

Scientific Investment in Green Energy and Building the Future

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Abstract

The essential objectives for this research to develop the skills of the public and private sectors at the national level for the State of Libya and the Arab world in order to identify, develop and implement investment projects in the field of renewable energy; assisting national authorities to carry out regulatory and institutional reforms to support these investment projects; Identifying opportunities for financing renewable energy projects in the region. The criteria for the advancement of civilization globally are to benefit from renewable and alternative energies, and green energy is represented in all renewable energy sources that God Almighty has granted to man without any human interference in them. It is worth noting that one of the most important advantages of green energy is that it is not implemented at all, no matter how much people use it, as it is renewable on its own, unlike non-renewable energy sources such as natural gas, petroleum, coal and others. They are sources that expire and are implemented with the end of use by human beings. It is worth noting here that in recent times, voices have been raised in many development conferences and conferences for preserving the environment in order to work towards the use and exploitation of green energy sources as a clean, renewable, financially and non-expensive alternative. Polluting the environment and replacing non-renewable energy sources with green energy sources.

Keywords: Renewable Energy – Green Energy – Future Health – Arab World

1.0 INTRODUCTION

Renewable energy is that energy generated from an inexhaustible, continuous and unconventional natural source, and requires only a process of converting natural energy sources into renewable energy, to make it easier for people to benefit from and use them in advanced and contemporary life technologies, and renewable energy methods are widely and widely available in the environment of life. Natural, and it may dispense with depleted and non-renewable energy sources, which may run out from frequent use, and its availability in nature is limited and non-renewable quantities, and it is one of the fossil fuels formed in the ground in its forms, oil, gas, and coal, and we will present the uses of renewable energy in detail [1].

In order to establish a new global system, concerned with the cleanliness of the environment from pollution, and push towards the generalization of sustainable

development in all parts of the globe, especially in the countries of the Arab world, efforts are directed to search for alternatives to traditional (fossil) energy, and to develop new technologies, which would deepen the use of renewable energies in a better economic way, and many countries of the world have made good strides in this field, so we hear about cities that run on solar energy, and power stations that rely on the power of water rushing, and factories that run their equipment and machines with energy from tidal sources, as in France and Canada. There are many sources of renewable energies, which many development experts and environmental scientists believe will manage the future of the world. What is the concept of renewable energies? What are its sources? What are its benefits and advantages? What are the global trends to invest in these energies? And to what extent is sustainable development linked to

the renewable energies market in light of the Kyoto Protocol, which focused on the most important policies for sustainable development?

2.0 Materials and Working Methods:

The increasing spread of renewable energy types would in turn yield other benefits, given that renewable energy technologies lead to job creation and reduced air pollution at the local levels, in addition to the need for less water. Rather, renewable energy technologies use almost exclusively domestic resources, helping to protect our economies from external shocks in terms of energy security. Most importantly, for many of our 173 member and signatories, Renewable energy also represents one of the fastest ways to expand the availability of electricity as the highly stereotypical nature of many of these technologies, especially solar photovoltaic and onshore wind, also means that, for the first time in the history of the electricity sector, there is an active role for individuals and communities in connection with providing them with the electricity they need. Thus, renewable energy technologies are at the fore in the process of changing a system characterized by more democracy in the distribution of energy in the regions of the Arab world.

The benefits of renewable energy are numerous and obvious as are the barriers that prevent us from absorbing them. Market structures, lack of understanding of emerging renewable technologies, in addition to difficulty in obtaining financing, as well as high financing costs, lack of regulatory frameworks and absence of rewards for substituting species exogenous fossil fuels (e.g., emissions of carbon and domestic air pollutants), small markets and inconsistent policies have all played a role in preventing the spread of renewable energies. Fortunately, and in light of the vigilant efforts of industry, governments, financial institutions and regulators in the Arab world, many of these barriers are falling apart [2].

3.0 Study Objectives

The main objectives that the study seeks to achieve can be identified and summarized as follows:

1. Identifying the medical relationship and the impact on the spread and provision of renewable energies in designing green building in the Arab world.
2. Diagnosing the most prominent areas of creativity in the use of diversified energy and benefiting from it in various sectors.

3. Recognize the importance of green building design, which the Arab countries seek to achieve.

4.0 The relationship of Scientific Investment in Green Energy to Sustainable Development

The 2030 Agenda for Sustainable Development and the Paris Climate Agreement represent key turning points in advancing global action to promote the transition towards a green economy and tackle climate change. Their implementation has contributed to the growth of environmental awareness and the integration of sustainability into the financial sector, which indicates a qualitative shift in the way financial intermediation is managed and monetary transactions are structured. On this basis, new environmental and climate-friendly, sustainable and responsible investment products and financial instruments have been developed, including green bonds and green, sustainable and responsible investment instruments.

The financial sector can play a crucial role in building a stable and prosperous economy with the implementation of the principle of responsibility and accountability. This requires redirecting investments towards economic activities, which balance economic, environmental and social objectives, in order to improve human well-being, and reduce the impact of global challenges, such as climate change, the absence of biodiversity, inequality, etc. In this sense, many analysts take a closer look at the "green economy", which can contribute to promoting economic growth and achieving sustainability goals at the same time.

5.0 Sustainable Development and Green Finance Program:

The Organization for Economic Co-operation and Development defines green finance as financing that aims to "achieving economic growth while reducing pollution and greenhouse gas emissions, minimizing waste, and improving the efficiency of natural resource use." Over the past decade, the global green finance market has seen rapid growth, with the development of financial instruments such as green bonds and unclassified sukuk, green loans, green investment funds, green insurance, and green sukuk issued in recently.

Although the first green bonds were issued in 2008, the market has evolved significantly to mobilize financing for the 17 Sustainable Development Goals by providing innovative structures, ratings and governance frameworks.

6.0 The Advantages and Characteristics of Renewable Energy:

One of the most important advantages of green energy is that almost no one can be ignorant of the benefits of green energy, but some may be ignorant of some of these benefits, which everyone should know without exception as a kind of recognition of the beauty of this energy, and the first benefits are certainly the protection of the environment and man. Perhaps the first and most important advantages of green energy are those related to maintaining human health, as we find the use of these types and sources of green energy is one of the things that preserve human health, and perhaps the secret is that it does not result in any sources of pollution in any way, unlike non-renewable energy sources that it is famous for polluting the environment surrounding humans, as it produces a lot of exhaust, especially fumes and carbon dioxide. Among the most important features and characteristics that encourage the investment of renewable energies are as follows:

- ✓ Availability in all countries of the world.
- ✓ It is a local resource that cannot be transferred, and it is compatible with the development of the needs and reality of cities and rural areas.
- ✓ Economic means with multiple benefits and uses, and they constitute a huge economic income for the Arab countries.
- ✓ It maintains the cleanliness of the environment and public health and has no waste that causes pollution.
- ✓ A guaranteed source that is available at reasonable and regulated prices.
- ✓ Availability of the techniques used in its manufacture in developing countries.
- ✓ It supports the economy of countries in terms of industrial, agricultural, and social aspects, and contributes to the development of the environment.

7.0 Renewable Energy Sources

- ✓ Solar energy.
- ✓ Watershed energy.
- ✓ Earth's heat energy.
- ✓ Wind Energy.
- ✓ Energy of living mass.
- ✓ The energy of the temperature difference in the depths of the oceans and seas.
- ✓ Energy of wave and tidal movement.

8.0 Uses of Renewable Energy

The importance of renewable energy comes from its multiple use in various fields of human life, and its role

in meeting human needs and daily requirements in the Arab world, which are as follows:

I. Home Field

- Solar energy is used to facilitate household chores such as showering, cleaning and washing, as it is considered one of the cheapest types of renewable energy available.

II. Industrial Field

- Water distillation.
- Lighting of the shipping lanes, and navigational alarms.
- Used in the operating system of the speakers.
- Solar energy is used in food factories, plastics, automated bakeries, dyeing and heating and evaporation processes.
- It is used in keeping medicine refrigerators in health centers and hospitals, and in operating televisions in open and spacious areas.
- It is used to charge batteries and generators.
- Generation of electric power to illuminate villages and remote places.

III. Agricultural Field

- Operating solar irrigation pumps that are useful in raising and reaching irrigation water for agricultural lands.
- Used in drying agricultural products.
- Operating solar greenhouses to heat some crops that need warmth and heat in the winter.

9.0 Different Types of Renewable Energy have their Economic Significance

In order to achieve a truly sustainable energy system, solar photovoltaic cells, along with wind energy, will have to play a rapidly increasing role in the electricity supply. So, the main challenge is to manage this startup

resources, and in such a way as to minimize any additional costs arising from the introduction of these resources. Hence, policy support needs to shift sooner rather than later from an isolated silo approach that supports individual technologies to one that sets long-term goals and minimizes overall system costs.

Renewable and diverse energies raise different questions for the electric grid, but the principle remains the same: a mix of technologies will be required within a range of locations to meet the demand that varies every day. Hydropower, biomass for energy, geothermal energy and CSP with thermal energy storage are minimal or interchangeable

technologies with no particular problems for grid operation [3].

There are no technical barriers to the increased integration of different renewable resources, such as solar energy and wind energy. As for the costs of introducing work into the network at low levels of penetration, they will be negative or modest, but they can increase with the increase of this integration. However, when the environmental costs of fossil fuels are taken into account, then the costs of introducing grids turn out to be much less severe even when 40 percent of the energy supply is provided by renewable and diversified sources. In other words, with an equal playing field, and taking into account all externalities, the types of renewable energies remain radically competitive.

Rather, it is characterized by relatively modest additional costs across the network, so that it can be viewed in one way or another as the cost of the various sources of renewable energy and green energy, because the cost implications for broadcast and distribution systems are usually minimal. However, the additional reserve needed to meet fluctuations in loads, counteract outages, and provide the ability to last over longer periods of time in lower sunlight or winds can increase the overall network costs.

10.0 Rely on Cost Reductions in Renewable and Green Energy Technology

This brings us back to the title of this scientific paper, which refers to the work of scientific investment in green energy and building the future. The topic should not be "How can renewable energy become competitive" because renewable energy technologies are already competitive. Therefore, the questions must be how to drive costs down further, and what are the challenges to achieving this goal. This is the main challenge we face today. The analyzes of the International Renewable Energy Agency show that the story of the competitiveness of renewable sources is a fabricated one. While there are variations in construction costs, not only between countries but within any of them, some of these differences are due to structural issues or to issues specifically related to a particular project. Although many of these issues can be addressed by adopting better policies [4].

At the same time, opportunities to reduce costs in equipment and in project construction can still be explored. However, in an era of declining equipment costs, future cost reductions can be increasingly accelerated thanks to reductions in both total project costs and lower operating, maintenance and

financing costs. Moreover, unlocking this potential in terms of reducing costs and narrowing the disparities in costs between markets will be essential in achieving the goals sought by the world in terms of economic, environmental and social aspects. The next stage in the prestigious story of renewables will be driven by its inherent competitiveness. As countries such as Chile, Jordan, the United Arab Emirates and India have found, renewable energy is now often the largest economic source to meet their demand for electricity. However, the pace of this change will become too slow for our planet even as these renewable sources of energy become increasingly competitive.

Currently, is the time to seize the opportunity to accelerate the spread of renewables to ensure that we meet our shared goals of achieving an environmentally sustainable energy sector that is safe, reliable and affordable. Never before has this involved such a low cost, and it is increasingly becoming an option that will save consumers money, both today and in the long term [5].

11.0 The Role of the Private Sector in Achieving the Sustainable Development Goals

The implementation of the sustainable development plan requires huge funding that the investment levels available so far do not meet. Despite the importance of funding countries and governments to implement the plan, the Secretary-General of the United Nations seeks to mobilize the private sector, which can play a very important role in contributing to financing the implementation of the sustainable goals. Through the circumstances and disasters that the world is going through in general and developing countries in particular, the Corona pandemic (Covid-19) has a crushing impact on the world's poor in particular. This pandemic may have pushed about 100 million people into poverty expected in 2020 alone, while the United Nations warns that poverty may increase in some regions to levels not seen in 30 years. In conclusion, the current crisis has led to a deviation in the path of progress towards the sustainable development goals, as low-income developing countries must now balance urgent spending on protecting lives and livelihoods with longer-term investments in health, education, physical infrastructure and other necessary needs.

12.0 Libya and the Relationship of Scientific Investment in Green Energy to Sustainable Development

The economic literature has shown that there is a growing consensus that development is a multi-dimensional process that involves overlapping interactions between its various objectives, and this requires a systematic design of policies and strategies to achieve these goals. Development issues are

complex and multifaceted, there is no single path of economic development that all countries can take in the long term, and the process of economic development requires changes in policies and strategies to keep pace with new and developing events and trends. Policy design also needs to take into account social, cultural, political, and institutional factors and considerations, which are constantly changing over time in a country. The economic and social problems in some Arab countries were similar, which led to the outbreak of the Arab revolutions since January 2011, such as what happened in Tunisia, Syria, Libya and Yemen. These revolutions have resulted in more dangers, political instability, civil wars, and an increase in terrorist attacks on the borders, which have become a real threat to development not only in Libya but in the entire region and threaten its Arab identity. In addition to that, global crises such as the energy crisis, the global economic crisis that occurred in America in 2008, the crisis of the spread of the Corona pandemic in 2019, and the crisis of high global food prices that appeared strongly in 2006 and worsened in 2008 and beyond, the global water crisis, and the financial market crisis. Recently, it poses a threat and a strong challenge to development, not only to the Libyan economy, but to all the economies of developing countries. Therefore, all these indicators are considered to have negative effects on scientific investment in green energy and its relationship to sustainable development in the State of Libya.

13.0 Means and Ways to Find the Competitive Stages

The economics of renewable energy and green energy technologies is essential to understanding the role these technologies can play in the energy sector, and the speed and cost of our transitions to a truly sustainable energy sector. Unfortunately, most governments have not systematically collected the data necessary to investigate trends associated with the evolution of costs for renewable energy technology, which many rightly call a revolution. As a result, we often see misunderstandings about costs or outdated data that undermine the effectiveness of policies.

To fill this gap, and ensure that rigorous, data-driven policies that are accurate and timely and based on a reliable source can be followed, the International Renewable Energy Agency has developed a world-class database on 15,000 utility-level renewable energy projects, and nearly Three quarters of a million small solar photovoltaic systems. The trends emerging from these data not only explain the success of proliferation policies in terms of cost reduction, but also what will underpin the transformation of the

energy sector in the future. The cost competitiveness of renewable energy generation has reached historic levels; The use of biomass for power generation, in addition to hydropower, geothermal energy and onshore wind, can now provide electricity competitively compared to generating electricity from fossil fuels where there are good resources and cost structures.

Typical solar photovoltaic prices in 2015 involve a decrease of 75 percent to 80 percent of their levels by the end of 2009. Between 2010 and 2014, the flat cost of electricity from solar photovoltaic energy was halved at the infrastructure level. The most competitive such energy projects now regularly supply electricity for \$0.8 per cent per kilowatt-hour without subsidies, compared with \$0.045 to \$0.14 per kilowatt-hour in the case of energy Fossil fuels. Rather, these lower costs are subject to reductions for 2017 and beyond. A recent tender in Dubai for US\$0.06/kWh illustrates this shift even in a region with a lot of fossil fuels.

On the other hand, offshore wind has now become one of the most competitively available sources of electricity. Improvements in technology that occur at the same time as installation costs continue to decline mean that the cost of onshore wind is now within the same range of costs and even lower in the case of fossil fuels. Also, wind projects around the world continue to provide electricity consistently at US\$ 0.05 to US\$ 0.09/kWh without financial support, and even the best projects cost even less.

Concentrated solar power and onshore wind are significantly more expensive today among the options for generating power from and excluding fossil fuels, and with the exception of onshore winds in island plazas. However, these technologies are still in their infancy in terms of deployment, and both are important sources of renewable energy and will play an increasing role in the energy pool in the future as their costs will continue to decline.

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In light of the installation costs and performance of today's renewable technologies, and the costs of conventional technologies, the fact remains:

Renewable energy generation has increasingly been competing shoulder to shoulder with fossil fuels without financial support.

14.0 RESULTS AND DISCUSSION

In conclusion, we propose a framework for developing countries to evaluate policy options that will increase long-term growth, mobilize more revenue, and attract private investment to help achieve the Sustainable Development Goals. Even with ambitious domestic reforms, most low-income developing countries will not be able to mobilize the necessary resources to finance these goals, and they need decisive and exceptional support from the international community – including private and official donors, and international financial institutions.

Currently, most of the production of renewable energy and green energy is produced in hydroelectric power stations by means of great dams wherever suitable places are found for their construction on rivers and watersheds. Power generation techniques based on wind and solar energy are widely used in developed countries and some developing countries; Recently, the means of producing electricity using renewable energy sources and green energy has become commonplace, and many countries have developed plans to increase their production of renewable energy to cover their energy needs by 20% of their consumption in 2020.

The production of renewable energy and green energy can be read in several ways. According to the amount of energy produced by countries in proportion to their population, the Scandinavian countries, in addition to Iceland, Canada and New Zealand, are at the forefront of countries using renewable energy, and the growth of renewable energy use accelerated in German-speaking countries in the 2000s, and between Major global economies Germany leads the way in the amount of renewable energy it produces in proportion to its population, and ranks third in total renewable energy production after China and the United States of America.

In the Arab world, what is known as the trade of renewable energy and green energy is increasing recently, which is a type of business that intervenes in converting renewable energies into sources of income and promoting it, despite the presence of many non-technical obstacles that prevent the spread of renewable energies on a large scale, such as the high initial cost. However, nearly 65 countries plan to invest in renewable energies, and have

worked out the necessary policies to develop and encourage investment in renewable energies and green energy, such as financial stimulus and electricity tariffs. Despite the increase in interest in renewable energy in recent years in the countries of the Middle East and the decline in oil prices, investment in renewable energy in the Arab countries has declined by 8% in the last two years, despite the initiatives undertaken by the oil countries in the Arab Gulf, but the paradox is that the three most active renewable energy markets in North Africa and the Middle East are Morocco, Egypt and Jordan with more than \$15 billion in the years from 2015 to 2019.

15.0 Recommendations:

For the global community, inclusive global sustainable energy should be made a top priority. We owe it to the 1.1 billion people who still live without electricity, and to the 2.9 billion people who still use polluting biomass fuels for cooking and heating. However, energy is fundamental to ending poverty, underpinning the processes of economic growth and progress in all areas of development - from food security to clean water to education, job opportunities and health care.

Urban green spaces provide great opportunities for positive change and sustainable development for our cities. Public green spaces open for walking, cycling, playing and other outdoor activities can improve safe mobility and provide essential services for women, the elderly and children, as well as low-income population groups, thus promoting health equity. Incorporating public health priorities into the development of public spaces provides a win-win approach in urban areas. A health-conscious approach when planning public green spaces can offer the potential for the greatest number of co-benefits.

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References:

- [1] Hosni, Mohamed Maher Mahmoud, Renewable energies and their fields of use in Egypt, (Cairo: The Egyptian Book Authority, 1992).
- [2] Najat Al-Nish, "Energy and Sustainable Development: Prospects and Developments", Arab Planning Institute - Kuwait.
- [3] Shanab, Omar Ali Salem, Mansour, Jaber, Sattar, Ali, Muhammad. Obstacles to the use of renewable energies in Libya, the First International Petroleum Conference, 2016.
- [4] Al-Shtiwi, Ali Omran et al., Evaluation and Estimation of Wind Energy in Libya, Journal of Economic Research, Issue 12, November 2018. Arab Planning - Kuwait.
- [5] Hafez, Mohamed El-Sayed, Wind and Electricity Production in the Eastern Desert of Egypt, Al-Zafarana Station as a Model, Research published in the Ninth Symposium of the Department of Geography and Geographical Information Systems "Sahara Egypt ..

Hope for the Future", Faculty of Arts, Alexandria University, July 2007.

[6] Osama El-Khouly, "Environment and Sustainable Development Issues," translated by Baha Shaheen, International House for Cultural Investments LLC, Cairo, 200, p. 17.

[7] Muhammad Talbi & Muhammad, Sahel The Importance of Renewable Energy in Environmental Protection for Sustainable Development - Presentation of Germany's Experience - Al-Bahith Magazine Issue 6, 2008.