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Review Article-Renewable Energies

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Abstract

A majority of the communities around the world rely heavily on oil, natural gas and coal for their energy needs. These fuels draw on lots of resources that will eventually diminish, which in turn makes them too expensive or too environmentally damaging to recover. This review article discusses the advantages and disadvantages of renewable energies; therefore based on the benefits of these energy resources, the use of renewable energies, instead of, fossil fuels will be a good solution for the control of the environmental, social and economical problems of our communities.

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1. Background

Based on statistical data from 2011 by the US Department of Energy Information, primary consumption of energy by source and sectors were [1]:

Table1. Energy sources for different sectors of the society in the US

Sources of Energy	% Use	Consumption by Sectors	%Use
Petroleum	36%	Commercial	40%
Natural Gas	26%	Transportation	28%
Coal	20%	Industrial	21%
Renewable Energy	9%	Residential	11%
Nuclear Electric Power	8%		

The above data shows almost 90% of sources of energy in the US were non-renewable; therefore it would be beneficial to employ renewable energy resources (wind, solar, geothermal, wave and biomass energy) because of their availability and cleanliness.

Renewable energy is derived from natural processes that are replenished constantly. In its various forms, it derives directly from the sun, wind, rain, tides of ocean, biomass and geothermal resources from heat generated deep within the earth. In 2008, about 19% of global final energy consumption came from renewable, with 13% coming from traditional biomass, and 3.2% from hydroelectricity. The share of renewable in electricity generation is around 18%, with 15% of global electricity coming from hydroelectricity and 3% from new renewable. Renewable energy replaces conventional fuels in four distinct areas: power generation, hot water, transport fuels and rural (off-grid) energy services [2]

The selection of energy has global implications that affect greenhouse gas emissions, water resource distribution, mineral consumption, and equipment manufacturing and transportation. The school of thought is that renewable energy technologies are more sustainable than many current sources of energy. There is a need for verification of the sustainability of renewable energy, which can easily be done by resource-use optimization, techno-economic feasibility and cost analysis, life cycle assessment, environmental externalities analysis, cost benefits analysis, manufacturing cost analysis, research and development targets and barrier identification and water requirements and distribution analysis. [3]

In general renewable energies are not adaptable to every single community because of two main factors, the distribution of the natural resources that has dependency on the geographical locations and energy-use with its dependency on the culture of individual community. The other limitations are growth rate and infrastructure.

Application of any renewable energy requires a sustainability analysis, which has dependency on three main components: environmental effects, externalities costs, and economics and financing. Each one of these variables has a major impact on the application of renewable energies; therefore before committing communities to different sorts of renewable energies, a thorough research must be done in order to have an assurance that no social, environmental or economical problems arise or are compromised because of them. [3]

2. Renewable Energies

This paper reviews advantages and disadvantages of few common renewable energies: hydropower, solar power, wind power, geothermal power and biomass. Hopefully after studying this review article, the public has a better

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