

RENEWABLE ENERGY IS AN ESSENTIAL VARIABLE IN ACHIEVING SUSTAINABLE DEVELOPMENT

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Abstract

Purpose- Accelerated life change due to globalization pushes global organizations, and companies who are interested in environments and their effects to think deeply in renewable energy and its importance, especially after many researches and studies that related to the side effects of normal sources of energy on societies and nature as well.

Design- Methodology- Approach- the current research aims to investigate the importance of renewable energy and its contribution to achieve sustainable development; it divides into four parts; started firstly with explain the main idioms of renewable energy; secondly explaining the main idioms that related to sustainable development; and third one working on finding the correlation between renewable energy & sustainable development; while the fourth part tries to analyze certain statistical numbers that reflect the consumption of renewable energy due to different source of data.

Findings- Most obvious results are related to the positive role of renewable energy in achieving sustainable development due to its role in recuring clean energy consumption at acceptable margins of prices.

Research limitations- implications- Still there is a power resistance to understand this methodology, due to the lack of knowledge of the importance role of both renewable energy and sustainable development, that leads the researchers to study only certain cases.

Practical implications- Researchers depend only on describing the phenomena in general and trying to build a virtual successful case if it adopts positively in certain community.

Social implications- Decreasing the side effects of using normal sources of energy especially after the international fear of climate change as a result of increased emissions that announced recently in (COP 26).

Originality- Value- it is a unique study that dealt with this dynamic phenomenon for time being especially in analyzing the economic effects on certain community as in Iraq.

Key word- Renewable energy, sustainable development, virtual case; climate change.

Paper Type- Research paper.

Introduction

The climate change and the (excess and/ or scarcity) of energy in addition to the global pollution are enough causes for international organizations as well as companies that interested in clean environment to look for other alternatives of energy resources. Energy security that related to the lack of fossil fuels (coal, oil; and natural gas) becomes a serious matter which needs more efforts to face it. Certain strategies, policies and producers have to be taken accordingly, and meanwhile; it represents an active chance of investment if societies affiliate their activities toward achieving sustainable development in economic, social, environmental, political aspects. Renewable energy has further featured related to energy security, decreasing the medical and/ or environmental side effects that related with fossil and nuclear fuels, enhancing the educational opportunities, creating novel job opportunities, decreasing the level of poverty and developing the gender equality.

Energy in general considered as one cause of existence, due to its ability to transfer into another one, energy could be in shaped differently such as; thermal, mechanical, chemical, nuclear and others. Energy could be transferred easily in many cases while others need much complicated techniques as in transferring the chemical into electrical ones (Al Alwani, 2002). Recently, before many decades General Council of United Nations exactly in 1987 announced its report concerning the sustainable development and its great role to protect future generations through many programs that interested in environment protection and technology usages to save societies and economies as well (Bakeer; AL Berezanchi, 2020).

In this sense, and according to International Energy Agency, renewable energy has many kinds such as Solar energy, Wind energy, Hydropower and Biofuel energy and so on, and these kinds of energies are characterized as an energy of low level of Carbon and more sustain (International Energy Agency, 2021).

Back Ground- To understand the purpose of this research, it is very important to think deeply about the role of renewable energy towards achieving sustainable development; trying to investigate the coins and / or pros of adopting new technologies of renewable energy. Renewable energy considered as clean source of energies, in which there is no trace emission of carbon or if there is; it would be less than harming environment compared with fossil fuel, meanwhile it is safety for use. Moreover, it could be a good chance to create many opportunities for those who live in country sides to develop their places and so on (Tripathi et al., 2021). On the contrary, many disadvantages could be under consideration such as, using the current techniques of renewable energy is harmful for wildlife especially by using Solar & Wind energies, another disadvantage, the high level of startup working.

Many threats have been raised during last decades concerning the fossil fuels and it could be as one of the main threats that global organizations and unions have to face; many social responsibility efforts should be taken accordingly in 21st century (Oxford Martin, 2022); due to the high level of requirements and novel systems to transfer the use of normal energies into renewable ones with consideration to environment protection (Flah; Abdullah, 2022). Moreover, renewable energy has its further dimensions toward achieving sustainable development (Hussain

et al., 2021) through encouraging the private project investments and then achieving independent economy that leads to social prosperity as well (Al Mahmadi, 2017).

Related Literature Review- recently and after the announcement of International Energy Agency, many efforts and expertise have been taken to discover other sources of energies, studies refer that for time being, there are five kinds of renewable energies for instance, Solar, Wind, Hydropower, Geothermal energy; and Biomass energy (Zohuri & Mcdaniel, 2021). In this context, many studies interested as well in the positive effects of using renewable energy upon having green environment in which there is no polluted emissions (or little), in addition to its role to fight the greenhouse effect (Kahar & Al Jawazi, 2020). Renewable energy is a unique sample of infinity which is considered as sustainable energy that paved the path towards achieving the target of International Energy Agency when it announced in 2015; that every human by the year (2030) has the right to live in peace and prosperity (United Nations Development Program for Arabian Countries, 2022). 21st century featured as a rapid dynamic change around the world, many hard efforts in all aspects of life should be united and have to get their social responsibilities to achieve sustainability; moreover studies refer that many dimensions of achieving sustainable development are in parrel with the use of renewable energy (Arab Network for Excellence & Sustainability, 2022); in this sense, fossil fuels (Oil, Coal, and Natural Gas) considered as a sample of unsustainable phase of consuming due to the high level of waste energy regardless the side effects upon environment and societies as well, meanwhile, advanced countries adopted certain mechanism procedures to achieve sustainable development through reducing the level of consuming in both energy and other natural resources, especially after many global announcements that warnings from the greenhouse effect & reduce pollution emissions; because for instance advanced countries like USA consumes around (33 times) rather than India.

Developing societies in fact depends firstly on developing the way of thinking, developing human mentality as well and by transferring into a green environment, it needs tangible efforts from both governments and societies to adopt new technologies, imitate other experiences related to the usages of renewable energies towards creating many projects to absorb labor intensity that results sustainable development accordingly (Arab Network for Excellence & Sustainability, 2022). Another consideration is that most of developed countries especially in (Middle East), their country-sides are suffered from negligence and the lack of resources; but on the contrary they have many other kinds of resources that could be adopted for many projects of renewable energies such as (Solar, Wind, Hydropower etc).

Taha el al., in 2018 noted that many initiations are raised from United Nations and/ or many international organizations that interested in environment, they initiated for adopting renewable energies as an alternative choice instead of fossil fuels due to damages of greenhouse effects and other polluted emissions, especially after the global population increasing as mentioned in (REN 21) report, and how these renewable energies have a great role in challenging the threats of climate changes and its effects on both environmental and economic life; whereas environment will be green enough for safety life for human beings; meanwhile, economic will be developed accordingly when many projects established and the level of unemployment would reduced as

well; even the level of education & health treatment ranking will be affected in a positive way as a results of prosperity which leads finally to sustainable development (Taha et al., 2018).

Research Method- This section, researchers try to exam and analyze certain published statistical indicators of selected years of global energy consumption from 1990- 2013, while the growth percentage have been presented by using Excel equations (Al Sudani & Al Ethari, 2018), as mentioned below in table (1):

Year	Solar Terawatt/ hour		Wind Terawatt/ hour		Hydropower Million Ton/ EQ Oil		Biomass Million Ton/ EQ Oil		Others Million Ton/ EQ Oil	
	Qty	Growth %	Qty	Growth %	Qty	Growth %	Qty	Growth %	Qty	Growth %
1990	0.4	-	3.6	-	483	-	19	-	21	-
1995	0.6	0.50	8.3	1.31	570	0.18	29	0.53	32	0.52
2000	1	0.67	29.5	2.55	616	0.08	39	0.34	43	0.34
2005	3.7	2.70	104.3	2.54	661	0.07	78	1	85	0.98
2010	31.4	7.49	343.4	2.29	783	0.18	138	0.77	168	0.98
2013	134.5	3.28	640.7	0.87	943	0.20	198	0.43	279	0.66

Source: Al Sudani & Al Ethari, 2018

According to A/M table, although there is an obvious evidence of high level of energy consumption especially after 2010 for all kinds of renewable energies, but these increasing trends are wobbly; another notable point is that, Hydropower consumption was started with high rank of consumption in 1990, it was (483 Million ton/ EQ Oil) in contrary with others, it was (23/time) than other competitor renewable energy source; while after 2005, this kind of renewable energy is decline dramatically, but again it started to increase in 2010 and 2013.

Results & Discussion- Researchers explain the data that mentioned obviously, it could be translated into many figures that reflects each kind of renewable energy individually, as mentioned below; starting with Solar energy in which there is high demand of it and the level of consumption increased continuously for the selected studied duration and the highest level was in 2013. Then, for Wind energy, Hydropower, Biomass, and other kinds of energies respectively; also increased continuously where the peak was in 2013 as well.

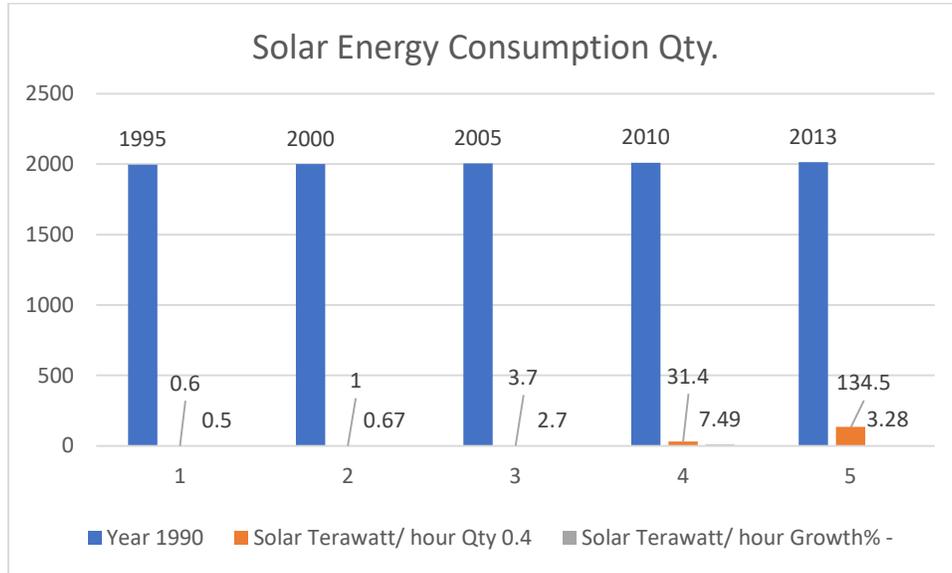


Figure (1) Solar Energy Consumption for (1990-2013)

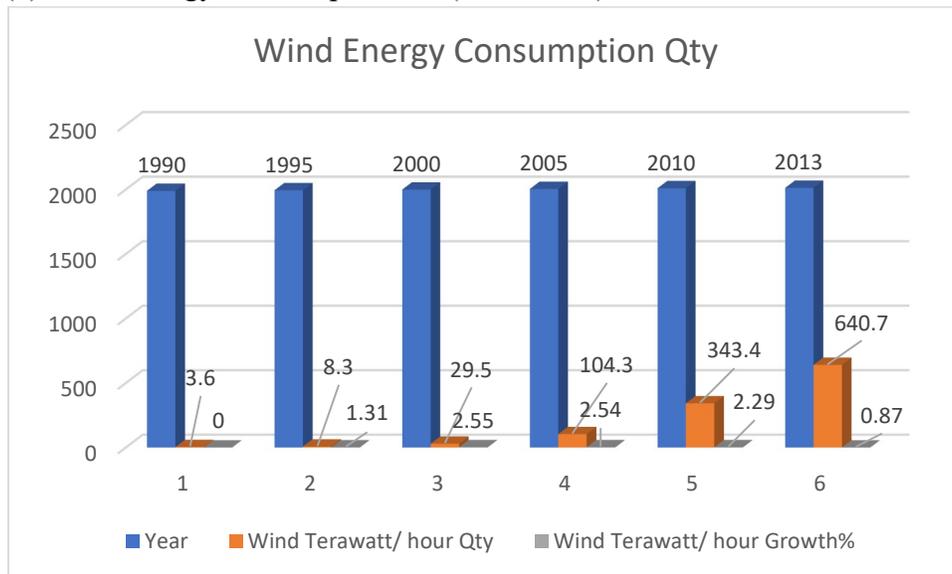


Figure (2) Wind Energy Consumption for (1990-2013)

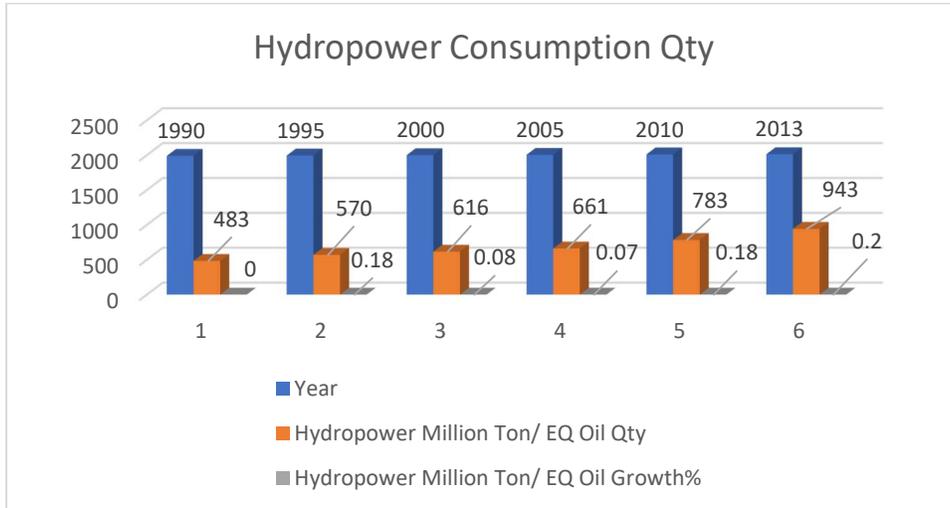


Figure (3) Hydropower Consumption for (1990-2013)

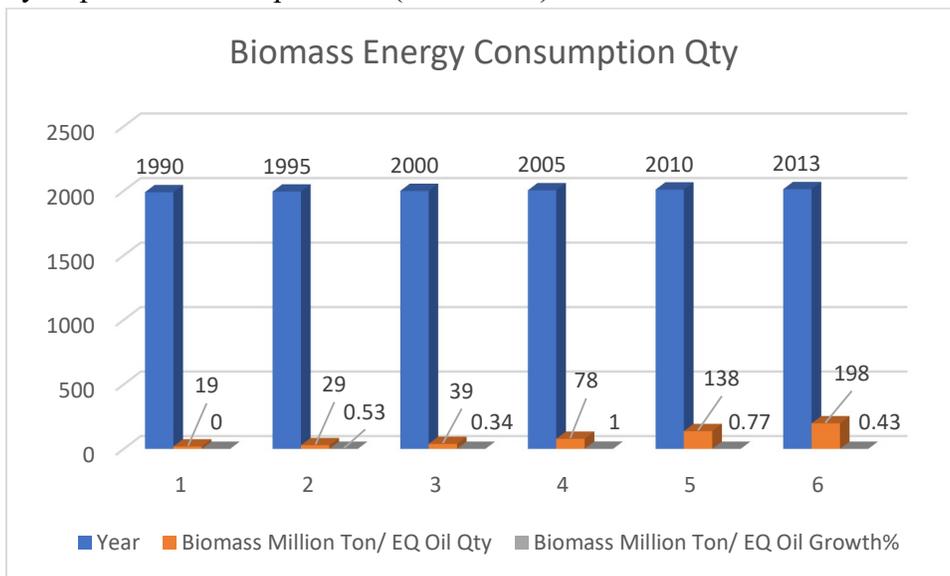


Figure (4) Biomass Energy Consumption for (1990-2013)

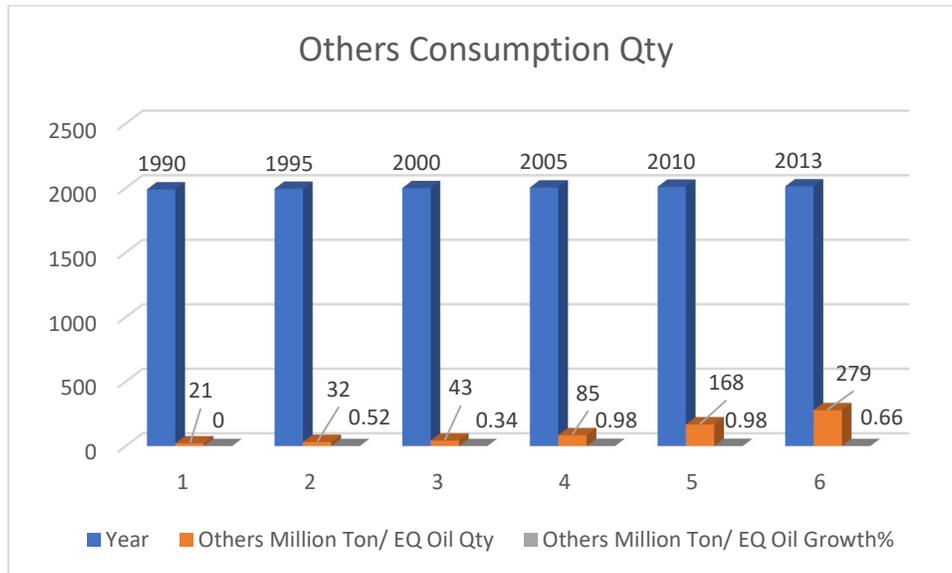


Figure (5) Others renewable energies Consumption for (1990-2013)

In brief, increasing level of renewable energy consumption is good evidence for being on the right path, in addition, using renewable energy is one of the sustainable development goals, especially after reviewing the global trends of investment in renewable energy around the world in which world is divided in to three main areas; APAC (Asia, Pacific Ocean), EMEA (Europe, Middle East & Africa); and third area is AMER (United State) as figured below.

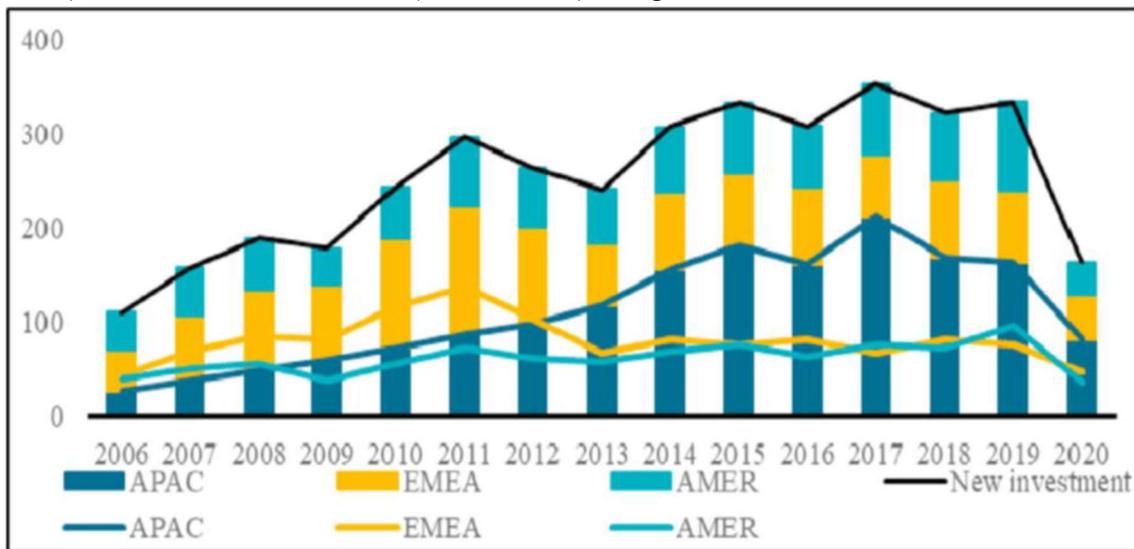


Figure (6) Global Trends of Investment in Renewable Energy

Source: Zhou et al., 2021.

The researchers noted that regional distribution of figure (6) reflects a tight alignment between renewable energy and sustainable development due to the balance of high demand in these regions, with the high level of job opportunities that could be raised through establishing new projects, high demand of technologies mean high demand of qualified employees; so, all these facts lead to

development of educational social, economic aspects of life. But on the contrary, there are a number of limitations or threats that have to be straggled such as; high costs of startup projects, vast spaces for establishing any renewable energy projects; and in some case certain outsourcing technologies.

Conclusions, Limitations & Further Research- although the demand for renewable energy is raised but still it is out of expectation; and many organizations and unions have to sacrifice more efforts toward encouraging these kinds of projects; the polices and legislations have to be formed into a structured ones for same purpose; developing and enhancing societies to be aware enough towards the importance of using these kinds of energies in addition to follow latest update of (Greenhouse Effects) and its effects on environment and human beings as well.

The researchers' point of view is that, more studies and researches are very important to enrich the knowledge of these renewable energies, especially if these studies depend on benchmarking of certain regions and compare the effects of using renewable energies before and/or after.

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