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TECHNOLOGICAL PROGRESS AND ITS ROLE IN DIVERSIFYING ENERGY SOURCES

Abbas Ali Jumaah
College of industrial management for oil and gas, basrah university for oil and gas, Iraq
Abbas.ali@buog.edu.iq

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Abstract:

This research consists of three topics, the researcher tries to clarify in the first research the concept of energy sources of both renewable and non-renewable types with a simple explanation of each, nd completes in the second topic to clarify the technology used recently to obtain clean energy and less impact on the environment, The researcher returns in the third topic to explain the impact of this technology and technical development on the diversity and multiplicity of sources that provide us with energy.

Keywords Boxer, Psychological And Volitional Training, Training Process, Coach, Champion.

INTRODUCTION

For a long time, traditional energy sources have supplied the world with a great deal of energy, but with the natural depletion of its reserves and its continuously increasing consumption as the global population grows and many changing factors, there seems to be uncertainty about the adequacy of these sources to meet the world's current and future energy needs, so it became necessary to invest in technological development in order to optimize the energy resources currently available on the one hand. The activation of the use of renewable energy sources is a safety element for humanity and is not only related to the question of the future of traditional (delectable) sources. In any case, whether the future of conventional energy is guaranteed or not, all measures related to the activation of renewable energy sources will eventually ensure supplies and achieve sustainable balance, especially if the world wants to preserve the environment from the deterioration caused by the increasing use of fossil fuels.

Technological development has an impact on humans, especially in the energy sector, after the energy used until the 19th century was limited to vital energy from wind, water, and steam engines that were used for specific industrial purposes, and thus the methods of obtaining energy from vital sources in terms of design and efficiency were developed by many inventors and engineers.

1.RESEARCH IMPORTANCE:

The research is important by seeking to delve into the extent of expansion and diversity in the production of renewable and non-renewable energy sources by highlighting the role of technological development and its impact on the multiplicity of energy sources.

Research objective:

The research seeks to reflect the reality of traditional and renewable energy sources in light of technological development, by identifying the reality of energy in different countries and their degree of dependence on both renewable and traditional sources and the role of technological development on the future of global energy.

Research problem:

Traditional sources have become questionable in meeting the world's growing future needs, requiring attention to renewable energy technology, taking its role as a complementary energy for the time being and alternative energy in the future.

Research hypothesis:

Given the unreliability of traditional energy sources to ensure future energy supplies, the technological development of renewable and non-renewable energy sources will play an important role in ensuring future energy supplies as well as preserving the environment from pollution caused by excessive use of fossil fuels.

Research methodology:

The research was based on a descriptive analysis approach by describing the realities of renewable and traditional energy and demonstrating the role of technological development in changing the future of energy sources.

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THE FIRST TOPIC

The concept of energy sources and types

First: The concept of energy sources:

There are multiple sources of energy, as well as multiple standards used that reflect the size of energy, according to the total primary energy needs criterion, that are used in the total raw materials used for power generation, including materials sold on the market such as coal, oil and natural gas, sometimes including non-commercial materials such as wood and not including electric and nuclear power. Energy sources or energy are liquid, such as oil or solid coal, as well as hydropower and nuclear power. (Kafi,2017,132)

Energy is the human fuel of the globe and the main engine for wind wheel recycling, without which man sacrifices the elements of economic resources that have been affected by the ideological and political changes of the 20th century unarmed and unable to carry out his work and activities. (Katter,2011,4)

Energy and its various forms, the main concern of many 21st century scientists, the challenges facing the energy sector are many and many, and threaten the progress of human civilization and despite the multiplicity and diversity of energy sources, but the technical, financial and design obstacles remain a stumbling block or those sectors and diverse sources. (Ismail,2015,162)

Energy is the main driver of economic and social development in all countries, whether developing or developed, and the development and good management of primary energy resources is one of the most important fundamentals of continuous development. The starting point of any energy resource management policy is to identify and evaluate available resources economically to determine the most appropriate means of sustaining, developing and consuming them rationally. (Mujahid,2002,13)

Based on the above, the researcher, sees the importance of energy for humans and not relying solely on traditional energy, attention and financing of the technical, financial and design sectors and using advanced and modern technology to obtain other sources of energy and more environmental companionship.

Second: types and forms of energy sources:

A. Renewable energy sources:

It is named after this because it is derived from renewable, available and inexhaustible sources. Renewable energy currently in use is estimated at only about 10 percent of the total energy used around the world and is expected to increase annually to about 15 percent by 2040. (Fergli,2020,10) With increased demand for traditional energy sources such as coal, gas and oil, the world must seek alternative energy sources, particularly renewable sources such as solar and wind power, geothermal and hydro, hydrogen energy, waves, biomass and nuclear energy. Studies have shown that the environmental impacts of renewable energy sources are few compared to other energy sources. (Fred,2017,34)

Table (1)

Distribution of total renewable energy reserves according to their sources in the countries of the world

Renewables	Amount of renewable energy reserves		
	unit	Unit of quadrillion Q	percentage
Solar energy	1337	197860	89
Wave energy	161	298840	1.1approximately

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Wind energy	5	7330	0.3
Biomass energy	1.8	2740	0.1
Geothermal energy	0.31	457	0
Hydropower	0.1	142	0
Total	1505.21	2228469	100

Source: Hani Obeid, Human and Environmental, Energy environment and population systems, (amman, Dar of Al Shorouk for Publishing and Distribution, 2000) p211.

There are many renewable energy sources and they are as follows:
1 – wind energy
Windmills represent early technical skills or a creative invention that was almost lost during the Industrial Revolution, due to the replacement of wind power with fossil fuel energy as an energy source. Some people in the 21st century have supported going back to relying on wind power to manage wind wheels because the wind capacity is clean and infinitely renewable. (Nassar,2018,164) Wind power is widely used in various countries of the world and if the largest of these rates is concentrated in European countries, Denmark gets 15% of its electricity from wind turbines, and in parts of Germany 75% of the electricity is generated from wind. The world's total wind turbine capacity was about 59,206 MW. (Ahmed,2016,11)
2 – solar energy: Solar energy has captured the human mind, since man lived on earth, dazzled by this energy and the strong and continuous heat in its activity. It is responsible for the continuation of life on Earth, and if solar energy exceeded its average, the earth would have become an unbearable hell, and if solar energy had been reduced, the seas and oceans of the world would have frozen and the

forms of life on Earth would have disappeared. (Al-Dulaimi,2014,31). One of the problems faced by researchers in the use of solar energy is the presence of dust and trying to clean solar devices from it, and more than 50% of the energy efficiency is lost if the receiving devices are not cleaned solar energy. The presence of salts in heating water that causes eating for solar complexes. (Al, Din,1994,431)

3 - Geothermal energy
The land we walk on contains large amounts of activity in the form of heat, all underground activity has the ability to generate thermal energy, and thermal underground activity has been used in the form of hot springs for centuries. This energy has been used to produce electricity around the world. (Jebali,2016,237) Geothermal energy is an important source of alternative energy that has been known for thousands of years (Zain,2011,95) some of the disadvantages of this energy, the initial cost of design, installation and the required area of pipeline construction used to produce geothermal energy, but investment in it will save a lot in the future. ((Jebali,2016,237)

4 – Bioenergy
This energy was used as a direct or indirect source and therefore contributed mainly to human civilization and progress, and over the past centuries the role of biomass has decreased and therefore the role of renewable bioenergy, as a result of the intensive use of non-renewable fossil energy sources of oil, coal and others, representing more than 15% of the world's energy needs. It has a more important role in our lives than solar and wind power, and it is an energy source for the rich country, not just the poor and developing. (Fergli,2020,14)

5 – water energy: The energy stored in the flow of water or fallen water from high places, used to move wheat windmill turbines to pump water and produce electricity, with kinetic energy or latent energy, and one of the advantages of this energy is 'medium energy production and access to electricity at low cost. (Al-Hamwi,2016,35)

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B. Non-renewable energy sources:
We get it from the ground as liquid as in oil, as gas as in natural gas, or as a solid material as in coal, which is not renewable because it cannot be made again or borrowed again. (Amara,2012,28). Non-renewable energy is the most used for a number of reasons, the cost of extraction is lower than renewable energy, more effective and stronger, widespread and characterized by availability, the dependence of developing countries on them in the conduct of their lives and does not need scientific research and studies required by renewable energy sources. (Khater,2011,40)
Some forms of non-renewable energy export include:
Fossil fuels / Society has recently become addicted to fossil products - oil - such as oil, natural gas and coal, to the extent of wars and conflicts, especially since the world has as of 2014 about 43 thousand wells although the world knows how dangerous it is to rely on fossil fuels. Fossil fuel consumption increases by 3% as a non-renewable source of energy. (Al-Hawari,2019,31)
The countries that consume the most non-renewable energy sources are as follows: (Fergli,2020,27)
1 - The United States consumes more than 20% of oil, followed by Europe, China, Japan and other developed countries of the world.
2 - China is at the forefront of the most coal-consuming countries.
3 - The United States tops the list with natural gas consumption, followed by Russia, China, Japan, India, South Korea and finally Africa.
4 - France supplies 75 percent of the country's nuclear power, followed by Ukraine (48 percent). South Korea (31%) Japan (27%).

Third: Energy sources and challenges
The quality of the challenges and variables facing energy systems today depends on the standards of development and technological innovation, changes in consumption patterns, with policies interested in investing in other clean energy sources. (Dajani,2017,26) The increase in the burning of fossil fuels during this century, especially oil and gas to meet the growing demand for energy has led to an increase in the emission of gases into the atmosphere and increased concentration, and large numbers of species of animals and plants are threatened to disappear forever from the planet as a result of the destruction of natural habitats in land, oceans and seas, and these challenges will lead to further discoveries and applications to develop alternative energy sources. Especially solar and wind power. (Al-Akkim,1999,29)

Fourthly: The evolution of energy source
Energy sources have evolved more clearly than ever before for the community of capacity, overexploitation, consumption of non-renewable energy sources and renewable resources as well. These activities have created consequences for future generations and are likely to be catastrophic. (Allom,2018,12) The review of human history since ancient times reveals to us that energy is the key and greatest key to achieving the dreams of man and the best for him, and since ancient civilization the potential energy was used for heating, lighting, self-defense against predators and access to food, and during the long centuries that man lived in the search for his happiness and material well-being using various forms of energy sources such as coal, oil and electricity and was able in modern times to harness energy to achieve the best for him and even reached outer space. (Samak,2020,261)

Table (2)
Forecasts - until 2050 - for primary energy sources and demand
(1 million tons of oil equivalent) and carbon dioxide emissions (1 million tons of carbon)

year	2010	2050
Energy demand	11171	21015
Energy sources (1 million tons equivalent)		

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oil	3900	5800
coal	3200	5000
gas	2500	6100
Water, nuclear, and other.	1560	4100
Carbon dioxide emissions	11	15

Source: Mahmoud Sri Taha, Energy conservation and demand management, (Cairo, Arab Nile Group) 2006, p14

THE SECOND TOPIC

Renewable energy technology

First: Energy technology and factors affecting it:

The scientific revolution began technology in the 17th century, which means the historic transition from handicraft to automated industry, and the energy source was derived from steam and the power of steam was replaced by muscle strength. In addition to factories that have developed and become close to coal mines to get it in the best economic ways, and through this technological revolution the connection of energy has become easier for different countries. (Al, Tikrit,2019,101)

Technological development is at the forefront of the changes affecting the global production system, relying on the latest means of production discovered by creators and pioneers of science and creativity. Hence, most of the range of modern energy will be affected by a range of rapid technologies, attention to the development of technologies and increased efficiency of their energy production, thereby reducing reliance on traditional sources of energy production. (Salman,2016,124)

The use of modern energy technology is influenced by a number of factors and can be explained as follows:

1 - The lack or lack of interest in the use of renewable energy sources to produce energy and the misperception of the nature of the work and applications of energy technologies by the parties concerned and society as a whole are a major obstacle to relying on clean sources in energy production. (Ahmed,2016,89)

2 - The high investment cost required in addition to supporting the prices of energy generated from traditional energy sources. (Ibrahim,2019,262)

3 - Solar and wind technology faces technical constraints due to the lack of effective electricity storage technology for facilities available during daylight hours, and the introduction of large projects in this way is an economic and technical challenge in itself. (Dajani,2017,34)

4 - Energy decisions require significant financial investments in obtaining energy-intensive technology and long planning times that cannot be easily reversed in the long run. (Taleb,2019,15)

Second: Modern technology for the production of renewable energy:

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To produce cleaner energy, the use of fossil fuels that release carbon dioxide should be reduced when used to generate electricity or for heating and transportation. This could be used temporarily to replace less polluting fossil fuels, such as natural gas replacing coal and highly polluting heavy oil. But by the end of the day, renewable energy such as electricity generated by wind, sun and water will be the best alternative to future energy. (IMF,2015,15)
Investing in clean energy sources will become the best alternative for different countries of the world, especially solar energy, not only acceptable, but probably with technological progress, experimental research and growth in production that will be characterized by low cost for other sources. (Al-Khoiter,2018,41)
Countries that have exploited renewable energy sources to be an alternative to depleted and highly polluting fossil fuels have differed from the most prominent countries that have used these sources, as illustrated by the following table:

Table (3)
The most widely used renewable energy technology in the world

Renewables	**Producing countries**	**Percentage production amount (Electricity production and heating)**
Thermal energy	Iceland	100%
Wind power and biomass	Norway	97%
Wind and waves	Sweden	50%
Wind, solar and biomass	Portugal	47%
Wind power and biomass	Denmark	45% 30% (wind power) 10% (biomass)
Solar and wind mass	Germany	20%

Source: Ola Adnan, 2014, the world's highest renewable energy use, Rank Politicians
http://www.irena.org
From the table above, we note Iceland is at the forefront of renewable energy-dependent countries, providing 100% of its electricity needs through renewable generation, particularly geothermal energy in home heating, hydropower for lighting and electricity generation for industrial uses and the like, while Norway also supplies largely hydropower generation, and has begun to add other means over the last decade to include wind power and biomass. Together, these means provide nearly 97% of Norway's total energy needs nationwide, Sweden exploits its geographical nature

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and provides water resources extensively in wind-based power generation and wave movement on its extended beaches, as well as hydropower generated by dam construction on rivers. The use of renewable energy in Sweden amounts to nearly 50% of the total energy consumed in the country, Portugal, it provides 47% of the country's energy through renewable energy. Portugal was able to provide only about 20% of the electricity needed through the exploitation of wind power, as well as lower proportions generated through biomass and solar energy. The remaining amount depends on hydropower, while Denmark relies on renewable energy to provide nearly 45% of its electricity needs nationwide, divided mainly by what is produced through the exploitation of wind power (about 30%). Biomass (15%). Denmark is one of the world's most wind-generating countries. Since that announcement, investment in renewable energy has increased in pursuit of this goal, and Germany's renewable energy production is expected to gradually increase in the coming years.

Third: Renewable energy technology:
The development of new technology and ideas, such as fuel cells that will become more important in the future and since wind and solar energy is the most abundant, inexhaustible and clean, are the fastest growing energy sources in the world. Hydroelectric energy is undoubtedly continuing to be a neglected source of electricity in the future, but it is not expected to grow much in some countries due to the lack of potential sites and environmental considerations (Environmental Generation,2014,471)
The various means and techniques for producing clean energy in various technological ways that can be explained as follows:
1 - Stream systems: Also called linear focus complex, which focuses the focal point of the sun for the purpose of generating electricity, and is named after the system of its curved shape, a group of them can be connected to each other to generate as much carp energy as possible, and one system of which can produce
(80) megawatts of electricity. The way it works is by concentrating sunlight inside the mirrors in the system and thus generating heat, which in turn turns into steam to power the turbine generating ceramic energy. (Mustafa,2018,124)
2 - Solar towers: solar towers or known as electric towers, power towers, central receivers or rotary mirror stations of power, which need a large area or extend high ' and through mirrors the sunlight is reflected to a fixed point which is the point of the incinerator and the anchor located at the top of the tower at a height of 50 to 150 meters captures the solar rays packed. This process can provide a temperature of up to 1000 degrees Celsius and help generate power. (Al halak,2007,542)
3 - Solar furnaces are mainly used to produce heat or steam to generate electricity and industrial uses, and the heat generated in industrial processes is clean and will not produce any harmful radiation. The oven was designed in the form of parabola and lenses, and some of these furnaces produced 100 kilowatt hours of electricity. Future uses of these furnaces can be in ceramics, hard surfaces, coatings and silicon processing processes. It is believed to contribute to the manufacture of space, defense and electronics products.
4 - Wind turbines: These poles expand to turn the wind into another form of energy that is easy to use, often electric using helicopters. Total wind power production for 2006 was 74,223 MW, equivalent to 1 percent of global electricity use.

THE THIRD TOPIC
The impact of technology on the multiplicity of energy sources
First: The impact of technological development on the future of energy:
The impact of the progress and development of modern means and technologies on the future of countries for their energy production can be explained by the following:
The future of fossil fuels in light of technological development, where wind energy is taken seriously, where wind turbines provided electricity at acceptable rates to various countries of the world, although wind provides less than (1%) of global demand for electricity. Its growth rate indicates that it will be a major energy supplier in the relatively near future, and wind power can provide 10 percent of the world's energy. In the long run, it could provide more electricity than hydropower, which currently provides 20 percent of the world's electricity. of electricity in the world
With a global generating capacity of 800 GW, hydroelectric plants provide about 20 percent of the total. of the total electricity consumed globally. Hydropower facilities can respond quickly to the change in Mona's energy needs from climatic conditions and provide support for other renewable energy sources. Large hydropower facilities store energy produced elsewhere, and provide water for irrigation and flood control. (UN Report,2010,57)
Other ways of producing energy, which affect the future of traditional energy production methods, are the production of energy in cells, furnaces or solar towers, and they hold an important position within the alternatives related to

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clean or renewable energy, but solar energy requires other considerations and special attention if countries want to replace this energy to replace conventional energy, it requires sunlight throughout the period of use, so technologies must be revered to store this energy produced during the period of the sun's protest. Such as thermal, mechanical, chemical and magnetic storage. The price of this energy is the price of equipment needed to convert PV into hydroelectric energy, which causes high costs but has begun to decline thanks to ongoing research and intensive studies. (Rhyme Thought Magazine,2019,127)

Second: The role of technology in the global energy system:

The world order is at a crossroads. Current global trends in energy supply and consumption are clearly unsustainable environmentally, socially and economically, and by 2030 carbon dioxide levels are expected to increase by 45%, resulting in a global temperature rise of more than 5%, leading to dramatic change and economic damage worldwide. The way power is generated and how it is used must be changed. (Carl,2012,112)

There is an improvement in the competitiveness of renewable resources after the rapid spread of these resources through the adoption of supportive policies aimed at overcoming most of the challenges preventing their use, and the technology of producing electric power, heating and transportation by wind and solar energy and various types of renewable energies has become more productive and cheaper than in the 1970s. This is due to technological innovation in reducing costs and increasing production. (Emirates Center for Strategic Studies and Research,2013,317) Various countries around the world have developed a technological reform strategy, as a kind of clean and alternative energy production technologies as the Netherlands did several years ago and proceeded with the carbon permitted ratio project. Developing countries can also cooperate with technologically advanced countries, and share these advanced technologies and means to reach a global solution that reduces the emission of gas polluting the environment. (Khalifa,2006,77)

Developing countries need to keep up with technological development as various global countries that have taken the path of clean and renewable energy in the future, especially with the heavy uses of traditional energy sources and future expectations described as depleted energy, and even if their consumption continues for another decade they pose a threat to the environment, and although some developing countries try to keep up with modern technology to ensure the future of their energy, they are still limited by the slow technological development and limited economies of renewable energy sources in these States.

CONCLUSIONS

1 - Although fossil fuels control oil, natural gas and coal globally, renewable energy technology can be taken care of as the best alternative to energy in the near future.

2 - Technological innovations throughout the history of fossil fuels have played a key role in its development, but with declining investments in research and development, this decline is due to changing patterns of investment in energy technology for the benefit of carbon-emitting technologies, but various countries around the world are still seeking and engaging in renewable energy as a potential alternative to clean energy.

3 - Analysis of the global energy market leads to the observation of increased demand for future energy, with increased expected population growth, and the need to develop appropriate policies for energy production, on the other hand, technological development offers great opportunities towards increasing the base of energy sources, especially renewable, which must be adapted between challenges and opportunities for better exploitation of energy sources.

4 - Renewable energy sources have the potential to be reliable and worthy of long-term alternative sources provided government support is available and clean energy policies are adopted

5 - At present, fossil fuels account for the largest share of global energy demand, and on the other hand, the natural depletion of fossil fuels and their environmental damage are important factors that have led many countries to look for inexhaustible energy alternatives that meet human energy needs, so renewable energy sources have emerged to take on the role of complementary sources of fossil fuels in the near future.

RECOMMENDATIONS

1 - It is necessary to reduce dependence on conventional energy and take all necessary measures in the future energy savings.

2 - Increase investments in renewable energy sources in order to develop them and benefit from the fact that they are a guarantee of the security of future energy supplies

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3 - Encouraging developing countries to follow technological development in renewable energy, and seeking to apply the latest and most efficient technologies in order to rely on the best energy production methods that are environmentally friendly
4 - The need for international cooperation in the field of scientific research and technology transfer in relation to renewable energy sources, and work to form a special international agency in the field of alternative sources in order to support and strengthen efforts aimed at enhancing the efficiency of the investment of these sources.
5 - The need to spread, understand and facilitate international cooperation in research and development and raise awareness about the opportunities and potential of renewable energy sources to ensure that the world is supplied with future energy.

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