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The Importance of Renewable Energy Investing In Protecting the Environment for Sustainable Development

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Abstract

The close link between environment and development led to the emergence of a concept of development called sustainable, which requires attention to environmental protection in order to achieve sustainable development, and renewable energy is one of the means to protect the environment, so we find many countries interested in developing this source of energy and setting it as a goal that it seeks to achieve. Renewable energy is of great importance in protecting the environment, as it is clean and non-polluting energy, and its use is expanded, thus reducing the use of traditional energy sources known to have a bad impact on the environment, given the pollution they generate, especially since the cost of generating electricity from renewable energy sources is decreasing .Including the possibility of achieving sustainable development.

Despite all the great global interest in renewable energy as a clean and alternative energy in the future to fossil energy, all signs indicate that renewable energy will not be able to play this role even in the distant future due to the availability of fossil energy in large quantities sufficient for the needs of our world until the end of the current century and the great difficulties that It faces renewable energy technology resulting from its dispersed, discontinuous and discontinuous nature, limited efficiency, and thus high investment costs. However, there are certain uses in which renewable energy can play a major role in supplying electricity to rural, poor and remote areas, and the cost of producing electricity from wind energy is constantly declining, making it more competitive, but its intermittent nature will prevent it from playing the main role in electricity production. Even on the distant future.

Renewable energy has been and will continue to play an important role of energy sources in our world and will contribute about 10-12% of energy sources, and this energy is a major source of energy supply in low-income countries, especially in Africa and Asia, at the same time, the liquid fuel resulting from fermentation (Ethanol) Its contribution as a mixture and alternative to petroleum products will increase, especially in Brazil and the European Union, but its role will remain limited due to its high cost and limited agricultural lands, as well as its need for relatively large commercial capacity to transport and produce it.

The future of renewable energy and its contribution to energy sources depends on two main factors, one of which is the progress in the technologies of this energy and the reduction of its costs, which is slow progress, and the other issue is related to environmental matters, the increasing taxes imposed on fossil fuels and financial and legislative support for renewable energy. However, these factors, although influential and will slightly increase the contribution of renewable energy, will not change much of the global energy mix even in the long run. Based on the above, *this research paper aims to crystallize the truth about the importance of renewable energy in protecting the environment for sustainable development, investment policies in the field of renewable energy, and identifying the experience of some countries in this field, which can benefit many developing countries.*

Keywords: Environment; Investment Policies And The Experiences Of Some Countries; Renewable Energy; Sustainable Development; Traditional Energy

Introduction

Both renewable energy and nuclear energy constitute the main sources of global energy outside of fossil energy, and there is great global interest in these two sources as future sources of energy as an alternative to fossil energy, which many countries, especially industrialized countries, seek to replace with these new sources. The first major driver of interest in renewable energy is the environmental drive to reduce emissions, especially carbon dioxide. It was also the first impetus for the approval of the Kyoto Agreement and also the legislative directions in the European Common Market aiming to play an increasing role in the supply of energy in European countries, so that its contribution is not less than 12% of primary energy sources in 2012. As a result, there was a clear impact on the use of fossil energy, especially in European countries.

This paper quickly reviews new and renewable energy issues (hereinafter called renewable energy) and its future in terms of global energy, linking all of this to the sustainable development needs in countries and moving from that to the methods that have been implemented to encourage them, tax ally and environmentally.

Firstly: Renewable Energy

It is necessary to start by defining what "renewable energy" means, as it has many interpretations, but this can be identified with three components:

(1) Conventional renewable energy (non-commercial)
(2) New Renewables
(3) Hydropower from dams and river flow

We will start in succession:

(1) Conventional renewable energy (non-commercial)

It is one of the sources of energy that was common in past centuries, especially before the advent of oil, and depends on the use of biomass materials that are produced and collected locally (such as crop residues, wood, animal dung ... etc.) despite the fact that most countries of the world have moved quickly from The use of this source to the uses of fossil energy since the start of the use of coal in the nineteenth century and the spread of the use of oil in the twentieth century, but that the traditional renewable energy based on biomass is still the only source of energy for more than 2 billion people, most of whom live in South Asia and Central Africa. Its used quantities amount to more than 1110 million tons of oil equivalent (MTMN) annually and thus they constitute about 10% of the primary sources of global energy, which are estimated at about 11500 Mt. Note that it is very difficult to estimate global quantities of biomass, and these figures are only estimated global figures.

(2) New Renewables

These include newly developed biofuels, wind and solar energy, ocean and ground energy.

Biomass energy as a source of biodiesel:

Man's control of fire was a great step in the history of mankind, a step that enabled man to cook his food and heat a home, and for these purposes man used and still wood, vegetable oils, manure derived from animal excrement, and so on. In order to obtain the energy necessary for plowing the soil and transporting goods, humans used animals, and even human power itself. This power is derived by man from what he consumes from foodstuffs, which makes the biological or biological resources the most important source of energy, and currently bioenergy shares 11% of the primary energy In addition to its environmental benefits, it is available and there is no fear of its limitations (Yusuf, 2017).

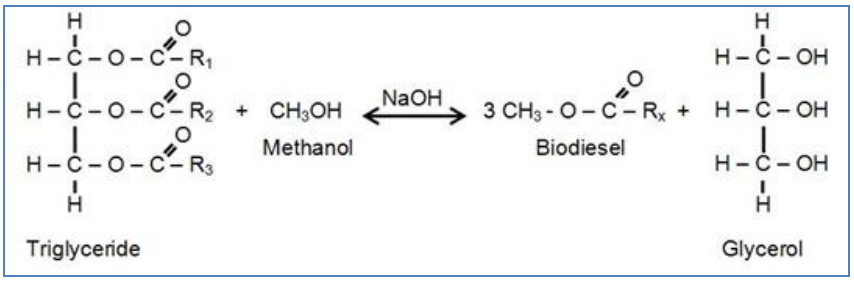
The issue of using algae as a new source of biomass to produce renewable energy is of great importance, as algae have a number of properties that allow for more sustainable production of their alternatives from raw materials. These characteristics include the formation of a high-yielding biomass, ***reaching*** **almost 100 % efficiency in use.** Small fertile lands, salty water and waste streams can be utilized in the cultivation of algae, and the use of gas burning as a source of carbon dioxide to generate biodiesel in light of the mounting need for Addressing fossil fuel waste as it causes more global warming and climate change impacts. The technology for producing biodiesel from microalgae is a promising technology, because algae has the ability to produce 500-15000 gallons of biodiesel per dunum per year, which solves the problem of oil prices reaching very high levels, especially when the used algae do not need water sources or Soil for its growth and with a high content of oily substances that are extracted and converted into biodiesel, which makes the process easier and less expensive (Brennan, et al 2010).

Photoautotrophic microalgae are characterized by a rapid growth rate and high density. They can double their growth within 24 hours under the right conditions, and their content of oily substances is high compared to the rest of the cellular components of proteins, hydrocarbons and other nutrients. After the growth of the algae biomass, it is separated and subjected to a mechanical crushing or electroporation process to tear the cell walls and remove the oily materials from them that undergo different chemical treatments to finally obtain pure biodiesel whose low cost compared to the cost of oil appears according to the following relationship:The price of algal biodiesel = 25.2×10^{-3} the price of oil.

Algal oil content

Algae contain oils, fats, fatty acids, membrane components, metabolism products, and energy sources which can be raw materials for biodiesel production, and oily substances and fats constitute 15 - 75% of the weight of the algae biomass (Brennan, et al 2010). The most important oily

substances in algae cells that can be converted into biodiesel are: oleic, which accounts for about 36% of all oleic substances, Palmetic 16%, Cetyaric stearic 11%, and Lenolic 7.4%.



Wind Energy:

The Persians used wind energy to run mills to grind grain and pump water, and it spread in ancient Europe for the same purposes until it was used in the production of electricity. The total installed capacity of wind turbines worldwide reached more than 74 thousand megawatts at the end of 2006, with an average annual increase of 28% for the period from 2000 to 2006, and this is a positive indicator that competes with the communications revolution that occurred in the last two decades, which helped in Reducing the cost of produced energy from 40 cents dollars / kWh in 1980 to less than 5 cents dollars / kWh. The number of countries that use wind energy in the production of electric energy reaches 45 countries, and in light of the high oil prices, production Electricity from wind competes with thermal power stations that depend on fossil fuels, especially in countries that do not provide support for this fuel. The Supreme Energy Council of Egypt in April 2007.

Solar energy:

Solar energy is used directly in many applications, including: heating, building lighting, water heating, steam production, torment and pumping of water and thermal electricity generation. The international authorities expect that by 2025 solar thermal systems will contribute to generating electricity of about 130 giga watts, also used Solar energy in the production of electricity directly through solar / photovoltaic cells, and as a result of ongoing research, the cost of energy production has decreased from 100 cents dollars / kWh in 1980 to about 15 cents / kWh at present. The growth rate of investments in solar cells ranged between 50% to 60% to record the highest growth rate at the level of renewable energy applications during 2006, and solar water heating from 15-20%, and the like These indicators reflect the great development in investments directed to the renewable energy sector.

Geothermal Energy:

Geothermal energy is described as one of the most important sources of energy, and scientists believe that it is sufficient to generate huge quantities of electricity in the future, since thousands of years ago humans have derived heat from it, then in the production of electricity over the past ninety years, and the heat energy of the Earth's interior is a source It is essential for renewable energy for about 58 countries, 39 of which can be fully supplied with 100% of this energy, and in Egypt the heat energy of the Earth's interior is used for healing, as in the Pharaoh's bath and Mossa's eyes, while in some European countries it is used as a source for heating homes in the cold winter.

(3) Hydropower from dams and river flow

Hydropower is a major source of energy production at the global level, with its production reaching about 3000 TWh in 2002 and thus it constitutes about 18% of the world's electricity production, and its growth in recent years has been slightly higher than the rate of energy demand growth. Globally. There are very wide sources in the world to increase the exploitation of hydropower, but their costs and their distance from the sources of consumption prevents them from investing. Also, the hydropower suffers from major environmental problems resulting from its immersion in large areas, which requires moving and re-housing large numbers of people after the implementation of dams.

Hydropower is a limited source of energy in the Arab countries due to the limited water and rivers in the region. The Arab hydropower production is estimated at about 28 thousand giga watt hours (GWh), and it constitutes only 12% of the electricity production in the Arab world (AUPTDE 2004), a percentage that is declining due to the increasing Production from fossil energy sources, and hydropower production is limited in some Arab countries with rivers.

The production of electricity from renewable (non-hydro) energy in the Arab world is very limited due to the questionable economics of this source, the proliferation of fossil fuels and the use of natural gas in the production of electricity. The production of electrical energy from renewable sources did not exceed 5.3% of the total production of electrical energy in the Arab world in 2004, which is very modest production and less than global rates of about 16%. It is not expected that this production will increase in the future, but rather it is expected to decline due to the limited water resources and the potential of electric energy in the Arab world and also the limited investment in the production of electricity from other sources (wind, solar energy, ... etc) due to the widespread use of natural gas to produce electricity in the Arabia world.

Secondly: Renewable Energy Investment Globally And Sustainable Development

We will start in succession:

- *Renewable energy policies and advances*
- *Cost investment and production costs for renewable energy*
- *Energy in the world and renewable energy*
- *Resource potential, global energy supply and the role of renewable energy*
- *The future of renewable energy*
- *Problems of renewable energy*
- *Energy from hydrogen*
- *Encouraging investment in renewable energy*
- *Methods of spreading and encouraging renewable energy*
- *Tax measures taken to encourage renewable energy*

Renewable energy in all its sources and forms (hydropower (hydroelectricity), living mass, solar energy including wind energy, and geothermal energy) constitute an increasing proportion of energy production in the world, and currently hydropower and living mass represent about 15.2% of global energy production .The electrical production of hydropower is about 3000 TWh in 2003, which is slightly more than the production of nuclear energy, and this production (thermal) is equal to about 250 MWh. N of fuel annually, but it saves about 640-680 Mt.

The theoretical potential of global hydropower production is about 14,000 TWh of electricity annually, which is close to the current global electricity production. However, for economic and environmental reasons, most of this energy will not be used. However, hydropower will continue to develop as it is the most important renewable energy source, as it is relatively clean and inexpensive, requires small operating costs, and its production efficiency is close to 100% (the rate of production efficiency of fossil and nuclear fuels is only about 33%). Thus, in the next few years, the contribution Hydropower in global energy sources may grow faster than global energy production.

Renewable energy sources other than hydropower are many and the most important one is biomass. The traditional biomass includes wood as fuel (which is the main source), animal dung, agricultural and forest product waste. The lack of reliable statistics as mentioned previously makes it difficult to accurately estimate the contribution of biomass to global energy production. However, it is estimated that the world consumed about 1110-1250 MT per year of biomass at the end of the twentieth century, two-thirds of that from wood fuel and the rest from animal and agricultural waste. Most of this production is sustainable and continuous, but there is ample scope for improving use efficiency which is currently very low.

The contribution of biomass to the global energy supply is not expected to increase, but it will continue to be used as a major source of energy in low-income developing countries. However, with the increasing demand for energy in these countries, a gradual shift from biomass to commercial energy is also expected in many low-income developing countries. Biomass technologies and their uses are currently developing rapidly. Besides direct burning, methods of converting urban waste to methane, fermentation and other technologies all contribute to enabling the use of biomass as a sustainable source of energy. The potential and uses of wind energy are also increasing rapidly (British Petroleum. 2005).

Wind energy and its role in global electricity generation is increasing annually at a rate of 13%. However, given that the current volume of this generation is modest and does not exceed about 65 terawatt hours in 2005, the contribution of wind energy in generating electricity will remain limited in the future and it is expected that this contribution will reach 930 terawatts. Hour 2030, about 3% of electricity production then. The annual investment currently in expanding wind energy is about 7 billion dollars annually. Most of these investments will be made in Germany, where the current capacity of the stations is about 17 thousand megawatts, which is about 4% of the electricity generation capacity in Germany. The current trend is to place wind power plants in the off-Shore waters due to the high wind speed there and to avoid noise pollution and fan scenes. However, the resulting costs are high and negatively affect the economics of wind energy, as explained in the next section (British Petroleum. 2005).

Renewable energy policies and advances

The interest in renewable energy matters actually began in earnest following the impact of the oil price correction at the end of 2003. Until the late 1980s, the interest was in research and development matters, especially in the United States, but the American interest declined and since the 1990s, European countries began to focus on implementing technologies more. However, the OECD production of renewable energy (electricity, heat, etc.) is about 2500 TWH (about 6% of the total energy), more than half of which is from hydropower. Nevertheless, progress in the European Union countries was clear as these countries set targets for them, the most important of which is that renewable energy should account for about 22% of electricity consumption and that bio fuel should account for 5.75% of car fuel in 2010. These are ambitious targets. The difficulty of achieving them now appears.

The European methods for achieving these goals are represented by two methods: the "quota system" and the "subsidy system". Britain, Poland and Belgium have implemented a quota system that binds electricity institutions to have a certain part of their sales to the public from renewable energy sources. While Germany and others have implemented a price subsidy system, which lures investment in them, and renewable energy currently in Germany employs about 150,000 workers, its success depends more on subsidies than economic efficiency. Despite all the European effort, the existing goals will not be achieved. It is not expected that the

contribution of renewable energy to energy will reach more than 8% in 2010 despite all this focus (while the target is 12%).

Cost investment and production costs for renewable energy

The investment costs in the production of renewable energy (all of which are produced in the form of electricity) vary from technology to another and are lower than in the case of wind energy (about $ 1,000 per kilowatt) and the highest possible in the case of a solar PV solar cell, where it currently reaches More than about $ 5,000 per kilowatt. These are very high costs when compared with the economic costs of investing in the traditional methods of generating electricity, which are single-cycle gas turbines (about $ 350 per kilowatt) or high-efficiency double-cycle (about $ 550 per kilowatt), as well as the costs of conventional coal plants. It does not currently exceed about $ 1,200 per kilowatt after adding all the equipment and environmental needs (E Coal. 2002).

Of course, the operating costs in the case of renewable energy are very low because there is no cost to fuel. However, even after these considerations are included in the costs of production, renewable energy is still expensive when comparing its cost of producing electricity with traditional methods, although there is difficulty in direct comparisons of the intermittent nature. In the production of electricity from renewable energy. The cost of producing electricity from wind energy (which is the lowest cost of renewable energy, ranges from 4-5 cents per kilowatt hour, while it does not exceed about 3 cents in the case of production from single-cycle gas turbines or 2 cents in the case of double cycle) The price of gas is about 5 $ Per million BTU}). Costs per kilowatt hour reach very high levels, around 30 cents in the case of a photovoltaic cell, and therefore the use of this type of technology is limited to small uses.

These small uses are of great importance in supplying electricity to rural, isolated and impoverished regions in Africa and South Asia. Where PV cell technology can be used to produce electricity for huts and rural areas in these relatively poor countries. A photovoltaic cell with a capacity of about 50 watts can provide a cottage or a small country house with electricity to meet basic needs, the most important of which is lighting (and also a small TV or a small Refrigerator in some cases). Thus, this use of renewable energy, even if it is not practical or economical, for large electricity supplies, but it may be the best and optimal way to supply electricity in rural and small areas in very low-income countries, and therefore it constitutes an important role for renewable energy in special cases.

The following two figures illustrate the investment costs and the production costs of renewable energy with various technologies as they are now and as they are expected to be in 2030. These two figures show the significant reduction in the expected costs during the next twenty-five years, but with all this progress, renewable energy will continue to suffer Its high cost and intermittent nature will limit its contribution to energy sources even in the medium and long term (Khatib, 2013).

Energy in the world and renewable energy

In the year 2005 the world's energy consumption was about 11,500 million tons of oil equivalent (MTMN), of which 9,120 m. I. M. N of fossil fuels and 630 AD. I. M. N from nuclear energy and 640 liters of electricity. M. N of hydropower is added to that more than 1110 m. I. M. Of the non-commercial energy, most of it comes from biomass. Total renewable energy (biomass, hydropower ... etc.) is 1750 MTA and it constitutes 15.2% of the primary energy sources.

Resource potential, global energy supply and the role of renewable energy

It is not expected that there will be a shortage of energy sources in the world during the first half of this century. The proven reserves of fossil commercial fuels (oil, gas and coal) are sufficient for the world's needs for many decades to come, and when the proven reserves of oil are exhausted, it is possible to resort to the enormous potential of the base of non-conventional sources of oil and gas, especially non-conventional oil and gas. After developing its production methods and generating electricity directly from it. Also, coal reserves are very large and the resource base exceeds twice that of conventional and unconventional oil and gas known. Clean technologies for coal will allow for better extraction and production from these large sources, especially for the production of electricity, but also by converting them into oil and gas, reducing the harmful gases usually emitted from coal (E Coal. 2002).

The resource base for uranium is also very large, but the demand for it is not expected to increase in the next few years. The quantities of uranium known today suffice the world's needs until the end of the current century. The resource base for renewable energy is also good, as only a limited portion of the hydropower potential has been exploited. Thus, with the increasing demand for electricity, hydroelectric power plants will continue to be built, and the improvement of high voltage technologies will help to transfer electricity from remote hydroelectric plants to long distances. Living mass has good potential for use in the future, not only by direct burning as conventional fuel, but by more sophisticated methods through chemical and biological reactions (Zhang, 2014). With the passage of time, it is expected that the contribution of new renewable energy sources, especially wind energy, which is currently undergoing continuous development of its technologies due to its environmental value, will increase slowly, but it will not be a major source of energy until 2030 at best. In short, the currently known energy sources provide good potential for providing energy to our world during the twenty-first century. Currently, proven fossil fuel reserves exceed 1,300,000m. I. M. The resource base exceeds 5,000,000 m. I. M. N.

The future of renewable energy

The future of renewable energy, for the next few decades at least, will not be bright due to the availability of fossil energy in large quantities sufficient for the world for many decades to come (and perhaps until the end of the century). New and renewable energy will not increase its contribution to energy sources and uses during the next three decades and it will hardly be able From maintaining its current contribution, which currently stands at about 14-16% of global energy resources and uses.

The situation in the Arab world will not differ much, as there is a continuous shift from traditional energy in the Arab countryside to the use of commercial energy sources LPG for the purposes of cooking and heating, as well as other uses such as hydropower, most of its potentials have been exhausted, and therefore the contribution of renewable energy is not expected to increase. In Arab energy uses for its current contribution .Consequently, expectations are that the contribution of renewable energy to the energy supply in the Arab world, which is currently modest, will become more modest in the future.

Problems of renewable energy

The most important problem of renewable energy, which is mainly represented by solar energy (including wind energy) is that it is intermittent and intermittent, and therefore it needs storage, which makes it expensive and is also widespread and disbursed, and therefore its collection is expensive and it is inefficient. They are only suitable for producing electricity (and also heating in some cases) and thus difficult to trade in. All this makes it inefficient energy when compared to fossil energy (oil, gas, and coal), which are concentrated sources of energy, efficient and suitable for various aspects of energy uses (transportation, direct combustion, heating, electricity generation ... etc.) and also energy that can be traded internationally and overseas. . Fossil energy sources are also very abundant. The availability of these large quantities, especially the sources of crude oil that can be extracted, severely limit the potential of renewable energy and transform this energy and take on a larger volume in the foreseeable future. Fossil energy sources, especially crude oil (conventional and unconventional), suffice global needs until at least the end of the twenty-first century. Thus, the trend towards renewable energy will remain very limited for the foreseeable future. Urbanization also limited the possibilities of using biomass, as more people were already deprived of commercial energy sources, as a result of urbanization, they moved to the city, and the use of modern commercial fuels was relatively widespread for the purposes of (cooking and heating), which are uses that were limited to biomass in the past. However, the European focus on renewable energy to fulfill the European Market Agreements and the Kyoto Agreement has helped create new uses of living mass for the purposes of producing renewable energy (Iea (international energy agency) 2004)).

Also, biomass needs relatively large quantities of fossil commercial fuels for the purposes of collecting and transporting it, which greatly reduces its capabilities and efficiency as a cheap source of energy and limits its economics, which must be taken into account when evaluating renewable energy, as the consumption of fossil energy needed to produce, transport and use renewable energy (Especially biomass) may outweigh the environmental and economic benefits of renewable energy, and this is something that is overlooked in many cases.

After 1973 and in recent periods there has been an increased interest in the production of alcohol, fermentation and the production of ethanol as a substitute (or mixture with oil). This substitute usually results from fermentation of sugar cane or some agricultural products, especially corn, or fermentation of alcohol. This is a worthwhile resource, albeit limited. The same applies to power from hydrogen and a fuel cell, as shown in the following items. The production of ethanol from agricultural products and mixing it with gasoline (or using it as an alternative to gasoline) has been increasing in some countries, where it is mainly found in Brazil, but some European countries are currently heading (by means of legislation in the European Common Market), with ethanol constituting 10% of car fuel. This is possible to achieve, but it is difficult to expand the production of ethanol more than that due to the limited arable land, water needs and the high costs, and also because it requires a large consumption of traditional energy for its production and transportation.

Energy from hydrogen

There is a growing interest in producing energy from hydrogen, especially by means of a fuel cell, for use in transportation. The fuel cell converts hydrogen into electricity and produces no pollution and thus appears ideal for energy use for transportation. However, it is not, in fact, that simple. There is a confusion between hydrogen energy and a fuel cell on the one hand and renewable energy on the other hand, and this mixing leads to a widespread belief that hydrogen and fuel cells are a form of renewable energy, which is incorrect.

Getting hydrogen is not easy and it is expensive too. The main source of hydrogen is natural gas (meaning fossil fuels). Natural gas will generate emissions when it is used to produce hydrogen, and gas is expensive and it is not economical to convert it into hydrogen at this stage. It may be better to use coal for this purpose, but it will require many years of development and investment.

In the future, it is hoped to use renewable energy (especially wind and solar energy) to produce hydrogen, so that renewable energy produces electricity and uses electric current to separate water into its hydrogen and oxygen components by means of an electrolyze, which is a reverse cell, but this method is also very expensive and its efficiency is low, It takes effort and many years to implement it, but it remains one of the few feasible methods in the future to use renewable energy. It is possible to use the electrical grid for

the purpose of the electrolyze , but this currently means using fossil fuels (especially coal) to produce hydrogen. It is important to note that a regular car that uses kerosene produces emissions of around 200-220 grams of carbon dioxide per kilometer traveled. If this car used hydrogen with a fuel cell, the emissions would be zero, but getting the hydrogen itself (in the case of using the electric grid to produce it) causes emissions of 280 grams of carbon dioxide per kilometer traveled (Iea (international energy agency) 2004).

All this shows that there is still a wide technical and economic gap between realities and hopes related to hydrogen energy and the fuel cell. Which is still in its early stages, its economies are very limited and its great technological challenges, and therefore its future potential and ability to replace fossil energy is still not available in the foreseeable future at least. In light of the availability of large and relatively cheap quantities of oil and gas in the Arab region, the possibilities of alternative and renewable energy, as well as nuclear energy as sources of energy in the Arab world, will remain very limited in the medium and distant future until at least 2030.

Encouraging investment in renewable energy

In order to overcome the weakness of the economics of generating from renewable energy, the British government has given financial incentives since April 1, 2002 through Renewable Obligations (RO) commitments. These require that renewable energy contributes certain and increasing rates of generated electricity, and this percentage was in 2002- 2003, about 3%, and will reach 10.4% in 2010-2011.

This commitment is achieved by the traditional electricity generation companies buying renewable energy commitment certificates from specialized companies that produce electricity from renewable energy. If the traditional companies fail to comply with this arrangement, they must pay a fine of 30 pounds per 1,000 kilowatt hours. The renewable energy commitments (RO) are guaranteed through 2025 to help renewable energy companies invest in the long term. All this is intended to encourage investment in the production of renewable energy and to reduce dependence on fossil energy (especially coal) in order to reduce emissions (Baron, and ECON-Energy, 2005).

Methods of spreading and encouraging renewable energy

Many countries, especially member states in the European market, try to encourage alternative energy, especially renewable energy, in multiple ways, and this is usually motivated by several goals, including:

- Energy security.
- An environmental drive to reduce emissions of greenhouse gases, especially carbon dioxide.
- Diversification of energy sources.

For this purpose, some countries have resorted to tax and pricing methods for the purposes of promoting and spreading renewable energy, as shown below. It is these methods and drivers that keep renewable energy a focus of attention in many countries.

Tax measures taken to encourage renewable energy

Many European member states of the European Union have taken several measures to reduce greenhouse gases emitted from them, by imposing taxes and providing financial support and incentives to their industrial companies, as well as by encouraging the use of alternative energy. Among the most active countries in this field are the Scandinavian countries, Britain and Germany. These policies and procedures are still in their infancy, and European countries are making use of their experiences and the experiences of others, and here are some British measures that can be mentioned as a model for what is going on and which other countries can follow with similar measures in the future.

These procedures are represented in many tax methods, including:

- Climate change taxes.
- Carbon taxes.
- Energy taxes and pricing of petroleum products.

Climate change taxes and the promotion of renewable energy (the British experience)

The cost of energy in Britain was increased to the users in order to limit and rationalize its use (as well as for national energy security goals). The government imposed a special tax on the public sector and energy-intensive companies, and exempted the renewable energy sector, and this tax was called the Climate Change Levy (CCL) tax.

This plan was officially announced in April 2002, but the preliminary arrangements for its implementation began in September 2001 at trading prices between 4-6 dollars per ton of carbon dioxide. The current trading price of carbon dioxide in European markets is € 22.5 ($ 25) per ton of carbon dioxide. Participation in this plan is open to most British companies and is optional, and the plan currently does not include power stations, the transport sector or the household sector, but it will be covered after a while. The government has offered many incentives for companies to contribute to the return of the tax in special circumstances, including compliance with certain conditions (see below). There are currently around 6000 companies in Britain that are able to trade.

This British plan is a pilot plan during the period 2002-2006, during which it is expected that it will be a pilot plan to start a similar plan that includes all European Union countries. It is expected that the British register of trading nationally is the same as the one expected to apply to the global trade of gases emitted in 2008. The government has also expressed its

willingness to return 80% of the value of the climate change tax (CCL) to companies that achieve satisfactory results in improving their energy efficiency or in energy use.

In the Energy White Paper 2003, the British government committed to reducing the carbon dioxide emissions from it in 2050 by about 60% from its level in 1990 and to try to reduce 20% of these emissions in 2020. According to the directives of the European Union for Renewables Direction. The British government has committed itself to adopting methods that lead to renewable energy contributing at least 10% of electricity production in 2010 and 20% in 2020. This is in addition to the climate change tax (CCL), which currently stands (in 2003) the amount of £ 4.30 per every thousand kilowatt hours of industrial consumption. All this is to reduce carbon emissions and to prepare British industrial consumers to participate in the EU Emissions Trading Scheme (EUETS), which came into effect in 2005. All this places a heavy burden on power plants that use fossil fuels, especially coal (Baron, and ECON-Energy, 2005).

Carbon taxes

The carbon tax is an addition to the price of fossil fuels and is proportional to the amount of carbon emitted when burning that fuel. Such taxes have been considered an efficient tool in reducing emissions, and thus they are an incentive tax for the use of renewable energy.

Carbon taxes are financial instruments that have a direct relationship to the market; for when a tax is imposed, goods whose production requires heavy consumption of energy will be more expensive and less profitable. As a result, market forces will act efficiently to reduce their use and thus emissions. These taxes have two effects, one of which is a direct result of increasing prices, which leads to efficient investments, energy conservation, change in fuels and how they are used, and the other indirect effect through recycling the withheld tax revenues, which leads to changes in the investment and consumption structure and better benefits for the public.

In addition to taxes on carbon and emissions, there are other taxes that have direct implications for energy use and the promotion of renewable energy. Energy taxes in general and energy sales taxes are actually carbon taxes, although they cannot be considered direct taxes because they are not determined by energy's carbon content. There are three problems with carbon taxes: their effect on competition, on the tax burden, and on the environment (Undp, 2003).

It is necessary to differentiate between a carbon tax and an energy tax. The energy tax is imposed on the production or consumption of energy, for example, in dollars per million British Thermal Units / BTU, or per kilowatt hour of electricity consumption, regardless of its carbon content. While the carbon tax is proportional to the carbon content of fossil fuels, and therefore it is related to fuels that contain carbon only, its burden is on coal more than other fossil fuels and is not exposed to nuclear energy. Therefore, if the intention is to reduce emissions, especially carbon, the carbon tax is more effective and better for implementation. And since coal is the fuel available in abundance in most industrialized countries (and it is subsidized in many cases), there has been a tendency on the European market to impose a common tax resulting from energy and carbon. Fuel is carbon and the other half is based on its energy content.

The first hurdle in applying carbon taxes is the effect on competition. As the countries that collect such taxes raise the cost of production and reduce their ability to compete, although the preliminary studies have indicated that the effect of these taxes does not directly affect profit and loss. Concerning the distribution of income, the primary indications indicate that these taxes have negative effects and affect the poor more than they affect those with high incomes, but the issue is still controversial. As a result of the negative effects of the carbon tax, several studies have been conducted to predict its economic results.

Coal-intensive countries such as Australia are affected by the cost more than other countries. It was found that in order not to have major direct impacts on the economy; it is preferable that the implementation of carbon taxes be gradual, giving consumer's time to make new choices, thus mitigating the negative impact on the economy.

Regarding renewable energy, such taxes reduce dependence on fossil fuels and thus reduce carbon dioxide produced in the atmosphere and improve the potential of renewable energy, but it must be noted that the global greenhouse is not only produced from carbon and for the sake of the environment there must be a similar interest in other gases that It may lead to a global greenhouse. Carbon taxes are controversial and their effects are unclear, although some of this can be addressed by taxation method and use of the proceeds. One of the controversial effects is that these taxes can penalize producers rather than fall on the shoulders of consumers (Baranzini, et al 2010).

The strategies to impose a carbon tax in both the European Union and the United States have not achieved their purpose, and this may be due to its negative impact on the production of coal, which is the main fuel for electricity production in the United States and some European Union countries. In 1992 President Clinton tried to impose a tax based on the fuel content of the fuel, called "Clinton BTU Tax", but he failed to do so. The carbon tax proposal presented by the European Union in 1990 was rejected by Britain in 1993 and some European countries remained hesitant. About him until he was permanently abandoned a few years ago. Other similar attempts in several countries met only limited acceptance.

Since 1991, Norway has implemented one of the highest carbon taxes in the world, amounting to $ 51 per ton of carbon dioxide emitted from gasoline and $ 24 per ton of carbon dioxide from coal. Now, after more than ten years of implementation, Norway has found that the impact of a carbon

tax on carbon dioxide emissions was minimal. In the ten-year period until the year 2000, Norway was able to reduce carbon dioxide emissions by 14%, but most of the reduction was a result of a decline in energy intensity in the economy and a change in the components of use, and the carbon tax only helped 2% of the reduction that occurred.

Thirdly: Renewable energy policies globally and Successful policies

These policies can be divided into five main axes:

a. *Demand and production development.*
b. *Policies to encourage local manufacturing.*
c. *Supporting renewable energy.*
d. *The bodies implementing the laws related to renewable energy.*
e. *Successful policies.*

Laws related to renewable energy include laws for the development and promotion of renewable energy, or special laws to improve energy efficiency and use, or laws for electricity that contain provisions for renewable energy articles, in the same way that renewable energy policies have agreed to allow the establishment and connection of stations or production units of energy. Renewable power to the electrical grid with giving it priority in relying on it vis-à-vis other sources (whenever available), provided: -

1. That the station has been licensed as a station to produce electricity from renewable energy and given a certificate of origin of the source of that energy.
2. The station must fulfill the technical conditions that allow the connection according to the network code, provided that the station bears the connection cost to the nearest point to the network and the network bears any expansions and additions required by that connection.
3. That these advantages granted to renewable energy apply to energy produced from secondary sources (recovered from lost energy) or cogeneration units.

These principles were mentioned in the laws on renewable energy in Germany, the Czech Republic, Denmark, China, and Jordan, or the energy laws of Bulgaria, South Africa, Georgia, or the electricity laws of France, Romania, Hungary and Croatia. It should be noted that there are countries that did not It sets a policy for developing renewable energy applications, and then its law stipulated that the state establishes a policy for the development and promotion of renewable energy, like Romania.

Demand and production development policies

These policies are divided into three main policies in addition to some supportive policies, and they can be summarized as follows:

First: major policies

Pricing policies

In this policy, the state sets a tariff for each unit of energy produced from a renewable source, and this tariff is higher than that granted to energy produced from traditional sources and guarantees an adequate return for investors in the production of renewable energy. Usually, there is a tariff for each type of renewable energy, such as if there is a tariff for electricity generated from wind, sun, or underground energy. The cost of renewable resources is covered through two means, the first: direct, i.e., paid by the final consumer, and the second indirect through tax exemptions on The project or imposing taxes / fees on conventional energy in favor of renewable energy, and the tariff value may vary according to the capacity and location of the station. In the case of winds, the tariff changes according to the nature of the site, meaning a higher tariff is granted for places with wind speed less than the standard site specified by law. Many countries have adopted this policy, such as Germany, France, Spain, the Czech Republic, and, most recently, China. At the end of 2006, 41 countries and states / provinces had this policy, more than half of which began implementation after 2002. The German Renewable Energy Act is the first law to adopt this trend, as it granted a distinct tariff for renewable energy, and that tariff is guaranteed for a period of twenty years and is reduced by only 1.0% annually (Khatib, 2011).

The feed-in tariff policy is known as the fixed value and variable capacity policy, as the law does not require the production of a specific amount of renewable energy, but market forces are relied upon to determine the amount of energy produced depending on the attractiveness of the offered prices, and the feed-tariff method is characterized by the following: -

- Provide a guarantee for investors in the production of electricity from renewable energy, as the value of the energy purchase is guaranteed for a long period of time (20 years in German law and fifteen years in French and Czech law) in a way that guarantees investors to recover their investments.
- Enabling investors to obtain financing more easily from banks as a result of the expected income.
- The possibility of encouraging the growth of certain types of renewable energy, especially those that depend on advanced technologies, where they are granted a more distinct tariff.
- Ease of application.
- Does not necessarily require a PPA.
- Ensure that the investor is keen on the optimal design of the station due to the correlation of project profitability with higher productivity.
- As for the defects of this policy, they can be summarized as follows:
- The element of political risk expelling investment, but some governments have reduced that risk by guaranteeing payment and buying electricity for a period ranging between 15 and 20 years. If the tariff falls, this will not affect the existing investors, but it will reduce the new investors.

- The risk of changing exchange rates, or in other words, the high cost of financing.
- The high cost, where the tariff is fixed for a long period of time, which does not allow the transfer of the cost reduction resulting from technological development and high efficiency to consumers.
- Not ensuring that specific targets are achieved for the percentage of renewable energy use, as this leaves the market mechanisms.
- The difficulty of forecasting the rate of growth in the use of renewable energy, which puts a burden on the transmission and distribution networks, as well as on the capabilities needed to maintain the balance of the networks.

It is worth noting that the German law has proven very successful upon implementation, as electricity production from renewable energy has increased from 5.2% in 1998 to 8% in 2003 of the total amount of electrical energy generated, and the amendment to the law that was implemented in 2008 has been given an advantage. Energy produced from wind, with the aim of achieving 30% of the participation of renewable resources by the year 2020, has also reached a third of the amount of electricity generated in Germany from wind energy despite the low average wind speed (from 6 to 7 meters / D) in Germany, as well as energy generated from both biomass and solar energy using photovoltaic panels.

The ruling of the Special Court of the European Union in March 2003 gave a great impetus to that policy, as it was considered that it did not contradict the principles of free trade. In general, the feed-tariff system is more appropriate from the viewpoint of investors, as it proved to be a great success. This policy has the greatest effect on stimulating investments (Khatib, 2011).

Policies for quantitative objectives

This policy is known as the "quota" policy or the "Renewable Portfolio Standard" policy, whereby the state requires, through law, on electric power supply companies or consumers to produce or consume a specific percentage or amount of electricity from a renewable source. Penalties are imposed on companies that fail to meet this target. As for pricing the value of energy produced from renewable sources, it is left to the nature of supply and demand, taking into account the need for all parties to fulfill their obligations. Consequently, this policy is sometimes known as a defined capacity and competitive price policy. This policy aims to reduce energy prices from renewable sources as a result of competition (Zhang, 2014).

The system has been developed in many countries to include Tradable Green Certificates, where certificates are issued that represent a mechanism for tracking and recording production from renewable energy. These certificates can be used to prove compliance with the requirements of the quota system that are binding or sold to the final consumer in a voluntary market for the clean energy trade. Energy prices and certificates are settled daily in the mechanism of the electricity market, and there are independent markets for certificates that set daily prices.

Several countries have national quota targets that were enacted as of 2001, and they are Australia, the United Kingdom, Japan, Sweden, Poland, Italy, Belgium, and Hungary. These systems are currently being expanded at the state / provincial level (32 states and provinces) in the United States of America, Canada and India as of 2003.

Since 1999, Denmark has adopted that policy, but changed it to the nutrition tariff policy. This is mandatory for what is known as clean or green energy certificates where producers issue production certificates equivalent to each certificate of one million kilowatt hours of renewable energy that is produced, and consumers buy a quantity of Certificates are equivalent to the amount of energy required to be consumed from the same renewable source.

In general, there is not enough international experience to allow a judgment on these regulations. However, there are reservations about them on the part of investors, including that they must work in two independent markets, one for energy and the other for certificates and supply and demand problems, as investors want to buy long-term certificates while companies separate Production is short term contracts. In other words, the green certificates trading system is more risky to investors, unless there is a market with long-term contracts for certificates (Undp, 2003).

Competitive Public Bidding Policy:

Investors are invited to set up projects to supply electricity from renewable sources during a certain period and with specific capacities through a tender, and contracts with the lowest production cost are chosen and the electricity networks are obligated to buy from those stations based on the prices reached through those tenders and the agreed time periods.

The adoption of these systems began in the United Kingdom in the nineties, and they are currently applied in six countries, namely Canada, China, France, India, Poland and the United States, while Ireland started with it and recently switched to the feed-in tariff system, and electricity companies in many countries resort to it to meet their target quotas according to the quota system.

This is usually the type of renewable energy is specified in the tender, as there are no tenders between different types of renewable energy, and this policy is characterized by the following:

- Competitiveness in a way that guarantees obtaining the lowest prices and helps reduce the subsidies provided to renewable energy.
- The ability to control the quantity and quality of electricity produced from renewable energy.

- Investments guarantee where prices are fixed for the length of the contract period to ensure that investors recover their investments.
- On the other hand, this policy is defective as follows:
- Concerning producers: competition may lead some producers to accept unrealistic prices, depending on the possibility of reducing the cost, which in the absence of this may lead to the inability of these producers to fulfill their obligations.
- For buyers: engaging in long-term purchase contracts in a way that does not lead to future benefit from technological development and improved efficiency.

Second: Complementary policies

There are several policies that complement the previous main policies, including (Baranzini, et al 2010):

- Financing arrangements (in more than 30 countries) that include providing grants and soft loans for either the investor or the consumer, as well as mechanisms to reduce financing risks through government guarantees, returning part of the financing, or by purchasing from producers at higher prices to encourage the industry.

Tax and customs advantages that include:

- Tax exemptions or reductions for specific periods, whether at the level of project investments or at the consumer level, for renewable energy systems and equipment and their spare parts, as well as lines and components for the production of such equipment.
- Providing a tax incentive on production, production tax credit, whereby producers of electricity from renewable sources are granted tax benefits on their production, which are usually set as a percentage of the product's kilowatt-hour price by deducting taxes on other activities.
- Imposing taxes on carbon emissions or other pollutants such as sulfur oxides or nitrogen oxides resulting from the use of petroleum fuels.
- Organizational and administrative arrangements, including the signing of long-term contracts for the purchase of energy, facilities for connection to the network, and prioritization of sites selected for projects according to the inventory of sources.
- Some countries have established a fund for renewable energies that is used for direct financing of investments, providing low interest loans, or supporting the market by another means such as research and development. The most important examples in this area are the United States, China and India.

Tax Credit Policy

In this policy, the production of electricity from renewable energy is encouraged by granting companies that invest in renewable energy a deduction in the taxes due on their other activities. This policy has been used as a complementary policy to the obligation in the United States of America, and this policy is characterized by being well supported The compulsory policy, as it leads to an increase in investments, but its flaw is that it may be affected by policy trends towards granting tax exemptions, as it has been proven that it is not supportive of small producers or specialists in renewable energy activities only.

3rd Party Finance

They are financing arrangements in which the government bears the risk. The most important examples of this type include concessional lending systems (lower interest rates or providing guarantees for lending).

Capital Grants

It is a percentage of the investment costs in the procurement and installation of renewable energy covered by government financing mechanisms directed to the electricity / energy product.

Consumers Grant / Rebate to consumers

A percentage of the investment costs from renewable energy purchases and installations covered by government financing mechanisms directed towards the final energy consumer.

Excise Tax Exemptions

Tax policies to exempt renewable energy enable offsetting for a portion of the high cost of energy use, which increases the competitiveness of renewable energy with other types.

Fossil Fuel Taxes

Taxes on carbon emissions or taxes on other pollutants such as sulfur oxides or nitrogen oxides resulting from the use of petroleum fuels, which indirectly benefit renewable energy by reducing the cost compared to petroleum fuels.

Fossil Fuel Taxes

Government purchases of renewable energy systems at prices higher than market rates, and in a manner that represents an incentive for industrial investments.

Green Pricing

A service that gives the consumer the option to support the increase in the contribution of renewable energy in the investments of electricity companies by paying an additional value on the electricity bill to cover the increased cost of renewable energy.

Investment Tax Credits

Benefits or tax incentives applied either to purchases or installations of renewable energy equipment.

Net metering

It is a system that allows consumers with systems of renewable energy units that produce electricity to save electric energy in excess of their needs for later consumption. A single gauge is used to measure the energy flow between the consumer and the grid, and the consumer only pays for the "net" electricity used outside of his renewable energy production over the course of the collection cycle.

Production Tax Credit Benefits

Where electricity producers from renewable sources are granted tax benefits on their production, which are usually indicated as a percentage of the product's kilowatt-hour price.

Property Tax Exemption

The owners of the units used for renewable energies are exempt from taxes on the ownership of these units, in a way that reduces their total taxes.

Policies to encourage local manufacturing:

These policies are related to countries with appropriate industrial capabilities and appropriate market size, such as China, India and Brazil. Policies to encourage local manufacturing of equipment producing electricity from renewable energy include (Khatib, 2013):

1. Requiring a percentage of local manufacturing.
2. Imposing taxes on equipment producing renewable energy imported from abroad.

This policy does not contradict the requirements of the World Trade Organization, as the renewable energy market has been described as a non-commercial market.
The experiences of different countries have shown the following:

- In Canada, a formula has been set up in bid evaluation conditions that take into account both price and local manufacturing ratio.
- Linking the qualification to enter auctions for electricity production from renewable energy to achieving a percentage of local manufacturing.
- Some governments, such as Spain, granted additional subsidies to be paid for several years if the local manufacturing rate exceeds a certain percentage.
- India, since the mid-nineties of the last century, has stipulated the necessity of achieving an increasing rate of domestic production of wind-generating units, starting from 30% and rising to reach 70%. Brazil has also applied a similar policy.
- China has requirements for a percentage of the domestic manufacturing of equipment used in the production of electricity from renewable energy. The government has also encouraged domestic / foreign partnership to produce wind farm equipment as two Chinese companies have been chosen to partner with international companies to produce wind farm equipment. The Chinese tenders recently stipulated a 70% local manufacturing rate.

It should be noted that all of these policies are not at the expense of product quality as the quality condition must be met under all circumstances, and they do not represent an obstacle to the market's attractiveness for investments as this attraction depends on the breadth of this market**.**

Policies to support the use of renewable energy

The support provided for the development of the use of renewable energy is divided into two types of support (Undp, 2003):

1. Support for research development of production equipment from renewable energy, as well as inventory, measurement and development operations for renewable energy production sites, training and capacity building, and the development of local manufacturing capabilities. All laws require the provision of such governmental support.
2. The subsidy provided for the price of a unit of energy produced from a renewable source, and this subsidy varies according to countries, as countries that do not support energy prices do not provide such support, as the cost of electricity production from renewable sources is distributed to consumers. In Germany, this increase is in the range of 1.08 Euroscent per Kilowatt hours. In the case of countries that subsidize energy prices, the government provides direct support for the final energy product, as in the case of China, where the government subsidizes 3 cents / kWh in excess of the price of electricity produced from a conventional plant powered by sulfur-free coal.

The bodies implementing the laws related to renewable energy

For any law, the body responsible for implementing that law must be determined in order not to lose responsibility, and when choosing that authority, the following must be taken into account:-

1. To be legally competent and possess the necessary human capabilities to implement the law.
2. To possess the powers that allow it to apply the law and to impose any penalties stipulated by the law.

The determination of that authority differed according to the type of law that is applied. In the case of electricity laws such as France, Croatia, Romania and Hungary, the law has been assigned to the electricity regulators in those countries. As for the case of new and renewable energy laws, such as Germany, Australia, China, Denmark, the Czech Republic and Jordan, the authorities responsible for implementing the law differed according to countries. In Australia, a regulator specializing in renewable energy was created, and in Germany it is the Ministry of the Environment since 2002, and in China the responsibility is shared between Central and provincial

governments, and in Jordan and the Czech Republic, the Electricity Regulatory Authority has been entrusted with the responsibility of supervising and monitoring renewable energy contracts. In the case of countries that adopt energy laws, such as Bulgaria, South Africa and Georgia, responsibility is delegated to the energy agency or the ministry responsible for energy (Khatib, 2011).

Successful policies

We review here some successful policies that have been implemented by some countries in the field of energy, and the reason for presenting these models is that presenting successful experiences is better than listing policies that approach utopia more than it is close to reality, and also my belief that presenting these successful models will be a convincing process of what can be achieved. I have tried, as much as possible, to present different policies towards more varied alternatives, and I hope to draw attention to the fact that some of these policies (succeeded) in many countries (and failed) in some, as the decisive factor in applying a policy is a study The extent of their suitability for the market mechanisms to be applied in.

First: feeding the network

The policy of "feeding the network" depends on the government to determine, in agreement with energy producers from renewable sources, an incentive for each kilowatt-hour that the government pays to producers in return for fulfilling their specific obligations, which means guaranteeing producers a remunerative price to sell electricity, and this policy is attractive to investors. It helps in spreading renewable energies and managing plants with high efficiency. This policy has been implemented in a number of countries, including Spain and France, as well as Germany, which implemented it in 1990, which led to the prosperity of renewable energy markets there and the dissemination of their applications and thus the growth of companies operating in the field to the extent that German companies became pioneers in the fields of renewable energies globally (US doe. 2005).

The application of this policy may lead to burdening the budgets of countries with large financial burdens, which is why the German government has called for low-interest bank loans for renewable energy projects, in addition to imposing small fees that represent a percentage of the monthly bill of energy consumers whose revenues are collected in favor of supporting renewable energies.

Second: The basket of sources of energies

The global transformation of alternative energies requires linking their sources to the local network, in order to support and increase production, reduce prices and ensure the reliability of energy systems, and the share of renewable energies can be divided into different ratios that accommodate most of the available resources, which is what happened in the states of Arizona and Nevada in the Americas where specific percentages were allocated for the production of electricity Of solar energy, and although this determination is difficult to implement in all places, it has proven successful in these two states. There is also the Japanese program for installing 70,000 photovoltaic cells, which began in 1994 and ends at the end of this year, as it led to a reduction in the cost of the system to the consumer by about 41% in 2002 compared to 1995 prices (US doe. 2005).

Third: the green market

The term green market means investment in energy obtained from renewable, environmentally friendly sources, and emissions trading is considered one of the important policies for developing the renewable energies market through the Kyoto Protocol that was adopted at the Third Parties Conference held in the Japanese city of Kyoto in 1997, where the protocol specified binding commitments For 39 developed countries and transition economies, by reducing their greenhouse gas emissions by an average of 5.2% than they were in 1990 during the initial commitment period 2008-2012, by helping developing countries achieve sustainable development. The green market policy also takes another form, which is represented by consumers agreeing to raise the value of the electricity bill in exchange for increasing the participation of renewable energies, which happened in the Netherlands in 2003.

Fourth: fair incentives for renewable energies

The current markets for traditional sources of energies are very weak and distorted due to the continuous financial support on the part of governments, and the problem is that this support harms renewable energy technologies, and unfortunately some policy makers are proposing new financial support sources for renewable sources, forgetting that the traditional sources of energies have occurred and are still occurring. I received large financial support, which resulted in unrealistic prices for energy generated using fossil fuels, making it difficult for renewable alternatives to compete. The continuing inequality in the support of energies gives a wrong idea about the potential of renewable energies, and the risks and instability of prices must be taken into account when distributing subsidies to various sources, in addition to calculating the environmental and social impacts resulting from the application of certain technology, and this policy was applied in America in 2003. 1999 The time of the planned allocation of capacity support (Undp, 2003).

Fourthly: Recommendations

- Promoting the use of renewable energy technologies that have proven economically feasible.
- Renewable energy is the best choice in terms of low costs to secure and sustain energy supplies.
- There are abundant renewable energy resources in the Arab region that can meet or at least help in facing the

increasing energy demand in these countries, with the possibility of concluding agreements between some Arab countries and European countries to export energy that can be generated from renewable sources to these countries.

- The use of various sources of renewable energy will help in achieving environmental, economic and social stability in the energy sector.
- The measures currently being followed in the Arab arena with the aim of supporting renewable energy require more effort, especially in the absence of the knowledge aspect and the necessary financing, with the easy and stimulating conditions.
- A balanced mix of renewable energy technologies could lead to the recognized traditional role of generating power during baseline, medium and peak load times. In this way, new business fields can be opened and the use of existing fossil energy sources extended for future generations in a manner compatible with the environment.
- Renewable energy and raising energy efficiency are the main pillars of environmental compliance. They need time-limited incentive investments, not long-term aid such as fossil energy and nuclear energy.

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