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Electrical Energy Problems And Proposals For Solutions In Kuwait

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Abstract :

The study aimed to identify the problems facing the electricity sector in the State of Kuwait, to identify global experiences in facing the problems of the electricity sector, and to develop a proposed scenario to confront the problems of the electricity sector in the State of Kuwait. The study reached some results and proposals that may contribute to relying on renewable energies such as solar energy. Wind energy is an alternative to traditional electricity, which costs the state a lot of money and also helps pollute the Kuwaiti environment.

Key Words: Electrical Energy – Problems – Proposals – Solutions – Kuwait

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Introduction :

Electricity is one of the most important vital commodities in modern societies, especially the advanced industrial countries, and with the increase in the development of societies, the increase in population numbers, and the increasing levels of urban expansion, the demand for electric energy has taken on the rise, and the consumption of electric energy is one of the most important indicators of economic growth in general, but the levels Growth is not the only determinant of the growth in demand for electricity consumption, as there are other factors that contribute to the increase in energy demand.

The State of Kuwait is characterized by a hot summer climate of approximately (50) degrees Celsius, which contributes to an increase in demand for electricity to meet the rising temperatures, *(State of Kuwait, 2021)* in addition to the weak electrical energy infrastructure, which cannot bear the increase in electrical loads and high temperatures that help in the combustion of generators, and the exit of some stations for service. *(Ministry of Electricity & Water, 2021)*

In the summer of 2021, the electricity was cut off during the afternoon hours in the areas of Mishref, Sabah Al-Salem, and Al-Adan, under the weight of an electric load of 13,700 MW, compared to 11,680 MW during the same period. And in the south of Sabah Al-Salem "H", it stopped working, which caused a power outage in large parts of the areas of Mishref, Sabah Al-Salem and Al-Adan. *(State of Kuwait, 2021)*

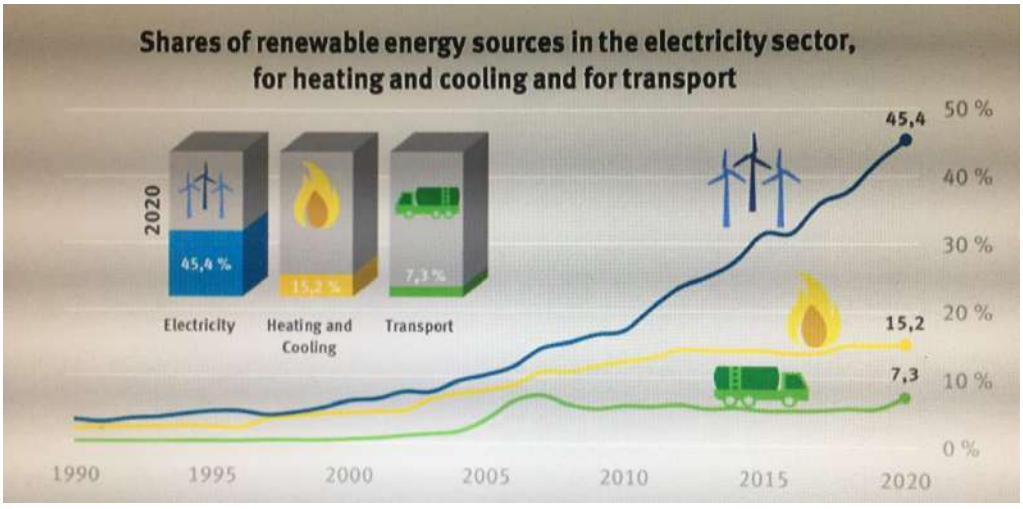

Fig. (1) Renewable energy in numbers

While the ministry revealed, in a statement, the mobilization of the emergency teams on the site, and working to fix the faults and restore power to the affected areas, these faults are likely to recur during the current summer season, as

a result of the significant increase in the load rate, which exceeded 600 megawatts. *(Ministry of Electricity & Water, 2021)*

The sources expected that this rate will continue to rise as a result of consumption resulting from the inability of the largest part of the citizens, along with the arrivals, to travel during the summer season, in compliance with the strict local and global measures to confront the Corona pandemic.

She warned that power outages are an indicator of what the situation will be like during the summer months, stressing that more than just steps are needed to rationalize energy consumption, especially that the peak of the heating season will be resolved during the next few weeks and this problem is repeated annually.

Research Problem :

The electric power industry is considered one of the leading industries in the world, whose sources of production vary in different forms until they have negative consequences for the environment in general, and the failure to keep pace with industrial developments in energy production is one of the most important problems facing the State of Kuwait.

There are many problems related to electrical energy in the State of Kuwait that citizens are accustomed to every year with the advent of the summer in particular, despite the fact that most citizens travel outside Kuwait for the purpose of tourism, and expatriates working in Kuwait travel outside Kuwait to visit family and relatives in their country, but with The (Covid-19) crisis that faced the world in 2019, which imposed on all countries closing borders and airports, and not allowing citizens to travel. *(WHO, 2020)*

And what resulted in the imposition of a general ban on the population inside the State of Kuwait, in implementation of the recommendations of the World Health Organization, which resulted in the residents' commitment to their homes throughout the day and the increase in their electricity consumption for all residents and service institutions, which added a burden and an increase in consumption of electrical energy, which basically suffers from many problems that cause Electricity cuts, electrical transformers burn out, and some electrical stations go out of service.

The problems also vary in the inability of companies in Kuwait to manage and design electric power plants using renewable energy that saves effort and money and preserves the polluted environment in the State of Kuwait from electric power plants that cause an increase in toxic gas emissions, which have a bad impact on the Kuwaiti environment and people. As a result of using fossil fuels.

Research Aims :

1. An inventory of the problems facing the electricity sector in the State of Kuwait.
2. Getting to know the international experiences in facing the problems of the electricity sector.
3. Develop a proposed vision to confront the problems of the electricity sector in the State of Kuwait.

Research Methodology :

The study depends on the descriptive approach, which describes the phenomenon related to the problems of the electricity sector in the State of Kuwait, and presents some similar experiences in developed countries, and develops a proposed vision to develop some solutions and suggestions for the problems of the electricity sector in the State of Kuwait.

Theoretical framework :

International Experiences In Facing The Problems Of The Electricity Sector :

Man in the current era is still searching and searching for new sources of energy in order to meet his growing needs and requirements to live a life with advanced applications, but there are many energy sources known for their high cost of exploitation and their negative impact on the environment.

In the modern era, man has predicted the possibility of benefiting from the sun's rays and wind, which are characterized as renewable and continuous energy that is no less than the energy that can be used and obtained from wind or water flow and other natural phenomena from which energy can be produced. *(Julia, et al., 2021)*

Scientists have realized the great danger that other energy sources such as oil and natural gas can cause, and what is known as the fossil fuel energy that causes pollution in the environment and its great contribution to global warming. Therefore, renewable energy sources in our time have become a national income for many countries.

Renewable energy is one of the modern scientific fields and disciplines, so the history of interest in it as an important source of energy may date back to the beginning of the thirties of the previous century when thinking about it relied on providing materials and devices that have the ability to convert solar and wind energy into electrical energy, as this is called (electricity generation) And it was discovered that a substance called (Selenium), which is greatly affected in its electrical resistance when exposed to light, and that this discovery was just a coincidence because the basis of the research was only to find a material with low

electrical resistance in order to extend communication cables at the bottom of the Atlantic Ocean. *(Carlisle, et al., 2021)*

In addition to the fact that the use of wind energy in Europe was to produce energy for mills in the past, and renewable energy sources in many countries are facing increasing energy requirements in these countries with ease and ease. Electric energy from wind power, geothermal heat, biomass and water capacity may fall Within the limits of (400-kilowatt hours) per year for each of them, and some of these sources are located in certain places, but the possibility of distributing them through the electric current network is available and economically feasible. *(Carlisle, et al., 2021)*

The German Center for Aeronautics and Space Affairs has shown that the most energy source currently available and more than others is the energy of solar radiation, with an electrical voltage that may exceed the world's consumption by several thousand times. *(Ahmet, et al., 2021)*

Interest in solar energy began to develop in the early fifties when high-strength chips were developed and developed with certain geometric shapes that had the ability to convert sunlight and wind into electrical energy, but it was a very high cost. *(Haoshui, et al., 2021)*

The first use of solar panels made of silicon in the field of communications was in remote areas, and then they were used in order to provide the satellites with electrical energy, so the sun shines its rays for (24) hours a day, in addition to the use of dams by exploiting water flow to rotate generators Electric energy and also wind energy that works to generate electricity. *(Darwesh, et al., 2021)*

The seventies were a very important period in the field of interest in renewable energy, especially solar energy, as an alternative to an energy, and one of the most important reasons was the Arabs cutting off oil from Western countries, and what gave great attention to the world towards solar energy and its use, and it was a fruitful period in the dissemination of solar renewable energy technology as it spread It is used in many fields such as communications, transportation, lighting, etc. *(Amo-Aidoo, et al., 2021)*

And renewable electric energy generated from the sun has become in places where solar energy is very high, such as Yemen and some Arab Gulf countries, and here there is a need to design integrated solar energy systems to generate and store electricity, and then convert it from a permanent alternating current such as electricity that is used in homes. *(Katherine, et al., 2021)*

Table. (1) The Share Of Energy From Renewable Sources

TIME	2004	2019
GEO (Labels)		
European Union - 27 countries (from 2020)	9.633	19.730
Belgium	1.890	9.924
Bulgaria	9.231	21.564
Czechia	6.774	16.244
Denmark	14.840	37.204
Germany (until 1990 former territory of the FRG)	6.207	17.354
Estonia	18.389	31.889
Ireland	2.378	11.984
Greece	7.161	19.677
Spain	8.339	18.362
France	9.508	17.216
Croatia	23.404	28.466
Italy	6.316	18.181
Cyprus	3.071	13.800
Latvia	32.794	40.975
Lithuania	17.223	25.461
Luxembourg	0.899	7.047
Hungary	4.364	12.614
Malta	0.102	8.488
Netherlands	2.030	8.768
Austria	22.554	33.626
Poland	6.914	12.164
Portugal	19.209	30.619
Romania	16.811	24.290
Slovenia	18.397	21.974
Slovakia	6.391	16.894
Finland	29.232	43.081
Sweden	38.677	56.391
Iceland	58.841	78.196
Norway	57.101	74.625
United Kingdom	1.096	12.336
Montenegro	:	37.373
North Macedonia	15.702	16.811
Albania	29.621	36.667
Serbia	12.724	21.443
Bosnia and Herzegovina	20.274	37.578
Kosovo (under United Nations Security Council Resolution 1244/99)	20.541	25.686
Moldova	7.450	23.844

At the beginning of the eighties, wind energy became a field of rapid growth and spread, as the efforts and ambitions that were made during the seventies in research and development resulted in a wealth of energy and from recent studies that proved that wind energy is a practical source of electricity, and it was found that large numbers of machines that operate wind in many countries for the first time in more than fifty years. *(Nasim, et al., 2021)*

Renewable energy plants have increased significantly around the world, due to several reasons, and the cost of generating electricity from solar and wind energy has become more economical than using coal, gas and oil. Carbon dioxide may be caused by fossil fuel power plants. *(Heffron, et al., 2021)*

[1] Renewable Energies :

There are types of renewable and non-renewable sources where the results of studies show that renewable energy sources have a lower impact than non-renewable energy sources, and given the analyzes conducted in this study, it can be concluded that renewable energy sources producing electricity have the least impact on human health, environmental damage and resource depletion. From fossil fuels, natural gas and solid coal, solar energy, as the name suggests, exploits energy from solar rays to produce usable energy, and there is great potential in this source of energy such that the total solar radiation intercepted by the earth is based on an order from (8000) times greater than the human demand for primary energy, and humans' ability to effectively collect and transform this energy is still severely limited. *(Amo-Aidoo, et al., 2021)*

[2] Concept of Renewable Energy :

Renewable energy is defined as energy generated from natural, non-traditional, inexhaustible and inexhaustible sources. All it requires is to convert it from natural energy to another energy that is easy to use through modern and contemporary technologies (German Center for Aviation and Space Affairs). *(Shen, et al., 2021)*

Renewable energy is a term used to describe permanent energy supplies such as sun, wind and water, and that using it to produce energy does not reduce its stock. *(Dang, et al., 2021)*

[3] Advantages of Using Renewable Energy :

The Use of Natural Renewable Energy Has Many Advantages, Including : *(Sakib, et al., 2021)*

- Solar, wind and geothermal energy are all renewable and free energy sources.
- You pay its cost only once and then install the tools for solar or wind energy, which are wind turbines, and do not pay again and periodically the bills for using that energy only when maintaining.
- Lack of interest in the rise in global fuel prices, which increases the rise and then electricity bills, ie, it will dispense with bringing energy through traditional means such as fossil fuels and with high efficiency.
- People do not feel wasted when using renewable energy.

- The supplies of oil, gas, coal and all fossil fuels that are being extracted will be gone.
- Renewable energy is environmentally friendly and may play a major role in mitigating climate change.
- Available all over the world.
- Reliance on energy imports decreases and may instead generate valuable domestic production.
- It works to create job opportunities in the fields of the industry with constant growth.
- It is characterized by its low risks, as it results in little waste.

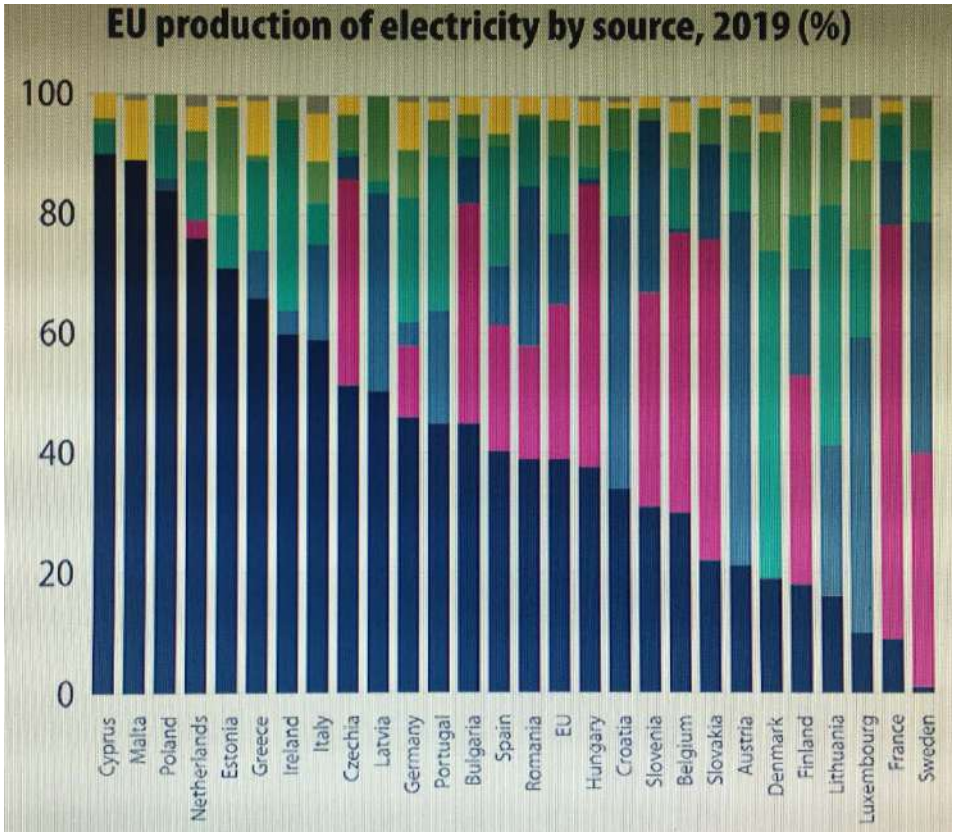

Fig. (2) Energy sources in the European Union

[4] Disadvantages of Using Renewable Energy :

The disadvantages of renewable energy are : *(Abhay, et al., 2021)*

- The establishment and establishment of generators of renewable energy, especially at the personal level, is of a high cost to him in relation to other persons.
- Not relying entirely on renewable energy, but it can come somewhat close to a realistic budget for providing various alternative energy technologies such as wind turbines and solar panels at the same time.

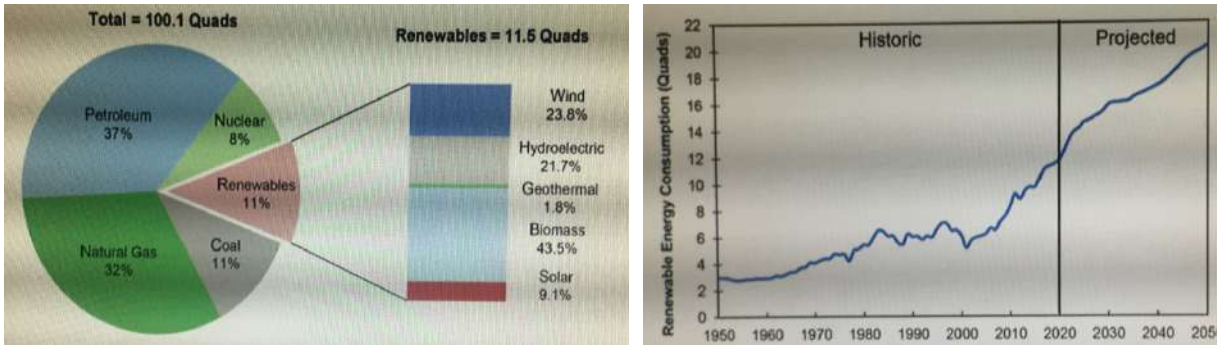

Fig. (3) U.S. Renewable Energy Consumption: Historic And Projected

[5] Renewable Energy :

[A] Solar Energy :

Solar energy is energy that comes to Earth every day as light and goes to outer space as heat radiation day and night whether we use it or not, and solar energy has undergone a major technological transformation, as early solar technology consisted of solar energy cells, and modern technologies are represented By large-scale photovoltaic systems feeding electricity grids, the costs of solar energy technologies have fallen considerably over the past thirty years, as the cost of a solar heating system has decreased from $27,000 in 1982 to $4000 in 2006), the cost of installing the solar heater system also decreased from (16000) dollars in (1992) to (6000) dollars in (2008), where it rose slightly. *(Chigbogu et al., 2021)*

The basic premise behind converting solar energy into electricity is by using photovoltaic systems, and these systems convert sunlight into electricity, and basically, the solar cells and the heart of the photovoltaic system are made of semiconductor materials while the sun shines its rays on the materials, the rays are absorbed Where these rays are converted into electricity by solar cells, for example, the air-cooled conditioner works on the principle of clean electricity, and at the right level before it is sent to the house. *(Alfred, et al., 2021)*

Solar energy is defined as the energy that belongs to energy sources that can be directly attributed to sunlight or heat that generates sunlight. *(Chigbogu et al., 2021)*

It is the production of heat through the transformation of the potential energy in sunlight into electrical energy, where this energy takes the heat of the sun and its photovoltaic cells to provide homes with hot water or heating. Which are used in the field of water heating, and electricity generation has increased now using solar energy and by photovoltaic systems and solar thermal technology, as it depends on converting sunlight into electricity using solar panels. *(Alfred, et al., 2021)*

Since solar energy depends entirely on sunlight, the need for a system that converts sunlight into energy called scientists to invent the solar heater, which converts the energy of sunlight into thermal energy, which can be used, when housewives wash pots or clothes they need this energy, Therefore, this energy is considered one of the important energies in life. Solar energy has benefits like other renewable energy sources: it is clean - environmentally friendly - does not pollute the environment or damage the place and is also available almost permanently, renewable and inexhaustible except in rare cases, in addition to that. It reduces the demand and consumption of fossil fuels and electric energy, which are among the most polluting causes of the environment in the world. *(Abhay, et al., 2021)*

[B] Solar Concept :

Solar energy is the light and heat emitted from the sun and includes techniques for harnessing solar energy using the thermal energy of the sun, whether for direct heating or as part of a mechanical conversion process for movement or electrical energy or to generate electricity through photovoltaic phenomena using photovoltaic panels. to solve some of the world's problems. *(Sakib, et al., 2021)*

Solar energy is what we get directly from sunlight, and he indicated that there are three basic ways to convert solar energy into usable energy, which are latent solar energy, active solar energy, and photovoltaic cells. *(Dang, et al., 2021)*

It is the energy produced from the sun-generated, which reaches the surface of the earth in the form of solar radiation, which receives the higher layers of the space surrounding the globe, which is equivalent to (174) petawatts of solar energy. *(Shen, et al., 2021)*

[C] Solar Technologies:

He *(Amo-Aidoo, et al., 2021)* referred to solar energy technologies, including:

- Ineffective Technology :

Passive solar technology collects energy without converting heat or light into other forms, and it includes making more use of daylight or heat through building design.

- Effective Technology :

Efficient solar technology harnesses solar energy to store or convert it for other applications and can be categorized into two groups: photovoltaic energy and solar thermal energy.

- Thermal Technology :

Solar thermal technology uses solar heat that can be used directly either in thermal application or electricity generation, and accordingly, solar thermal technology can be divided into two categories: solar thermal electric energy, and non-electric solar thermal energy.

[D] Methods of Converting Solar Energy Into Usable Energy :

Heffron (2021) indicated that there are three basic ways to convert solar energy into usable energy, which are :

- **Latent solar energy:** It is a means for trapping sunlight directly into a formation to heat air and water, especially in homes.
- **Active solar energy:** It is the energy that uses pumps and fans to transfer heat from the meeting point of the sun to the point of use such as water heaters, solar tower systems, and solar chimney systems.
- **Photovoltaic cells:** Cells that are used to generate electricity directly from sunlight. The photovoltaic cell consists of thin wafers of purified silicon that are added to small amounts of other materials so that when sunlight falls on the chips, the electronics that produce small amounts of electricity are transmitted. A large number of cells must be grouped together in order to generate usable amounts of electrical energy.

[E] Applications for the use of solar energy :

Solar energy may refer primarily to the use and application of solar radiation in many scientific fields, apart from the use of tidal energy and geothermal energy that derives its energy from the heat of the sun.

(Nasim, et al., 2021) referred to this technology that depends on solar energy, which is generally characterized as either being described as negative or positive, within the method that is exploited in order to convert and distribute sunlight through, and positive solar energy technology may contain the use of photovoltaic panels and fans. And pumps to convert sunlight to other useful sources of energy, and passive solar technology may also include some processes for selecting materials with appropriate thermal properties, in addition to designing places that allow the air to function naturally and choosing suitable places for buildings to face the sun’s rays.

(Katherine, et al., 2021) believes that positive solar energy technologies are characterized by the production of an abundant amount of energy, so it is considered one of the secondary sources of energy production in abundant quantities, while passive solar energy technologies are a means to reduce the need for alternative sources, and therefore they are considered secondary sources to fill the need for large quantities. great energy.

(Darwesh, et al., 2021) mentioned some of the uses of solar energy, including:

[A] Civil and Architectural Planning :

Sunlight may affect the design of many urban buildings since the beginning of what was known as architectural history, where many modern architectural planning methods were used, which is mainly focused on the exploitation of solar energy, and it was exploited for the first time by the Greeks and Chinese who worked to erect their buildings to be To the south side for sunlight and warmth.

[B] Solar Lighting :

The use of natural sunlight is one of the most widely used types of lighting since ancient times to the present time, as solar lighting has become used in many industrial means, which is the main source of indoor lighting, but the techniques based on the exploitation of sunlight are still hybrid lighting stations that are based on light The sun and other means that reduce energy consumption.

And *(Haoshui, et al., 2021)* believes that it is also possible to use solar energy technologies to exploit its heat in the process of heating water powered by solar energy, that is, the use of sunlight in the process of water heating, in addition to heating, cooling and ventilation, which can be used for Compensating some of this energy, as well as treating water using solar energy, in which solar distillation is used in order to make salty and medium-saline water into freshwater suitable for drinking, as it can be used with stagnant water ponds for the treatment of wastewater without the use of chemicals or electrical in addition to Solar energy is used to detoxify polluted water using photolysis, but it requires very high costs.

He points out that the cost and components of the solar heater are a reason to deter the population from using it, as it consists of cadmium, batteries and radioactive materials that may leak *(Ahmet, et al., 2021)* cause serious diseases and problems of the solar heater, like others, that can be avoided by planning and organizing.

[1] **Wind Energy :**

Wind energy contributes to providing the kinetic energy of the moving air, as the use of wind energy is applied in many areas, such as the production of electricity from large wind turbines located on land or perhaps in seas and freshwater bodies, so that it produces industries of wind energy technologies on the ground already and spread them over areas Wind energy technologies have greater potential for continuous technological advancement.

Wind electricity is variable and unpredictable to some extent, but experience and detailed studies from many areas have revealed that wind energy integration has no technical and technical consequences. *(Carlisle, et al., 2021)*

[A] Wind Energy Concept :

Wind energy can be defined as the exploitation of the wind to move things so that the normal wind movement is converted into a form of energy that is often used to convert it into easy-to-use electrical energy, and this is done by using helicopters in places where the wind is present. *(Julia, et al., 2021)*

Wind energy is one of the energies that are increasingly being used around the world, and it is a simple technology of renewable energies, and this technology is applied in areas that are characterized by high wind speeds and suitable for generating electric power (6-20 m/s) so that this technology consists of a group Fans are turbines within special standards that make them rotate when the wind hits them. The electrical power of commercially deployed wind turbines ranges from (1 kilowatt to 5 megawatts). *(Ahmet, et al., 2021)*

[B] Advantages and Benefits of Wind Energy :

(Carlisle, et al., 2021) indicates that with regard to environmental aspects, wind energy is clean, renewable energy so that it does not cause any kind of environmental pollution and does not produce gases such as carbon dioxide, nitric oxide or methane, and therefore its impact on the environment Very few, and 95% of the lands used as wind fields can also be used for other purposes such as agriculture or grazing, and turbines can be placed on top of buildings.

As for the economic aspects, wind energy is an important issue in the economic market, as it invests large projects to work in this renewable energy, as every billion kilowatt-hours of annual wind energy production provides from 440 to 460 job opportunities. *(Haoshui, et al., 2021)*

One of the important things in the field of wind energy is that it has a negative impact on the role of turbines and the noise emanating from them, which may disturb people living near wind fields, and reduce these effects, it is preferable to establish wind rights in areas far from residential areas. Giant generators sometimes kill some birds, especially during periods of their migration, and their impact on the extinction of some bird species is currently being studied, but the initial results indicate that the generators do not have this severe effect. *(Darwesh, et al., 2021)*

[C] Wind Energy Uses :

(Katherine, et al., 2021) indicates that there are many uses for wind energy, including :

- Mechanical Energy :

One of the uses of wind energy is that it helps in the process of pumping water from underground or regular wells, and this is one of the ancient uses of water, as well as it was used to grind grain, and for other human purposes.

Fig. (1) Mechanical Energy (Nasim, et al., 2021)

- Electricity Generation :

The energy source is the most widely used in the world through a simple technology of renewable energies, and this technology is applied in areas characterized by high wind speeds and suitable for generating electric power (6-20 m/s) so that this technology consists of a group of fans turbines within special standards that make them rotate when the wind collides with them, and the electrical capacity of commercially deployed wind turbines ranges from (1 kilowatt to 5 megawatts). *(Heffron, et al., 2021)*

[1] Global And Regional Trends In The Use Of Wind Energy As An Alternative Energy And Its Impact On The Global And Industrial Market:

(Amo-Aidoo, et al., 2021) This indicates that in light of the economic concerns and the major financial crises that the world suffers from, it has tended to adopt the idea of generating turbines and generators that generate electrical energy and the use of wind energy, which is a continuous and renewable idea from year to year.

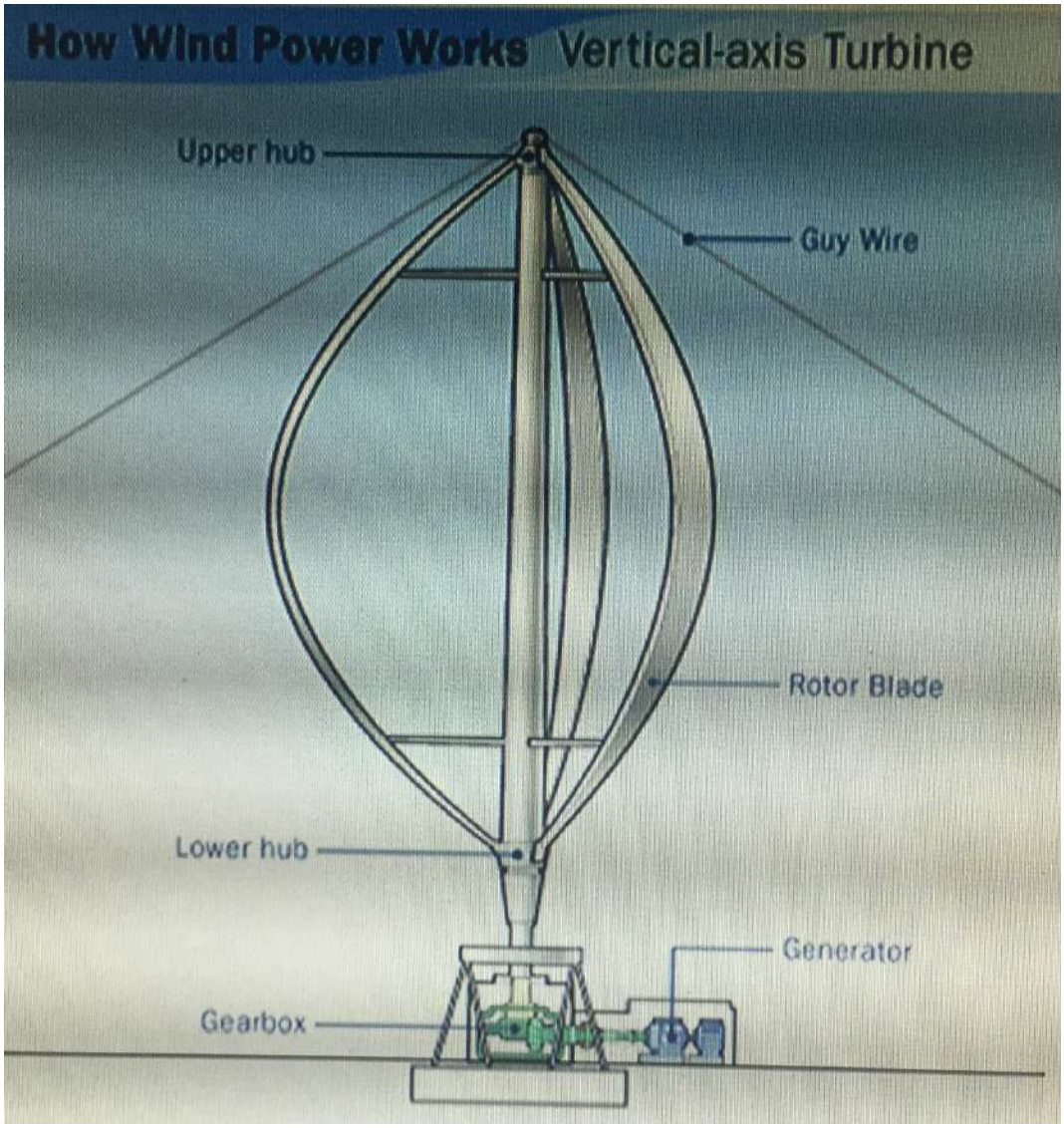

Fig. (2) The use of wind energy is increasing around the world (Shen, et al., 2021)

The World Wind Energy Association (WWEA, 2006) emphasized that one of the most prevalent sources of energy is wind energy technology, as it is the most dynamic energy in the world, and the best suitable solution instead of fossil fuels to 800 dollars, and in proportion to the tremendous development that is occurring in a rapid manner around the world Wind energy continued its dynamic global growth, bringing the total installed capacity globally to 904.73 MW during 2007, 70% of which was in the European market. *(Dang, et al., 2021)*

(Sakib, et al., 2021) Indicated that the proportion of workers in the field of wind energy in the world reaches 100,000, and annual investments in wind energy reach 11 billion euros, and the European market countries have set a goal of generating 12% of their electricity needs from renewable energy. By 2020, when

the wind energy capacity will reach 1250 megawatts, the percentage of workers in this industry to 3.2 million workers, and annual investments to 80 billion euros, and in return, the cost of producing a kilowatt will drop to 512, which is less than the cost of production in a power plant based on electricity Fossil fuel energy, which leads to a reduction in carbon dioxide emissions by 832.1 million tons annually.

Many countries of the world also depend on wind to generate electric power. We find a country such as Denmark that generates 20% of its electricity needs by wind, and the percentage reaches 9.25% in the United States, 9.4% in Germany, 6.4% in Spain, and 5.3 % in India, 9.2% in France and Italy, 2.5% in Canada, 3.2% in the United Kingdom, and 8.1% in Portugal. In general, the percentage of wind energy generated in the European Union in 2009 is up to 2.21%, and the percentage of wind-generated electric energy in China is 36%, and 9.10% in the rest of the world, and there is a current global trend to establish wind farms in the seas to take advantage of the high wind speed. *(Abhay, et al., 2021)*

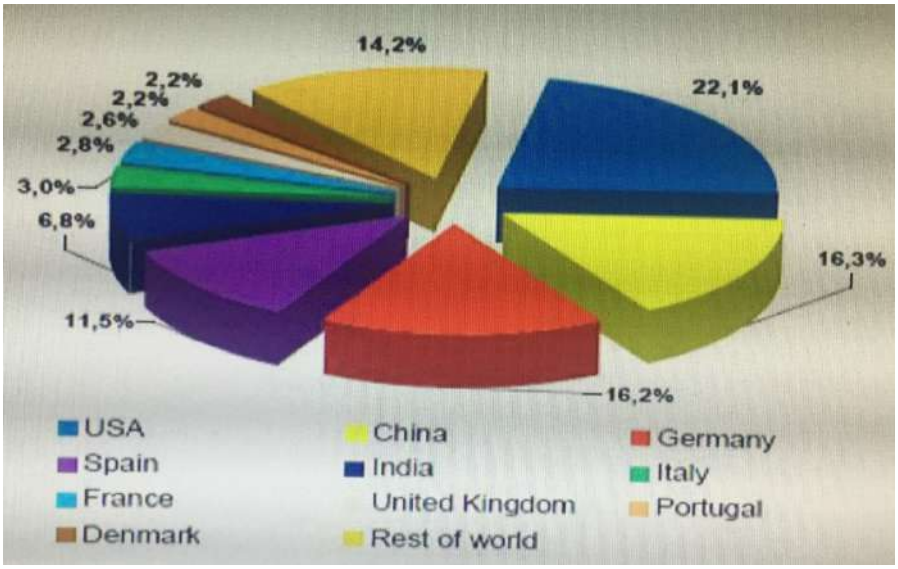

Fig. (3) The percentage of electricity generated by wind in countries (Abhay, et al., 2021)

And (WWEA, 2009) indicated that despite the deterioration in the global economy, solar and wind energy projects, and other forms of alternative energy, occur in fossil fuels and that China has emerged as the largest investor in renewable energy, especially solar energy, more than wind energy. *(Chigbogu et al., 2021)*

The study (Sakib, et al., 2021) also confirmed that it is worth noting that the increase in types of renewable and alternative energy was noticeable significantly, especially in developing projects that have more than half of the global capacity for

renewable energy, and that China has surpassed the United States to become the first investor in Wind energy The wind energy sector in the Middle East and North Africa has achieved a growth of 38%.

Discussion and Results :

When looking at the location of the countries of the Middle East, which enjoy the sun's rays to a large extent, they are able to exploit those rays to a large extent, enabling them to exploit those rays to produce solar energy and rely on it as an alternative to electric energy. On renewable energy management in terms of developing special strategies for investing renewable energy and following up on their optimal implementation.

And the future of the Arab region in general, and the State of Kuwait in particular, is promising for the production of electricity from solar energy that relies on photovoltaic systems, as it was stated in the renewable energy policy network of the century that every square kilo of land in the Middle East, may take a measure of solar energy annually The equivalent of 5.1 million barrels of crude oil, and despite the availability of this energy in the Arab countries, they have shown a slowdown in the adoption of relative power generation techniques, due to several reasons, including the huge fossil fuel reserves that these countries enjoy, as well as the support of their governments for energy For a long-term period, the power plants have contributed using solar energy, and in some developed countries, they have contributed to enriching this sector and giving it more momentum and rich and extensive experiences at the operational level and methods of maintenance and repair, and an example of the development of these projects is a solar power plant in California.

The researcher concludes by extrapolating the above that human societies basically and greatly need services that meet the daily human needs (such as lighting, heating, cooling, cooking, providing comfort, ease of movement and communication). The close connection between the environment and the human being led to the emergence of renewable services to serve humans and the environment, as energy Renewable forms one of its means. Natural, renewable forms of energy are available in most countries of the world, such as wind energy, and solar energy. Both are available, economical, healthy, and do not make noise and are used in an uncomplicated manner. Moreover, technology has worked to harness these sources, but as was the case in all human discoveries their Difficulties in using them, cost and climate variability are among the biggest problems that limit the exploitation of these resources.

This was confirmed by *(Sakib, et al., 2021)* that the domestic use of renewable energy contributes to reducing energy exhaustion and the ability of renewable energy sources to meet all needs and that the combination of wind and solar energy improves the stability of the system compared to using only wind and solar energy only. It was also concluded that the combination Between solar energy and wind energy needs to study geographical locations and weather.

And *(Broders, 2020)* tried to study the relationship between the amount of radiation falling on solar cells and wind speed in that area to increase the efficiency of the system, and (Brazil Corporation for Public and Private Works, 2012) conducted a project called (The Minerva Program), where the link between Generation using alternative energy with the Brazil line to supply energy, and this was based on the directive of the Brazilian government to rely more on alternative energy.

India has studied and applied energy generation from renewable sources as a result of the high rates of GDP and GDP growth and the increase in energy demand in India. India has also relied on solar energy as a source of electricity generation.

After presenting these previous global experiences in the use of renewable energy, it becomes clear to us that despite the fact that the Arab world has the highest percentage in the amount of incident radiation, the amount of benefit from solar energy does not exceed 10% of the benefit from the rest of the world.

Proposals :

The Study Suggests Converting Power Stations To Alternative Energy, In Whole Or In Part, Depending On The Following Factors :

- The capacity of the plant-based on the required output from the plant.
- The alternative energy sources available for use in the station.
- The area around the power station.

It Is Suggested *(Robert, Et Al., 2019)* When Applying And Constructing A Solar Power Plant On The Following:

- The amount of radiation from the sun.
- Free space (required).
- City consumption.
- Wind speed.
- The type of solar cells.
- The type of electric generators that run on wind.

Working on overcoming the obstacles facing renewable energy projects from various laws and legislations for development processes that reduce carbon emissions to the atmosphere, in addition to setting up regulatory work for the renewable energy sector.

References

1- Abhay, Lingayat, & Ramakrishna, Balijepalli, (2021): Applications Of Solar Energy-Based Drying Technologies In Various Industries – A Review, Solar Energy Journal, Vol. (2), No. (3).

2- Ahmet, Hamzaog˘lu, & Ali, Erdman, & Mustafa Alçı., (2021): Reduction Of Distribution System Losses Using Solar Energy Cooperativity By Home User, Ain Shams Engineering Journal, Vol. (3), No. (15).

3- Alfred, Johna & Srijit Basua & Akshaya & Anil Kumarab., (2021): Design And Evaluation Of Stand-Alone Solar-Hydrogen Energy Storage System For Academic Institute: A Case Study, Materialstoday Proceedings Journal, Vol. (2), No. (11).

4- Alfred, John, & Srijit Basu, & Akshay, & Anil Kumar., (2021) : Design And Evaluation Of Stand-Alone Solar-Hydrogen Energy Storage System For Academic Institute: A Case Study, Vol. (3), No. (5).

5- Amo-Aidoo, & Hensel, O, & Korese, J.K., & Abunde Neba, F., & Sturm B., (2021): A Framework For Optimization Of Energy Efficiency And Integration Of Hybridized-Solar Energy In Agro-Industrial Plants: Bioethanol Production From Cassava In Ghana, Energy Reports Journal, Vol. (7), No. (4).

6- Amo-Aidoo, Hensel A, Kroese, Abunde Neba, Sturm., (2021): A Framework For Optimization Of Energy Efficiency And Integration Of Hybridized-Solar Energy In Agro-Industrial Plants: Bioethanol Production From Cassava In Ghana, Energy Reports, Report (7), Pp. 1501-1519.

7- Carlisle, JE, Kane SL, Solan D, Joe JC. Support For Solar Energy: Examining Sense Of Place And Utility-Scale Development In California. Energy Res. Soc. Sci. 2014;3: 124–30. Https://Doi.Org/10.1016/J.Erss.2014.07.006.

8- Chigbogu, G., Ozoegwu, & Patrick U. Akpan., (2021): A Review And Appraisal Of Nigeria's Solar Energy Policy Objectives And Strategies Against The Backdrop Of The Renewable Energy Policy Of The Economic Community Of West African States, Vol. (143), No. (3).

9- Dang, Qi, & Wei Zhang, & Yuen, Li, & Liang, Tang., & Ming, Hu., (2021): Algae-Inspired Multifunctional Ocean Solar-Energy Conversion Chain Enabled By Coordination Polymers, Cell

Reports Physical Science Journal, Vol. (5), No. (3).

10- Darwesh, & Ghoname., (2021): Experimental Studies On The Contribution Of Solar Energy As A Source For Heating Biogas Digestion Units, Energy Reports, Report (7), Pp. 1657-1671.

11- Haoshui, Yu, & Henrik Helland, & Xingji Yu, & Truls Gundersen, & Gürkan Sin., (2021): Optimal Design And Operation Of An Organic Rankine Cycle (ORC) System Driven By Solar Energy With Sensible Thermal Energy Storage, Energy Conversion And Management Journal, Vol. (24), No. (2).

12- Heffron, R, & Stephanie Halbrügge, & Marc-Fabian Korner, & Nana A. Obeng-Darko, & Theresia Sumarno, & Jonathan Wagner, & Martin Weibelzah, (2021) : Justice In Solar Energy Development, Solar Energy Journal, Vol. (218), No. (14).

13- Julia, Cousse, (2021): Still In Love With Solar Energy? Installation Size, Affect, And The Social Acceptance Of Renewable Energy Technologies, Renewable And Sustainable Energy Reviews Journal, Vol. (145), No. (3).

14- Katherine, Moore, & Wei Wei., (2021): Applications Of Carbon Nanomaterials In Perovskite Solar Cells For Solar Energy Conversion,
Nano Materials Science Journal, Vol. (12), No. (3).

15- Ministry Of Electricity & Water, (2021): Electricity Emergency Centers, Ministry Of Electricity & Water, Kuwait.

16- Nasim, Ghadami, & Mohammad Gheibi, & Zahra Kian, & Mahdieh G. Faramarz, Reza Naghedi, & Mohammad Eftekhari, & Amir M. Fathollahi-Fard, & Maxim A. Dulebenets, & Guangdong Tian., (2021): Implementation Of Solar Energy In Smart Cities Using An Integration Of Artificial Neural Network, Photovoltaic System And Classical Delphi Methods, Sustainable Cities And Society Journal, Vol. (74), No. (2), Pp. 1-16.

17- Sakib, Bin Amin, & Mainul Islam Chowdhury, & Asif Ehsan, & Zahid Iqbal., (2021): Solar Energy And Natural Disasters: Exploring Household Coping Mechanisms, Capacity, And Resilience In Bangladesh, Energy Research & Social Science Journal, Vol. (79), No. (3).

18- Shen, Xu, & Haihua Jiang, & Feng Xiong, & Chen Zhang, & Mengju Xie, &, Zhixin Li, (2021): Evaluation For Block-Scale Solar

Energy Potential Of Industrial Block And Optimization Of Application Strategies: A Case Study Of Wuhan, China, Sustainable Cities And Society Journal, Vol. (72), No. (4).

19- State Of Kuwait, (2021): Climate Of Kuwait, Kuwait Government, State Of Kuwait, Https://E.Gov.Kw/Sites/Kgoenglish/Pages/Visitors/Aboutkuwait/Kuwaitataglaneclimate.Aspx (27/7/2021)

20- (WHO) World Health Organization (2020**):** Coronavirus Disease (COVID-19) Advice For The Public, Https://Www.Who.Int/Emergencies/Diseases/Novel-Coronavirus- 2019/Advice-For-Public 29/5/2021