

RENEWABLE ENERGY SOURCES AND TECHNOLOGIES

Narimanov Baxodir Absalomovich*

**Senior Lecturer,
Jizzakh Polytechnic Institute,
UZBEKISTAN

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ABSTRACT

The world is rapidly turning into a global village due to the increase in the daily energy demand of the entire population around the world, while the earth in its form cannot change. The need for energy and related services to meet the needs of social and economic development, welfare and health of people is increasing. Returning to the use of renewable energy sources for climate change mitigation is an excellent approach that must be sustainable in order to meet the energy needs of future generations. The study looked at the opportunities associated with renewable energy, including: energy security, energy access, socio-economic development, climate change mitigation and reduced environmental and health impacts. Despite on the these opportunities exist _ challenges that hinder the sustainability of renewable energy use for climate change mitigation. These challenges include market failures, lack of information, access to raw materials for the future use of renewable resources, and our daily carbon footprint. The study proposes some measures and policy recommendations that, if considered, will help achieve the goal renewable energy sources to reduce emissions, mitigate the effects of climate change and ensure a clean environment and clean energy for all and future generations.

KEYWORDS: *Rapidly Turning, Comfort, Mobility, Traditional, Renewable.*

1. INTRODUCTION

The world is rapidly turning into a global village due to the increase in the daily energy demand of the entire population around the world, while the earth in its form cannot change. The need for energy and related services to meet the needs of social and economic development, welfare and health of people is increasing. All societies require energy services to meet basic human needs such as: health, lighting, cooking, space comfort, mobility and communication, and serve as generative processes. Ensuring energy supply and containing the contribution of energy to change climate are two main tasks energy sectors on the path to a sustainable future. It is surprising to realize that in today's world 1.4 billion people do not have access to electricity, and 85% of them live in rural areas. As a result, the number of rural communities using traditional style biomass is projected to grow from 2.7 billion today to 2.8 billion in 2030. Research on alternative energy sources began in the late 90s, when the world began to receive the shock of oil produces in terms of rising prices. The literature proves that the replacement of fossil fuel-based energy sources with renewable energy sources, which include: bio energy, direct solar energy, geothermal energy, and hydropower, wind and ocean energy (tides and waves), will gradually help the world achieve this idea. Sustainability. Governments, intergovernmental institutions,

stakeholders and individuals around the world today look forward to achieving a sustainable future through the opportunities created in recent decades to replace petroleum-derived materials from fossil fuel-based energy sources with renewable energy alternatives. The recent launch of a set of global SDGs helps ensure that climate change is tackled in the twenty-first century and its impacts, as well as a sustainable and legacy future.

2. Renewable Energy Sources and Sustainability.

Renewable energy sources are replenished naturally without being depleted in the ground; they include bioenergy, hydropower, geothermal, solar, wind and ocean (tide and wave) energy. The main types of renewable energy and their use are presented in Table 1.

Despite the outstanding benefits of renewable energy sources, there is a certain disadvantage such as: intermittent production due to seasonal fluctuations since most renewable energy sources are climate-dependent, so their operation requires complex design, planning and control optimization methods. Fortunately, continuous technological progress in computer technology and software allow scientific researchers to deal with these optimization challenges using computing resources applicable to renewable and sustainable energy.

TABLE 1. RENEWABLE ENERGY SOURCES AND THEIR USAGE SOURCES	
Energy sources	Energy conversion options and uses
Hydropower	Power generation
Morden biomass	Heat and power generation, pyrolysis, gasification, fermentation
Geothermal	Urban heating, power generation, hydrothermal vents, hot dry rocks
Sunny	Solar home systems, solar dryers, solar cookers
Direct solar energy	Photovoltaics, thermal power, water heaters
Wind	Power generation, wind turbines, windmills, water pump
Wave and tide	Numerous design, barrage, tidal current

2.1. Renewable Energy and Climate Change

Currently, the term "climate change" is of great interest around the world, both in scientific and political discussions. The climate has been changing since the beginning of creation, but the rate of change in recent years is worrying, and this may be one of the threats facing the Earth. The growth rate of carbon dioxide has increased over the last 36 years (1979-2014) "averaging about 1.4 ppm a year until 1995 and 2.0 ppm a year thereafter." The United Nations Framework Convention on Climate Change defines climate change as being directly or indirectly related to human activities that change the composition of the global atmosphere and in turn exhibit natural climate variability observed over comparable time periods.

Renewable technologies are considered clean energy sources and the optimal use of these resources reduces environmental impact, produces minimal recycled waste and is sustainable

based on current and future economic and social needs. Renewable energy technologies provide an exceptional opportunity to reduce greenhouse gas emissions and reduce global warming by replacing traditional energy sources (based on fossil fuels).

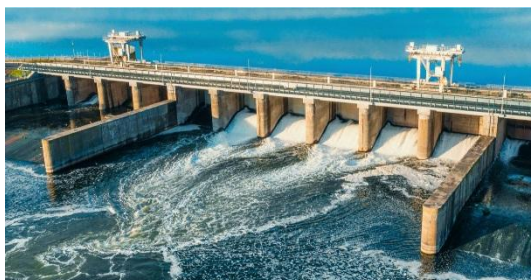
3. Renewable energy sources and technologies

Renewable energy sources are sources of energy from the natural and constant flow of energy that occurs

in our immediate environment. These include: bioenergy, direct solar energy, geothermal energy, Hydropower, wind and ocean power (tides and waves).

3.1. Hydropower

Hydropower is an important source of energy derived from water moving from higher to lower levels, mainly to turn turbines and generate electricity. Hydropower projects include dam project with reservoirs, channel and riverbed projects and cover various project scales. Hydropower technology is technically mature and its projects use resources that change temporarily. Primary energy is provided by gravity and the height from which the water falls onto the turbine. The potential energy of the stored water is the mass of water, the gravity coefficient ($g = 9.81 \text{ m/s}^2$) and the head, defined as the difference between the level of the dam and the level of the downstream. The level of the reservoir changes downwards to some extent when the water is released and accordingly affects the generation of electricity. Turbines are designed for additional water flow. Hydropower emits virtually no particulate matter, can be upgraded quickly, and is capable of storing energy for many hours.



3.2. Direct Solar Energy

The word "direct" solar energy refers to the energy base of those renewable energy technologies that directly use solar energy. Some renewable technologies, such as wind and ocean thermal, use solar energy after it has been absorbed by the earth and converted into other forms. Solar energy technology is derived from solar radiation to generate electricity using photovoltaic and concentrating solar energy (CSP), to produce thermal energy, to meet the demand for direct lighting, and possibly to produce fuel that can be used for transportation and other purposes. According to the World Energy Council, "the total energy of solar radiation falling on the earth is more than 7,500 times the world's total annual primary energy consumption of 450 EJ."



3.3. Bioenergy

Bioenergy is a renewable energy source derived from biological sources. Bioenergy is an important source of energy that can be used for biodiesel-powered transport, electricity generation, cooking and heating. Electricity from bioenergy draws on a wide range of different sources, including forest by-products such as wood waste; agricultural waste such as sugar cane waste; and animal waste such as cow dung. One advantage of biomass-based electricity is that the fuel is often a by-product, residue or waste from the above sources. Notably, this does not create competition between land for food and land for fuel. Currently, the world production of biofuels is relatively small, but constantly growing. Annual consumption of biodiesel in the United States in 2006 was 15 billion liters. It grew at a rate of 30-50% per year to reach the annual goal of 30 billion liters at the end of 2012.



3.4. Wind Energy

The emergence of wind as an important source of world energy has taken a dominant position among renewable sources. Wind exists everywhere in the world, in some places with significant energy density. Wind energy uses the kinetic energy of moving air. The main application of the importance of climate change mitigation is in the production of electricity with large turbines located on land (land) or offshore (sea or fresh water). Onshore wind technologies are already being produced and deployed on a large scale. Wind turbines convert wind energy into electricity.



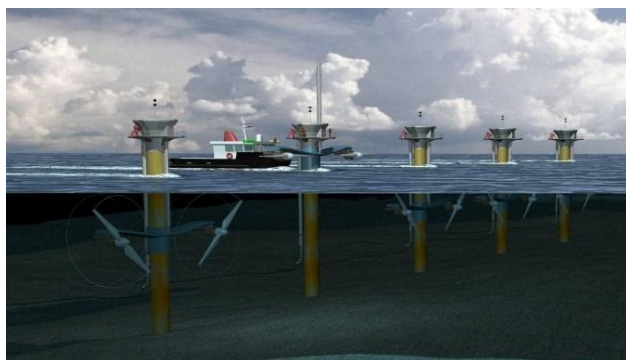
3.5. Geothermal Energy

Geothermal energy is naturally extracted from the bowels of the earth as a source of thermal energy. The origin of heat is associated with the internal structure of the planet and the physical processes occurring on it. Although heat is present in vast quantities in the earth's crust, not to mention the deepest parts of it, it is unevenly distributed, rarely concentrated, and often too deep to be exploited mechanically.



3.6. Ocean Energy (Tides and Waves)

Surface waves are created when wind passes over water (ocean). The higher the wind speed, the longer the wind lasts, the greater the distance the wind travels, the greater the height of the wave, and the greater the wave energy produced. The ocean stores enough energy to meet the world's total electricity demand many times over in the form of waves, tides, currents and heat. In 2008, the production of the first generation of commercial Ocean Energy devices began, the first of which were installed in the UK - SeaGen and Portugal-Pelamis. There are currently four ways to obtain energy from marine areas, namely wind, tides, waves, and thermal differences between deep and shallow sea waters.



6. CONCLUSION

Energy is a need in our daily lives as a way to improve human development, leading to economic growth and productivity. A return to renewable energy will help mitigate the effects of climate change. Great way, but it needs to be sustainable to ensure a sustainable future for generations meet their energy needs. Knowledge of the relationship between sustainable development and, in particular, the use of renewable energy sources is still limited. The purpose of the article was to find out whether renewable energy sources were sustainable and how to move from fossil fuel to renewable energy sources energy sources will help reduce climate change and its impacts. A qualitative study was carried out reviewing papers as part of the study. Although the full life cycle of renewable energy sources have no net emissions, which will help limit future global greenhouse gases emissions. However, cost, price, political environment and market conditions have become barriers preventing developing, least developed and developed countries from realizing their full potential. Thus, creating global opportunities through international cooperation that supports least developed and developing countries to the availability of renewable energy sources, energy efficiency, clean energy technologies and investment in research and energy infrastructure will reduce renewable energy costs, remove barriers to energy efficiency (high discount rate) and promote new opportunities for climate change mitigation.

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