EPRI), pumping and hydroelectric storage represent the most extensive form among the other forms of energy storage available, as the efficiency of pumping and hydroelectric storage is estimated at more than (99%) of the total storage capacity globally, which is equivalent to (127) thousand gig watts **(Al-Ammar,2013:247)**. It can be seen from Table No. (2) that the global production of hydroelectric power amounted to about (34.69) gig watts in 2011, and despite the fluctuations in the amount of energy added between increases and decreases at the global level, the global production of hydroelectric energy has developed to reach (38.99) gig watts in 2017 at a growth rate of (0.83), and the production of energy from water sources has been increasing for the period from 2011 to the present day.

Table (2) Total global production of hydroelectric power for the period (2021-2011)

(Thousand megawatt)

Years	Global Production	Growth rate per annum (%)
2011	34.69	.....
2012	35.95	3.63

2013	**37.17**	**3.39**
2014	**37.93**	**2.04**
2015	**37.60**	**-0.87**
2016	**38.67**	**2.85**
2017	**38.99**	**0.83**
2018	**39.84**	**2.18**
2019	**40.15**	**0.78**
2020	**41.09**	**2.34**
2021	**40.26**	**-2.02**
Growth rate 2011-2021 (%)	**0.02**	

It was prepared based on:

Source: bp Statistical Review of World Energy 2022, p.42.

b) Ocean energy: It is considered part of the hydroelectric energy, but it differs in terms of the concept and technology used in its production processes and includes several types of energy: -

(**First): Wave energy**: which results from the effect of sunlight on the earth's atmosphere and the movement of winds, which It leads to the formation of waves that generate continuous energy through their movement.

(Secondly): Tidal energy: It is the energy generated from exploiting the tidal phenomenon that occurs due to the attraction between the earth and the moon, and it began to be clearly invested in 1966, as the largest global tidal energy station was built in French Malou, with an estimated energy of approximately (240). megawatt-hours annually, and it is still operating until now, and in light of the oil price adjustment that took place in 1973, and the (developed) consuming countries' endeavor to find energy alternatives (oil), the Scottish engineer (Stephen Salter) accomplished the first steps To develop ocean energy through (generator directed ocean), and the calculated cost of obtaining a kilowatt-hour was (1) $ (16) and it was a high cost at the time, but with the rise in fossil fuel prices, this type of energy has become Economically feasible.

(Third)Ocean energy: The oceans are a huge storehouse of solar energy, and the energy of the oceans is represented by the energy stored in the waves and the energy of the difference. Low-pressure thermal machines, as there are many places in the oceans where temperature differences reach (20) - (25) at depths less than 1000 m**(signal,2013:2)**. And the oceans cover about (70%) of the surface of the globe, so it is one of the largest areas in which solar heat accumulates, and it is possible to benefit from the warm waters of the ocean surfaces in generating electricity, as the United States has produced electrical stations in the Hawaiian Islands, as well as India and China, the latter, which were able to enter into commercial work with somewhat narrow limits, as they marketed the managed marine buoys that warn ships in the oceans. Table No. (3) shows the volume of global production of ocean energy during the period (2010-2021) as follows: -

Table (3) World production of ocean energy for the period (2010-2021)

MW

Years	Global Production	Growth rate per annum (%)
2011	**502.7**	**.....**
2012	**509.4**	**1.33**
2013	**509.9**	**0.10**
2014	**513.0**	**0.61**
2015	**512.9**	**-0.02**
2016	**523.8**	**2.13**
2017	**527.6**	**0.73**
2018	**528.7**	**0.21**
2019	**530.6**	**0.36**
2020	**532.9**	**0.43**
2021	**536.2**	**0.62**
Growth rate 2011-2021 (%)	**0.01**	

It was prepared based on:

Source: https://www.irena.org/Energy-Transition/Technology/Ocean-energy**.**

4) Wind Energy:

Wind energy is a form of indirect solar energy, as 1% of solar energy is transformed into wind energy while it is in the atmosphere **(Chauhan,2012:7)**, as wind energy is one of the original sources of renewable energy, and man has

developed it over time **(jhingan,2007:61)**, as Wind power is used on the scale of wind energy, I have used countries in raising water from wells, and in grinding grain. And that the first use of wind energy was in 1931The former Soviet Union, as it was used to generate electric power through the establishment of experimental stations **(Abdel-Ridha,2011:185)** As a result of the improvements achieved by wind energy, its contribution to power generation has increased and this has led to a decrease in its costs, as it is expected to have a promising future, due to the competitive advantage it possesses compared to other renewable sources, or even with traditional sources of energy **(Al-Ammar,2013:243)**. The global production of wind energy has evolved, and as shown in Table No. (4) for the period (2011-2021), the world production of wind energy reached (220.1) gig watts in 2011 and increased to reach (1-220) gig watts, with a growth rate of (72%). -12) In the year 2021, it is also noted that the added quantities of wind energy have increased in the world, and the year 2020 marks the largest increase in the added energy of wind energy if it reached (731.8) gig watts, with a growth rate of (17.79). This large increase in 2020 comes as a result of the development of production of Wind power in China despite the COVID-19 pandemic, where developers have built nearly 100 megawatts of wind farms.China is the largest country in the production of wind energy, followed by the United States of America, Germany, and then India. In general, the manufacturing of wind turbines is concentrated in China, the European Union, India, and the United States of America. On the Arab side, Morocco stands at the fore in the production of wind energy, followed by Egypt, Tunisia, Jordan, Algeria, and Bahrain. Syria, Kuwait, and finally Lebanon, and the Arab countries seek to develop the production of electric energy from wind **(OAPEC,2017:165).**

Table (4) Total global production of wind energy for the period (2011-2021)
(winding mW)

Years	Global Production	Growth rate per annum (%)
2011	**220.1**	**.....**
2012	**266.9**	**21.26**
2013	**299.8**	**12.33**
2014	**349.3**	**16.51**
2015	**416.2**	**19.15**
2016	**466.9**	**12.18**
2017	**514.2**	**10.13**
2018	**563.5**	**9.59**
2019	**621.3**	**10.26**
2020	**731.8**	**17.79**
2021	**220.1**	**12.72**
Growth rate 2011-2021 (%)	**0.14**	

Source: Prepared based on:
Source: bp, Statistical Review of World Energy 2022, p.47.

4) Geothermal Energy:

It is thermal energy that is found in the ground as a result of the friction of hot rocks with water nearby, or water that humans somehow connect to those rocks, and it comes out in various forms such as springs, hot water springs, and volcanoes **(Ismail,1981:224).**

Geothermal energy is growing modestly when compared to the growth of other renewable energies, and its markets are organized, and despite its slow growth, the total installed geothermal energy in the world has increased from (1:10) gig watts in 2011) to (14.7) gig watts in 2021, with a growth rate It reached (4.26%), and the energy that was added from geothermal heat in 2021 is the largest addition for the period (2011-2021), and as evidenced by this In Table No (5).

Table (5) Total installed geothermal energy production in the world for the period (2011-2021)

Years	Global Production	Growth rate per annum (%)
2011	**10.1**	**.....**
2012	**10.4**	**2.97**
2013	**10.7**	**2.88**
2014	**11.1**	**3.74**
2015	**11.8**	**6.31**

2016	**12.2**	**3.39**
2017	**12.7**	**4.10**
2018	**13.2**	**3.94**
2019	**13.9**	**5.30**
2020	**14.1**	**1.44**
2021	**14.7**	**4.26**
Growth rate 2011-2021 (%)	**0.04**	

It was prepared based on:

Source: bp, Statistical Review of World Energy 2022, p.48.

5) Biomass Energy:

Biomass, which is called biomass in the strict sense, is all organic matter, and any part made up of living matter that can be used as an energy source. Different types of trees are the most well-known examples as a form of biomass **(Energy and Non-Renewable Resources,1988:8).**

It is one of the natural energy known to mankind for the purposes of obtaining heat and heating long ago, and this energy was not known in the sixties of the last century on how to extract it from foodstuffs or plants, and when talking about biomass it is diverse and includes all living materials on The globe, which includes wood, plants, and animal waste), is a product of describing all organic materials resulting from photosynthesis on the surface of the earth, and approximately (24) billion people worldwide depend on this source to meet their daily life needs. In the forefront of the producing countries, the United States and Brazil stand this substance from vital sources, and Sweden obtains more than (17%) of its energy needs from vital sources, as a result of expanding the cultivation of willow trees to produce (ethanol - Biodisin)(**Saleh,2017:319).**

With regard to biofuels, global production of it increased from (1197) thousand tons of oil equivalent in 2011 to reach (1747) thousand tons of oil equivalent in 2021, with fluctuating annual growth rates between Increase and decrease This fluctuation is due to competition with other types of fuel as well as costs, prices and conditions needed by biofuels to produce economically viable quantities. Table No. (6) shows these facts and developments in the global production of biofuels for the period (2011_2021)

Table (6) The evolution of global production of

Years	Global Production	Growth rate per annum (%)
2011	**1197**	**.....**
2012	**1216**	**1.59**
2013	**1325**	**8.96**
2014	**1443**	**8.91**
2015	**1443**	**0.00**
2016	**1492**	**3.40**
2017	**1560**	**4.56**
2018	**1720**	**10.26**
2019	**1796**	**4.42**
2020	**1682**	**-6.35**
2021	**1747**	**3.86**
Growth rate 2011-2021 (%)	**0.04**	

It was prepared based on:

Source:- BP, Statistical Review of World Energy, June 2022, p.48.

6) Hydrogen gas energy:

It represents an important type of fuel, and it is expected to play a major role in securing energy in the future Cars that run on hydrogen gas have appeared, and their most prominent applications are utilization of it in (fuel cells), which are promising cells for wide applications in the future, and electricity is generated inside them directly by passing hydrogen and air in them, and through the union of hydrogen and oxygen, you get electrical energy, and the waste of this process is water Only, that is, fuel cells do not contribute to environmental pollution (**Arij,2010:3).**

It is found in the air in a small percentage, while it is found in great abundance united with oxygen in the form of ocean water Because of its importance, some believe that hydrogen will become the fuel of the future and an ideal fuel, whether in terms of economic and technical feasibility or in terms of its effects on the environment, as one kilogram of hydrogen gives three times the energy resulting from the same amount of gasoline, and hydrogen can be provided through decomposition Water electrolysis, or thermal decomposition of water by direct heating to about 3500 °C or more, or through the direct influence of solar radiation like the process of photosynthesis **(Rifkin,2020:23).**

The second topic: the nature and type of technology and alternative energy sources.

1-technology type.

Renewable energy technology is new compared to other sources of energy, as it is characterized by many advantages that traditional energy sources do not possess, but its current cost is high compared to traditional sources of energy, in addition to the fact that it cannot meet all energy requirements at present, except for a part. They are small and require high capabilities and expertise that are only available in some developed countries that have been able to exploit these sources with a small amount of their energy requirements. There is no doubt that crude oil is after the main source in meeting the world's energy needs, and the percentage of dependence on it reaches more than (40%) of the total global energy consumption, while other energy sources share the remaining percentage at varying rates, as coal occupies the second place, followed by natural gas, and other sources of energy come Renewable energy ranks fourth, as all renewable energy sources represent (13%) of the total energy consumed in the world and most of it is consumed to generate electricity, of all kinds solar energy, wind energy, biofuels, tidal energy, thermal energy, and other renewable energies (**Abdel-Reda,2016:340**). **Environment Programme:26**).

2)volume costs.

That most renewable energies, perhaps before the past half century, are all characterized by high costs, and therefore companies specialized in this field do not tend to invest in these energies, due to the high risk in them, especially since the prices of alternatives to them (traditional relationships) are low, prices, and what happened in The truth is the continuation of funded research within the framework of the strategy to access any kind of renewable energies that meet the directions of developed countries to adjust the course their (energy security), and on the other hand to find an alternative competitor to traditional energies (fossil) to limit the control of OPEC countries with this energy. That is why funding for research and development continued to reach suitable technologies for renewable energies, stimulating the direction of investments towards them, to ensure an energy mix in which non-fossil energies constitute an ever-increasing proportion driven by global stimulus to reduce the consumption of polluting fossil energy, which makes it a competitor real **(IRENA,2021:2)**.

The investment costs in the field of renewable energy production (all of which are produced in the form of electricity differ from one technology to another, and are lower than in the case of wind energy (about $ 1000 per kilowatt) and the highest possible in the case of the P Solar photovoltaic cell, which currently reaches More than about 5,000 US dollars per kilowatt. These costs are very high when compared with the economic costs of investing in traditional methods of generating electricity, which are single-cycle gas turbines (about 350 US dollars per kilowatt) or high-efficiency double cycle (which is about 550 dollars). US dollars per kilowatt and the costs of traditional coal plants do not currently exceed about 1200 US dollars per kilowatt after adding all the equipment and environmental requirements **(Ahmed,2016:53)** . From Table No. (7) we notice that solar energy of both types is the most affordable in its costs, and thus the prices of electricity generated from it are low, and at a lower level than the Arabian wind and offshore wind, as the intensification of research and development in these sources was the highest, while concentrated solar energy and energy The most expensive wind compared to other types.

Table (7) Costs and production capacities of renewable energies between (2010-2020)

Energy type	Total installed cost 2020 $ KW\h			production capacity factor (%)			The flat cost of electricity 2020 $ KW		
	2010	2020	%	2010	2020	%	2010	2020	%
Bioenergy	2619	2543	3-	72	70	2-	0.076	0.076	0
Geothermal energy	2620	4468	71	87	83	5-	0.049	0.071	45
hydropower	1269	1870	47	44	46	4	0.038	0.044	18
solar energy photonic	4731	883	81-	14	16	17	0.381	0.057	85-
Concentrated solar energy	9095	4581	50-	30	42	40	0.340	0.108	68-
Onshore wind energy	1971	1355	31-	27	36	31	0.089	0.039	56-
Offshore wind energy	4706	3185	32-	38	40	6	0.162	0.084	48-

It was prepared based on:

Source: IRENA, Renewable Power Generation Cost in 2020.

The costs of generating electricity from renewable energy have decreased significantly over the past decade, and the costs of generating electricity from solar PV projects at the utility level have decreased by 85% between 2010 and 2020.

The third topic: the motives for resorting to renewable energy policies.

There are three main motives that drive the world to develop and use renewable energies, as follows:

First, environmental drivers

As for health problems, loss of biodiversity and other environmental challenges, only the deployment of renewable energy to become an integral part of the strategies of governments around the world to face many challenges. All levels of Policies support renewable energy sources in order to reduce the health impacts associated with energy production and use In China, for example, the search for cleaner air and water has become an important driver of renewable energy goals and policies, along with reducing carbon dioxide emissions, job creation and development Economic concerns about the effects of the traditional use of biomass, and the burning of kerosene and other fossil fuels for cooking and heating on indoor air quality, as well as the need to reduce local deforestation, have prompted policies to promote modern renewable energy sources (**http://www.ucsusa.org/clean_energy our-energy-choices/energy-and- water-use/water-energy electricity-overview.html. VnHHSYdgmUk).**

Second: Economic Drivers:

The economic benefits associated with renewable energy that drive the adoption of subsidy policies include the following:

1) Improving the trade balance and reducing price fluctuations.

The majority of countries import most, if not all, of the fossil fuels they consume, and investment in renewable energy sources can improve the trade balance of the country or region, and can reduce fuel price volatility and supply risks, as well as reduce the import of fossil fuels, etc. associated economic savings for consumers and government budgets), one of the main drivers of renewable energy policies including 100% renewable energy targets. Denmark, for example, expects its strategy to shift towards 100% renewable energy (power and heating) by 2035, and free from fossil fuels at the level of the economy by 2050 **(http://www.ens.dk/sites/ens.dk/files/policy/danish-climate).**

2) Creating job opportunities and developing new industries and skills.

Job creation has been a driver of renewable energy policies that aim to help boost local economies, and halt or reverse population and brain drain. For example, the deployment of concentrated solar thermal power (CSP) is a means to achieve multiple development goals in local communities, including Creating job opportunities, skills development and training, as well as social development, social and cultural promotion, and climate change. In this field, the US state of Iowa supported the production of Ethanol and the deployment of other renewable technologies to create new jobs that strengthen the middle class in the state, increase technological investment within the state, reduce dependence on imported fuel, and provide clean air and water **(World Bank,2015:33**).

3) To meet the rapidly increasing demand for energy.

The modularity of many renewable technologies and the relative speed with which they can be implemented, together with their rapidly declining costs (particularly for solar photovoltaic and wind energy), have made them the technologies of choice to meet the ever-increasing demand for energy services across the Global South. Brazil has transformed Which relied heavily on hydroelectric energy, which met more than (80%) of the domestic electricity demand, to other renewable technologies to meet the growing demand for electricity while reducing the country's exposure to supply shortages in dry years. In Africa, Egypt is working to promote the deployment of Renewable energy sources in the electricity sector to help meet the growing energy demand, and South Africa plans to significantly increase its electricity production from renewable sources to help stabilize the electricity grid and to alleviate the electric power shortage that caused blackouts across the country **(World Bank,2015:34).**

4) Providing access to energy and alleviating poverty

Many countries have set targets and enacted support policies for scaling up renewable energy to provide access to modern energy services to people living in increasingly remote and rural areas. National and regional governments are adopting Local and renewable policies and goals to advance energy access. In Africa, Uganda's Kasese district (home to about 130,000 households) has set a goal of achieving 100% access to energy services to meet all domestic, productive and social needs using renewable energy by 2020. Drivers include the promotion of local development by eliminating poverty associated with lack of access to energy.

5) Preserving local energy revenues

When fuel imports are replaced by domestic renewable energy, whether at the national or sub-national level, energy expenditures can stimulate more economic activity in the local economy. For example, the US state of Hawaii adopted binding legislation in 2015 aiming to obtain 70% renewable electricity. By 2030, and 100% by 2045 Hawaii faces the highest electricity prices of any US state and an unsustainable reliance on imported fossil fuels. Renewable energy is expected to address both these challenges, providing local electricity at a much lower cost and increasing tax revenues **(Bird&other,2013:532).**

6) Reducing public health costs.

Low costs are one of the incentives that push the world towards using these energies and replacing them with traditional energies, and the reason for the lack of these costs that improve the use of production technologies can be attributed to، this is what traditional energy technologies require in their infancy**.**

(Madahi,2022:7).

Third: political motives

1) Improving global energy security.

The rapid growth of emerging developing countries such as China and India put increasing pressure on the global oil markets, and this is a problem that is likely to worsen with time, and the continuity of consuming fossil energy sources at the same rate will lead to the depletion of these sources and the possibility of their depletion within the next few decades, which may lead to a major global shock to achieve the sustainability of the energy sector **(Madahi,2022:7).**

2) Increased flexibility and reliability.

Concerns about risks associated with transporting fuels (for example, rail and pipeline accidents, power outages, and many other factors) drive renewable energy policies and distributed renewable energy systems less likely to fail on a large scale and can make the power grid and other energy systems More resilient to threats, including the weather-related impacts of global climate change, energy distributed locally on rooftops, or from wind power projects. The goal is to transition to a safe, resilient and sustainable energy system based on renewable energy.

3) Ensuring energy democracy

Energy democratization is playing an increasingly important role in guiding domestic goals and policies, both to support renewable energy and local control over energy production and distribution and in combination with energy efficiency improvements, particularly at the local level, for example, recalled by the increasing number of municipalities in Japan, Germany, the United States and elsewhere. Elsewhere, ownership of local utilities is needed to achieve more democratic control, a path often associated with the desire to promote local renewable energy. In this regard, a major alliance was made in the German capital, Berlin, by local groups to address climate change and achieve broader environmental sustainability goals, to make the local energy system more democratic and socially equitable.

conclusions

1) Renewable energy is characterized by a wide range of energy sources that are not exhausted. With the use of it, it is not an energy derived from natural resources that are renewable and cannot be implemented with the use of it.
2) Attention is focused on alternative energy sources at the global level, in light of the global concern about air pollution, acid rain, oil leakage and nuclear risks.
3) Poor developing countries have poor energy resources, but they do not have sufficient financial resources, and for this reason, Rich developed countries occupy the forefront in the field of technological innovation in finding energy sources alternative.
4) The process of finding alternative energy sources is subject to the logic of economic theory in both sides of the costs that it needs when producing and to the prices when selling it to individuals or other productive establishments, and from this standpoint, it is often seen as not economically feasible. Those sources by developed countries under the pressures of the so-called (Security energy) have.
5) The diversity of the reasons for resorting to the use of traditional energy alternatives (crude oil, natural gas, coal, including environmental motives resulting from the extraction and refining of traditional sources as a result of the formation of land, water and air, including political motives that fall under the so-called necessary not to find alternative energy sources.

Recommendations

1) Work on concerted international efforts to ensure the equitable use of alternative energy sources for all countries and not be limited to the rich developed countries, because the main cause of global pollution is borne by the industrialized countries through their industries that pollute the environment.
2) Reducing heat emissions by countries contributing to global warming, led by the states, China and India, through the use of technology that is less dependent on energy sources fossil.
3) The rich developed countries must bear the costs of finding fossil energy sources in their industries in a way that exceeds the permissible rates. Rather, they have spread industries that pollute the environment in developing countries, taking advantage of the state of money and the low income of their societies
4) Increasing the role of the appreciating international organizations, the parties, in holding conferences that prepare programs and policies to reduce greenhouse emissions according to timetables that are monitored periodically to ensure adherence to them by the countries that contribute most to the phenomenon of global warming.
5) Increasing international development assistance to poor developing countries to reduce the damages of environmental pollution and the resulting problems of desertification, drought and lack of rain, which make these countries unable to provide the requirements of daily life for their citizens.

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